BLOOMINGTON HISTORIC PRESERVATION COMMISSION
Showers City Hall
McCloskey Room
Thursday, June 23, 2016
5:00 P.M.
AGENDA

I. **CALL TO ORDER**
II. **ROLL CALL**
III. **APPROVAL OF MINUTES**
March 31, 2016
May 12, 2016
IV. **CERTIFICATES OF APPROPRIATENESS**
Staff Review
A. COA-16-27
528 S. Highland Ave.: Elm Heights
Petitioner: Debra Herbenick
Tree removal.
B. COA-16-31
613 W. 4th St.: Greater Prospect Hill
Petitioner: Sandra Washburn
Add faux chimney with cap to conceal fireplace flue pipe.
C. COA-16-32
701 S Ballantine: Elm Heights
Petitioner: Jennifer Schopf and Jon Fiedler
Replace fence and remove trees.
Automatically approved per 30 day statute.
A. COA-16-28
713 W. Wylie: McDoel
Petitioner: Jennifer Will
Installation of a porch railing and porch step rebuild.
B. COA-16-29
1210 S. Madison: McDoel
Petitioner: Derek Taylor
Demolish storage shed and build a new one.
C. COA-16-30
416 E. 16th St.: Garden Hill
Petitioner: Justin Fox
Reside house and replace windows.
Commission Review
A. COA-16-33
912 W. 2nd St.
Petitioner: Scott and Jessica David
Request to replace two front steel framed windows with Midway vinyl double hung windows.

V. **DEMOLITION DELAY**

A. Demo Delay 16-15
106 E. Hillside Dr.
Petitioner: James Crane
Full demolition.

B. Demo Delay 16-17
3820 E. Moores Pike
Petitioner: Loren Stumpner, Stumpner's Building Services
Substantial demolition.

C. Demo Delay 16-18
504 W. 11th St.
Petitioner: Bill Beggs (Bunger & Robertson)
Full demolition.

D. Demo Delay 16-19
600 E. Hillside
Petitioner: Dwellings, LLC (Mark Lauchli)
Full demolition.

E. Demo Delay 16-20
602 E. Hillside
Petitioner: Dwellings, LLC (Mark Lauchli)
Full demolition or potential moving building by BRI, Inc.

F. Demo Delay 16-21
444 S. Walnut St.
Petitioner: TDDM LLC (Tim Ellis)
Full demolition.

G. Demo Delay 16-22
812 N. College Ave.
Petitioner: Hannah's House
Roof material change.

VI. **NEW BUSINESS**

A. Comment on Dunnhill PUD
B. Comment on Hillside and Henderson PUD
C. Comment on 7th and Morton development, adjacent to Antique Mall

VII. **OLD BUSINESS**

A. Kirkwood Manor update

VIII. **COMMISSIONERS' COMMENTS**

IX. **PUBLIC COMMENTS**

X. **ANNOUNCEMENTS**

XI. **ADJOURNMENT**

Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or e-mail human.rights@bloomington.in.gov.

Next meeting date is Thursday, June 23, 2016 at 5:00 p.m. in the McCloskey Room

Posted: June 16, 2016

STAFF ISSUED PERMITS REPORT **June 23, 2016**

Certificates of Appropriateness: Staff Review

A. COA-16-27
528 S. Highland Ave.: Elm Heights
Contributing, c. 1945, split level.
Petitioner: Debra Herbenick
Tree removal due to proximity to house.

B. COA-16-31
613 W. 4th St.: Greater Prospect Hill
Contributing, c. 1905, pyramidal roof cottage
Petitioner: Sandra Washburn
Add faux chimney with cap to conceal fireplace flue pipe.

C. COA-16-32
701 S Ballantine: Elm Heights
Notable, c. 1925, dormer front bungalow
Petitioner: Jennifer Schopf and Jon Fiedler
Replace fence and remove trees.

BLOOMINGTON HISTORIC PRESERVATION COMMISSION

Showers City Hall
McCloskey Room
Thursday, March 31, 2016
5:30 P.M.
Minutes

I. CALL TO ORDER

Meeting is called to order by Vice-Chairman Chris Cockerham at 5:30.

II. ROLL CALL

Commissioners:

Jeannine Butler
Chris Cockerham
Dave Harstad
Marleen Newman
Lee Sandweiss
Chris Sturbaum

Advisory:

Lesie Abshier
Duncan Campbell
Jeff Goldin
Derek Richey

Staff:

Patty Mulvihill – City Legal
Dan Sherman – Council Office
Bethany Emenhiser – HAND
Doris Sims – HAND
Valerie Hosea – HAND
Jackie Scanlan – Planning & Transportation Dept.
James Roach – Planning & Transportation Dept.

Guest(s):

Doran May – 401 S. Walnut
Steven Hoffman – H.M.Mac
Harris Mujezinovic – H.M.Mac
Tim Copper – H.M.Mac
Mark Hoffman – H.M.Mac
Kale Wills – IU News Net
Ash Vega – Public
Catherine Brennan – Public
Emily Hines – Public
Keith Siezer – Public
Susan Seizer – Public
Jeremy Stone – Public

I. NEW BUSINESS

A. 401 S Walnut St

Bethany Emenhiser gave her presentation. See packet for details.

Marleen Newman asked if the original building begins under the roof.

Bethany Emenhiser said yes.

Marleen Newman asked if the pink and brown roof is original.

Bethany Emenhiser said no.

Chris Sturbaum asked if the lot includes the parking lot and the building.

Bethany Emenhiser said yes.

Dave Harstad asked about the building's square footage, lot acreage, and what the Commission is designating.

Bethany Emenhiser estimated 180 to 200 square feet. It is on 1/3 of an acre. The Commission is designating the property as it exists today. The Commission can decide whether to include the signs or not. The property could also be relocated if it is designated.

Leslie Abshier asked if the building could be sold to a different company.

Bethany Emenhiser said yes.

Marleen Newman asked how the Commission could determine whether to designate a building as it today versus the building in past years.

Bethany Emenhiser explained the Commission can't designate something that is not currently visible.

Patty Mulvihill explained the Commission is discussing whether it wants to designate the building. The owner has the right to demolish due to a vested permit right. The property owner could rescind the permit application and the Commission could place the property under interim protection.

Jeff Goldin asked if the roof is compromised without the A-Frame.

Bethany Emenhiser said that can't be verified.

Chris Cockerham asked if the general condition is good enough to move the structure.

Bethany Emenhiser explained it is in fairly good condition. A lot of the base is original. **Bethany Emenhiser** read a letter, from Justin Loveless, the Chocolate Moose owner, about the condition of the surrounding buildings.

Doran May, 401 S Walnut St property owner, explained the people of Bloomington will not lose the Chocolate Moose. It is just moving. The current building is falling apart and needs to go.

A number of residents in attendance wanted to discuss the developer's plans for the Chocolate Moose and the parking lot.

Bethany Emenhiser and **Patty Mulvihill** clarified the purpose of the meeting is to discuss designation of the structure at 401 S. Walnut, not the business operating at the location or the parking lot.

Marleen Newman suggested the developer build over the structure with a flat roof as a compromise to allow integration between the interior and exterior space.

Derek Richey supported the compromise idea to preserve the building.

Lee Sandweiss asked if anything salvageable from the structure could be incorporated in the new business structure.

Jeff Goldin said the building has been changed enough that it is no longer valuable enough to designate. He encourages the developer to donate the building.

Chris Sturbaum made a motion to waive Demolition Delay for 401 S Walnut Street. **Dave Harstad** seconded. Motion passed 6-0.

VIII. COMMISSIONERS' COMMENTS

Chris Sturbaum said he would like the Commission to meet about a structure before the demo permits are out.

IX. PUBLIC COMMENTS

No comments.

X. ANNOUNCEMENTS

No announcements.

XI. ADJOURNMENT

Meeting is adjourned by Chris Cockerham at 6:44 p.m.

END OF MINUTES

BLOOMINGTON HISTORIC PRESERVATION COMMISSION

Showers City Hall
McCloskey Room
Thursday, May 12, 2016
5:00 P.M.
Minutes

I. CALL TO ORDER

Meeting was called to order by Chairman John Saunders at 5:00 p.m.

II. ROLL CALL

Commissioners:

Jeannine Butler
Dave Harstad
Marjorie Hudgins
Marleen Newman – arrived at 5:15 p.m.
Lee Sandweiss
John Saunders
Chris Sturbaum

Advisory:

Leslie Abshier
Jeff Goldin

Staff:

Patty Mulvihill – City Legal
Bethany Emenhiser – HAND
Doris Sims – HAND
Valerie Hosea – HAND

Guest(s):

Doug Horn – Stasny & Horn
Noah Sandweiss - Public

III. APPROVAL OF MINUTES

A. April 14, 2016
Marjorie Hudgins made a motion to approve the minutes from April 14, 2016 with two corrections. **Jeannine Butler** seconded. Motion carries **6-0-0.**

IV. CERTIFICATES OF APPROPRIATENESS

Staff Review
A. COA-16-23
402 S. Euclid Ave.: Greater Prospect Hill
Petitioner: David NaKarado
Replace front porch vinyl siding and vertical wood paneling with 5¼" horizontal fiber cement board.
Bethany Emenhiser gave her presentation. See packet for details.

B. COA 16-26
1101 E. Hunter: Elm Heights
Petitioner: Estela Vieira
Replacement of non-original garage door with steel overhead Clopay Coachman style door.
Bethany Emenhiser gave her presentation. See packet for details.

V. DEMOLITION DELAY

A. Demo Delay 16-14
1410 E. Hunter
Full demolition.
Bethany Emenhiser gave her presentation. See packet for details.

Bethany Emenhiser stated that staff does not recommend approval, but to release the permit.

Chris Sturbaum asked if there are any other houses similar to this one nearby.

Bethany Emenhiser said there are not. However, the other houses fit that era. This house has an earlier-period design.

Chris Sturbaum commented about his concern with losing other properties like this. He asked if anyone has considered moving it.

Kris Floyd said this property has been owned as rental for 13 years. If BRI will move it, he is interested. He feels it is not a great house on the inside as it has several very small rooms.

Jeannine Butler made a motion to waive the Demolition Delay waiting period for **Demo Delay 16-14. Marjorie Hudgins** seconded. Motion carries **6-1-0.**

VI. NEW BUSINESS

A. Approval of Findings of Fact for COA-16-15 and COA-16-22
Marjorie Hudgins made a motion approve the Proposed Findings of Fact for COA 16-15. **Dave Harstad** seconded. Motion carries **6-1-0.**

Marjorie Hudgins made a motion approve the Proposed Findings of Fact for COA 16-22. **Jeannine Butler** seconded. Motion carries **7-0-0.**

B. Demolition Delay Update

Bethany Emenhiser discussed the Common Council's Demolition Delay updates with the commission.

Chris Sturbaum discussed the changes to the SHAARD survey commitments.

Jeannine Butler asked if partial demolitions will go to staff.

Patty Mulvihill explained this will have to go back to the Planning Commission.

Bethany Emenhiser explained the new survey process.

Patty Mulvihill explained **Bethany Emenhiser** can review contributing structures on the 2001 survey (as amended in 2007) subject to a partial demolition request in a residential zoning district. The contributing structures on the new survey will only be reviewed if they will have 50% or more destruction.

John Saunders asked if roofs will come to the Commission.

Patty Mulvihill explained the Commission will only get those on the 2001 as amended in 2007 properties.

Bethany Emenhiser stated if it is residential and contributing then staff will review it.

Patty Mulvihill explained that staff will know what will come to the Commission for review.

VII. OLD BUSINESS

A. 5th Annual Old House Expo & Architectural Cake Contest
Bethany Emenhiser discussed the events scheduled for the Architectural Cake Contest on May 14, 2016.

VIII. COMMISSIONERS' COMMENTS

Chris Sturbaum announced that BRI is in the process of getting a price to move the Chocolate Moose and finding funding.

Bethany Emenhiser added there is Indiana Landmarks to help with this.

Jeannine Butler and **Lee Sandweiss** commented that Camp Vincennes was very informative.

Marleen Newman congratulated **John Saunders** on his marriage.

IX. PUBLIC COMMENTS

No comments.

X. ANNOUNCEMENTS

Bethany Emenhiser announced that Nancy Hiestand was nominated in the fall of last year for the Secretary of Interiors National Awards. She has received one of the four CLG awards and will be accepting it in Washington D.C.

