THE CITY OF HARRISONVILLE
WHERE TRADITION MEETS INNOVATION

AGENDA
CITY OF HARRISONVILLE
HISTORIC PRESERVATION COMMISSION
REGULAR MEETING
CITY HALL
JULY 1, 2026
12:00 PM

1. **Call to Order**
   - A. **Roll Call**
2. **Approval of Minutes**
   - A. **Minutes from the June 3, 2026, meeting.**
3. **Action Items**
   - A. **Selection of Chairman and Vice-Chairman**
4. **Certificate of Appropriateness**
   - A. **Appl. COA-26-001 and 002--Certificates of Appropriateness for 101 and 103 S. Lexington St.**
5. **Discussion Items**
   - A. **Code Amendments to Divisions 7 - 10, Article XVI**
6. **Adjourn**

Posted on City Hall Bulletin Board this 24th day of June, 2026.

_____

Daniel Barnett, City Clerk

THE CITY OF HARRISONVILLE
WHERE TRADITION MEETS INNOVATION

MINUTES
CITY OF HARRISONVILLE
HISTORIC PRESERVATION COMMISSION
REGULAR MEETING
CITY HALL
JUNE 3, 2026
12:00 PM

1. Call to Order

The meeting was called to order at 12:01 PM by Chairman Atkinson.

A. Roll Call

Attendee Name	Title	Status
David Atkinson	Chairman	Present
April McLaughlin	Vice-Chairman	Present
Dale Franklin	Commissioner	Present
Amanda Stites	Commissioner	Excused
Bing Schimmelpfenning	Commissioner	Excused
Robert Wiseman	Commissioner	Present
Cameron Chenoweth	Commissioner	Present
Aldermen Davidson	Aldermen Liaison	Excused

Others present: Christina Stanton, Community Development Director; and Jamie Martin, Recording Secretary.

2. Approval of Minutes

A. Minutes from the May 6, 2026, meeting.

RESULT: **Approved**
MOVER: Dale Franklin
SECONDER: Robert Wiseman
AYES: David Atkinson, April McLaughlin, Dale Franklin, Robert Wiseman
EXCUSED: Amanda Stites, Bing Schimmelpfenning, Cameron Chenoweth (new to Commission), and Aldermen Davidson

3. Discussion Items

A. Code Amendments to Division IV, Procedure for Designation of Property As A Landmark or Historic District, Article XVI

RESULT:	**Approved**
AYES:	David Atkinson, April McLaughlin, Dale Franklin, Robert Wiseman, Cameron Chenoweth
EXCUSED:	Amanda Stites, Bing Schimmelpfenning, Aldermen Davidson
	The Commission did not take an official vote, but all agreed to changes after the discussion.

Director Stanton presented the Staff Report for proposed Code Amendments to Division V- Certificates of Appropriateness; and Division VI- Design Guidelines. The amendments proposed seek to review, update, and add consistency and clarity.
The review and update of our regulations is recommended by the SHPO, the 2021 Historic Preservation Plan, and as a general best practice.
The amendments proposed come from a review of the historic preservation regulations of ten other jurisdictions with a historic downtown square, and a comparison of the Model Ordinance from SHPO.

- Initial changes to Sections 405.430, 440, and 450 were primarily from the July 1993 amendments that were not previously captured and minor adjustments to provide additional clarity. Staff has added a clarifying purpose statement under Section 405.430, that primarily comes from the City of Liberty with minor adjustments.
- Additional clarifications regarding potential submittal materials has been added to Section 405.435.
- The last sentence that has been added to Section 405.440, Stop Work Order, was originally in Section 405.445. This change is consistent with the SHPO Model Ordinance and many of the other communities that staff reviewed. Additional changes to this Section are to provide clarity to the process and better align with both the SHPO Model Ordinance and the city's current Stop Work Order process in Section 510.050.
- Staff is recommending the removal of the specific time limits from the language in Section 405.445, consistent with the recommendation from last month's meeting for Division IV's Sections 405, 410, and 420. Additionally, staff has added a subpart C that provides an option for an applicant of an approved COA the ability to request an extension of the time limit.
- Changes to Section 405.455 and 460 are largely to better align with the SHPO Model Ordinance.
    a. Changes to subpart A, in Section 405.455, includes a blending of the SHPO Model Ordinance and language from the City of Liberty.
    b. Staff would like to asked the HPC's opinion regarding the language in subpart C, Section 405.455, "All buildings, structures and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged." The corresponding

language from the SHPO Model Ordinance reads: "Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken."

Director Stanton asked if the HPC had a preference over the two versions or recommended any changes. She said that the other communities mirrored SHPO.
Robert Wiseman said that the differences are the words undertaken and discouraged. Director Stanton said that the sentences have similar meanings but the SHPO version is clearer.
David Atkinson asked if this had ever been an issue. Director Stanton said that as far she knows, it has not been. But it would give stronger teeth to the review process.
April McLaughlin said that the SHPO version is more definitive and better than the current language.
David Atkinson asked if she knew where the current language came from. Director Stanton said that she did not know.
The Commissioners agreed to strike the current language and use the SHPO language.

There was some discussion about the Design Guidelines and small changes and cleanup items that need to be made. Director Stanton said that the two sections that need attention are signage and maintenance.
Robert Wiseman asked about new work and how someone would be able to differentiate new and old. Director Stanton said that there are sometimes markings that reviewers of the building would see or know that would not be seen by the naked eye.
Mr. Wiseman asked what should be done if work is being done that should go through the review process. Director Stanton said to notify staff to handle it.
There was some discussion about minimum maintenance and signage.
Director Stanton reminded the Commission that they will review the remaining divisions as follows:

- In July, Divisions 7-10 (Maintenance of Properties, Appeals, Fees and Penalties, and Guidelines for Landmarks and Preservation Districts.
- Also, the sum of these amendments will go to the Planning & Zoning Commission and Board of Aldermen for review and approval in August/September. August 20th for P&Z; September 7th for BOA, with the second reading and adoption being September 21st.

The Commission asked about the Scavenger Hunt for Historic Preservation Month. I told them we had seven participants and that all would receive a prize from the donations.
Chairman Atkinson welcomed Cameron Chenoweth to the Commission.

4. Adjourn

With nothing further to come before the Commission, April McLaughlin made a motion to adjourn. Dale Franklin seconded. The meeting was adjourned at 12:41 PM.

Respectfully Submitted:

Jamie Martin, Recording Secretary

THE CITY OF HARRISONVILLE
WHERE TRADITION MEETS INNOVATION
300 E. Pearl Street, P.O. Box 367 • Tel: 816-380-8900 • Fax: 816-380-8906 • Harrisonville, MO 64701

To: **Historic Preservation Commission**

From: **Christina Stanton, AICP, Community Development Director**

Date: **October 1, 2025**

Re: **Appl. COA-26-001 and 002--Certificates of Appropriateness for 101 and 103 S. Lexington St.**

GENERAL INFORMATION

Applicant/Owner: Cole Putthoff, Putthoff Construction, LLC

Requested Actions: Approval of Certificates of Appropriateness

Date of Application: June 16, 2026

Existing Zoning: Downtown Core Business (CBD-1) District

PROPOSAL

The Applicant has requested Certificates of Appropriateness to allow for the recently replaced windows and to change the color (paint) as indicated in the Paint Colors attachment.

BACKGROUND

The building descriptions, according to the National Register Nomination for the Courthouse Square Historic District (page 20) are as follows:

101 S. Lexington Street (c. 1888; altered 1925):

> **"Two-story, brick vernacular, commercial building. Built on a stone foundation, …. The recessed entrance features a modern, centrally-placed aluminum frame glass door with transom. Modern plate glass display windows flanked the entry. The bulkhead is modern brick. The transom area is covered with wooden lattice. Above the lattice is a cast-iron lintel. Second story fenestration consists of 1/1 light, double-hung sash windows with stone sills and lintels. A rectangular brick design, with square stone accents at each corner, comprise the cornice. Cut stone coping runs along the roof line. (Contributing)"**

103 S. Lexington Street (c. 1900; altered 1909, 1925, 1970, 2000):

> **"Two-story, brick, vernacular commercial building Tudor Revival elements. Built on a stone foundation, …. The main entrance, a modern aluminum frame glass door, is centrally placed. Plate glass display windows flank the entrance. Below the windows are modern brick veneer bulkheads. The second story entrance, a wood panel door with a glass upper panel, is situated at the south end of the storefront level. The prominent transom is covered with wood. Above the wide transom is a modern, shingle shed roof supported by wooden brackets. Fenestration at the second story consists of modern 8/1 light, double-hung, sash windows placed at the lower half of segmental openings. The upper-half of each opening is in-filled with brick. The fenestration also features metal sills and buff brick radiating voussoirs. Buff brick quoining forms the window surrounds. Buff brick in a**

diamond pattern comprises the cornice, while buff brick coursing runs below the cornice. The building has been sandblasted. (Contributing)"

According to the recent resurvey work (Phase I) completed by Civil & Environmental Consultants, Inc. 101 S. Lexington Street remains "contributing to the Harrisonville Courthouse Square Historic District in the areas of commerce and architecture" despite façade changes that occurred in 1925 due to a fire in 103 S. Lexington Street.

"A 1911 postcard shows the original façade which had a much more elaborate cornice with a central pediment. Windows on the second story were 2/2 arched windows with pediment hoods. The storefront still had the recessed entry with cast iron pilasters and bulkheads. Signboards were above the display windows on the western and northern elevations. The current state of the façade is similar to its appearance in the 1970s and 1980s. During the time of the 1991 survey, the transom was covered with lattice."

Snip of 1911 Postcard

The recent survey work (Phase I) completed by Civil & Environmental Consultants, Inc. states 103 S. Lexington Street "retains sufficient integrity to be considered contributing to the Harrisonville Courthouse Square Historic District in the areas of commerce and architecture".

ANALYSIS

In "Harrisonville's Guidebook for Landmarks and Preservation Districts", the table on pages 8 – 11 summarizes the guidelines and potential types of work which do and don't need approval by the Historic Preservation Commission (HPC). Basically, it is stated that changes which are visible from the street require approval from the HPC. More specifically, as applied to the current requests, under III. Painting, Guidelines for Harrisonville's Preservation Districts and Landmarks, "A" states that "HPC must approve color selection and will emphasize colors that fit the style and age of the building and complement the overall color schemes on the street. Avoid using bright and obtrusive colors, too many colors, or a single color for the entire building." Under V. Windows and Door Changes, Guidelines for Harrisonville's Preservation Districts and Landmarks, "B" is specifically pertaining to "changes [that are] not visible from any street"; however, it is worth noting that even these areas that typically have a lower level of scrutiny state that "New windows and doors must be compatible in height, width and style with original windows and doors..".

On September 3, 2025, the Mr. Putthoff appeared before the HPC to discuss some of the work he had done on the north façade of 101 and the interior rehab work being completed on both 101 and 103. At that time, Mr. Putthoff informed the Commission that the stucco on the north side of 101 was cracked and had been the cause of water seeping into the brick inside. He further explained how deteriorated much of the brick had become and stated that he had decided to remove the brick and replaced it with CMUs ("cinder block") to pack it solid and provide a good base. Mr. Putthoff stated that the stucco was then replaced. Then, he briefly discussed windows for the storefronts and mentioned changing the green. He further shared plans for the business.

On multiple accounts, staff has reminded Mr. Putthoff that a formal Certificate of Appropriateness (COA) needed to be submitted for any proposed changes to the portions of the buildings that are visible from the streets rights-of-way. This application should have been submitted and reviewed prior to *any* exterior changes; however, the applicant has already replaced a number of the windows at 101 and 103 S. Lexington Street. For the most part, the windows that have been replaced appear to be consistent with others that have been replaced around the Historic Square. However, it has been noted that the second-floor windows at 103 S. Lexington Street are somewhat different. Staff understands that this is due to the larger window openings but would like to also note that the original window openings were previously reduced by the space above the top half being covered (as is visible from the Google Street View Images). Additionally, it is worth noting that there is a mixture of buildings with three (3) panes separated by two (2) muntins on the second floor and those with two (2) panes separated by one (1) muntin—some with additional material filling in a portion of the window opening to reduce the size of the window.

- **Buildings with three (3) panes on the second floor include the following:**
  - **On the south side—105, 107, 109, 113, and 115 E. Wall Street;**
  - **100 W. Pearl Street at the northwest corner;**
  - **104 and 106 N. Independence Street just north of the northwest corner.**
- **Portions of the second floor window openings are closed in or covered in some fashion at 101 W. Wall Street, 104 and 116 S. Independence Street.**

The applicant is also requesting to replace the green with a darker color. Staff has expressed concerns about the color being too dark and creating the same recessed appearance and modernized effect that staff had been warned by SHPO by the use of too much black. The applicant is requesting to paint the two cast iron pilasters at 101 S. Lexington such that the base color proposed is the dark SW 7069—Iron Ore and the details are proposed to be painted SW 9109—Natural Linen. Neither of these proposed colors are considered historic colors. Staff has included Preservation Briefs #11 and #27 as attachments and valuable references for both the applicant and the HPC.

- **Preservation Briefs #11: Rehabilitating Historic Storefronts, provides some basic history and guidance along with recommended preservation treatments.**
- **Preservation Briefs #27: The Maintenance and Repair of Architectural Cast Iron, contains a plethora of information on architectural cast iron including cleaning and paint removal (page 7) and some very important information regarding what types of paint to and not to use (page 9).**

Staff has conveyed concerns about the darker color to the applicant previously and that there are several architectural details on the cast iron pilasters that could be highlighted with either a lighter or darker color. Additionally, after reviewing the picture of the 1911 postcard, staff has inferred that the original style was likely Italianate style, but unfortunately this detail was largely lost in the 1925 fire except for the two cast iron pilasters. Staff did a little research on "Scherpe & Koken", which is embossed on both cast-iron pilasters, and was able to locate the 1887 catalogue and identify the exact model (No. 125)—screenshots of this information is included as the Scherpe & Koken attachment. Moreover, staff believes that the current colors of the two cast iron pilasters are likely the original colors, though it is impossible to know for sure without a paint analysis being done.

Standards for Review. Section 405.455 lists standards for review that the Historic Preservation Commission is to use to help guide their review of an application for a certificate of appropriateness. Of these standards, B, E, and H are the most appropriate to consider for this application. The standards for review have been attached.