Bethany Emenhiser announced Kirkwood Manor will be going to Council on May 21st and 25th.

Bethany Emenhiser announced that Noah Sandweiss will be joining the HAND Department as the new Historic Preservation intern.

XI. ADJOURNMENT

Meeting was adjourned by John Saunders at 5:41 p.m.

END OF MINUTES

SUMMARY

Request to replace two front steel framed windows with Midway vinyl double hung windows.

COA-16-33

912 W. 2nd St.
Greater Prospect Hill
Petitioner: Scott and Jessica David

Contributing **105-055-54249** **House;** Bungalow, c. 1930

This is a c. 1930 slightly altered Bungalow in good condition. The property is located within the Greater Prospect Hill local historic district. This is a proposal to replace two front steel framed windows with Midway vinyl double hung windows. The petitioner's would like to replace the two front windows, which are "in need of replacement based on their poor condition and lack of energy efficiency."

Per the Prospect Hill design guidelines:

Definition: In general, **original material** refers to the material and elements first used on the structure, but may also include materials used in subsequent updates to the house. (Note that some, many, or all original materials may already have been removed from the structure, while in other cases, some original materials may exist but remain hidden under more recently added materials.)

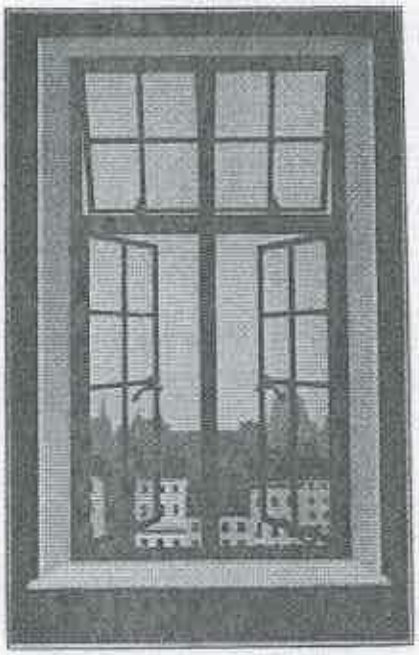
1. Retain historical character-defining architectural features and detailing, and retain detailing on the public way façade such as brackets, cornices, dormer windows, and gable end shingles.
2. Avoid removing or altering historic material or distinctive architectural features, like those listed. If materials are original and in good shape, means with which to keep them intact should be explored. If the existing material cannot be retained because of its condition, document the material and its condition and apply for a COA. If the desire is to restore or renovate to a certain design or style, provide a replacement plan and apply for a COA.


Cracks


Broken light

The metal framed casement and picture windows appear to be original as steel windows because more available and used in late 19th century and early 20th century. Steel windows even became popular in 1920s for cottage style residential structures like the one above. In the images above show some broken or cracked lights, but modern replacements are available. Weatherization, interior storm windows or thermal glazing may be an option for adding energy efficiency to the property. Per the design guidelines that if replacing material, that it be replaced "in the same style or design," and "should duplicate in size and scale in ways that do not visually impact the public way façade." Although staff recognizes that the proposed windows will match the other double-hung replacement windows, but since these steel windows still existing, staff recommends exploring other options that either retain and repair existing or find a replacement closer to the existing steel windows. The Greater Prospect Hill design subcommittee is supportive of the petitioner's request for new replacement windows.

13 PRESERVATION BRIEFS



The Repair and Thermal Upgrading of Historic Steel Windows

Sharon C. Park, AIA

U.S. Department of the Interior
National Park Service
Cultural Resources
Heritage Preservation Services

The Secretary of the Interior's "Standards for Rehabilitation" require that where historic windows are individually significant features, or where they contribute to the character of significant facades, their distinguishing visual qualities must not be destroyed. Further, the rehabilitation guidelines recommend against changing the historic appearance of windows through the use of inappropriate designs, materials, finishes, or colors which radically change the sash, depth of reveal, and muntin configuration; the reflectivity and color of the glazing; or the appearance of the frame.

Windows are among the most vulnerable features of historic buildings undergoing rehabilitation. This is especially the case with rolled steel windows, which are often mistakenly not deemed worthy of preservation in the conversion of old buildings to new uses. The ease with which they can be replaced and the mistaken assumption that they cannot be made energy efficient except at great expense are factors that typically lead to the decision to remove them. In many cases, however, repair and retrofit of the historic windows are more economical than wholesale replacement, and all too often, replacement units are unlike the originals in design and appearance. If the windows are important in establishing the historic character of the building (see fig. 1), insensitively designed replacement windows may diminish—or destroy—the building's historic character.

This *Brief* identifies various types of historic steel windows that dominated the metal window market from 1890-1950. It then gives criteria for evaluating deterioration and for determining appropriate treatment, ranging from routine maintenance and weatherization to extensive repairs, so that replacement may be avoided where possible.[1] This information applies to do-it-yourself jobs and to large rehabilitations where the volume of work warrants the removal of all window units for complete overhaul by professional contractors.

This *Brief* is not intended to promote the repair of ferrous metal windows in every case, but rather to insure that preservation is always the first consideration in a rehabilitation project. Some windows are not important elements in defining a building's historic character; others are highly significant, but so deteriorated that repair is infeasible. In such cases, the *Brief* offers guidance in evaluating appropriate replacement windows.

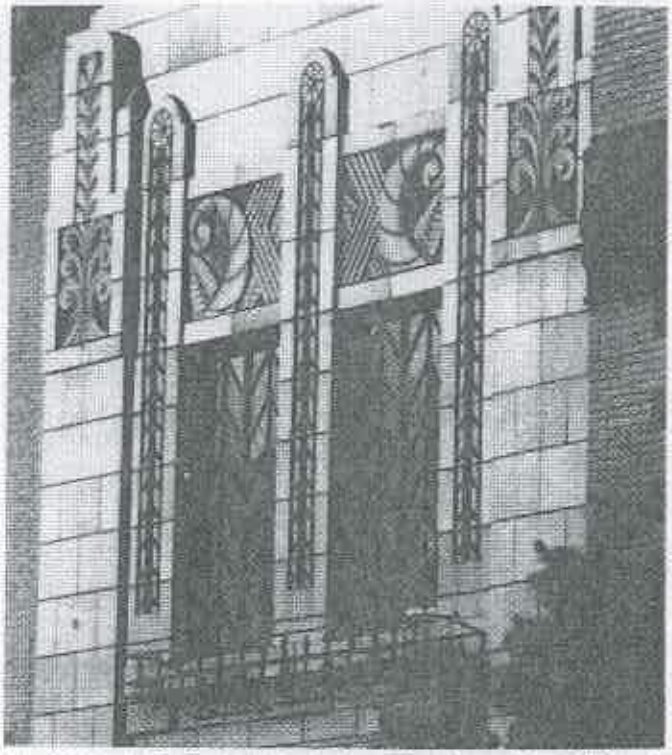


Fig. 1 Often highly distinctive in design and craftsmanship, rolled steel windows play an important role in defining the architectural character of many later nineteenth and early twentieth century buildings. Art Deco, Art Moderne, the International Style, and Post World War II Modernism depended on the slim profiles and streamlined appearance of metal windows for much of their impact. Photo: William G. Johnson.

[1]The technical information given in this brief is intended for most ferrous (or magnetic) metals, particularly rolled steel. While stainless steel is a ferrous metal, the cleaning and repair techniques outlined here must not be used on it as the finish will be damaged. For information on cleaning stainless steel and non-ferrous metals, such as bronze, Monel, or aluminum, refer to *Metals in America's Historic Buildings* (see bibliography).

HISTORICAL DEVELOPMENT

Although metal windows were available as early as 1860 from catalogues published by architectural supply firms, they did not become popular until after 1890. Two factors combined to account for the shift from wooden to metal windows about that time. Technology borrowed from the rolling industry permitted the mass production of rolled steel windows. This technology made metal windows cost competitive with conventional wooden windows. In addition, a series of devastating urban fires in Boston, Baltimore, Philadelphia, and San Francisco led to the enactment of strict fire codes for industrial and multi-story commercial and office buildings.

As in the process of making rails for railroads, rolled steel windows were made by passing hot bars of steel through progressively smaller, shaped rollers until the appropriate angled configuration was achieved (see fig. 2). The rolled steel sections, generally 1/8" thick and 1" - 1 1/2" wide, were used for all the components of the windows: sash, frame,and subframe (see fig. 3). With the addition of wire glass, a fire-resistant window resulted. These rolled steel windows are almost exclusively found in masonry or concrete buildings.

A byproduct of the fire-resistant window was the strong metal frame that permitted the installation of larger windows and windows in series. The ability to have expansive amounts of glass and increased ventilation dramatically changed the designs of late 19th and early 20th century industrial and commercial buildings.

The newly available, reasonably priced steel windows soon became popular for more than just their fire-resistant qualities. They were standardized, extremely durable, and easily transported. These qualities led to the use of steel windows in every type of construction, from simple industrial and institutional buildings to luxury commercial and apartment buildings. Casement, double-hung, pivot, projecting, austral, and continuous windows differed in operating and ventilating capacities. Figure 4 outlines the kinds and properties of metal windows available then and now. In addition, the thin profiles of metal windows contributed to the streamlined appearance of the Art Deco, Art Moderne, and International Styles, among others.

The extensive use of rolled steel metal windows continued until after World War II when cheaper, non-corroding aluminum windows became increasingly popular. While aluminum windows dominate the market today, steel windows are still fabricated. Should replacement of original windows become necessary, replacement windows may be available from the manufacturers of some of the earliest steel windows. Before an informed decision can be made whether to repair or replace metal windows, however, the significance of the windows must be determined and their physical condition assessed.

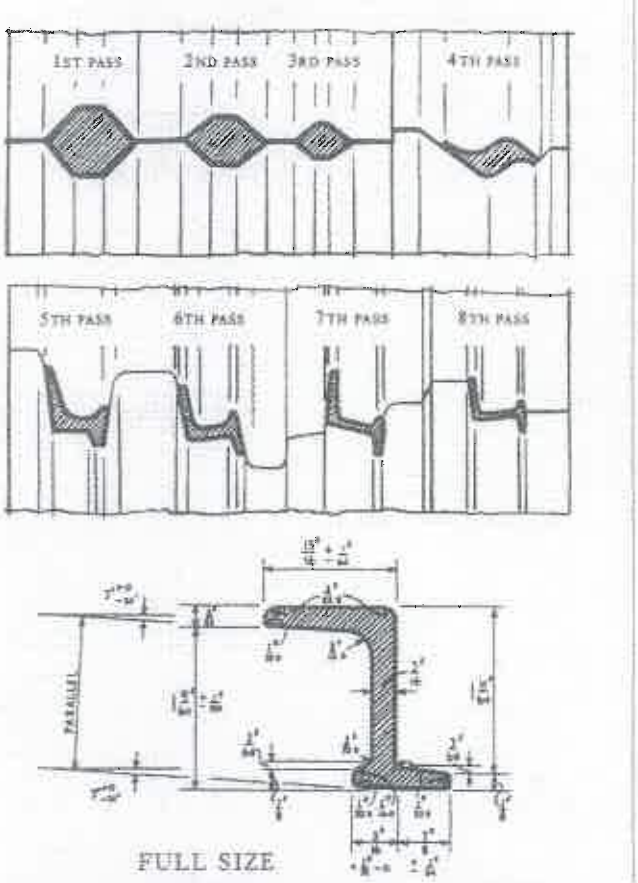


Fig. 2. The process of rolling a steel bar into an angled section is illustrated above. The shape and size of the rolled section will vary slightly depending on the overall strength needed for the window opening and the location of the section in the assembly: subframe, frame, or sash. The 1/8" thickness of the metal section is generally standard. Drawing: A Metal Window Dictionary. Used with permission.