REQUEST AND OPTIONS

The Applicant is seeking approval of:

1) **The replaced windows; and**
2) **The paint colors proposed for the exterior façades as shown on the attachments.**

The Commission may:

- **Approve the request for Certificates of Appropriateness**
- **Conditionally approve the applications for Certificates of Appropriateness**
- **Deny the requests for Certificates of Appropriateness**

STAFF RECOMMENDATION

Staff recommends *approval* of the requested Certificates of Appropriateness with the suggestion that the proposed colors for the cast iron pilasters be reversed so that the lighter color (Natural Linen) is the primary and the details are painted the darker color (Iron Ore) to better maintain the integrity of the cast iron pilasters.

ATTACHMENTS

Applications and attachments—Applications for 101 and 103, Pictures, and Paint Colors
Google Street View Images
Pictures Around the Square
Historic Pictures
Missouri Main Street Connection (MMSC)—Painting 101: Historic Buildings
Preservation Briefs 11: Rehabilitating Historic Storefronts
Preservation Briefs 27: The Maintenance and Repair of Architectural Cast Iron
Scherpe & Koken
Section 405.455—Standards for Review

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS
TO
HARRISONVILLE HISTORIC PRESERVATION COMMISSION

UNDER ORDINANCE NO. 1825 OF THE CITY OF HARRISONVILLE, MISSOURI

I (we) the undersigned do hereby respectfully make application for the Certificate of Appropriateness for the following plans and proposals to be undertaken within the boundaries of the Historic District.

Property Location: 101 S Lexington Street

Property Owner: Ruthhoff Construction

Owner's Address: 1053 NW 1501st Rd Holden, MO 64040

TYPE OF WORK (check all that apply)

X **Exterior Alteration or Repair**

____ **New Construction**

____ **Demolition of Structures**

____ **Relocation of Structures**

____ **Other** _____

See page 2 of this application for additional information to be submitted.

Signature: Applicant [signature]

Address 1053 NW 1501st Rd Holden, MO 64040

Phone 816-406-8448

RETURN APPLICATION TO: **Community Development Department**
Harrisonville City Hall
P.O. Box 367, 300 E. Pearl Street
Harrisonville, MO 64701

The application, including all additional information, must be filed no later than fourteen days prior to the regularly scheduled meeting of the Historic Preservation Commission. The Commission meets on the first Wednesday of each month at 12:00 PM in the Council Chambers of City Hall, or as needed. Property Owners are urged to attend the meeting. Copies of all information submitted with an application must be retained by the Historic Preservation Commission.

Date Received by Department June 16, 2026 **(Initials)**
Date Approved _____
Certificate Number _____

ADDITONAL INFORMATION TO BE SUBMITTED WITH APPLICATION

1. **EXTERIOR ALTERATION OR REPAIR**

Describe clearly and in detail all work to be done. Include the following items where appropriate:

A. Sketches, photographs, specifications, manufacturer's illustrations or other description of proposed changes to the building façade or roof, new additions, or site improvements. Drawings will be required for major changes in design for such items as roofs, facades, porches, or prominent architectural features.
Replace storefront glass and doors (see attached), new paint on trim & old green stucco

B. Color schedule (see attached).
Iron ore (see attached) Natural Linen

C. Color of brick and type of mortar to be used, for masonry work.
n/a

D. Samples of proposed materials when the original material will not be retained.

E. Site information, including the location of all large trees, parking areas, walls, fences, outbuildings, or other landscape features of note where major site improvements are proposed.
n/a

F. Landscape plan with measured distances for new parking areas or other major site improvements.
n/a

2. **NEW CONSTRUCTION**

Describe the nature of the proposed project. Include the following items where appropriate:

A. Site plan with measured distances.

B. Elevation drawings of each façade and specifications which clearly show the exterior appearance of the project.

C. Photograph of the proposed site.

D. Landscape plan.

E. Color Schedule.

F. Samples or other description of materials to be used.

G. Drawings or other description of site improvements: fences, walls, walks, lighting, pavement, patios, decks, ect.

3. **DEMOLITION OF STRUCTURES**

A. **Describe the structure and give the reason for demolition. Include a photograph.**

B. **Describe the proposed reuse of the site, including landscaping.**

4. **RELOCATION OF STRUCTURES**

A. **Give the reason for the relocation. Include a photograph. If the structure is to be relocated withing the district, describe any proposed changes.**

B. **Describe any site features, which will be altered or may be disturbed, including foundation, walls, driveways, vegetation, etc.**

- Window manufacturers do not make Sinyle hung windows in excess of 84". Withe the openings of the exsisting windows being 102½" we had to add transom windows above the Sinyle hung windows. The openings from 103 & 101 were different. we decided we needed to Match the window Sizes and adjust the transom size. That is why the transoms are different Sizes. we looked around the Seuare and old & New windows both have the transom windows Some Smaller and Some larger, Plenty of older windows have transoms of many Sizes Creating the historic look of the window relative to what we did.

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I (we) the undersigned do hereby respectfully make application for the Certificate of Appropriateness for the following plans and proposals to be undertaken within the boundaries of the Historic District.

Property Location: 103 S Lexington Street

Property Owner: Pitthoff Construction

Owner's Address: 653 NW 1501st Rd Holden, MO 64040

TYPE OF WORK (check all that apply)

X **Exterior Alteration or Repair**

_____ **New Construction**

_____ **Demolition of Structures**

_____ **Relocation of Structures**

_____ **Other** _____

See page 2 of this application for additional information to be submitted.

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Replace storefront glass and doors (see attached), new paint on trim & old green stucco

B. Color schedule (see attached).
Iron Ore (see attached) natural Linen

C. Color of brick and type of mortar to be used, for masonry work.
n/a

D. Samples of proposed materials when the original material will not be retained.
n/a

E. Site information, including the location of all large trees, parking areas, walls, fences, outbuildings, or other landscape features of note where major site improvements are proposed.
n/a

F. Landscape plan with measured distances for new parking areas or other major site improvements.
n/a

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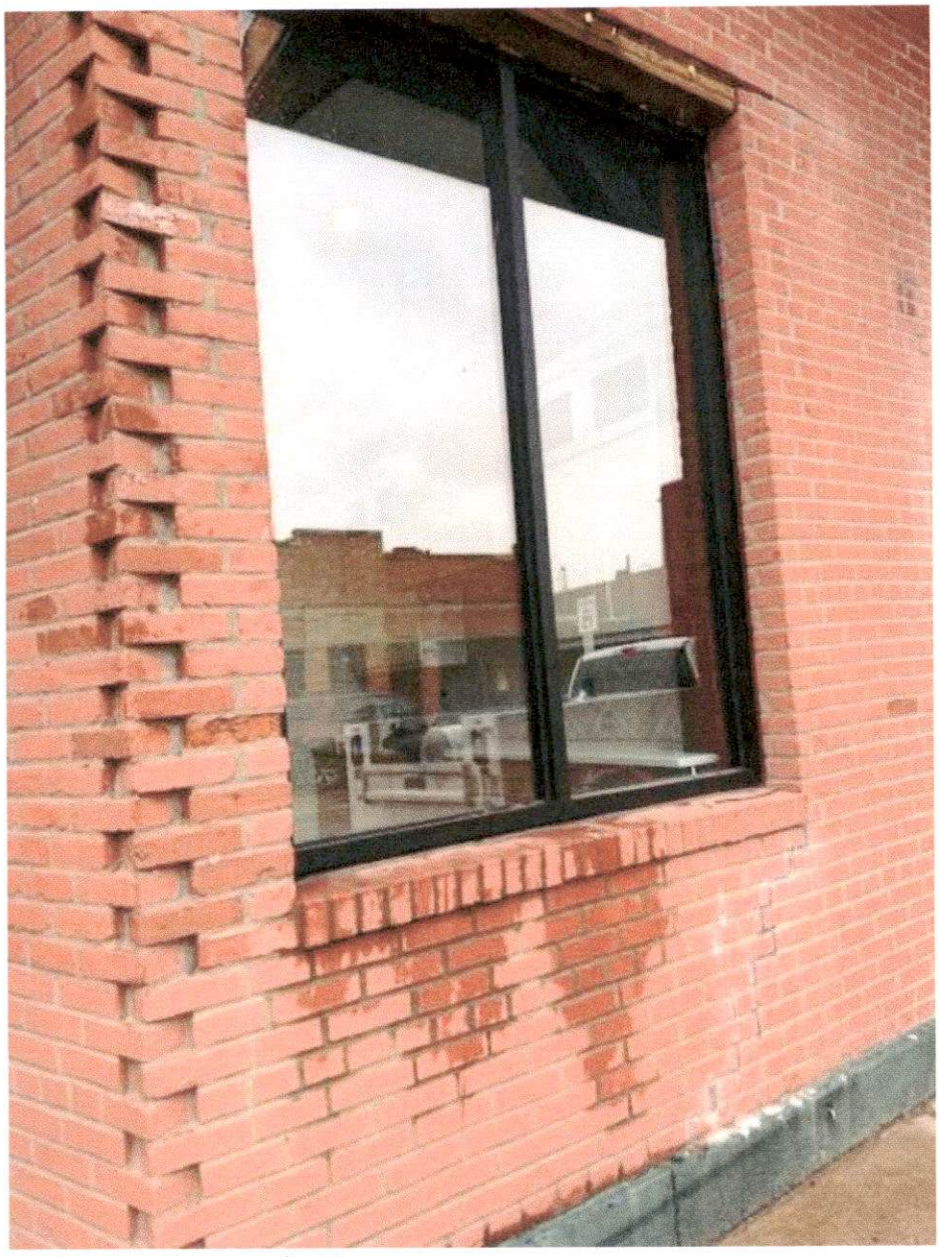
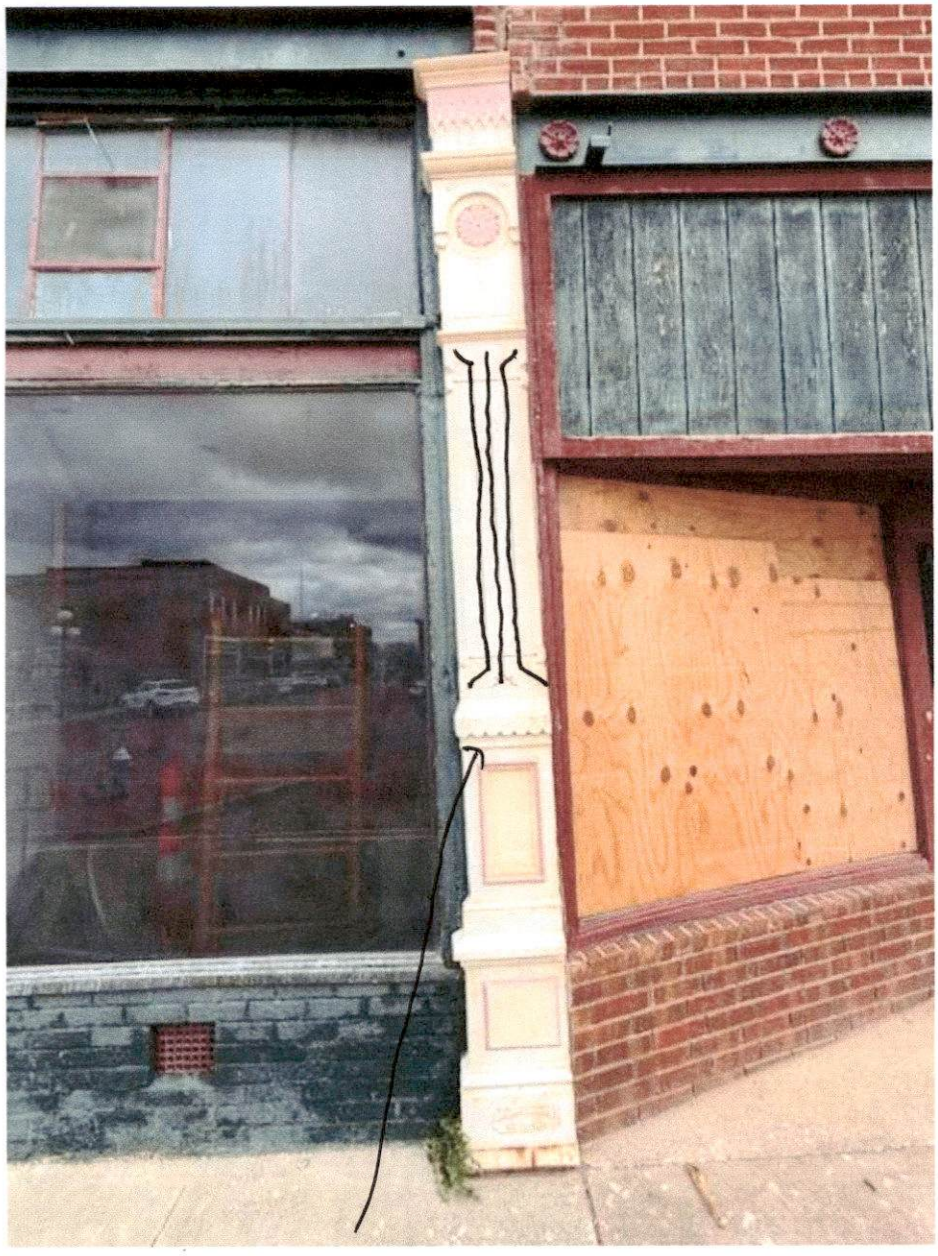
* Second Floor Windows