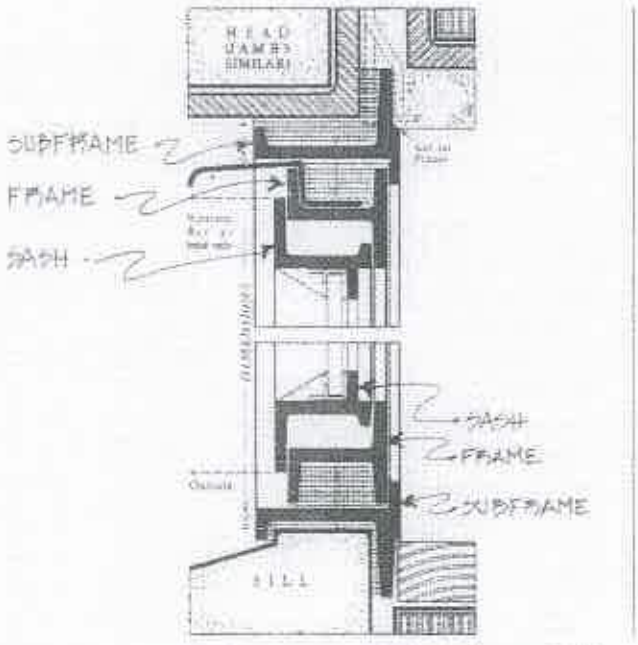


Fig. 3 A typical section through the top and bottom of a metal window shows the three component parts of the window assembly: subframe, frame, and sash. Drawings: Catalogue No. 15, January 1931; International Casement Co, Inc., presently Hope's Architectural Products, Inc., Jamestown, NY. Used with permission.

Cover illustration: from *Hope's Metal Windows and Casements: 1818-1926*, currently Hope's Architectural Products, Inc. Used with permission.

10

EVALUATION

Historic and Architectural Considerations

An assessment of the significance of the windows should begin with a consideration of their function in relation to the building's historic use and its historic character. Windows that help define the building's historic character should be preserved even if the building is being converted to a new use. For example, projecting steel windows used to introduce light and an effect of spaciousness to a warehouse or industrial plant can be retained in the conversion of such a building to offices or residences.

Other elements in assessing the relative importance of the historic windows include the design of the windows and their relationship to the scale, proportion, detailing and architectural style of the building. While it may be easy to determine the aesthetic value of highly ornamented windows, or to recognize the importance of streamlined windows as an element of a style, less elaborate windows can also provide strong visual interest by their small panes or projecting planes when open, particularly in simple, unadorned industrial buildings (see fig. 5).

One test of the importance of windows to a building is to ask if the overall appearance of the building would be changed noticeably if the windows were to be removed or radically altered. If so, the windows are important in defining the building's historic character, and should be repaired if their physical condition permits.

Physical Evaluation

Steel window repair should begin with a careful evaluation of the physical condition of each unit. Either drawings or photographs, liberally annotated, may be used to record the location of each window, the type of operability, the condition of all three parts—sash, frame and subframe—and the repairs essential to its continued use.

Specifically, the evaluation should include: presence and degree of corrosion; condition of paint; deterioration of the metal sections, including bowing, misalignment of the sash, or bent sections; condition of the glass and glazing compound; presence and condition of all hardware, screws, bolts, and hinges; and condition of the masonry or concrete surrounds, including need for caulking or resetting of improperly sloped sills.

Corrosion, principally rusting in the case of steel windows, is the controlling factor in window repair; therefore, the evaluator should first test for its presence. Corrosion can be light, medium, or heavy, depending on how much the rust has penetrated the metal sections. If the rusting is merely a surface accumulation or flaking, then the corrosion is light. If the rusting has penetrated the metal (indicated by a bubbling texture), but has not caused any structural damage, then the corrosion is medium. If the rust has penetrated deep into the metal, the corrosion is heavy. Heavy corrosion generally results in some form of structural damage,through delamination, to the metal section, which must then be patched or spliced. A sharp probe or tool, such as an ice pick, can be used to determine the extent of corrosion in the metal. If the probe can penetrate the surface of the metal and brittle strands can be dug out, then a high degree of corrosive deterioration is present.

In addition to corrosion, the condition of the paint, the presence of bowing or misalignment of metal sections, the amount of glass needing replacement, and the condition of the masonry or concrete surrounds must be assessed in the evaluation process. These are key factors in determining whether or not the windows can be repaired in place. The more complete the inventory of existing conditions, the easier it will be to determine whether repair is feasible or whether replacement is warranted.

Rehabilitation Work Plan

Following inspection and analysis, a plan for the rehabilitation can be formulated. The actions necessary to return windows to an efficient and effective working condition will fall into one or more of the following categories: routine maintenance, repair, and weatherization. The routine maintenance and weatherization measures described here are generally within the range of do-it-yourselfers. Other repairs, both moderate and major, require a professional contractor. Major repairs normally require the removal of the window units to a workshop, but even in the case of moderate repairs, the number of windows involved might warrant the removal of all the deteriorated units to a workshop in order to realize a more economical repair price. Replacement of windows should be considered only as a last resort.

Since moisture is the primary cause of corrosion in steel windows, it is essential that excess moisture be eliminated and that the building be made as weathertight as possible before any other work is undertaken. Moisture can accumulate from cracks in the masonry, from spalling mortar, from leaking gutters, from air conditioning condensation runoff, and from poorly ventilated interior spaces.

Finally, before beginning any work, it is important to be aware of health and safety risks involved. Steel windows have historically been coated with lead paint. The removal of such paint by abrasive methods will produce toxic dust. Therefore, safety goggles, a toxic dust respirator, and protective clothing should be worn. Similar protective measures should be taken when acid compounds are used. Local codes may govern the methods of removing lead paints and proper disposal of toxic residue.

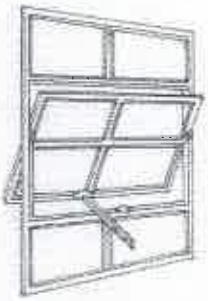
ROUTINE MAINTENANCE

A preliminary step in the routine maintenance of steel windows is to remove surface dirt and grease in order to ascertain the degree of deterioration, if any. Such minor cleaning can be accomplished using a brush or vacuum followed by wiping with a cloth dampened with mineral spirits or denatured alcohol.

Double-hung industrial windows duplicated the look of traditional wooden windows. Metal double-hung windows were early examples of a building product adapted to meet stringent new fire code requirements for manufacturing and high-rise buildings in urban areas. Soon supplanted in industrial buildings by less expensive pivot windows, double-hung metal windows regained popularity in the 1940s for use in speculative suburban housing.

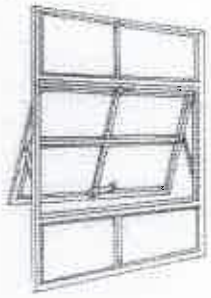
Austral windows were also a product of the 1920s. They combined the appearance of the double-hung window with the increased ventilation and ease of operation of the projected window. (When fully opened, they provided 70% ventilation as compared to 50% ventilation for double-hung windows.) Austral windows were often used in schools, libraries and other public buildings.

Pivot windows were an early type of industrial window that combined inexpensive first cost and low maintenance. Pivot windows became standard for warehouses and power plants where the lack of screens was not a problem. The window shown here is a horizontal pivot. Windows that turned about a vertical axis were also manufactured (often of iron). Such vertical pivots are rare today.



Casement windows adapted the English tradition of using wrought iron casements with leaded cames for residential use. Rolled steel casements (either single, as shown, or paired) were popular in the 1920s for cottage style residences and Gothic style campus architecture. More streamlined casements were popular in the 1930s for institutional and small industrial buildings.

Projecting windows, sometimes called awning or hopper windows, were perfected in the 1920s for industrial and institutional buildings. They were often used in "combination" windows, in which upper panels opened out and lower panels opened in. Since each movable panel projected to one side of the frame only, unlike pivot windows, for example, screens could be introduced.



Continuous windows were almost exclusively used for industrial buildings requiring high overhead lighting. Long runs of clerestory windows operated by mechanical tension rod gears were typical. Long banks of continuous windows were possible because the frames for such windows were often structural elements of the building.

Fig. 4 Typical rolled steel windows available from 1890 to the present. The various operating and ventilating capacities in combination with the aesthetics of the window style were important considerations in the selection of one window type over another. Drawings: Sharon C. Park, AIA.

If it is determined that the windows are in basically sound condition, the following steps can be taken: 1) removal of light rust, flaking and excessive paint; 2) priming of exposed metal with a rust-inhibiting primer; 3) replacement of cracked or broken glass and glazing compound; 4) replacement of missing screws or fasteners; 5) cleaning and lubrication of hinges; 6) repainting of all steel sections with two coats of finish paint compatible with the primer; and 7) caulking the masonry surrounds with a high quality elastomeric caulk.

Recommended methods for removing light rust include manual and mechanical abrasion or the application of chemicals. Burning off rust with an oxy-acetylene or propane torch, or an inert gas welding gun, should never be attempted because the heat can distort the metal. In addition, such intense heat (often as high as 3800° F) vaporizes the lead in old paint, resulting in highly toxic fumes. Furthermore, such heat will likely result in broken glass. Rust can best be removed using a wire brush, an aluminum oxide sandpaper, or a variety of power tools

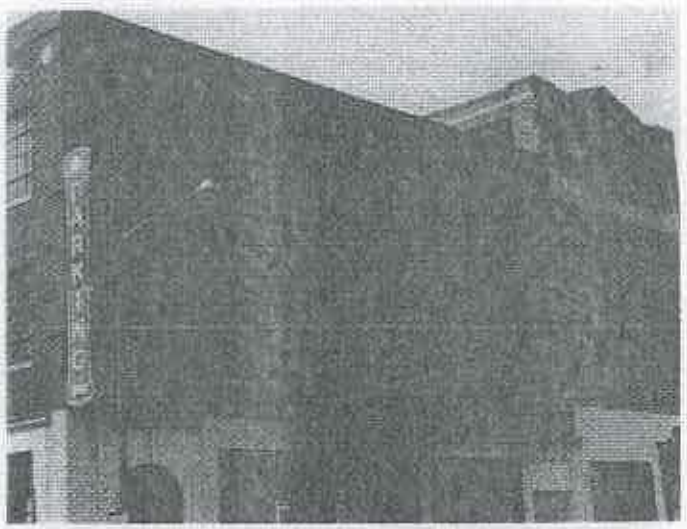


Fig. 5 Windows often provide a strong visual element to relatively simple or unadorned industrial or commercial buildings. This design element should be taken into consideration when evaluating the significance of the windows. Photo: Michael Auer.

adapted for abrasive cleaning such as an electric drill with a wire brush or a rotary whip attachment. Adjacent sills and window jambs may need protective shielding.

Rust can also be removed from ferrous metals by using a number of commercially prepared anti-corrosive acid compounds. Effective on light and medium corrosion, these compounds can be purchased either as liquids or gels. Several bases are available, including phosphoric acid, ammonium citrate, oxalic acid and hydrochloric acid. Hydrochloric acid is generally not recommended; it can leave chloride deposits, which cause future corrosion. Phosphoric acid-based compounds do not leave such deposits, and are therefore safer for steel windows. However, any chemical residue should be wiped off with damp cloths, then dried immediately. Industrial blow-dryers work well for thorough drying. The use of running water to remove chemical residue is never recommended because the water may spread the chemicals to adjacent surfaces, and drying of these surfaces may be more difficult. Acid cleaning compounds will stain masonry; therefore plastic sheets should be taped to the edge of the metal sections to protect the masonry surrounds. The same measure should be followed to protect the glazing from etching because of acid contact.

Measures that remove rust will ordinarily remove flaking paint as well. Remaining loose or flaking paint can be removed with a chemical paint remover or with a pneumatic needle scaler or gun, which comes with a series of chisel blades and has proven effective in removing flaking paint from metal windows. Well-bonded paint may serve to protect the metal further from corrosion, and need not be removed unless paint build-up prevents the window from closing tightly. The edges should be feathered by sanding to give a good surface for repainting.

Next, any *bare* metal should be wiped with a cleaning solvent such as denatured alcohol, and dried immediately in preparation for the application of an anti-corrosive primer. Since corrosion can recur very soon after metal has been exposed to the air, the metal should be primed immediately after cleaning. Spot priming may be required periodically as other repairs are undertaken. Anti-corrosive primers generally consist of oil-alkyd based paints rich in zinc or zinc chromate.[2] Red lead is no longer available because of its toxicity. All metal primers, however, are toxic to some degree and should be handled carefully. Two coats of primer are recommended. Manufacturer's recommendations should be followed concerning application of primers.

REPAIR

Repair in Place

The maintenance procedures described above will be insufficient when corrosion is extensive, or when metal window sections are misaligned. Medium to heavy corrosion that has not done any structural damage to the metal sections can be removed either by using the chemical cleaning process described under "Routine Maintenance" or by sandblasting. Since sandblasting can damage the masonry surrounds and crack or cloud the glass, metal or plywood shields should be used to protect these materials. The sandblasting pressure should be low, 80-100 pounds per square inch, and the grit size should be in the range of #10-#45. Glass peening beads (glass pellets) have also been successfully used in cleaning steel sections. While sandblasting equipment comes with various nozzle sizes, pencil-point blasters are most useful because they give the operator more effective control over the direction of the spray. The small aperture of the pencil-point blaster is also useful in removing dried putty from the metal sections that hold the glass. As with any cleaning technique, once the bare metal is exposed to air, it should be primed as soon as possible. This includes the inside rabbeted section of sash where glazing putty has been removed. To reduce the dust, some local codes allow only wet blasting. In this case, the metal must be dried immediately, generally with a blow-drier (a step that the owner should consider when calculating the time and expense involved). Either form of sandblasting metal covered with lead paints produces toxic dust. Proper precautionary measures should be taken against toxic dust and silica particles.

Bent or bowed metal sections may be the result of damage to the window through an impact or corrosive expansion. If the distortion is not too great, it is possible to realign the metal sections without removing the window to a metal fabricator's shop. The glazing is generally removed and pressure is applied to the bent or bowed section. In the case of a muntin, a protective 2 x 4 wooden bracing can be placed behind the bent portion and a wire cable with a winch can apply progressively more pressure over several days until the section is realigned. The 2 x 4 bracing is necessary to distribute the pressure evenly over the damaged section. Sometimes a section, such as the bottom of the frame, will bow out as a result of pressure exerted by corrosion and it is often necessary to cut the metal section to relieve this pressure prior to pressing the section back into shape and making a welded repair.

Once the metal sections have been cleaned of all corrosion and straightened, small holes and uneven areas resulting from rusting should be filled with a patching material and sanded smooth to eliminate pockets where water can accumulate. A patching material of steel fibers and an epoxy binder may be the easiest to apply. This steel-based epoxy is available for industrial steel repair; it can also be found in auto body patching compounds or in plumber's epoxy. As with any product, it is important to follow the manufacturer's instructions for proper use and best results. The traditional patching technique—melting steel welding rods to fill holes in the metal sections—may be difficult to apply in some situations; moreover, the window glass must be removed during the repair process, or it will crack from the expansion of the heated metal sections. After these repairs, glass replacement, hinge lubrication, painting, and other cosmetic repairs can be undertaken as necessary.

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[2]Refer to Table IV. Types of Paint Used for Painting Metal in *Metals in America's Historic Buildings*, p. 139. (See bibliography).

To complete the checklist for routine maintenance, cracked glass, deteriorated glazing compound, missing screws, and broken fasteners will have to be replaced; hinges cleaned and lubricated; the metal windows painted, and the masonry surrounds caulked. If the glazing must be replaced, all clips, glazing beads, and other fasteners that hold the glass to the sash should be retained, if possible, although replacements for these parts are still being fabricated. When bedding glass, use only glazing compound formulated for metal windows. To clean the hinges (generally brass or bronze), a cleaning solvent and fine bronze wool should be used. The hinges should then be lubricated with a non-greasy lubricant specially formulated for metals and with an anti-corrosive agent. These lubricants are available in a spray form and should be used periodically on frequently opened windows.

Final painting of the windows with a paint compatible with the anti-corrosive primer should proceed on a dry day. (Paint and primer from the same manufacturer should be used.) Two coats of finish paint are recommended if the sections have been cleaned to bare metal. The paint should overlap the glass slightly to insure weathertightness at that connection. Once the paint dries thoroughly, a flexible exterior caulk can be applied to eliminate air and moisture infiltration where the window and the surrounding masonry meet.

Caulking is generally undertaken after the windows have received at least one coat of finish paint. The perimeter of the masonry surround should be caulked with a flexible elastomeric compound that will adhere well to both metal and masonry. The caulking used should be a type intended for exterior application, have a high tolerance for material movement, be resistant to ultraviolet light, and have a minimum durability of 10 years. Three effective compounds (taking price and other factors into consideration) are polyurethane, vinyl acrylic, and butyl rubber. In selecting a caulking material for a window retrofit, it is important to remember that the caulking compound may be covering other materials in a substrate. In this case, some compounds, such as silicone, may not adhere well. Almost all modern caulking compounds can be painted after curing completely. Many come in a range of colors, which eliminates the need to paint. If colored caulking is used, the windows should have been given two coats of finish paint prior to caulking.

Repair in Workshop

Damage to windows may be so severe that the window sash and sometimes the frame must be removed for cleaning and extensive rust removal, straightening of bent sections, welding or splicing in of new sections, and reglazing. These major and expensive repairs are reserved for highly significant windows that cannot be replaced; the procedures involved should be carried out only by skilled workmen. (see fig. 6a—6f.)

As part of the orderly removal of windows, each window should be numbered and the parts labelled. The operable metal sash should be dismantled by removing the hinges; the fixed sash and, if necessary, the frame can then be unbolted or unscrewed. (The subframe is usually left in place. Built into the masonry surrounds, it can only be cut out with a torch.) Hardware and hinges should be labelled and stored together.

The two major choices for removing flaking paint and corrosion from severely deteriorated windows are dipping in a chemical bath or sandblasting. Both treatments require removal of the glass. If the windows are to be dipped, a phosphoric acid solution is preferred, as mentioned earlier. While the dip tank method is good for fairly evenly distributed rust, deep set rust may remain after dipping. For that reason, sandblasting is more effective for heavy and uneven corrosion. Both methods leave the metal sections clean of residual paint. As already noted, after cleaning has exposed the metal to the air, it should be primed immediately after drying with an anti-corrosive primer to prevent rust from recurring.

Sections that are seriously bent or bowed must be straightened with heat and applied pressure in a workshop. Structurally weakened sections must be cut out, generally with an oxy-acetylene torch, and replaced with sections welded in place and the welds ground smooth. Finding replacement metal sections, however, may be difficult. While most rolling mills are producing modern sections suitable for total replacement, it may be difficult to find an exact profile match for a splicing repair. The best source of rolled metal sections is from salvaged windows, preferably from the same building. If no salvaged windows are available, two options remain. Either an ornamental metal fabricator can weld flat plates into a built-up section, or a steel plant can mill bar steel into the desired profile.

While the sash and frame are removed for repair, the subframe and masonry surrounds should be inspected. This is also the time to reset sills or to remove corrosion from the subframe, taking care to protect the masonry surrounds from damage.

Missing or broken hardware and hinges should be replaced on all windows that will be operable. Salvaged windows, again, are the best source of replacement parts. If matching parts cannot be found, it may be possible to adapt ready-made items. Such a substitution may require filling existing holes with steel epoxy or with plug welds and tapping in new screw holes. However, if the hardware is a highly significant element of the historic window, it may be worth having reproductions made.

Following are illustrations of the repair and thermal upgrading of the rolled steel windows in a National Historic Landmark (fig. 6). Many of the techniques described above were used during this extensive rehabilitation. The complete range of repair techniques is then summarized in the chart titled *Steps for Cleaning and Repairing Historic Steel Windows* (see fig. 7).

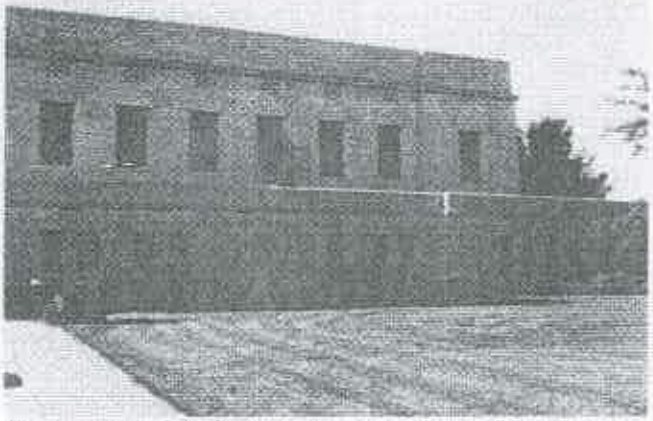

Fig. 6 a. View of the flanking wing of the State Capitol where the rolled steel casement windows are being removed for repair.

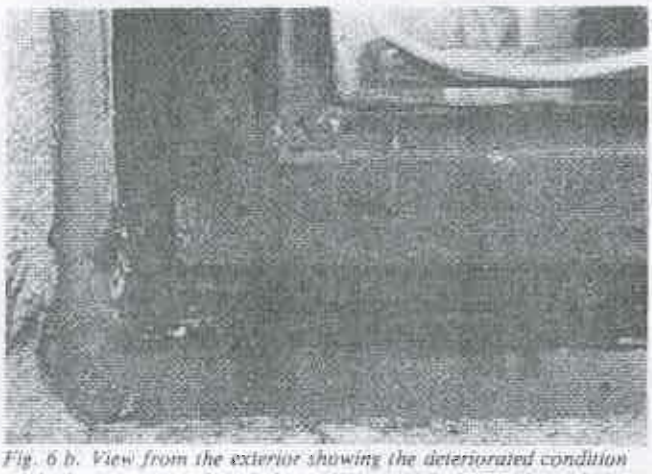

Fig. 6 b. View from the exterior showing the deteriorated condition of the lower corner of a window prior to repair. While the sash was in relatively good condition, the frame behind was rusted to the point of inhibiting operation.

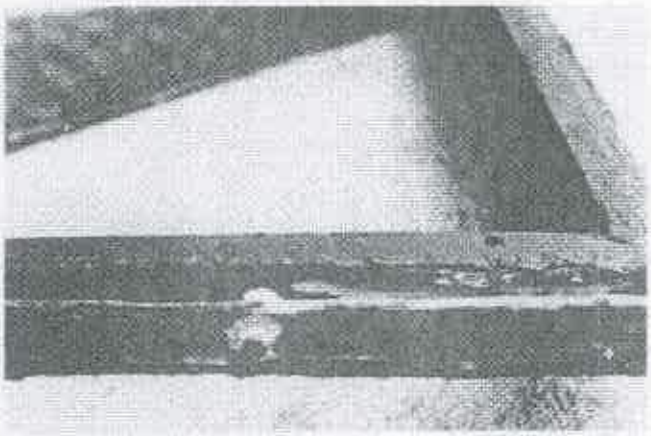

Fig. 6 c. View of the rusted frame which was unscrewed from the subframe and removed from the window opening and taken to a workshop for sandblasting. In some cases, severely deteriorated sections of the frame were replaced with new sections of milled bar steel.

Fig. 6 d. View looking down towards the sill. The subframes appeared very rusted, but were in good condition once debris was vacuumed and surface rust was removed, in place, with chemical compounds. Where necessary, epoxy and steel filler was used to patch depressions in order to make the subframe serviceable again.

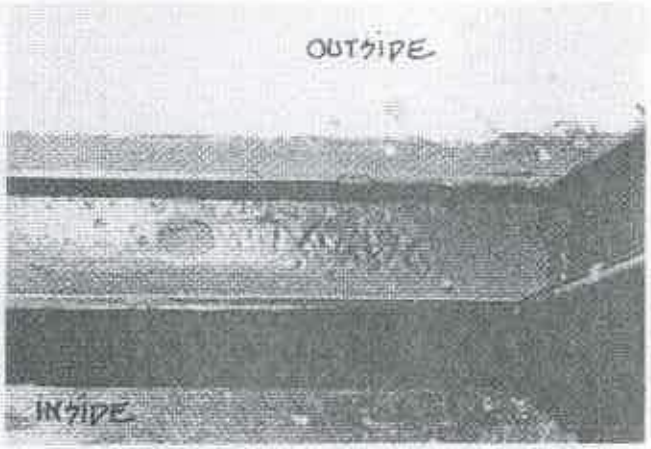

Fig. 6 e. View looking down towards the sill. The cleaned frame was reset in the window opening. The frame was screwed to the refurbished subframe at the jamb and the head only. The screw holes at the sill, which had been the cause of much of the earlier rusting, were infilled. Vinyl weatherstripping was added to the frame.

Fig. 6 f. View from the outside of the completely refurbished window. In addition to the steel repair and the installation of vinyl weatherstripping, the exterior was caulked with polyurethane and the single glass was replaced with individual lights of thermal glass. The repaired and upgraded windows have comparable energy efficiency ratings to new replacement units while retaining the historic steel sash, frames and subframes.

Fig. 6. The repair and thermal upgrading of the historic steel windows at the State Capitol, Lincoln, Nebraska. This early twentieth century building, designed by Bertram Goodhue, is a National Historic Landmark. Photos: All photos in this series were provided by the State Building Division.