*storefront glass



- Iron ore
- Natural Linen Accents

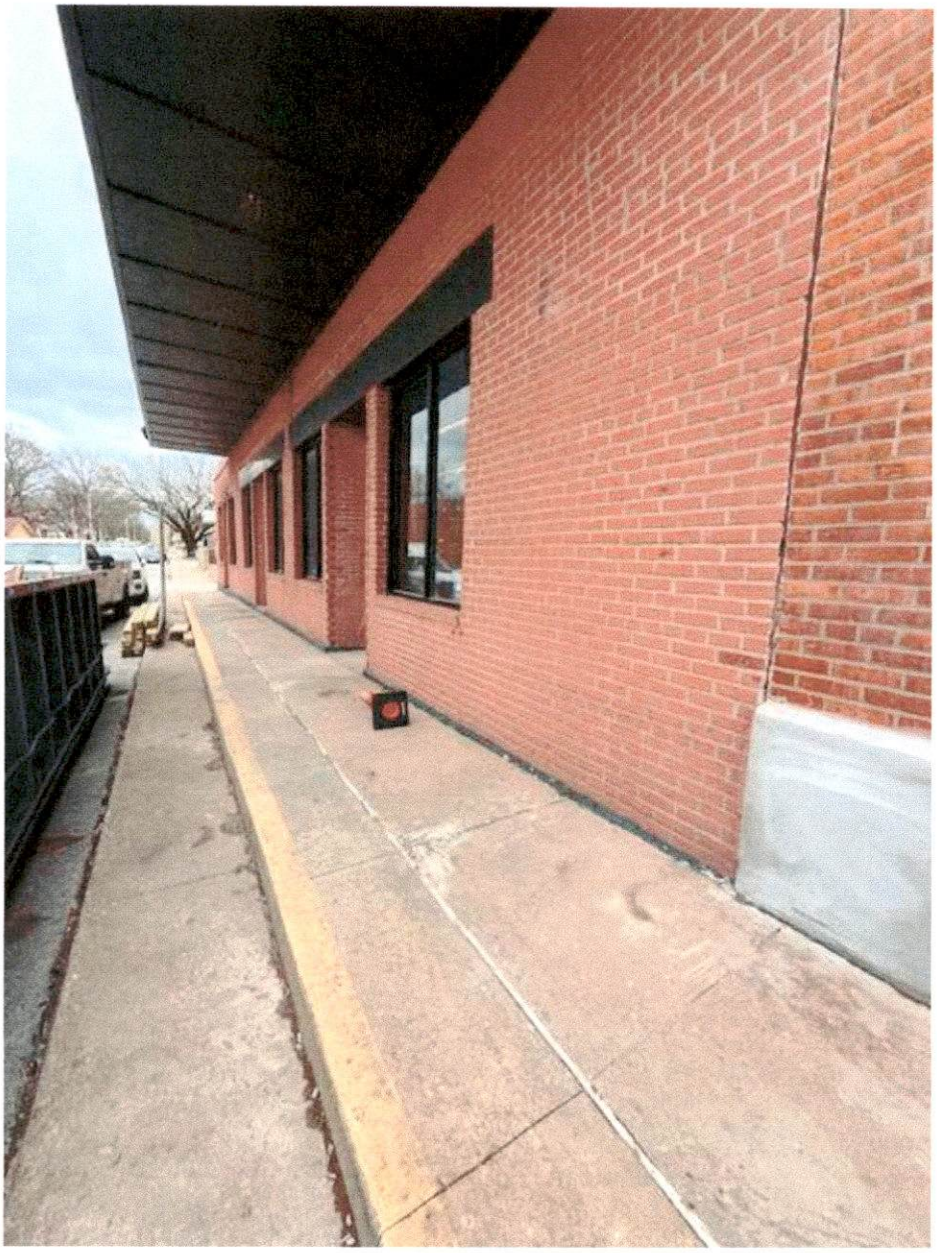

LEXINGTON
101
FINE DINING

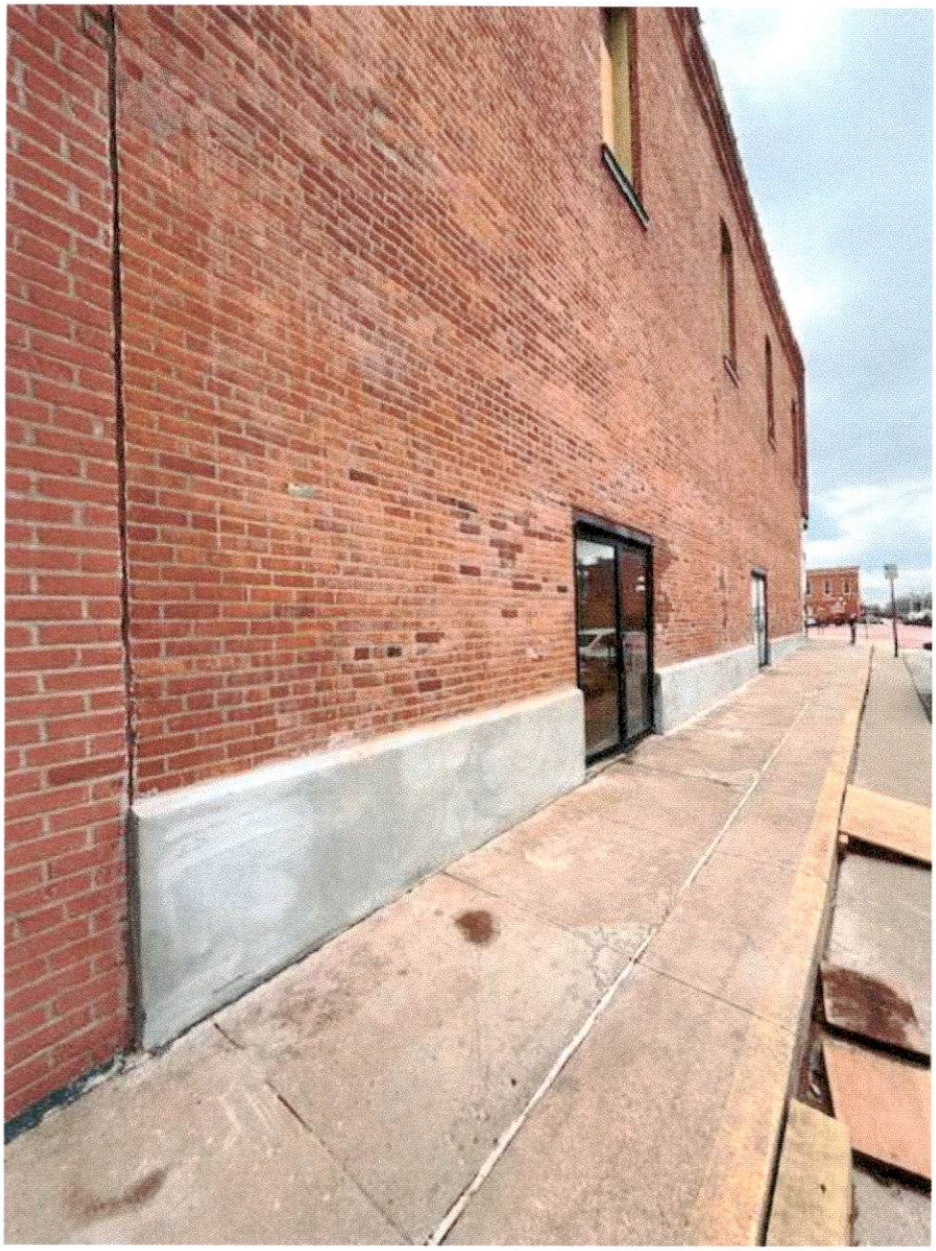

LEXINGTON
101
FINE DINING

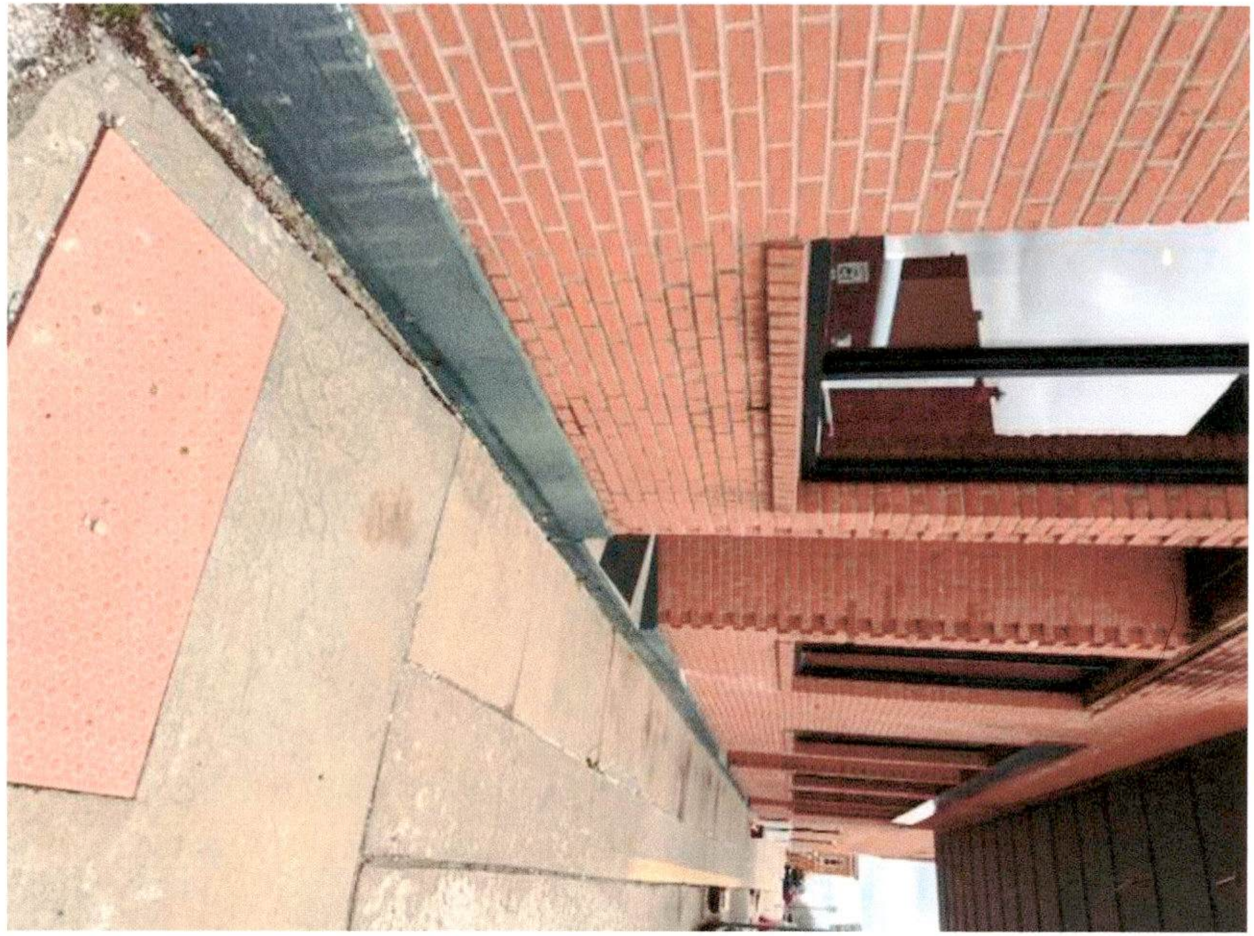
- All Green Iron one

Add windows above 103 Door.