STEPS FOR CLEANING AND REPAIRING HISTORIC STEEL WINDOWS

Work Item	Recommended Techniques	Tools, Products and Procedures	Notes
	*(Must be done in a workshop)		
1. Removing dirt and grease from metal	General maintenance and chemical cleaning	Vacuum and bristle brushes to remove dust and dirt; solvents (denatured alcohol, mineral spirits), and clean cloths to remove grease.	Solvents can cause eye and skin irritation. Operator should wear protective gear and work in ventilated area. Solvents should not contact masonry. Do not flush with water.
2. Removing Rust/ Corrosion			
Light	Manual and mechanical abrasion	Wire brushes, steel wool, rotary attachments to electric drill, sanding blocks and disks.	Handsanding will probably be necessary for corners. Safety goggles and masks should be worn.
	Chemical cleaning	Anti-corrosive jellies and liquids (phosphoric acid preferred); clean damp cloths.	Protect glass and metal with plastic sheets attached with tape. Do not flush with water. Work in ventilated area.
Medium	Sandblasting/abrasive cleaning	Low pressure (80-100 psi) and small grit (#10-#45); glass peening beads. Pencil blaster gives good control.	Removes both paint and rust. Codes should be checked for environmental compliance. Prime exposed metal promptly. Shield glass and masonry. Operator should wear safety gear.
Heavy	*Chemical dip tank	Metal sections dipped into chemical tank (phosphoric acid preferred) from several hours to 24 hours.	Glass and hardware should be removed. Protect operator. Deepset rust may remain, but paint will be removed.
	*Sandblasting/ abrasive cleaning	Low pressure (80-100 psi) and small grit (#10-#45).	Excellent for heavy rust. Remove or protect glass. Prime exposed metal promptly. Check codes for environmental compliance. Operator should wear safety gear.
3. Removing flaking paint.	Chemical method	Chemical paint strippers suitable for ferrous metals. Clean cloths.	Protect glass and masonry. Do not flush with water. Have good ventilation and protection for operator.
	Mechanical abrasion	Pneumatic needle gun chisels, sanding disks.	Protect operator; have good ventilation. Well-bonded paint need not be removed if window closes properly.
4. Aligning bent, bowed metal sections	Applied pressure	Wooden frame as a brace for cables and winch mechanism.	Remove glass in affected area. Realignment may take several days.
	*Heat and pressure	Remove to a workshop. Apply heat and pressure to bend back.	Care should be taken that heat does not deform slender sections.

Work Item	Recommended Techniques	Tools, Products and Procedures	Notes
	*(Must be done in a workshop)		
5. Patching depressions	Epoxy and steel filler	Epoxy fillers with high content of steel fibers; plumber's epoxy or autobody patching compound.	Epoxy patches generally are easy to apply, and can be sanded smooth. Patches should be primed.
	Welded patches	Weld in patches using steel rods and oxy-acetylene torch or arc welder.	Prime welded sections after grinding connections smooth.
6. Splicing in new metal sections	*Cut out decayed sections and weld in new or salvaged sections	Torch to cut out bad sections back to 45° joint. Weld in new pieces and grind smooth.	Prime welded sections after grinding connection smooth.
7. Priming metal sections	Brush or spray application	At least one coat of anti-corrosive primer on bare metal. Zinc-rich primers are generally recommended.	Metal should be primed as soon as it is exposed. If cleaned metal will be repaired another day, spot prime to protect exposed metal.
8. Replacing missing screws and bolts	Routine maintenance	Pliers to pull out or shear off rusted heads. Replace screws and bolts with similar ones, readily available.	If new holes have to be tapped into the metal sections, the rusted holes should be cleaned, filled and primed prior to redrilling.
9. Cleaning, lubricating or replacing hinges and other hardware	Routine maintenance, solvent cleaning	Most hinges and closure hardware are bronze. Use solvents (mineral spirits), bronze wool and clean cloths. Spray with non-greasy lubricant containing anti-corrosive agent.	Replacement hinges and fasteners may not match the original exactly. If new holes are necessary, old ones should be filled.
10. Replacing glass and glazing compound	Standard method for application	Pliers and chisels to remove old glass, scrape putty out of glazing rabbet, save all clips and beads for reuse. Use only glazing compound formulated for metal windows.	Heavy gloves and other protective gear needed for the operator. All parts saved should be cleaned prior to reinstallation.
11. Caulking masonry surrounds	Standard method for application	Good quality (10 year or better) elastomeric caulking compound suitable for metal.	The gap between the metal frame and the masonry opening should be caulked; keep weepholes in metal for condensation run-off clear of caulk.
12. Repainting metal windows	Spray or brush	At least 2 coats of paint compatible with the anti-corrosive primer. Paint should lap the glass about 1/8" to form a seal over the glazing compound.	The final coats of paint and the primer should be from the same manufacturer to ensure compatibility. If spraying is used, the glass and masonry should be protected.

Fig. 7. STEPS FOR CLEANING AND REPAIRING HISTORIC STEEL WINDOWS. Compiled by Sharon C. Park, AIA.

WEATHERIZATION

Historic metal windows are generally not energy efficient; this has often led to their wholesale replacement. Metal windows can, however, be made more energy efficient in several ways, varying in complexity and cost. Caulking around the masonry openings and adding weatherstripping, for example, can be do-it-yourself projects and are important first steps in reducing air infiltration around the windows. They usually have a rapid payback period. Other treatments include applying fixed layers of glazing over the historic windows, adding operable storm windows, or installing thermal glass in place of the existing glass. In combination with caulking and weatherstripping, these treatments can produce energy ratings rivaling those achieved by new units.[1]

Weatherstripping

The first step in any weatherization program, caulking, has been discussed above under "Routine Maintenance." The second step is the installation of weatherstripping where the operable portion of the sash, often called the ventilator, and the fixed frame come together to reduce perimeter air infiltration (see fig. 8). Four types of weatherstripping appropriate for metal windows are spring-metal, vinyl strips, compressible foam tapes, and sealant beads. The spring-metal, with an integral friction fit mounting clip, is recommended for steel windows in good condition. The clip eliminates the need for an applied glue; the thinness of the material insures a tight closure. The weatherstripping is clipped to the inside channel of the rolled metal section of the fixed frame. To insure against galvanic corrosion between the weatherstripping (often bronze or brass), and the steel window, the window must be painted prior to the installation of the weatherstripping. This weatherstripping is usually applied to the entire perimeter of the window opening, but in some cases, such as casement windows, it may be best to avoid weatherstripping the hinge side. The natural wedging action of the weatherstripping on the three sides of the window often creates an adequate seal.

Vinyl weatherstripping can also be applied to metal windows. Folded into a "V" configuration, the material forms a barrier against the wind. Vinyl weatherstripping is usually glued to the frame, although some brands have an adhesive backing. As the vinyl material and the applied glue are relatively thick, this form of weatherstripping may not be appropriate for all situations.

Compressible foam tape weatherstripping is often best for large windows where there is a slight bending or distortion of the sash. In some very tall windows having closure hardware at the sash mid-point, the thin sections of the metal window will bow away from the frame near the top. If the gap is not more than 1/4", foam weatherstripping can normally fill the space. If the gap exceeds this, the window may need to be realigned to close more tightly. The foam weatherstripping comes either with an adhesive or plain back; the latter variety requires application with glue. Compressible foam requires more frequent replacement than either spring-metal or vinyl weatherstripping.

A fourth type of successful weatherstripping involves the use of a caulking or sealant bead and a polyethylene bond breaker tape. After the window frame has been thoroughly cleaned with solvent, permitted to dry, and primed, a neat bead of low modulus (firm setting) caulk, such as silicone, is applied. A bond breaker tape is then applied to the operable sash covering the metal section where contact will occur. The window is then closed until the sealant has set (2-7 days, depending on temperature and humidity). When the window is opened, the bead will have taken the shape of the air infiltration gap and the bond breaker tape can be removed. This weatherstripping method appears to be successful for all types of metal windows with varying degrees of air infiltration.

Since the several types of weatherstripping are appropriate for different circumstances, it may be necessary to use more than one type on any given building. Successful weatherstripping depends upon using the thinnest material adequate to fill the space through which air enters. Weatherstripping that is too thick can spring the hinges, thereby resulting in more gaps.

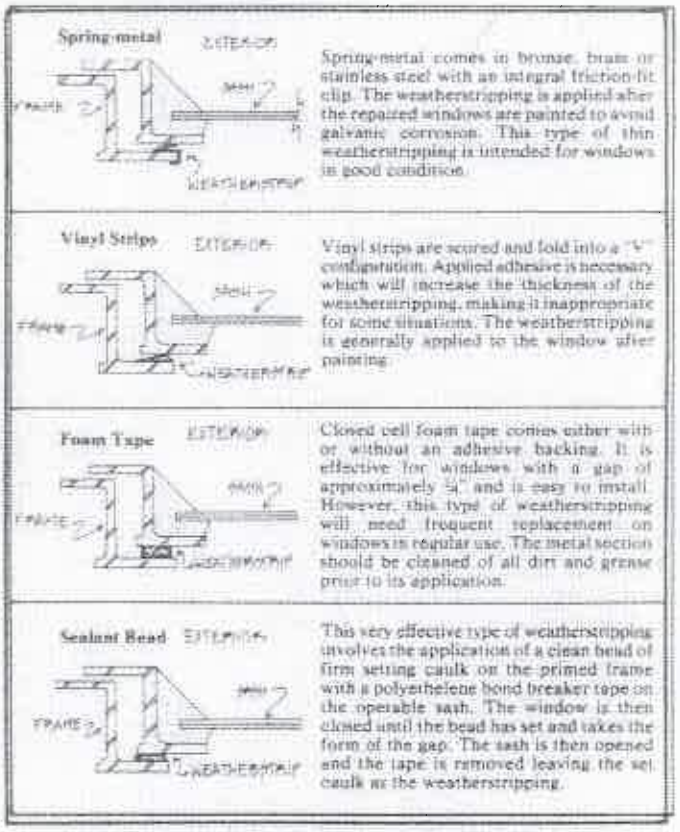

Fig. 8 APPROPRIATE TYPES OF WEATHERSTRIPPING FOR METAL WINDOWS. Weatherstripping is an important part of upgrading the thermal efficiency of historic steel windows. The chart above shows the jamb section of the window with the weatherstripping in place. Drawings: Sharon C. Park, AIA.

[1] One measure of energy efficiency is the U-value (the number of BTUs per hour transferred through a square foot of material). The lower the U-value, the better the performance. According to *ASHRAE HANDBOOK-1977 Fundamentals*, the U-value of historic rolled steel sash with single glazing is 1.3. Adding storm windows to the existing units or reglazing with 5/8" insulating glass produces a U-value of .69. These methods of weatherizing historic steel windows compare favorably with rolled steel replacement alternatives: with factory installed 1" insulating glass (.67 U-value); with added thermal-break construction and factory finish coatings (.62 U-value).

24

Thermal Glazing

The third weatherization treatment is to install an additional layer of glazing to improve the thermal efficiency of the existing window. The decision to pursue this treatment should proceed from careful analysis. Each of the most common techniques for adding a layer of glazing will effect approximately the same energy savings (approximately double the original insulating value of the windows); therefore, cost and aesthetic considerations usually determine the choice of method. Methods of adding a layer of glazing to improve thermal efficiency include adding a new layer of transparent material to the window; adding a separate storm window; and replacing the single layer of glass in the window with thermal glass.

The least expensive of these options is to install a clear material (usually rigid sheets of acrylic or glass) over the original window. The choice between acrylic and glass is generally based on cost, ability of the window to support the material, and long-term maintenance outlook. If the material is placed over the entire window and secured to the frame, the sash will be inoperable. If the continued use of the window is important (for ventilation or for fire exits), separate panels should be affixed to the sash without obstructing operability (see fig. 9). Glass or acrylic panels set in frames can be attached using magnetized gaskets, interlocking material strips, screws or adhesives. Acrylic panels can be screwed directly to the metal windows, but the holes in the acrylic panels should allow for the expansion and contraction of this material. A compressible gasket between the prime sash and the storm panel can be very effective in establishing a thermal cavity between glazing layers. To avoid condensation, 1/8" cuts in a top corner and diagonally opposite bottom corner of the gasket will provide a vapor bleed, through which moisture can evaporate. (Such cuts, however, reduce thermal performance slightly.) If condensation does occur, however, the panels should be easily removable in order to wipe away moisture before it causes corrosion.