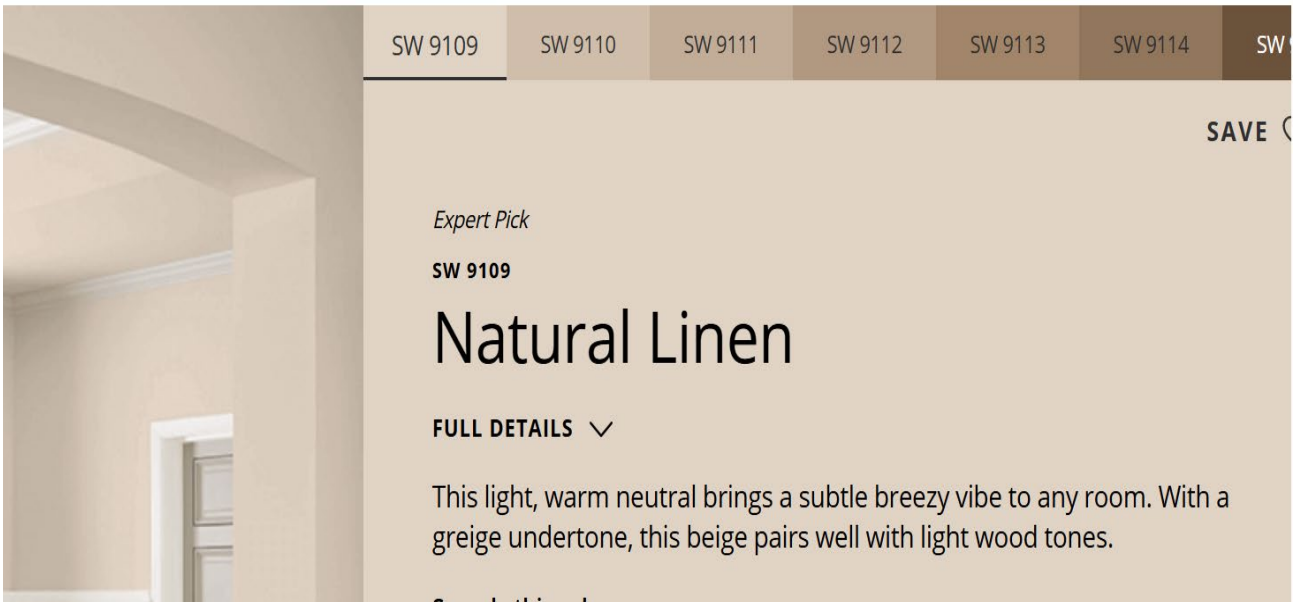

PEARL STREET
GRILL

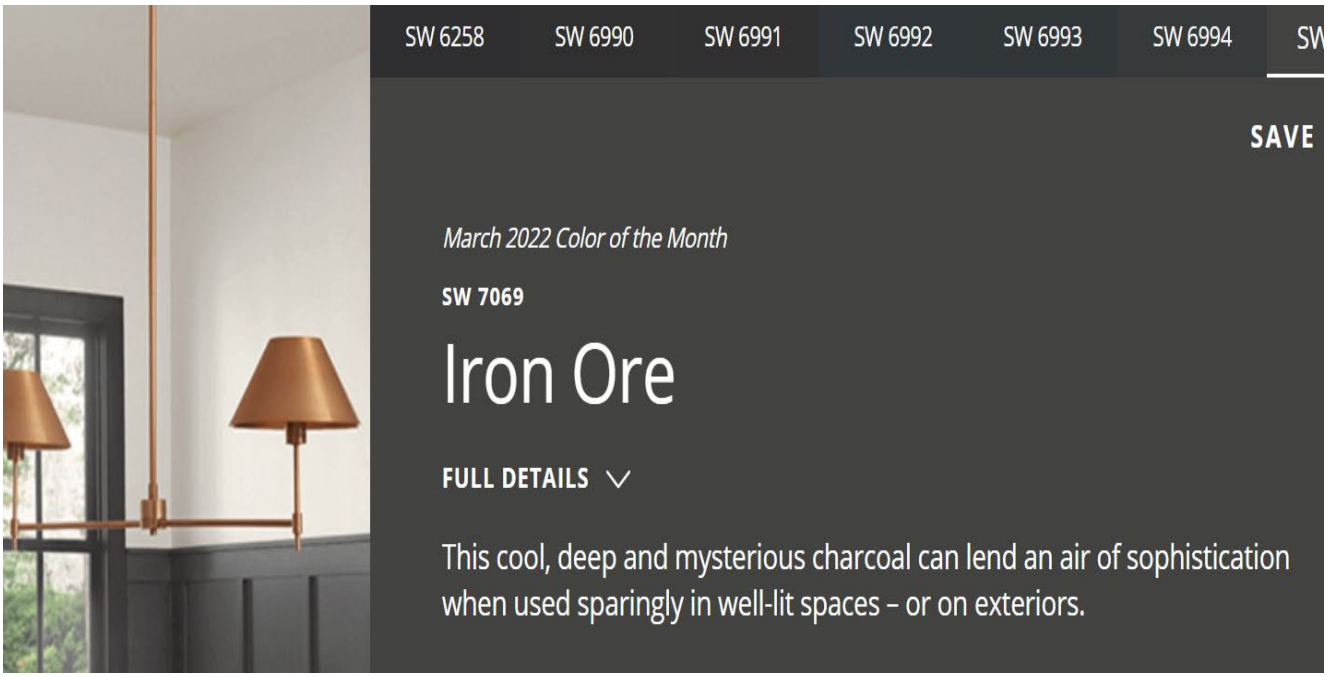






› SW 9109 Natural Linen

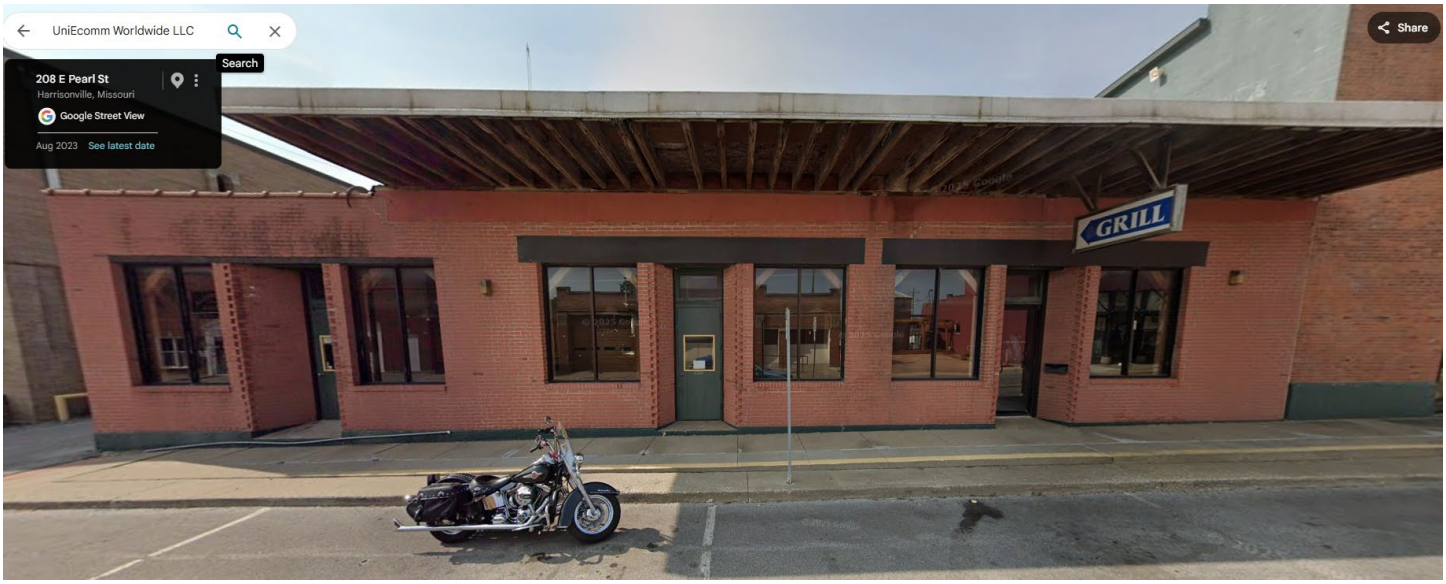




Google Street View Image from August 2023:

Google Street View Image from August 2024:

Google Street View Image from August 2023:

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DISTRICT


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ONE WAY
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Salon 14


Salon 114
THE BOARDMAN BUILDING
Service Tech Solutions


the VAULT
Amazingly Ageless


HEADQUARTERS
100 WEST PEARL
BOUTIQUE CLOTHING
CRAFT BEER
W PEARL


N LEXINGTON
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Historic Pictures

PH426 Box 5 BW Postcard City:H'ville Street Scene:Square:West & East 1911

PH39 City:Harrisonville Street Scene:Square,NE Corner 1930-40 BW

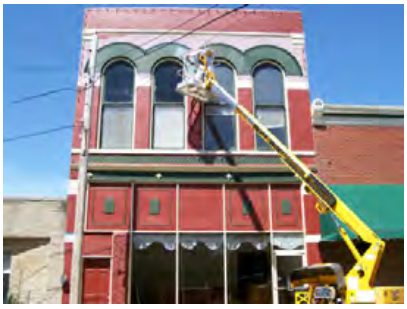
PH65 City:Harrisonvile Street Scene:Square:East Business:P.K.Glenn H'ville Book Store ca.1970s BW

PH187 City:Harrisonville Square:East Business:P.K.Glenn,Bookstore, Cass Cty Title ca. 1872 color

PH49 City:Harrisonville Buildings:Square,East Side 1980 2 copies BW

PH490 Box 6 Hville Square East 490.1 101-109 S. Lexington 490.2 111-118 S. Lexington 1995

PAINTING 101: HISTORIC BUILDINGS



Painting can be one of the most dramatic improvements you make to your building. However, only paint a building that has been previously painted to maintain the historic look of the building. Measures should be taken to remove old paint from brick to restore the original brick, if applicable. In addition, if repointing must be done to prep the façade, before painting, consult with a mason experienced with using the type of mortar for the age of your building. If the building is metal or has metal components, we recommend consulting with a professional company for cleaning and preparatory work. The following steps will help smooth the way for a successful paint job on your historic building:

1. Evaluation. Determine what you need to prepare for painting. Check all the wood. Is it sound or rotting? Does it have insect damage? Repair or replace any damaged areas that you find. If you need to repaint your masonry building, first check the mortar. Make sure the surface is prepped correctly before proceeding, including looking for moisture damage or possible areas where moisture could come in. If the building needs repointing, do that before painting.

2. Timing. Plan a painting schedule. Some times of the year are better than others for painting. Good weather usually ensures a better paint job. Ask your local paint dealer for assistance.

3. Windows. Check the condition of your windows. Glaze and repair windows as necessary. Replace any deteriorated putty with a glazing compound; be sure to put it all around the window. Wait two or three days for the compound to dry before painting.

4. Old Paint. Prepare the surface adequately. Be sure to remove all peeling and loose paint. A variety of tools can be used: a wire brush, a scraper, a blow torch, or an electric heat gun. Use these last two devices carefully; employ only enough heat to soften the paint so that it can be easily removed. Do not blast masonry as this can ruin the old brick; instead, use a chemical application to help remove the old paint.

5. Primer. A primer should be used for all bare wood surfaces as it helps the final coat adhere. Mix a little of the finish coat paint with the primer to achieve a richer color. If working with metal, primers need to be chemically compatible with the type of metal material before painting; be sure to choose a paint that is rust-inhibiting as well.

6. Building Material. Determine the type of paint best suited for your building. Stone, brick, wood, concrete block, and metal all require different paints and primers.

7. Oil vs. Latex. Which kind of paint should you use, oil or latex? That can depend on the material!
We recommend reading more about this from Preservation Brief 11 from the National Park Service. There are advantages and disadvantages to each:

8. Shine. Be aware that there are three degrees of shine for paint: gloss, semi-gloss, and flat/matte.

9. Quality. Remember that quality paint will last longer than a cheap brand. It will not fade or peel as quickly and usually gives better coverage.

A Note on Lead Paint

If your building is more than 50 years old, it may contain lead-based paint. If you are removing the existing paint as part of the repainting process, have a sample tested. It is *imperative* that the testing be done by a reputable company or by a state testing lab. If there is a problem, contact your state environmental department for information on options for removing or encasing the lead-based paint.

An important reminder: Once you use latex, you must continue to use it. It is difficult to switch back to oil. If you have been using an oil-based paint, it is best to continue with oil.

PAINT COLOR

The color you paint your building, window trim, or door is, to some extent, a personal decision. It is an expression of yourself and your commercial establishment. However, there are other people and things to think about. The following procedures can help you decide what colors to use on your building.

1. Look Around! Be a good neighbor and look at your building in the context of the entire block or downtown. The color of your building can affect the overall character of Main Street.

2. Investigate. Decide whether you'd like to return your building to its original paint colors. If you are seeking historical accuracy, carefully scrape a small area to reveal different layers of paint. Please note that over time, the original color may have faded. To get a better idea of the true color, wet the original surface. The base color will appear more accurately when moist.

3. Research. Color schemes for commercial buildings differ by region of the country. They also differ according to the period when the building was constructed. Scrape a small area of the building to determine its historic color. Sherwin Williams also has a line of historically-used colors to choose from. Choose a swatch that fits with the era of your building and what it was historically painted.

4. Sunlight. Think about how the sun strikes your building. The amount of sunlight can change the hue of paint color. Hold a paint splotch against your building on cloudy and sunny days. To be certain about your color choice, invest in a quart of paint and apply it. There is a great difference between a small color spot and an entire wall.

5. White Paint. It is important to remember that white paint was not used as widely during the Victorian period as it is today. White is a glaring color that does not blend in readily with most downtown environments. Historic downtown buildings traditionally used dark colors, especially on the window's trim and architectural features.

6. Trim. Traditionally, building trim was painted as decoration, often in a contrasting shade lighter or darker than the primary building color. This paint treatment defined the trim, but it was not so overpowering that the trim colors dominated the buildings.

7. Aluminum Frames. Today, aluminum frames have frequently replaced traditional wood doors and windows. The shine and metallic color of the aluminum do not complement historic buildings. Paint them a more neutral color or choose darker, anodized frames if the original window has to be replaced or the original window has previously been replaced.

8. Accent. Paint color should be used to tie together all building elements, including the cornice, upper facade, windows, storefront, and doors. Use at most 4 colors to accent the features of your building that bring character.

9. Express Yourself! With these procedures in mind, express the identity of your business through paint color. It adds to the richness and variety of Main Street.

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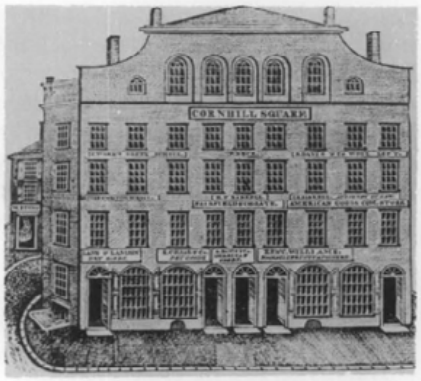
11 PRESERVATION BRIEFS



Rehabilitating Historic Storefronts

H. Ward Jandl

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

The storefront is the most important architectural feature of many historic commercial buildings. It also plays a crucial role in a store's advertising and merchandising strategy to draw customers and increase business. Not surprisingly, then, the storefront has become the feature most commonly altered in a historic commercial building. In the process, these alterations may have completely changed or destroyed a building's distinguishing architectural features that make up its historic character.

As more and more people come to recognize and appreciate the architectural heritage of America's downtowns, however, a growing interest can be seen in preserving the historic character of commercial buildings. The sensitive rehabilitation of storefronts can result not only in increased business for the owner but can also provide evidence that downtown revitalization efforts are succeeding (see figure 1).

Once a decision is made to rehabilitate a historic commercial building, a series of complex decisions faces the owner, among them:

- if the original storefront has survived largely intact but is in a deteriorated condition, what repairs should be undertaken?
- if the storefront has been modernized at a later date, should the later alterations be kept or the building restored to its original appearance or an entirely new design chosen?
- if the building's original retail use is to be changed to office or residential, can the commercial appearance of the building be retained while accommodating the new use?

This Preservation Brief is intended to assist owners, architects, and planning officials in answering such questions about how to evaluate and preserve the character of historic storefronts. In so doing, it not only addresses the

Figure 1. *Inappropriate storefront alterations over the years—metal cladding, oversized signs and canopies—have detracted from the character of this historic district in Van Buren, Arkansas. A carefully considered rehabilitation plan for Main Street, including the removal of poorly designed signs, false fronts and the selection of an appropriate exterior paint color palette, serves to enhance the visual environment and preserves the district's sense of time and place. Photo above: Bob Dunn; Drawing, David Fitts*

basic design issues associated with storefront rehabilitation, but recommends preservation treatments as well. Finally, although the Brief focuses on storefront rehabilitation, it is important to review this specific work in the broader context of preserving and maintaining the overall structure. Money spent on storefront rehabilitation may be completely wasted if repair and maintenance problems on the rest of the building are neglected.

Historical Overview

Commercial establishments of the 18th and early 19th centuries were frequently located on the ground floor of buildings and, with their residentially scaled windows and doors, were often indistinguishable from surrounding houses. In some cases, however, large bay or oriel windows comprised of small panes of glass set the shops apart from their neighbors. Awnings of wood and canvas and signs over the sidewalk were other design features seen on some early commercial buildings. The ground floors of large commercial establishments, especially in the first decades of the 19th century, were distinguished by regularly spaced, heavy piers of stone or brick, infilled with paneled doors or small paned window sash. Entrances were an integral component of the facade, typically not given any particular prominence although sometimes wider than other openings.

The ready availability of architectural cast iron after the 1840's helped transform storefront design as architects and builders began to experiment using iron columns and lintels at the ground floor level. Simultaneous advances in the glass industry permitted manufacturing of large panes of glass at a reasonable cost. The combination of these two technical achievements led to the storefront as we know it today—large expanses of glass framed by thin structural elements. The advertisement of the merchant and his products in the building facade and display windows quickly became critical factors in the competitive commercial atmosphere of downtowns. In the grouping of these wide-windowed facades along major commercial streets, the image of America's cities and towns radically changed.

The first cast iron fronts were simple post-and-lintel construction with little decoration. As iron craftsmen became more adept and as more ornate architectural styles became popular, cast iron fronts were given Italianate, Venetian Gothic, and French Second Empire details. Cast iron storefronts could be selected directly from catalogs, which began to appear in the early 1850's. Standardized sills, columns, and lintels could be arranged to create fronts of all sizes, styles and configurations. In the 1870's sheet metal storefronts became popular; they were also sold in standardized sizes and configurations through manufacturers' catalogs (see figure 2).

The typical 19th century storefront consisted of single or double doors flanked by display windows (see figure 3). The entrance was frequently recessed, not only to protect the customer from inclement weather but to increase the amount of space in which to display merchandise. In some cases an additional side door provided access to the upper floors. Thin structural members of cast iron or wood, rather than masonry piers, usually framed the storefront. The windows themselves were raised off the ground by wood, cast iron or pressed metal panels or bulkheads; frequently, a transom or series of transoms (consisting of single or multiple panes of glass) were

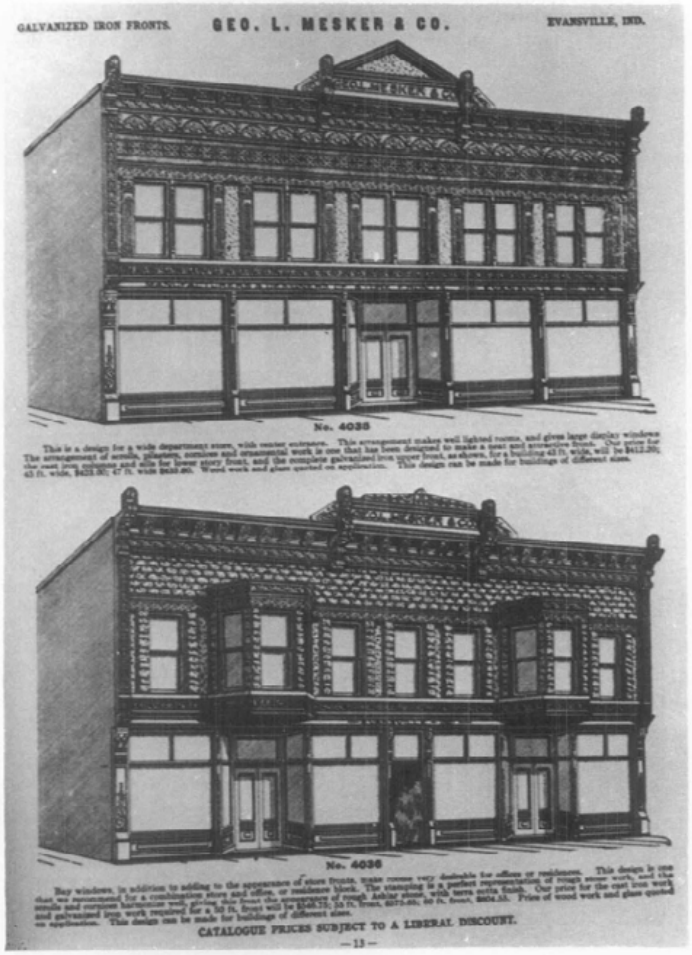


Figure 2. *These 19th century galvanized iron storefronts could be purchased from George L. Mesker & Co. in Evansville, Indiana.*

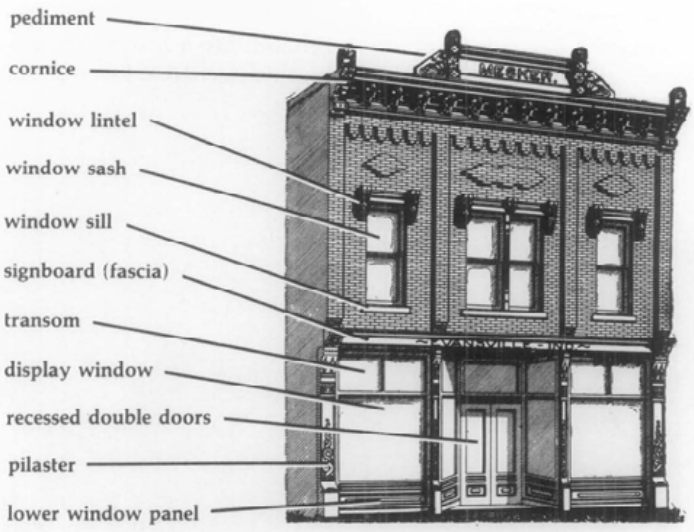


Figure 3. *Become familiar with the architectural features typical of historic commercial buildings. A close look at a storefront's construction materials, features and relationship to the upper stories will help in determining how much of the original facade remains.*

This particular storefront is No. 4016 in the George L. Mesker and Company catalog of 1905. One of Mesker's most popular designs, it featured cast-iron sills, columns and lintels, galvanized iron lintel and main cornice, window caps and pediment.

placed above each window and door. The signboard above the storefront (the fascia covering the structural beam) became a prominent part of the building. Canvas awnings, or in some cases tin or wooden canopies, often shaded storefronts of the late 19th century. Iron fronts were frequently put onto existing buildings as a way of giving them an up-to-date appearance. Except for expanding the display window area to the maximum extent possible and the increasing use of canvas awnings, few major technical innovations in storefront design can be detected from the 1850's through 1900.

The first decades of the 20th century saw the growing use of decorative transom lights (often using small prismatic glass panes) above display windows; in some cases, these transoms could be opened to permit air circulation into the store. Electric incandescent lights enabled storeowners to call attention to their entrance and display windows and permitted nighttime shopping. In the 1920's and 1930's a variety of new materials were introduced into the storefront, including aluminum and stainless steel framing elements, pigmented structural glass (in a wide variety of colors), tinted and mirrored glass, glass block and neon. A bewildering number of proprietary products also appeared during this period, many of which went into storefronts including Aklo, Vitrolux, Vitrolite, and Extrudalite. Highly colored and heavily patterned marble was a popular material for the more expensive storefronts of this period. Many experiments were made with recessed entries, floating display islands, and curved glass. The utilization of neon lighting further transformed store signs into elaborate flashing and blinking creations. During this period design elements were simplified and streamlined; transom and signboard were often combined. Signs utilized typefaces for the period, including such stylized lettering as "Broadway," "Fino" and "Monogram." Larger buildings of this period, such as department stores, sometimes had fixed metal canopies, with lighting and signs as an integral component of the fascia (see figure 4).

Because commercial architecture responds to a variety of factors—environmental, cultural, and economic, distinct regional variations in storefronts can be noted. Fixed metal canopies supported by guy wires, for example, were common in late 19th and early 20th century storefronts in southern states where it was advantageous to have shaded entrances all year long. Such a detail was less common in the northeast where moveable canvas awnings predominated. These awnings could be lowered in summer to keep buildings cooler and raised in winter when sunlight helps to heat the building.

Evaluating the Storefront

The important key to a successful rehabilitation of a historic commercial building is planning and selecting treatments that are sensitive to the architectural character of the storefront. As a first step, it is therefore essential to identify and evaluate the existing storefront's construction materials; architectural features; and the relationship of those features to the upper stores (see figure 5). This evaluation will permit a better understanding of the storefront's role in, and significance to, the overall design of the building. A second and equally important step in planning the rehabilitation work is a careful examination of the storefront's physical conditions to determine the extent and nature of rehabilitation work needed (see figure 6). In most cases, this examination is best undertaken by a qualified professional.

Figure 4. *This storefront in New York City designed by Raymond Loewy typifies the streamlined look of the 1930's. Added to an earlier buiding, the front utilizes glass, stainless steel and neon to make a modern statement. This is a good example of a later storefront which has acquired significance and should be retained in any rehabilitation.*

Figure 5. *In some cases, as in the storefront on the extreme left, it is a simple matter to determine original appearance by looking at neighboring storefronts. Removal of the board and batten fasciaboard, pent roof, and "colonial" style door, all of which could be undertaken at minimal cost, would restore the original proportions and lines of the building. Photo: Day Johnston*

Guidelines for Rehabilitating Existing Historic Storefronts

1. Become familiar with the style of your building and the role of the storefront in the overall design. Don't "early up" a front. Avoid stock "lumberyard colonial" detailing such as coach lanterns, mansard overhangings, wood shakes, nonoperable shutters, and small paned windows except where they existed historically.
2. Preserve the storefront's character even though there is a new use on the interior. If less exposed window area is desirable, consider the use of interior blinds and insulating curtains rather than altering the existing historic fabric.
3. Avoid use of materials that were unavailable when the storefront was constructed; this includes vinyl and aluminum siding, anodized aluminum, mirrored or tinted glass, artificial stone, and brick veneer.
4. Choose paint colors based on the building's historical appearance. In general do not coat surfaces that have never been painted. For 19th century storefronts, contrasting colors may be appropriate, but avoid too many different colors on a single facade.

Figure 6. *Storefronts of the 1940's, 50's, and 60's were frequently installed by attaching studs or a metal grid over an early front and applying new covering materials. If the existing storefront is a relatively recent addition with little or no architectural merit, begin by removing the covering materials in several places as was done here. If this preliminary investigation reveals evidence of an earlier front, such as this cast-iron column, carefully remove the later materials to assess the overall condition of the historic storefront. The black mastic visible on the lower masonry panels was used for installing pigmented structural glass. Some attachment methods for modern facings, such as mastic or metal lath, may have seriously damaged the original fabric of the buiding, and this must be taken into account in the rehabilitation process. Photo: Bob Dunn*

The following questions should be taken into consideration in this two-part evaluation:

Construction Materials, Features, and Design Relationships

Storefront's Construction Materials: What are the construction materials? Wood? Metal? Brick or other masonry? A combination?

Storefront's Architectural Features: What are the various architectural features comprising the storefront and how are they arranged in relationship to each other?

- Supporting Columns/Piers:
  What do the columns or piers supporting the storefront look like? Are they heavy or light in appearance? Are they flush with the windows or do they protrude? Are they all structural elements or are some columns decorative?
- Display Windows and Transoms:
  Are the display windows and transoms single panes of glass or are they subdivided? Are they flush with the facade or are they recessed? What is the proportion of area between the display windows and transom? Are there window openings in the base panels to allow natural light into the basement?
- Entrances:
  Are the entrances centered? Are they recessed? Is one entrance more prominent than the others? How is the primary retail entrance differentiated from other entrances? Is there evidence that new entrances have been added or have some been relocated? Are the doors original or are they later replacements?
- Decorative Elements:
  Are there any surviving decorative elements such as molded cornices, column capitals, fascia boards, brackets, signs, awnings or canopies? Is there a belt-course, cornice, or fascia board between the first and second floor? Are some elements older than others indicating changes over time?

Storefront's Relationship to Upper Stories: Is there a difference in materials between the storefront and upper stories? Were the storefront and floors above it created as an overall design or were they very different and unrelated to each other?

It is also worthwhile to study the neighboring commercial buildings and their distinctive characteristics to look for similarities (canopies, lighting, signs) as well as differences. This can help determine whether the storefront in question is significant and unique in its own right and/or whether it is significant as part of an overall commercial streetscape.

Physical Condition

Mild Deterioration: Do the surface materials need repair? Is paint flaking? Are metal components rusting? Do joints need recaulking where materials meet glass windows? Mild deterioration generally requires only maintenance level treatments.

Moderate Deterioration: Can rotted or rusted or broken sections of material be replaced with new material to match the old? Can solid material (such as Carrara glass) from a non-conspicuous location be used on the historic facade to repair damaged elements? Do stone or brick components need repointing? Is the storefront watertight with good flashing connections? Are there leaky gutters or air conditioner units which drip condensation on the storefront? Is caulking needed? Moderate deterioration generally requires patching or splicing of the existing elements with new pieces to match the deteriorated element.

Severe Deterioration: Have existing facing materials deteriorated beyond repair through vandalism, settlement, or water penetration? Is there a loss of structural integrity? Is the material rusted through, rotted, buckling, completely missing? Are structural lintels sagging? Are support columns settled or out of alignment? Severe deterioration generally requires replacement of deteriorated elements as part of the overall rehabilitaton.

In evaluating whether the existing storefront is worthy of preservation, recognize that good design can exist in any period; a storefront added in 1930 *may* have greater architectural merit than what is replaced (see figure 4). In commercial historic districts, it is often the diversity of

styles and detailing that contribute to the character; removing a storefront dating from 1910 simply because other buildings in the district have been restored to their 1860's appearance may not be the best preservation approach. If the storefront design is a good example of its period and if it has gained significance over time, it should be retained as part of the historical evolution of the building (this architectural distinctiveness could also be an economic asset as it may attract attention to the building).

Deciding a Course of Action

The evaluation of the storefront's architectural features and physical condition will help determine the best course of action in the actual rehabilitation work. The following recommendations, adapted from the Secretary of the Interior's "Standards for Rehabilitation" and the accompanying interpretive guidelines, are designed to ensure that the historic commercial character of the building is retained in the rehabilitation process.

If the original or significant storefront exists, repair and retain the historic features using recommended treatments (see following sections on rehabilitating metal, wood and masonry storefronts as well as the guidelines for rehabilitating existing historic storefronts found on page 3).

If the original or significant storefront no longer exists or is too deteriorated to save, undertake a contemporary design which is compatible with the rest of the buiding in scale, design, materials, color and texture; or undertake an accurate restoration based on historical research and physical evidence (see section on "Replacement Storefronts"). Where an original or significant storefront no longer exists and *no* evidence exists to document its early appearance, it is generally preferable to undertake a contemporary design that retains the commercial "flavor" of the building. The new storefront design should not draw attention away from the historic building with its detailing but rather should respect the existing historic character of the overall building. A new design that copies traditional details or features from neighboring buildings or other structures of the period may give the building a historical appearance which blends in with its neighbors but which never, in fact, existed. For this reason, use of conjectural designs, even if based on similar buildings elsewhere in the neighborhood or the availability of different architectural elements from other buildings or structures, is generally not recommended.

Rehabilitating Metal Storefronts

Rehabilitating metal storefronts can be a complex and time-consuming task. Before steps are taken to analyze or treat deteriorated storefronts, it is necessary to know which metal is involved, because each has unique properties and distinct preservation treatments. Storefronts were fabricated using a variety of metals, including cast iron, bronze, copper, tin, galvanized sheet iron, cast zinc, and stainless steel. Determining metallic composition can be a difficult process especially if components are encrusted with paint. Original architect's specifications (sometimes available from permit offices, town halls, or records of the original owner) can be important clues in this regard and should be checked if at all possible.

Iron—a magnetic, gray-white malleable metal, readily susceptible to oxidation. Cast iron, most commonly found in storefronts, is shaped by molds and can withstand great compressive loads. Rolled sheet iron, sometimes galvanized with zinc, also was used in storefront construction. Stainless steel began to appear in storefronts after 1930.

Zinc—a medium-hard, bluish-white metal, widely used as a protective coating for iron and steel. It is softer than iron and is nonmagnetic.

Copper—a nonmagnetic, corrosion-resistant, malleable metal, initially reddish-brown but when exposed to the atmosphere turns brown to black to green.

Bronze and brass—nonmagnetic, abrasive-resistant alloys combining copper with varying amounts of zinc, lead, or tin. These copper alloys, more commonly found in office buildings or large department stores, range in color from lemon yellow to golden brown to green depending on their composition and are well suited for casting (see figure 7).

Aluminum—a lightweight, nonmagnetic metal commonly found on storefronts dating from the 1920's and 30's. Its brightness and resistance to corrosion has made it a popular storefront material in the 20th century.