The second method of adding a layer of glazing is to have independent storm windows fabricated. (Pivot and austral windows, however, which project on either side of the window frame when open, cannot easily be fitted with storm windows and remain operational.) The storm window should be compatible with the original sash configuration. For example, in paired casement windows, either specially fabricated storm casement windows or sliding units in which the vertical meeting rail of the slider reflects the configuration of the original window should be installed. The decision to place storm windows on the inside or outside of the window depends on whether the historic window opens in or out, and on the visual impact the addition of storm windows will have on the building. Exterior storm windows, however, can serve another purpose besides saving energy: they add a layer of protection against air pollutants and vandals, although they will partially obscure the prime window. For highly ornamental windows this protection can determine the choice of exterior rather then interior storm windows.

The third method of installing an added layer of glazing is to replace the original single glazing with thermal glass. Except in rare instances in which the original glass is of special interest (as with stained or figured glass), the glass can be replaced if the hinges can tolerate the weight of the additional glass. The rolled metal sections for steel windows are generally from 1" - 1 1/2" thick. Sash of this thickness can normally tolerate thermal glass, which ranges from 3/8" - 5/8". (Metal glazing beads, readily available, are used to reinforce the muntins, which hold the glass.) This treatment leaves the window fully operational while preserving the historic appearance. It is, however, the most expensive of the treatments discussed here. (See fig. 6f).

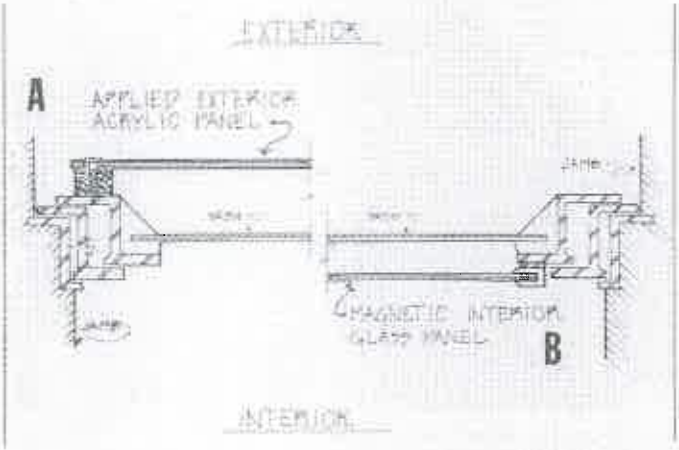

Fig. 9 Two examples of adding a second layer of glazing in order to improve the thermal performance of historic steel windows. Scheme A (showing jamb detail) is of a 1/4" acrylic panel with a closed cell foam gasket attached with self-tapping stainless steel screws directly to the exterior of the outwardly opening sash. Scheme B (showing jamb detail) is of a glass panel in a magnetized frame affixed directly to the interior of the historic steel sash. The choice of using glass or acrylic mounted on the inside or outside will depend on the ability of the window to tolerate additional weight, the location and size of the window, the cost, and the long-term maintenance outlook. Drawing: Sharon C. Park, AIA.

WINDOW REPLACEMENT

Repair of historic windows is always preferred within a rehabilitation project. Replacement should be considered only as a last resort. However, when the extent of deterioration or the unavailability of replacement sections renders repair impossible, replacement of the entire window may be justified. In the case of significant windows, replacement in kind is essential in order to maintain the historic character of the building. However, for less significant windows, replacement with compatible new windows may be acceptable. In selecting compatible replacement windows, the material, configuration, color, operability, number and size of panes, profile and proportion of metal sections, and reflective quality of the original glass should be duplicated as closely as possible.

A number of metal window manufacturing companies produce rolled steel windows. While stock modern window designs do not share the multi-pane configuration of

25

historic windows, most of these manufacturers can reproduce the historic configuration if requested, and the cost is not excessive for large orders (see figs. 10a and 10b). Some manufacturers still carry the standard pre-World War II multi-light windows using the traditional 12" x 18" or 14" x 20" glass sizes in industrial, commercial, security, and residential configurations. In addition, many of the modern steel windows have integral weatherstripping, thermal break construction, durable vinyl coatings, insulating glass, and other desirable features.

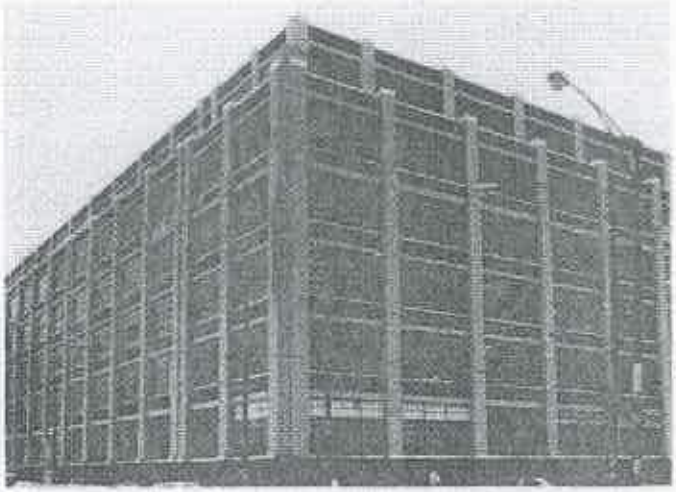

Fig. 10 a. A six-story concrete manufacturing building prior to the replacement of the steel pivot windows. Photo: Charles Parrott.

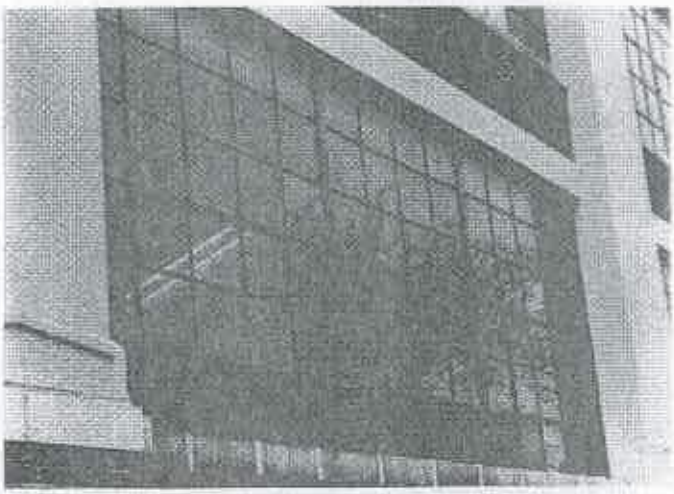

Fig. 10 b. Close-up view of the new replacement steel windows which matched the multi-lighted originals exactly. Photo: Charles Parrott.

Windows manufactured from other materials generally cannot match the thin profiles of the rolled steel sections. Aluminum, for example, is three times weaker than steel and must be extruded into a box-like configuration that does not reflect the thin historic profiles of most steel windows. Wooden and vinyl replacement windows generally are not fabricated in the industrial style, nor can they reproduce the thin profiles of the rolled steel sections, and consequently are generally not acceptable replacements.

For product information on replacement windows, the owner, architect, or contractor should consult manufacturers' catalogues, building trade journals, or the Steel Window Institute, 1230 Keith Building, Cleveland, Ohio 44115.

SUMMARY

The National Park Service recommends the retention of significant historic metal windows whenever possible. Such windows, which can be a character-defining feature of a historic building, are too often replaced with inappropriate units that impair rather than complement the overall historic appearance. The repair and thermal upgrading of historic steel windows is more practicable than most people realize. Repaired and properly maintained metal windows have greatly extended service lives. They can be made energy efficient while maintaining their contribution to the historic character of the building.

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Gayle, Margot; David W. Look, AIA; John G. Waite. *Metals in America's Historic Buildings: Uses and Preservation Treatments.* Technical Preservation Services, U.S. Department of the Interior. Washington,D.C.: U.S.Government Printing Office, 1980.

Gillet, William. "Steel Windows." *Windows and Glass in the Exterior of Buildings.* National Academy of Sciences Publication 478. Washington, D.C.: 1957,75-78.

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Sweet's Architectural Catalogue. 13th Edition, New York, Sweets Catalogue Service, Inc., 1918.

The author gratefully acknowledges the invaluable assistance of co-worker Michael Auer in preparing this brief for publication. This publication is an extension of research initiated by Frederec E. Kleyle. Special thanks are given to Hope's Architectural Products, Inc., Jamestown, NY, for their generous contribution of historic metal window catalogues which were an invaluable source of information. The following individuals are also to be thanked for reviewing the manuscript and making suggestions: Hugh Miller, Chief, Park Historic Architecture Division, National Park Service; Barclay L. Rogers, Museum Services, National Park Service; Susan M. Young, Steel Window Institute, and Danny Schlichenmaier, State Building Division, Lincoln, Nebraska. Finally, thanks go to Technical Preservation Services Branch staff and to cultural resources staff of the National Park Service Regional Offices, whose valuable comments were incorporated into the final text and who contributed to the publication of this brief.

This publication has been prepared pursuant to the Economic Recovery Tax Act of 1981, which directs the Secretary of the Interior to certify rehabilitations of historic buildings that are consistent with their historic character; the guidance provided in this brief will assist property owners in complying with the requirements of this law.

Preservation Briefs: 13 has been developed under the technical editorship of Lee H. Nelson, AIA, Chief, Preservation Assistance Division, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240. Comments on the usefulness of this information are welcomed and can be sent to Mr. Nelson at the above address.

RECEIVED
MAY 3 0 2016
BY: BME

APPLICATION FORM
CERTIFICATE OF APPROPRIATENESS

Case Number: COA - 16-33

Date Filed: 5/30/2016

Scheduled for Hearing: June 23, 2016

********** Greater Prospect Hill

Address of Historic Property: 912 W 2nd St, Bloomington IN 47403

Petitioner's Name: Scott and Jessica David

Petitioner's Address: 912 W 2nd St, Bloomington IN 47403

Phone Number/e-mail: (812) 887-4688 (Jessica) / jessicadavid926@gmail.com

Owner's Name: Scott David

Owner's Address: 912 W 2nd St

Phone Number/e-mail: (812) 890-5244 / scottdavid927@gmail.com

Instructions to Petitioners

The petitioner must attend a preliminary meeting with staff of the Department of Housing and Neighborhood Development during which the petitioner will be advised as to the appropriateness of the request and the process of obtaining a Certificate of Appropriateness. The petitioner must file a "complete application" with Housing and Neighborhood Department Staff no later than seven days before a scheduled regular meeting. The Historic Preservation Commission meets the second Thursday of each month at 5:00 P.M. in the McCloskey Room. The petitioner or his designee must attend the scheduled meeting in order to answer any questions or supply supporting material. You will be notified of the Commission's decision and a Certificate of Appropriateness will be issued to you. Copies of the Certificate must accompany any building permit application subsequently filed for the work described. If you feel uncertain of the merits of your petition, you also have the right to attend a preliminary hearing, which will allow you to discuss the proposal with the Commission before the hearing during which action is taken. Action on a filing must occur within thirty days of the filing date, unless a preliminary hearing is requested.

Please respond to the following questions and attach additional pages for photographs, drawings, surveys as requested.

A **"Complete Application"** consists of the following:

1. A legal description of the lot. Section 05, Township 08N, Lot #11, Parcel 53-08-05-113-000-009

2. A description of the nature of the proposed modifications or new construction:
Window Replacement - We plan to remove the existing (non-original) windows from the front facade and replace with new, energy efficient windows. We will keep the existing window openings and trim material. The current windows are single-pane and in need of replacement.

3. A description of the materials used.
The only materials used will be the new windows which will be installed, made of aluminum and glass. Please see additional page for specifications.

4. Attach a drawing or provide a picture of the proposed modifications. You may use manufacturer's brochures if appropriate.

5. Include a scaled drawing, survey or geographic information system map showing the footprint of the existing structure and adjacent thoroughfares, Geographic Information System maps may be provided by staff if requested. Show this document to Planning Department Staff in order to ascertain whether variances or zoning actions are required.

6. Affix at least three photographs showing the existing full facade at each street frontage and the area of modification. If this petition is a proposal for construction of an entirely new structure or accessory building, include photographs of adjacent properties taken from the street exposure.

****

If this application is part of a further submittal to the Board of Zoning Appeals for a Conditional Use or development standard variance, please describe the use proposed and modification to the property which will result.