Figure 7. *Part of a large office building constructed in Washington, D.C. in 1928, this finely detailed bronze storefront is typical of many constructed during this period. It should be noted that the original grilles, spandrel panel and window above are all intact. Photo: David W. Look, AIA*

Repair and Replacement of Metal

Simply because single components of a storefront need repair or replacement should not be justification for replacing an entire storefront. Deteriorated metal architectural elements can be repaired by a variety of means, although the nature of the repair will depend on the extent of the deterioration, the type of metal and its location, and the overall cost of such repairs. Patches can be used to mend, cover or fill a deteriorated area. Such patches should be a close match to the original material to prevent galvanic corrosion. Splicing—replacement of a small section with new material—should be undertaken on structural members only when temporary bracing has been constructed to carry the load. Reinforcing—or bracing the damaged element with additional new metal material—can relieve fatigue or overloading in some situations.

If metal components have deteriorated to a point where they have actually failed (or are missing), replacement is the only reasonable course of action. If the components are significant to the overall design of the storefront, they should be carefully removed and substituted with components that match the original in material, size and detailing (see figure 8).

Figure 8. *When the Grand Opera House in Wilmington, Delaware, was rehabilitated, missing cast-iron columns were cast of aluminum to match the original; in this particular case, because these columns do not carry great loads, aluminum proved to be successful substitute. Photo: John G. Waite*

Before going to the expense of reproducing the original, it may be useful to check salvage yards for compatible components. Missing parts of cast iron storefronts can be replaced by new cast iron members that are reproductions of the original. New wooden patterns, however, usually need to be made if the members are large. This procedure tends to be expensive (it is usually impossible to use existing iron components as patterns to cast large elements because cast iron shrinks 1/5 inch per foot as it cools). In some situations, less expensive substitute materials such as aluminum, wood, plastics, and fiberglass, painted to match the metal, can be used without compromising the architectural character of the resource.

Cleaning and Painting

Cast iron storefronts are usually encrusted with layers of paint which need to be removed to restore crispness to the details. Where paint build-up and rust are not severe problems, handscraping and wire-brushing are viable cleaning methods. While it is necessary to remove all rust before repainting, it is not necessary to remove all paint. For situations involving extensive paint build-up and corrosion, mechanical methods such as low-pressure gentle dry grit blasting (80-100 psi) can be effective and economical, providing a good surface for paint. Masonry and wood surfaces adjacent to the cleaning area, however, should be protected to avoid inadvertent damage from the blasting. It will be necessary to recaulk and putty the heads of screws and bolts after grit blasting to prevent moisture from entering the joints. Cleaned areas should be painted immediately after cleaning with a rust-inhibiting primer to prevent new corrosion. Before any cleaning is undertaken, local codes should be checked to ensure compliance with environmental safety requirements.

Storefronts utilizing softer metals (lead, tin), sheet metals (sheet copper), and plated metals (tin and terneplate) should not be cleaned mechanically (grit blasting) because their plating or finish can be easily abraded and damaged. It is usually preferable to clean these softer metals with a chemical (acid pickling or phosphate dipping) method. Once the surface of the metal has been cleaned of all corrosion, grease, and dirt, a rust-inhibiting primer coat should be applied. Finish coats especially formulated for metals, consisting of lacquers, varnishes, enamels or special coatings, can be applied once the primer has dried. Primer and finish coats should be selected for chemical compatibility with the particular metal in question.

Bronze storefronts, common to large commercial office buildings and major department stores of the 20th century, can be cleaned by a variety of methods; since all cleaning removes some surface metal and patina, it should be undertaken only with good reason (such as the need to remove encrusted salts, bird droppings or dirt). Excessive cleaning can remove the texture and finish of the metal. Since this patina can protect the bronze from further corrosion, it should be retained if possible. If it is desirable to remove the patina to restore the original surface of the bronze, several cleaning methods can be used: chemical compounds including rottenstone and oil, whiting and ammonia, or precipitated chalk and ammonia, can be rubbed onto bronze surfaces with a soft, clean cloth with little or no damage. A number of commercial cleaning companies successfully use a combination of 5% oxalic acid solution together with *finely* ground India pumice powder. Fine glass-bead blasting (or peening) and crushed walnut shell blasting also can be acceptable mechanical methods if carried out in controlled circumstances under low (80-100 psi) pressure. Care should be taken to protect any adjacent wood or masonry from the blasting.

The proper cleaning of metal storefronts should not be considered a "do-it-yourself" project. The nature and condition of the material should be assessed by a competent professional, and the work accomplished by a com-pany specializing in such work.

Rehabilitating Wooden Storefronts

The key to the successful rehabilitation of wooden storefronts is a careful evaluation of existing physical conditions. Moisture, vandalism, insect attack, and lack of maintenance can all contribute to the deterioration of wooden storefronts. Paint failure should not be mistaken-

ly interpreted as a sign that the wood is in poor condition and therefore irreparable. Wood is frequently in sound physical condition beneath unsightly paint. An ice pick or awl may be used to test wood for soundness—decayed wood that is jabbed will lift up in short irregular pieces; sound wood will separate in long fibrous splinters.

Repair and Replacement of Wood

Storefronts showing signs of physical deterioration can often be repaired using simple methods. Partially decayed wood can be patched, built up, chemically treated or consolidated and then painted to achieve a sound condition, good appearance, and greatly extended life.

To repair wood showing signs of rot, it is advisable to dry the wood; carefully apply a fungicide such as pentachlorophenol (a highly toxic substance) to all decayed areas; then treat with 2 or 3 applications of boiled linseed oil (24 hours between applications). Afterward, fill cracks and holes with putty; caulk the joints between the various wooden members; and finally prime and paint the surface.

Partially decayed wood may also be strengthened and stabilized by consolidation, using semi-rigid epoxies which saturate porous decayed wood and then harden. The consolidated wood can then be filled with a semi-rigid epoxy patching compound, sanded and painted. More information on epoxies can be found in the publication "Epoxies for Wood Repairs in Historic Buildings," cited in the bibliography.

Where components of wood storefronts are so badly deteriorated that they cannot be stabilized, it is possible to replace the deteriorated parts with new pieces (see figure 9). These techniques all require skill and some expense, but are recommended in cases where decorative elements, such as brackets or pilasters, are involved. In some cases, missing edges can be filled and rebuilt using wood putty or epoxy compounds. When the epoxy cures, it can be sanded smooth and painted to achieve a durable and waterproof repair.

Figure 9. *Rather than replace an entire wooden storefront when there is only localized deterioration, a new wooden component can be pieced-in, as seen here in this column base. The new wood will need to be given primer and top coats of a high quality exterior paint—either an oil-base or latex system. Also wood that is flaking and peeling should be scraped and hand-sanded prior to repainting. Photo: H. Ward Jandl*

Repainting of Wood

Wooden storefronts were historically painted to deter the harmful effects of weathering (moisture, ultraviolet rays from the sun, wind, etc.) as well as to define and accent architectural features. Repainting exterior woodwork is thus an inexpensive way to provide continued protection from weathering and to give a fresh appearance to the storefront.

Before repainting, however, a careful inspection of all painted wood surfaces needs to be conducted in order to determine the extent of surface preparation necessary, that is, whether the existing layers of paint have deteriorated to the point that they will need to be partially or totally removed prior to applying the new paint.

As a general rule, removing paint from historic exterior woodwork should be avoided unless absolutely essential. Once conditions warranting removal have been identified, however, paint can be removed to the next sound layer using the gentlest method possible, then the woodwork repainted. For example, such conditions as mildewing, excessive chalking, or staining (from the oxidization of rusting nails or metal anchorage devices) generally require only thorough surface cleaning prior to repainting. Intercoat peeling, solvent blistering, and wrinkling require removal of the affected layer using mild abrasive methods such as hand scraping and sanding. In all of these cases of limited paint deterioration, after proper surface preparation the exterior woodwork may be given one or more coats of a high quality exterior oil finish paint.

On the other hand, if painted wood surfaces display continuous patterns of deep cracks or if they are extensively blistering and peeling so that bare wood is visible, the old paint should be completely removed before repainting. (It should be emphasized that because peeling to bare wood—the most common type of paint problem—is most often caused by excess interior or exterior moisture that collects behind the paint film, the first step in treating peeling is to locate and remove the source or sources of moisture. If this is not done, the new paint will simply peel off.)

There are several acceptable methods for total paint removal, depending on the particular wooden element involved. They include such thermal devices as an electric heat plate with scraper for flat surfaces such as siding, window sills, and doors or an electric hot-air gun with profiled scraper for solid decorative elements such as gingerbread or molding. Chemical methods play a more limited, supplemental role in removing paint from historic exterior woodwork; for example, caustic or solvent-base strippers may be used to remove paint from window muntins because thermal devices can easily break the glass. Detachable wooden elements such as exterior shutters, balusters and columns, can probably best be stripped by means of immersion in commercial dip tanks because other methods are too laborious. Care must be taken in rinsing all chemical residue off the wood prior to painting or the new paint will not adhere.

Finally, if the exterior woodwork has been stripped to bare wood, priming should take place within 48 hours (unless the wood is wet, in which case it should be permitted to dry before painting). Application of a high quality oil type exterior primer will provide a surface over which either an oil or latex top coat can be successfully used.

Rehabilitating Masonry Storefronts

Some storefronts are constructed of brick or stone, and like their metal and wooden counterparts, also may have been subjected to physical damage or alterations over time. Although mortar may have disintegrated, inappropriate surface coatings applied, and openings reduced or blocked up, careful rehabilitation will help restore the visual and physical integrity of the masonry storefront.

Repair and Replacement of Masonry

If obvious signs of deterioration—disintegrating mortar, spalling bricks or stone—are present, the causes (ground moisture, leaky downspouts, etc.) should be identified and corrected. Some repointing may be necessary on the masonry surface, but should be limited to areas in which so much mortar is missing that water accumulates in the mortar joints, causing further deterioration. New mortar should duplicate the composition, color, texture, and hardness, as well as the joint size and profile of the original. Badly spalling bricks may have to be replaced. Deteriorated stone may be replaced in kind, or with a matching substitute material; in some cases where not visually prominent, it may be covered with stucco, possibly scored to resemble blocks of stone.

Cleaning Masonry

Inappropriate cleaning techniques can be a major source of damage to historic masonry buildings. Historic masonry should be cleaned only when necessary to halt deterioration or to remove graffiti and stains, and always with the gentlest means possible, such as water and a mild detergent using natural bristle brushes, and/or a non-harmful chemical solution, both followed by a low-pressure water rinse.

It is important to remember that many mid-19th century brick buildings were painted immediately or soon after construction to protect poor quality brick or to imitate stone. Some historic masonry buildings not originally painted were painted at a later date to hide alterations or repairs, or to solve recurring maintenance or moisture problems. Thus, whether for reasons of historical tradition or practicality, it may be preferable to retain existing paint. If it is readily apparent that paint is not historic and is a later, perhaps unsightly or inappropriate treatment, removal may be attempted, but only if this can be carried out without damaging the historic masonry. Generally, paint removal from historic masonry may be accomplished successfully only with the use of specially formulated chemical paint removers. No abrasive techniques, such as wet or dry sandblasting should be considered. If non-historic paint cannot be removed without using abrasive methods, it is best to leave the masonry painted, although repainting in a compatible color may help visually.

Removing unsightly mastic from masonry presents a similarly serious problem. Its removal by mechanical means may result in abrading the masonry, and chemical and heat methods may prove ineffective, although solvents like acetone will aid in sofening the hardened mastic. If the mastic has become brittle, a flat chisel may be used to pop it off; but this technique, if not undertaken with care, may result in damaging the masonry. And even if total removal is possible, the mastic may have permanently stained the masonry. Replacement of these masonry sections marred by mastic application may be one option in limited situations; individual pieces of stone or bricks that have been damaged by inappropriate alterations may be cut out and replaced with new pieces that duplicate the original. However, since an exact match will be nearly impossible to achieve, it may be necessary to paint the repaired masonry in order to create a harmonious facade. Replacement of a large area with new materials may not be acceptable as it may give the building a new, non-historic appearance inappropriate to the building style and period.

Designing Replacement Storefronts

Where an architecturally or historically significant storefront no longer exists or is too deterioriated to save, a new front should be designed which is compatible with the size, scale, color, material, and character of the building. Such a design should be undertaken based on a thorough understanding of the building's architecture and, where appropriate, the surrounding streetscape (see figure 10). For example, just because upper floor windows are arched is not sufficient justification for designing arched openings for the new storefront. The new design should "read" as a storefront; filling in the space with brick or similar solid material is inappropriate for historic buildings. Similarly the creation of an arcade or other new design element, which alters the architectural and historic character of the building and its relationship with the street, should be avoided. The guidelines on page 8 can assist in developing replacement storefront designs that respect the historic character of the building yet meet current economic and code requirements.

Guidelines for Designing Replacement Storefronts

1. *Scale:* Respect the scale and proportion of the existing building in the new storefront design.
2. *Materials:* Select construction materials that are appropriate to the storefronts; wood, cast iron, and glass are usually more appropriate replacement materials than masonry which tends to give a massive appearance.
3. *Cornice:* Respect the horizontal separation between the storefront and the upper stories. A cornice or fascia board traditionally helped contain the store's sign.
4. *Frame:* Maintain the historic planar relationship of the storefront to the facade of the building and the streetscape (if appropriate). Most storefront frames are generally composed of horizontal and vertical elements.
5. *Entrances:* Differentiate the primary retail entrance from the secondary access to upper floors. In order to meet current code requirements, out-swinging doors generally must be recessed. Entrances should be placed where there were entrances historically, especially when echoed by architectural detailing (a pediment or projecting bay) on the upper stories.
6. *Windows:* The storefront generally should be as transparent as possible. Use of glass in doors, transoms, and display areas allows for visibility into and out of the store.
7. *Secondary Design Elements:* Keep the treatment of secondary design elements such as graphics and awnings as simple as possible in order to avoid visual clutter to the building and its streetscape.

Figure 10. *(A) This existing storefront, added in the 1950's to a late 19th century brick building, extends beyond the plane of the facade; faced with anodized aluminum and permastone, it does not contribute to the architectural and historic character of the building. (B) This replacement design uses "lumberyard colonial" detailing, such as barn-type doors, shutters, small paned windows, and a wood shake pent roof. The design, detailing, and choice of materials are clearly inappropriate to this commercial building. (C) This replacement design retains the 1950's projecting canopy but symmetrical placement of the doors relates well to the second floor windows above; this contemporary design is compatible with the scale and character of the building. (D) This replacement design accurately restores the original appearance of the building; based on historical research and physical evidence, it too is an acceptable preservation approach. Drawings: Sharon C. Park, AIA*

A restoration program requires thorough documentation of the historic development of the building prior to initiating work. If a restoration of the original storefront is contemplated, old photographs and prints, as well as physical evidence, should be used in determining the form and details of the original. Because storefronts are particularly susceptible to alteration in response to changing marketing techniques, it is worthwhile to find visual documentation from a variety of periods to have a clear understanding of the evolution of the storefront. Removal of later additions that contribute to the character of the building should not be undertaken.

Other Considerations

Pigmented Structural Glass

The rehabilitation of pigmented structural glass storefronts, common in the 1930's, is a delicate and often frustrating task, due to the fragility and scarcity of the material. Typically the glass was installed against masonry walls with asphaltic mastic and a system of metal shelf angles bolted to the walls on three-foot centers. Joints between the panels were filled with cork tape or an elastic joint cement to cushion movement and prevent moisture infiltration.

The decision to repair or replace damaged glass panels should be made on a case-by-case basis. In some instances, the damage may be so minor or the likelihood of finding replacement glass so small, that repairing, reanchoring and/or stabilizing the damaged glass panel may be the only prudent choice. If the panel is totally destroyed or missing, it may be possible to replace with glass salvaged from a demolition; or a substitute material, such as "spandrel glass," which approximates the appearance of the original. Although pigmented structural glass is no longer readily available, occasionally long-established glass "jobbers" will have a limited supply to repair historic storefronts.

Awnings

Where based on historic precedent, consider the use of canvas awnings on historic storefronts (see figure 11). Awnings can help shelter passersby, reduce glare, and conserve energy by controlling the amount of sunlight hitting the store window, although buildings with northern exposures will seldom functionally require them. Today's canvas awnings have an average life expectancy of between 4 and 7 years. In many cases awnings can disguise, in an inexpensive manner, later inappropriate alterations and can provide both additional color and a strong store identification. Fixed aluminum awnings and awnings simulating mansard roofs and umbrellas are generally inappropriate for older commercial buildings. If awnings are added, choose those that are made from soft canvas or vinyl materials rather than wood or metal; be certain that they are installed without damaging the building or visually impairing distinctive architectural features and can be operable for maximum energy conservation effect.

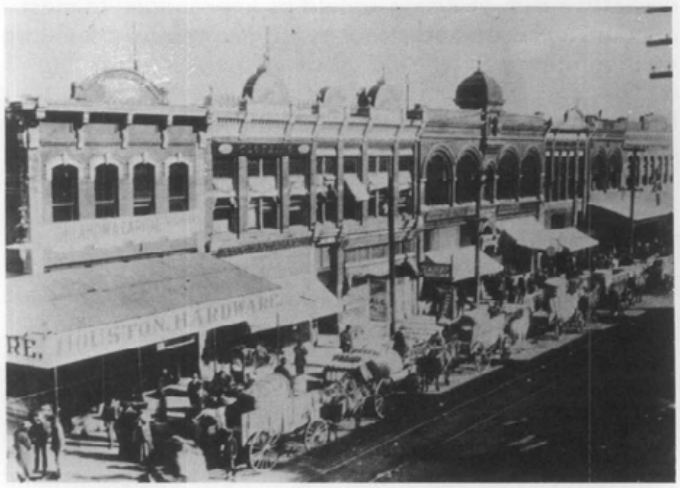


Figure 11. *Try to locate old photographs or prints to determine what alterations have been made to the storefront and when they were undertaken. Awnings were common elements of storefronts at the turn of the century. They can be equally useful today.*

Signs

Signs were an important aspect of 19th and early 20th century storefronts and today play an important role in defining the character of a business district. In examining historic streetscape photographs, one is struck by the number of signs—in windows, over doors, painted on exterior walls, and hanging over (and sometimes across) the street. While this confusion was part of the character of 19th century cities and towns, today's approach toward signs in historic districts tends to be much more conservative. Removal of some signs can have a dramatic effect in improving the visual appearance of a building; these include modern backlit fluorescent signs, large applied signs with distinctive corporate logos, and those signs attached to a building in such a way as to obscure significant architectural detailing. For this reason, their removal is encouraged in the process of rehabilitation. If new signs are designed, they should be of a size and style compatible with the historic building and should not cover or obscure significant architectural detailing or features. For many 19th century buildings, it was common to mount signs on the lintel above the first story. Another common approach, especially at the turn of the century, was to paint signs directly on the inside of the display windows. Frequently this was done in gold leaf. New hanging signs may be appropriate for historic commercial buildings, if they are of a scale and design compatible with the historic buildings. Retention of signs and advertising painted on historic walls, if of historic or artistic interest (especially where they provide evidence of early or original occupants), is encouraged.

Paint Color

Paint analysis can reveal the storefront's historic paint colors and may be worth undertaking if a careful restoration is desired. If not, the paint color should be, at a minimum, appropriate to the style and setting of the building. This also means that if the building is in a historic district, the color selection should complement the building in question as well as other buildings in the block. In general, color schemes for wall and major decorative trim or details should be kept simple; in most cases the color or colors chosen for a storefront should be used on other painted exterior detailing (windows, shutter, cornice, etc.) to unify upper and lower portions of the facade.

Windows

Glass windows are generally the most prominent features in historic storefronts, and care should be taken to ensure that they are properly maintained. For smaller paned windows with wooden frames, deteriorated putty should be removed manually, taking care not to damage wood along the rabbet. To reglaze, a bead of linseed oil-based putty should be laid around the perimeter of the rabbet; the glass pane pressed into place; glazing points inserted to hold the pane; and a final seal of putty beveled around the edge of the glass. For metal framed windows, glazing compound and special glazing clips are used to secure the glass; a final seal of glazing compound then is often applied. If the glass needs replacing, the new glass should match the original in size, color and reflective qualities. Mirrored or tinted glass are generally inappropriate replacements for historic storefronts. The replacement of cracked or missing glass in large windows should be undertaken by professional glaziers.

Code Requirements

Alterations to a storefront called for by public safety, handicapped access, and fire codes can be difficult design problems in historic buildings. Negotiations can be undertaken with appropriate officials to ensure that all applicable codes are being met while maintaining the historic character of the original construction materials and features. If, for instance, doors opening inward must be changed, rather than replace them with new doors, it may be possible to reverse the hinges and stops so that they will swing outward.

Summary

A key to the successful rehabilitation of historic commercial buildings is the sensitive treatment of the first floor itself (see figure 12). Wherever possible, significant storefronts (be they original or later alterations), including windows, sash, doors, transoms, signs and decorative features, should be repaired in order to retain the historic character of the building. Where original or early storefronts no longer exist or are too deteriorated to save, the commercial character of the building should nonetheless be preserved—either through an accurate restoration based on historic research and physical evidence or a contemporary design which is compatible with the scale, design, materials, color and texture of the historic building. The sensitive rehabilitation of historic storefronts will not only enhance the architectural character of the overall building but will contribute to rejuvenating neighborhoods or business districts as well.

Figure 12. *This photograph of three late 19th century commercial buildings clearly shows the impact of preserving and rehabilitating storefronts. The one on the right has been totally obscured by a "modern" front added in the 1950's. Although inappropriate alterations have taken place on the left storefront, it is still possible to determine the original configuration of the doors and display windows. The storefront in the middle has remained intact. Although in need of some minor maintenance work, the appeal of the original design and materials is immediately apparent.*

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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 advice and guidance provided in this brief will assist property owners in complying with the requirements of this law.

Preservation Briefs 11 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.

Cover drawing: This woodcut of the Joy Building, built in 1808 in Boston, shows early storefronts with shutters; note the profusion of signs covering the facade, advertising the services of the tenants.

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27 PRESERVATION BRIEFS

The Maintenance and Repair of Architectural Cast Iron

John G. Waite, AIA

Historical Overview by Margot Gayle

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

In Cooperation with the
New York Landmarks Conservancy

The preservation of cast-iron architectural elements, including entire facades, has gained increasing attention in recent years as commercial districts are recognized for their historic significance and revitalized. This Brief provides general guidance on approaches to the preservation and restoration of historic cast iron.

Cast iron played a preeminent role in the industrial development of our country during the 19th century. Cast-iron machinery filled America's factories and made possible the growth of railroad transportation. Cast iron was used extensively in our cities for water systems and street lighting. As an architectural metal, it made possible bold new advances in architectural designs and building technology, while providing a richness in ornamentation (Fig. 1).

This age-old metal, an iron alloy with a high carbon content, had been too costly to make in large quantities until the mid-18th century, when new furnace technology in England made it more economical for use in construction. Known for its great strength in compression, cast iron in the form of slender, non-flammable pillars, was introduced in the 1790s in English cotton mills, where fires were endemic. In the United States, similar thin columns were first employed in the 1820s in theaters and churches to support balconies.

By the mid-1820s, one-story iron storefronts were being advertised in New York City. Daniel Badger, the Boston foundryman who later moved to New York, asserted that in 1842 he fabricated and installed the first rolling iron shutters for iron storefronts, which provided protection against theft and external fire. In the years ahead, and into the 1920s, the practical cast-iron storefront would become a favorite in towns and cities from coast to coast. Not only did it help support the load of the upper floors, but it provided large show windows for the display of wares and allowed natural light to flood the interiors of the shops. Most importantly, cast-iron storefronts were inexpensive to assemble, requiring little on-site labor.

A tireless advocate for the use of cast iron in buildings was an inventive New Yorker, the self-taught architect/engineer James Bogardus. From 1840 on, Bogardus extolled its virtues of strength, structural stability, durability, relative lightness, ability to be cast in almost any shape and, above all, the fire-resistant qualities so sought after in an age of serious urban conflagrations. He also stressed that the foundry casting processes, by which cast iron was made into building elements, were thoroughly compatible with the new concepts of prefabrication, mass production, and use of identical interchangeable parts.

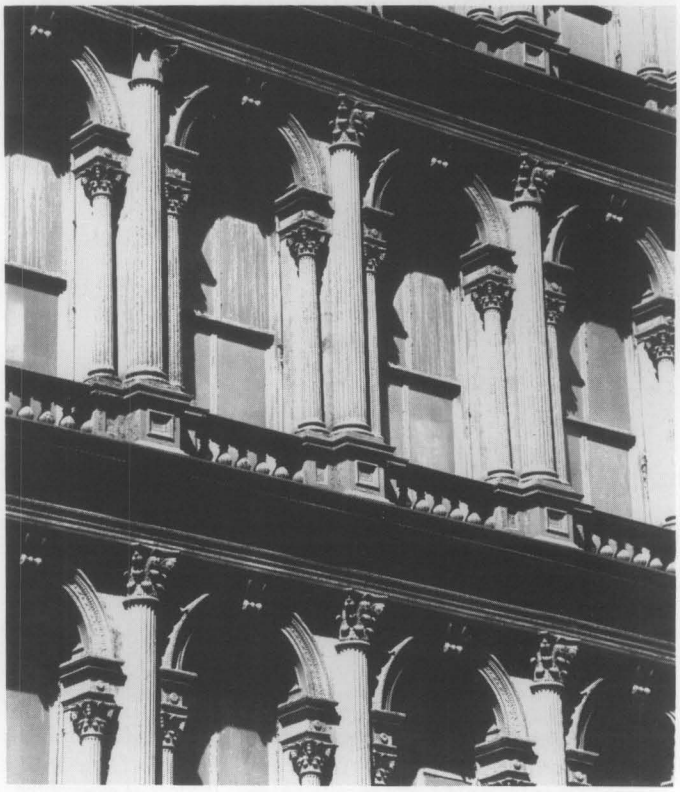

Fig. 1. The Haughwout Building in New York City is an excellent example of the quality and character of mass-produced cast-iron architecture. Once wood patterns were made, any number of elements could be cast, as was done with each of these repetitive bays. Photo: New York City Landmarks Preservation Commission.

In 1849 Bogardus created something uniquely American when he erected the first structure with self-supporting, multi-storied exterior walls of iron. Known as the Edgar Laing Stores, this corner row of small four-story warehouses that looked like one building was constructed in lower Manhattan in only two months. Its rear, side, and interior bearing walls were of brick; the floor framing consisted of timber joists and girders. One of the cast-iron walls was load-bearing, supporting the wood floor joists. The innovation was its two street facades of self-supporting cast iron, consisting of multiples of only a few pieces—Doric-style engaged columns, panels, sills, and plates, along with some applied ornaments (cover photo and Fig. 2). Each component of the facades had been cast individually in a sand mold in a foundry, machined smooth, tested for fit, and finally trundled on horse-drawn drays to the building site. There they were hoisted into position, then bolted together and fastened to the conventional structure of timber and brick with iron spikes and straps (Fig. 3).

The second iron-front building erected was a quantum leap beyond the Laing Stores in size and complexity. Begun in April 1850 by Bogardus, with architect Robert Hatfield, the five-story Sun newspaper building in Baltimore was both cast-iron-fronted and cast-iron-framed. In Philadelphia, several ironfronts were begun in 1850: The Inquirer Building, the Brock Stores, and the Penn Mutual Building (all three have been demolished). The St. Charles Hotel of 1851 at 60 N. Third Street is the oldest ironfront in America. Framing with cast-iron columns and wrought-iron beams and trusses was visible on a vast scale in the New York Crystal Palace of 1853.

In the second half of the 19th century, the United States was in an era of tremendous economic and territorial growth. The use of iron in commercial and public buildings spread rapidly, and hundreds of iron-fronted buildings were erected in cities across the country from 1849 to beyond the turn of the century. Outstanding examples of ironfronts exist in Baltimore, Galveston, Louisville, Milwaukee, New Orleans, Philadelphia, Richmond, Rochester (N.Y.), and especially New York City where the SoHo Cast Iron Historic District alone has 139 iron-fronted buildings (Fig. 1). Regrettably, a large proportion of ironfronts nationwide have been demolished in downtown redevelopment projects, especially since World War II.

Fig. 2. The Edgar Laing Stores Block in New York City was designed by James Bogardus. It was the first building constructed with facades of self-supporting cast iron. This corner view shows the Doric-style engaged columns, panels, and spandrel beams; the loss of most of the original ornamental castings give it an austere look. As part of an urban renewal project, the facades were carefully disassembled in 1971 for later re-erection in another location—only to have its iron parts stolen for scrap. Photo: Jack E. Boucher, HABS Collection.