Brand: Midway Vinyl

Tommy D's Windows

Customer Quotation Install **Page 1**

Sold To	Factory Ship To	
Jessica David	Tommy D's Windows 3148 S. State Rd. 446 Bloomington, IN 47401 812-330-8898	Order # 407282 Ordered 11/27/2015

Special Instructions

PO #
Dealer 5660

Line	Qty		Description	Color		Width	Height	Unit Net	Extended
	--Multiple Unit--								
1	2	2002	Envirosealed Twin	WHITE	TTT	68 Even	49 1/2	20.59	
							Line Item Total Price	20.59	41.18
1	2	2200	Envirosealed Double Hung U-FACTOR = 0.28 / SHGC = 0.21 Low-E D.S. Top 366 Dg W/Neat Low-E D.S. Bottom 366 Dg W/Neat Sash Reinforcement Bars Insulating Foam Fill Clear-Vue Full Screen	WHITE	TTT	34 Even	49 1/2	297.00	
							Line Item Total Price	297.00	594.00
1	2	2200	Envirosealed Double Hung U-FACTOR = 0.28 / SHGC = 0.21 Low-E D.S. Top 366 Dg W/Neat Low-E D.S. Bottom 366 Dg W/Neat Sash Reinforcement Bars Insulating Foam Fill Clear-Vue Full Screen	WHITE	TTT	34 Even	49 1/2	297.00	
							Line Item Total Price	297.00	594.00
							Multiple Unit Total Price	614.59	1,229.18

Other Charges

2.0	INSTALL	550.00	550.00	1,100.00

From
Tommy D's Windows
3148 S. State Rd. 446
Bloomington, IN 47401

Order Totals

Total	2,329.18
Sales Tax	0.00
Grand Total	2,329.18

Scott and Jessica David

912 W 2nd St

Bloomington, IN 47403

Petitioner's Statement

We are petitioning for permission to replace the windows on the front of our house, located in the Prospect Hill neighborhood of Bloomington at 912 W 2nd St. The windows in question face 2nd Street on the south side of the house. The current windows are not original to the house and are in need of replacement based on their poor condition and lack of energy efficiency.

The current windows are single pane glass panels divided by a metal grid pattern. Several of the glass panes are cracked or broken entirely. Because the windows are comprised of a single, very thin layer of glass, they are not energy efficient. We hope to improve both the appearance and functionality of these windows by replacing them with new, energy efficient models.

We have submitted information on the proposed replacement windows in our application: two double hung windows for each current large window opening. However, we are open to other window styles or configurations at a comparable price point. Our main concerns are increased efficiency through double pane construction as well as the ability to open the windows to allow air flow.

Thank you for your time and consideration of our proposed project. We look forward to moving forward on this project, which we feel will improve our home while honoring its position within one of Bloomington's historic neighborhoods.

32

912 E. 2nd St.
Interior of windows

DEMOLITION DELAY-16-15

Summary

Full demolition.

106 E. Hillside

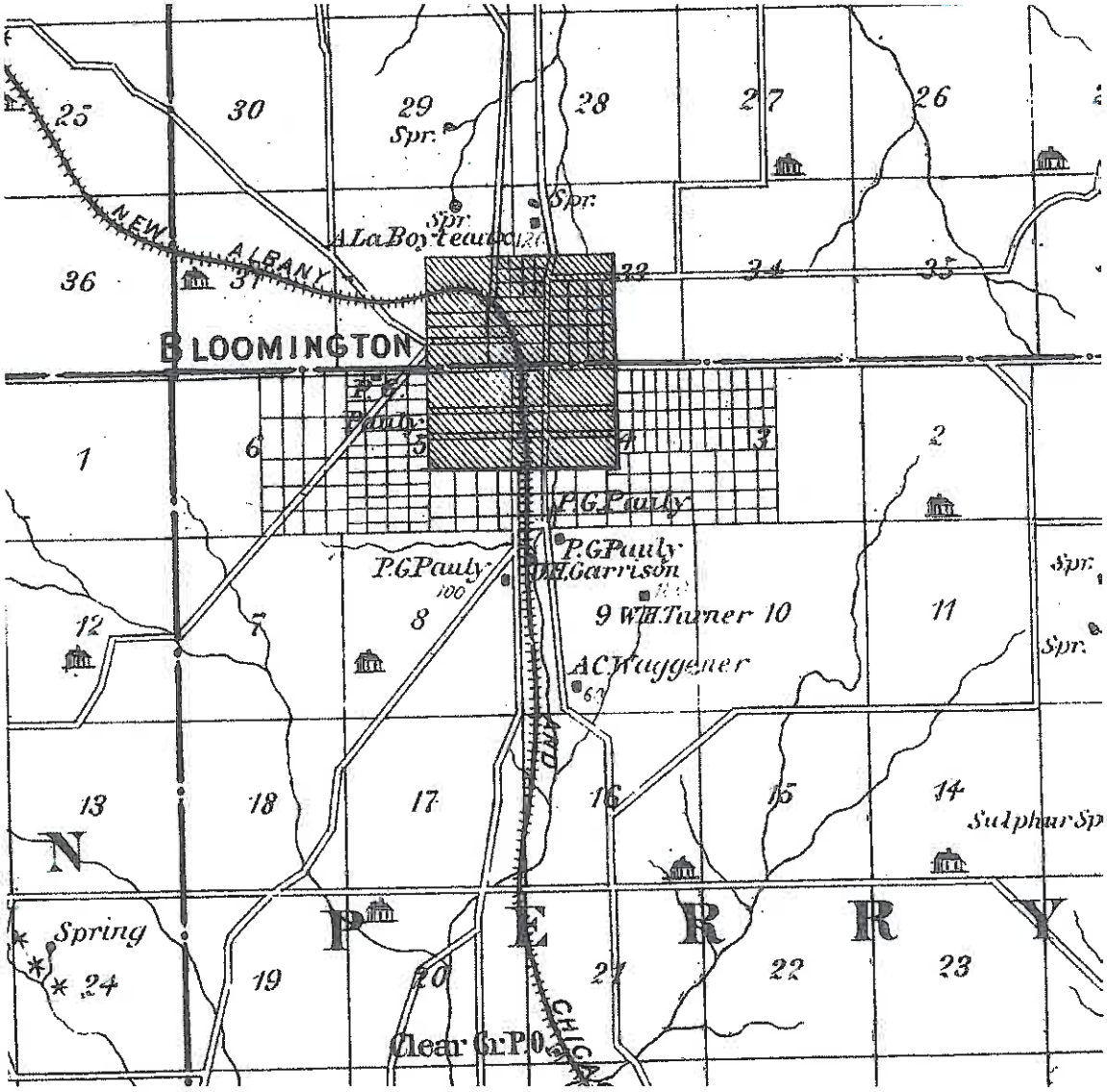
Contributing **105-055-52208** **House,** Bungalow/Craftsman, c. 1925

This is a contributing c.1925 bungalow/craftsman style house. It is slightly altered, but highly deteriorated from years of deferred maintenance. It was listed as Notable in the 2001 Survey, but has deteriorated over the years. A site visit was conducted on May 19th and an earlier structure was dated to pre-Civil War due to saw marks on floor beams. The original house was presumably an I-House with a central hall flanked by two rooms with end fireplaces and a second story mimicking the first floor. There was also an L off the north side with two additional rooms based on the brick exterior walls discovered behind the deteriorating plaster.

The land that now comprises the Monon Study Area was created from Seminary Lots 66 and 67. The oldest residential neighborhood was Railroad Park (1891), located adjacent to the Monon Railroad Round House. In these early days the extension of Hillside west of Walnut was called Railroad Street, leading as it did, to the Monon yards. Walnut Street was simply called South Pike and Rogers was named Bedford Pike. Sarah and Phreborn Pauley, who were significant landholders in Perry Township and descended from its earliest settlers, owned the undeveloped land. When the Driscoll Plat was recorded in February of 1916 there were only two houses in the area. One was a farmstead with a barn on the east side of Walnut north of Driscoll, which had become a service station by 1929 and the other is the existing house at 106 East Hillside. The land for 239 lots was subdivided by the Driscoll Land Company, whose president was William Graham, later the owner of Graham Motor Sales and developer of the Graham Hotel (1929).

Perry Township formed later 1830, October 1827 land sale to Abraham Pauley (section 7 Perry township and Isaac Pauley Section 17. In town members of the family attended the First United Methodist Church (Phreeborn) was the name on an early map. There is a map with the name Phreborn Pauley over this parcel before the 20th century. At the time of the Driscoll subdivision (1917) I believe it was still in the hands of the Pauleys.

The land that now comprises the Monon Study Area was created from Seminary Lots 66 and 67. The oldest residential neighborhood was Railroad Park (1891), located adjacent to the Monon Railroad Round House. In these early days the extension of Hillside west of Walnut was called Railroad Street, leading as it did, to the Monon yards. Walnut Street was simply called South Pike and Rogers was named Bedford Pike. Sarah and Phreborn Garrison (PG) Pauley, who were significant landholders in Perry Township and descended from its earliest settlers, owned the undeveloped land. When the Driscoll Plat was recorded in February of 1916 there were only two houses in the area. One was a farmstead with a barn on the east side of Walnut north of Driscoll, which had become a service station by 1929 and the other is the existing house at 106 East Hillside. The land for 239 lots was subdivided by the Driscoll Land Company, whose president was William Graham, later the owner of Graham Motor Sales and developer of the Graham Hotel (1929). "



1876 Atlas of Monroe County

Although there is no documentation showing the transition of this site due to the Sanborn mapping no expanding this far south, the site is assumed to have held a hotel for Monon workers at some point. This property may have been "bungalowized" at some point and the porch was added. The bricks are wire brushed so presumably around the 1930s. The house has seen changes over time and the same lot has been plotted since the late 1820s, which is consistent with the age of the original I-House that remains. The house has deteriorated over the years, but has not been deemed unsafe per the engineering report, attached. Staff would like to encourage discussion on possible designation, especially if more research can be gathered on the Pauly family in early Bloomington history.

Research by HAND intern:
Noah Sandweiss

DEMOLITION DELAY-16-15
106 E. Hillside
Contributing **106-055-52208**

Research Summary

The bungalow on 106 E. Hillside -- located on the north half of the northwest corner of Perry Township Section 9 -- encompases a mid 19th century I-house built by one of Bloomington's founding settler families in the late 1850s or early 1860s. On October 9th 1857, Phreborn Garrison Pauley purchased the half-quarter section from the estate of the late John Clark. As of the 1850s census, the Clark family lived in Washington Township, and the Pauleys lived in Van Beuren. By 1860, PG Pauley and his family lived in Perry Township. Though the Pauley family sold off much of their land in Perry shortly after the initial purchase, they retained the parcel containing the property in question through the 19th century. Maps from 1875 show a structure on the site, and label the property PG Pauley. The saw cuts on the boards used in the original structure suggest antebellum origins. According to a newspaper article from 1886, Helton Pauley began building a barn south of town. The bungalow exterior was built in 1926, with subsequent additions built over the years.

The Pauley family itself, according to family documents at the Monroe County History center has its origins in Alsatian nobility. A staunch monarchist and Huguenot, Louis Pauley supported the American cause in the revolutionary war. He came to Virginia as a settler after the American victory, having spent much of his family fortune backing General Lafayette. The Pauleys moved to Monroe County in 1818 during the first wave of settlement, establishing their first residence in Richland Township. The family purchased land in 1821, shortly after their arrival. (According to county histories, many squatters inhabited the southern part of the county during this early period). The property that is now 106 E. Hillside became the home of the Bloomington branch of the Pauley family, though in 1870 PG Pauley alone had $18,000 worth of land throughout the county, and family members lived in Ellettsville and elsewhere in Perry Township.

Sources:

Ancestry.com, US Census

Monroe County Deed Indexes

Monroe County 1875 Plat Map

Pauley Family Records at the Monroe County History Center

POTTER ENGINEERING
Structural Engineering
P.O. Box 5563
Bloomington, IN 47407
Phone (812) 331-7981
EMAIL- kevinbpotter@gmail.com

May 11, 2016

James A. Crane
110 East Hillside Avenue
Bloomington, IN 47401

Re: 106 East Hillside Avenue, Bloomington, IN

Per your request, I recently performed a structural inspection at 106 East Hillside Avenue, Bloomington, IN. The subject house at this location is a vacant 1 ½ story structure. The house has a 46 foot by 48 foot main level with a partial second floor typical of bungalow structures using the roof volume and dormers to create a partial second level of living space.

The subject home has had neglected maintenance for an extended period of time. The problems seen in this structure include the following:

1. Extensive roof leaks resulting in collapsed ceiling areas and flooring damage.

2. The exterior walls are brick masonry with stucco on the outside and plaster inside. The brick walls are in poor condition at the Northwest corner and on the West side adjacent to the porch. Sections of brick are missing and wall movement is present. The exterior stucco is cracked and allowing water to enter behind resulting in brick damage.

3. Interior ceiling and wall plaster has fallen off in numerous location. Bricks from the exterior walls have also fallen into the inside of the building.

4. Holes exist in the floor due to water damage. Several floor areas are spongy due to water exposure.

5. Some of the original windows are missing with the openings boarded up.

6. Interior floors are uneven due to failing structural floor support.

Restoration of this house into habitable code compliant living space would require the following:

a. Complete removal of all roof shingles. Replacement of all damaged roof decking. Replacement or reinforcement of damaged roof framing. Entire new roof underlayment and shingles.

b. Complete removal of exterior stucco. Rebuild damaged brick wall at Northwest corner. Replace missing brick in several other locations. Re-point missing mortar as required. Install new conventional exterior stucco or EIFS.

c. Removal and replacement of all siding on second level gable walls and dormer walls.

d. Replacement of all windows and exterior doors.

e. Complete interior finish removal including lath, plaster, floor coverings, and interior doors.

f. Remove and replace all damaged flooring, floor framing, wall framing.

g. Furr out all exterior walls with 2 x 4 framing and insulate.

h. Additional piers and beams in the crawl space as required for structural support.

i. Install all new drywall, floor sheathing, interior doors and trims.

j. Replace all electrical, plumbing, and HVAC systems.

k. Painting and floor finishes as required.

l. Exterior yard cleanup, grade and re-seed yard, and new walks/ steps.

The property card indicates 2208 sft on the main level. There is a potential 1000 sft, more or less, available on the second level, if finished.

We estimate a cost of at least $110/sft for restoring this structure to code compliant living space which would equal $242,880 for the main level or $352,880 if both levels are finished. Costs could easily be more due to unknown conditions encountered during the restoration process.

Please contact us if there are questions.

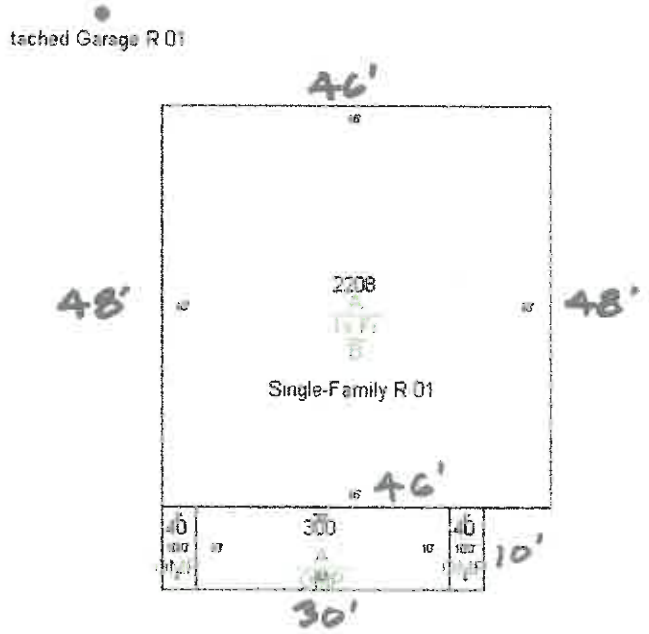
Kevin B. Potter, P.E. j

NORTH & WEST SIDES -
LOOKING SOUTHEAST

Floors

Floor	Construction	Base	Finished
1	Wood Frame	2208	2208
A		2508	0
B		2208	0

Photos and Sketches



INTERIOR PICTURES - 106 E. HILLSIDE







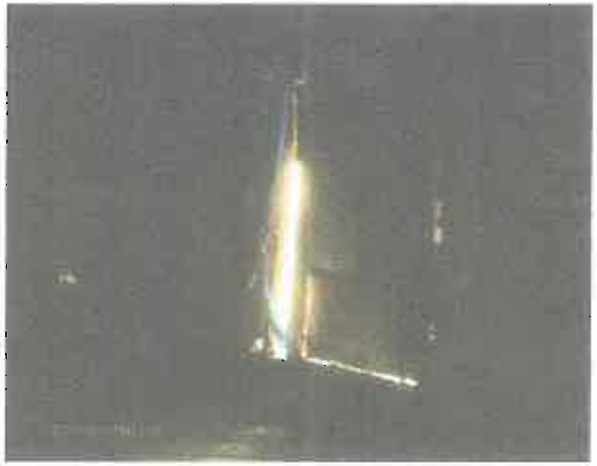


GP

INTERIOR PICTURES - 106 E. HILLSIDE



SW PORCH CORNER 7



106 E. HILLSIDE - WEST PORCH PICTURES

DEMOLITION DELAY-16-16

Violation

Summary

Partial demolition.

611 E. University St.

Contributing **105-055-49090** **House,** pyramidal cottage, c. 1910

This is a contributing c.1910 pyramidal roof cottage. It is slightly altered and in good condition. This case is retroactive as the porch roof was removed without a permit or review. Staff would recommend rebuilding the porch roof, but as this is demolition delay staff recommends not recommending local designation.

DEMOLITION DELAY-16-17

Summary

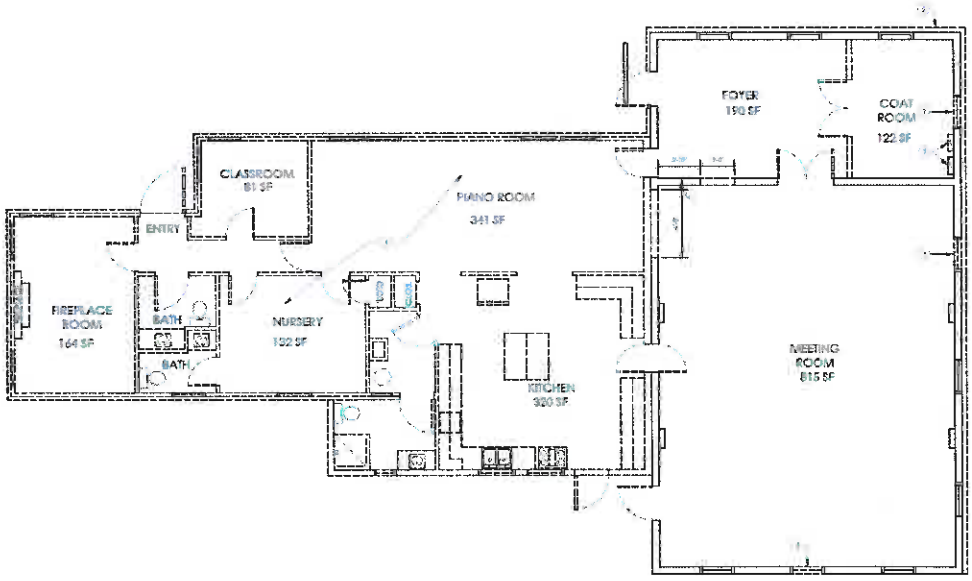
Substantial demolition.

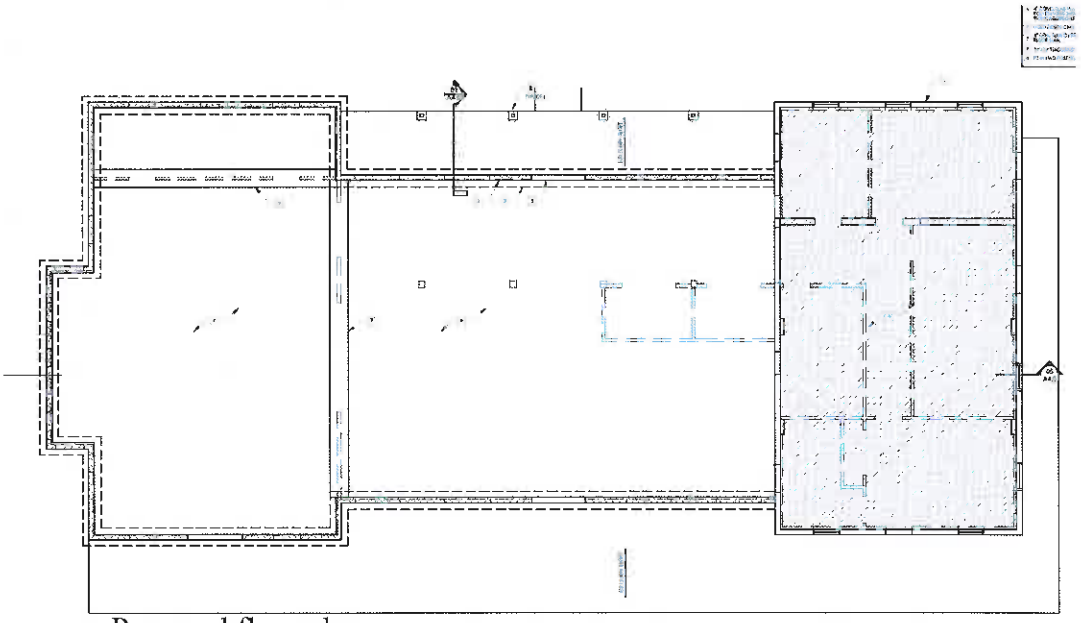
3820 E. Moores Pike

Contributing **105-639-31326** **Meeting House,** ranch, c. 1960

This is a contributing c.1960 ranch Meeting House for the Bloomington Religious Society of Friends. It is slightly altered and in good condition. The petitioner is proposing removing just over 50% of the original building, but maintaining the east side meeting room and mirroring the meeting room on the other side.

Existing Floor Plan





Proposed floor plan

The ranch feel will be maintained in the proposed changes and staff does not recommend local designation of this property individually. Staff recommends release of the permit.

DEMOLITION DELAY-16-18

Summary

Full demolition.

504 W. 11th St.

Contributing **105-055-35677** **House;** Bungalow, c. 1930

This is a contributing c.1930 slightly altered Bungalow in good condition. The property retains some originals features but has been altered over time. The property is isolated and has lost its context since its construction. As you can see below in the 1949 air photo, the house was surrounded by other residences, but is now the only one left. The property is surrounded by industrial buildings and warehouses or expanses of grass and gravel. As such, staff is recommending release of the demolition permit.

2014 Aerial

1949 Historic Air Photo

DEMOLITION DELAY-16-19 and 16-20

Summary

Full demolition. **Bryan Park Amended Survey District**

Demolition Delay-16-19
600 E. Hillside Dr. **Contributing** **House;** Gabled ell, c. 1900

This property is a slightly altered c. 1900 gabled ell in good condition. This property is located at the corner of S. Henderson St. and E. Hillside Dr. The property retains the form of a gabled ell, but most other original features have been removed or altered over time. As this property is not worthy of individual designation, staff recommends release of the demolition permit.

Demolition Delay-16-20
602 E. Hillside Dr. **Contributing** **House;** Minimal Traditional, c. 1950

This property is a slightly altered c. 1950 minimal traditional in good condition. This property is located just east of the corner of S. Henderson St. and E. Hillside Dr. The property originally had four over one windows and a mid-century wooden door and has lost original features. As this property is not worthy of individual designation, staff recommends release of the demolition permit.

DEMOLITION DELAY-16-21

Summary

Full demolition.

444 S. Walnut St.

Contributing **105-055-60032** **Auto Shop;** Commercial, c. 1960

This is a contributing, unaltered c.1960 commercial style auto body good condition. The property retains original window, doors and transoms. The property was a single-family residence originally but was replaced by this existing auto shop in c. 1960. This property remains a good example of auto shops from this era, but does not retain enough integrity to warrant individual designation and staff recommends release of the permit.

DEMOLITION DELAY-16-22

Summary

Roof material change (partial demolition).

444 S. Walnut St. (William Lowe Bryan House)

Notable **105-055-35798** **House;** Queen Anne, c. 1895

This is a notable c.1895 slightly altered Queen Anne house in excellent condition. The property retains most original features of the property and has been well maintained. This property was originally inhabited by one of Indiana University's presidents from 1902-1937. This is a petition for roof material change from non-original cedar shingles to a green, non-reflective standing seam roof. As the roof is not the most character defining feature of this property, same is recommending release of the permit to complete the work.