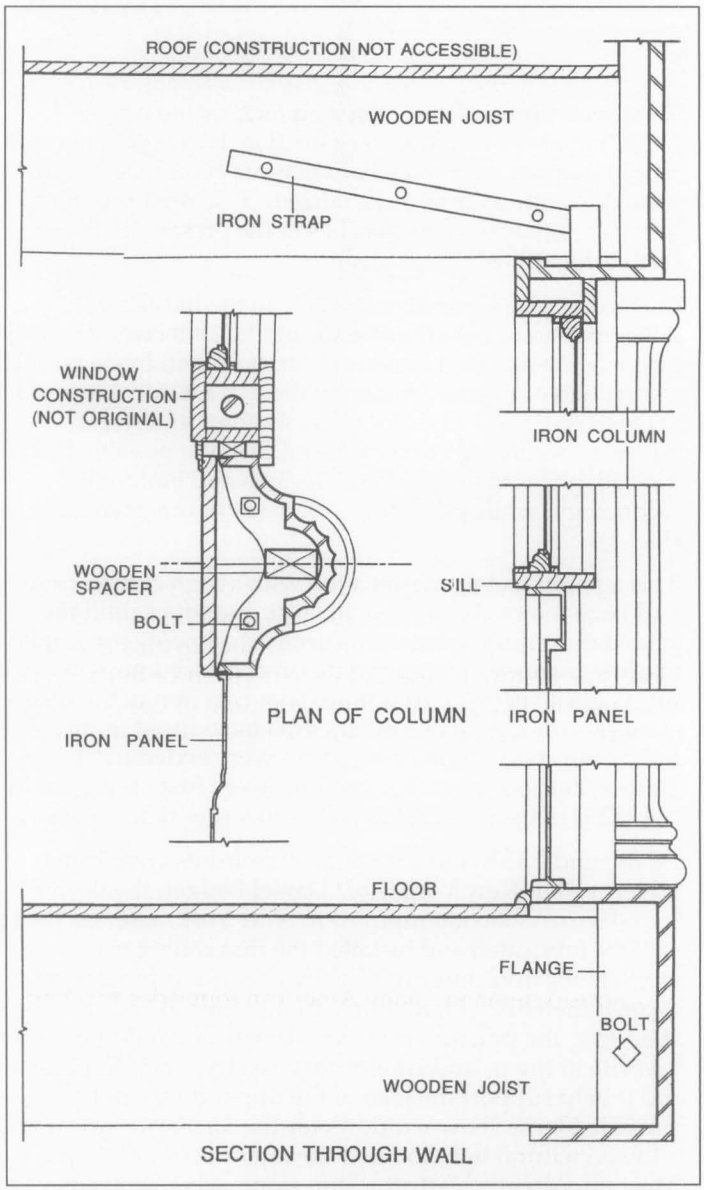

Fig. 3. Section drawing through the wall of Edgar Laing Stores showing how the cast-iron facade components were anchored to the wood floor and roof framing members. Drawing: John G. Waite, HABS Collection.

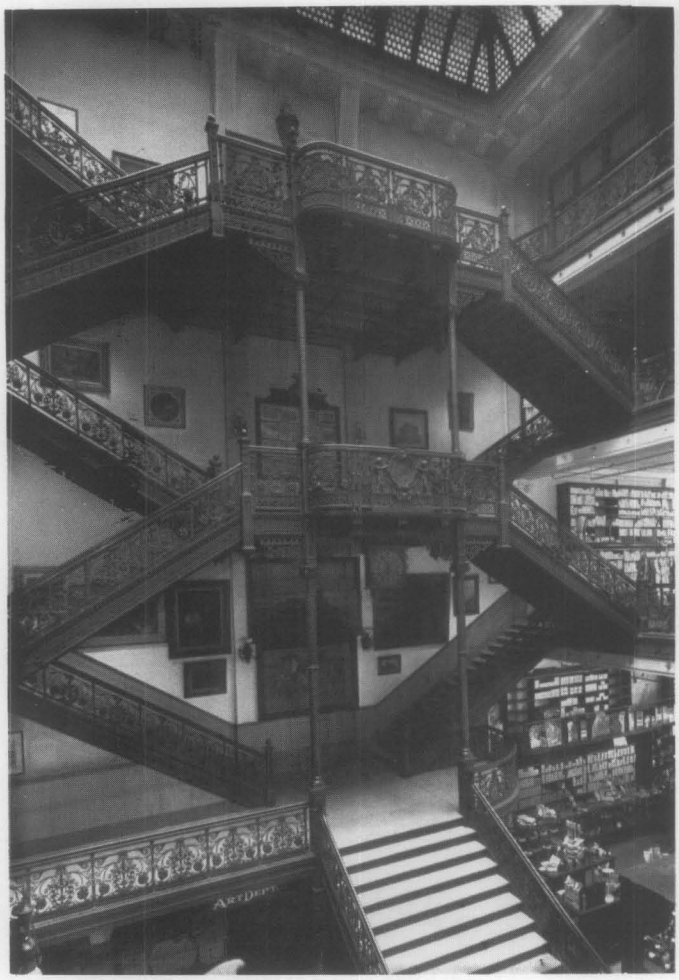

Fig. 4. The 1904 grand stairway of the former Frear's department store in Troy, N.Y. was constructed of cast iron, as was the frame of the skylight above. Some ornamental wrought iron was also employed. This use of iron was typical in major commercial buildings constructed throughout the United States. Courtesy: Rensselaer County Historical Society.

In addition to these exterior uses, many public buildings display magnificent exposed interior ironwork, at once ornamental and structural (Fig. 4). Remarkable examples have survived across the country, including the Peabody Library in Baltimore; the Old Executive Office Building in Washington, D.C.; the Bradbury Building in Los Angeles; the former Louisiana State Capitol; the former City Hall in Richmond; Tweed Courthouse in New York; and the state capitols of California, Georgia, Michigan, Tennessee, and Texas. And it is iron, of course, that forms the great dome of the United States Capitol, completed during the Civil War. Ornamental cast iron was a popular material in the landscape as well, appearing as fences, fountains with statuary, lampposts, furniture, urns, gazebos, gates, and enclosures for cemetery plots (Fig. 5). With such widespread demand, many American foundries that had been casting machine parts, bank safes, iron pipe, or cookstoves added architectural iron departments (Fig. 6). These called for patternmakers with sophisticated design capabilities, as well as knowledge of metal shrinkage and other technical aspects of casting. Major companies included the Hayward Bartlett Co. in Baltimore; James L. Jackson, Cornell Brothers, J. L. Mott, and Daniel D. Badger's Architectural Iron Works in Manhattan; Hecla Ironworks in Brooklyn; Wood & Perot of Philadelphia; Leeds & Co., the

Fig. 5. The Slatter Family Tomb in Mobile, Alabama, consisting of a cast-iron mausoleum and fence, exhibits the wide range of uses of the material in the 19th century. Photo: Jack E. Boucher, HABS Collection.

Shakspeare (sic) Foundry, and Miltenberger in New Orleans; Winslow Brothers in Chicago; and James McKinney in Albany, N.Y.

Cast iron was the metal of choice throughout the second half of the 19th century. Not only was it a fire-resistant material in a period of major urban fires, but also large facades could be produced with cast iron at less cost than comparable stone fronts, and iron buildings could be erected with speed and efficiency. The largest standing example of framing with cast-iron columns and wrought-iron beams is Chicago's sixteen-story Manhattan Building, the world's tallest skyscraper when built in 1890 by William LeBaron Jenney. By this time, however, steel was becoming available nationally, and was structurally more versatile and cost-competitive. Its increased use is one reason why building with cast iron diminished around the turn of the century after having been so eagerly adopted only fifty years before. Nonetheless, cast iron continued to be used in substantial quantities for many other structural and ornamental purposes well into the 20th century: storefronts; marquees; bays and large window frames for steel-framed, masonry-clad buildings; and street and landscape furnishings, including subway kiosks.

The 19th century left us with a rich heritage of new building methods, especially construction on an altogether new scale that was made possible by the use of metals. Of these, cast iron was the pioneer, although its period of intensive use lasted but a half century. Now the surviving legacy of cast-iron architecture, much of which continues to be threatened, merits renewed appreciation and appropriate preservation and restoration treatments.

What is Cast Iron?

Cast iron is an alloy with a high carbon content (at least 1.7% and usually 3.0 to 3.7%) that makes it more resistant to corrosion than either wrought iron or steel. In addition to carbon, cast iron contains varying amounts of silicon, sulfur, manganese, and phosphorus.

While molten, cast iron is easily poured into molds, making it possible to create nearly unlimited decorative and structural forms. Unlike wrought iron and steel, cast iron is too hard and brittle to be shaped by hammering, rolling, or pressing. However, because it is more rigid and more resistant to buckling than other forms of iron, it can withstand great compression loads. Cast iron is relatively weak in tension, however, and fails under tensile loading with little prior warning.

The characteristics of various types of cast iron are determined by their composition and the techniques used in melting, casting, and heat treatment. Metallurgical constituents of cast iron that affect its brittleness, toughness, and strength include ferrite, cementite, pearlite, and graphite carbon. Cast iron with flakes of carbon is called gray cast iron. The "gray fracture" associated with cast iron was probably named for the gray, grainy appearance of its broken edge caused by the presence of flakes of free graphite, which account for the brittleness of cast iron. This brittleness is the important distinguishing characteristic between cast iron and mild steel.

Compared with cast iron, wrought iron is relatively soft, malleable, tough, fatigue-resistant, and readily worked by forging, bending, and drawing. It is almost pure iron, with less than 1% (usually 0.02 to 0.03%) carbon. Slag varies between 1% and 4% of its content and exists in a purely physical association, that is, it is not alloyed. This gives wrought iron its characteristic laminated (layered) or fibrous structure.

Wrought iron can be distinguished from cast iron in several ways. Wrought-iron elements generally are simpler in form and less uniform in appearance than cast-iron elements, and contain evidence of rolling or hand working. Cast iron often contains mold lines, flashing, casting flaws, and air holes. Cast-iron elements are very uniform in appearance and are frequently used repetitively. Cast-iron elements are often bolted or screwed together, whereas wrought-iron pieces are either riveted or forge-molded (heat welded) together.

Mild steel is now used to fabricate new hand-worked metal work and to repair old wrought-iron elements. Mild steel is an alloy of iron and is not more than 2% carbon, which is strong but easily worked in block or ingot form. Mild steel is not as resistant to corrosion as either wrought iron or cast iron.

Maintenance and Repair

Many of the maintenance and repair techniques described in the Brief, particularly those relating to cleaning and painting, are potentially dangerous and should be carried out only by experienced and qualified workmen using protective equipment suitable to the task. In all but the most simple repairs, it is best to involve a preservation architect or building conservator to assess the condition of the iron and prepare contract documents for its treatment.

As with any preservation project, the work must be preceded by a review of local building codes and environmental protection regulations to determine whether any conflicts exist with the proposed treatments. If there are conflicts, particularly with cleaning techniques or painting materials, then waivers or variances need to be negotiated, or alternative treatments or materials adopted.

Deterioration

Common problems encountered today with cast-iron construction include badly rusted or missing elements, impact damage, structural failures, broken joints, damage to connections, and loss of anchorage in masonry (Figs. 7, 8).

Oxidation, or rusting, occurs rapidly when cast iron is exposed to moisture and air. The minimum relative humidity necessary to promote rusting is 65%, but this

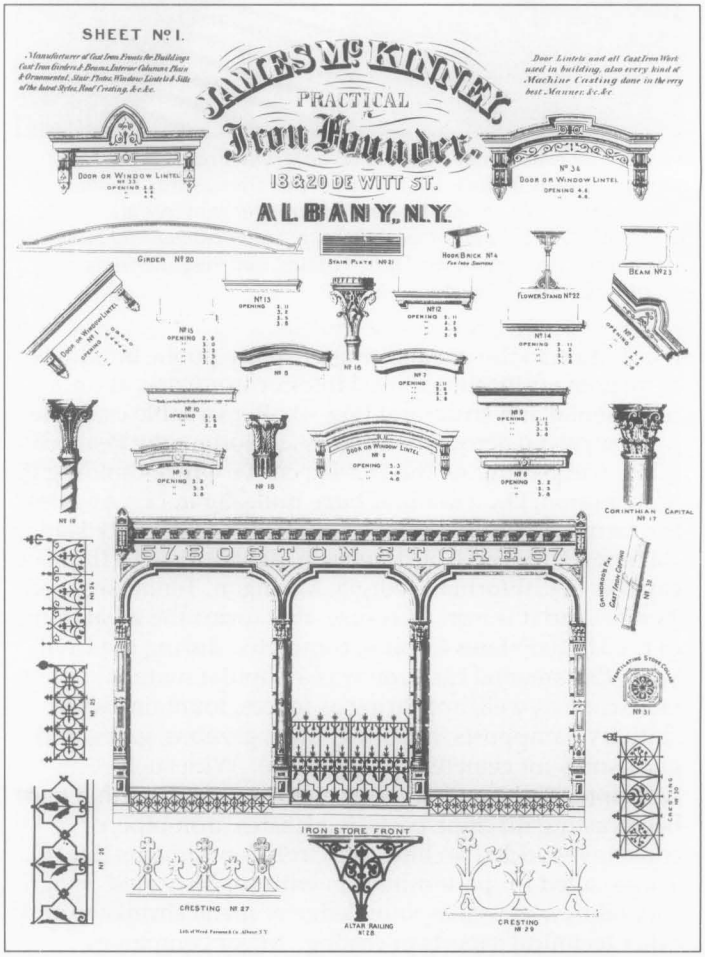

Fig. 6. Sheet from a late 19th century manufacturer's trade catalog illustrates some of the products available from foundries, such as storefronts, girders and beams, columns, stairs, window lintels and sills, and roof crestings. Courtesy: Albany Institute of History and Art.

Fig. 7. Despite an impact that shattered the main castings, this fence post remains upright, demonstrating the great strength of cast iron. Originally, the post was held together by a long bolt that extended from the finial to the base. Photo: John G. Waite.

figure can be lower in the presence of corrosive agents, such as sea water, salt air, acids, acid precipitation, soils, and some sulfur compounds present in the atmosphere, which act as catalysts in the oxidation process. Rusting is accelerated in situations where architectural details provide pockets or crevices to trap and hold liquid corrosive agents. Furthermore, once a rust film forms, its porous surface acts as a reservoir for liquids, which in turn causes further corrosion. If this process is not arrested, it will continue until the iron is entirely consumed by corrosion, leaving nothing but rust.

Galvanic corrosion is an electrochemical action that results when two dissimilar metals react together in the presence of an electrolyte, such as water containing salts or hydrogen ions (Fig. 9). The severity of the galvanic corrosion is based on the difference in potential between the two metals, their relative surface areas, and time. If the more noble metal (higher position in electrochemical series) is much larger in area than the baser, or less noble, metal, the deterioration of the baser metal will be more rapid and severe. If the more noble metal is much smaller in area than the baser metal, the deterioration of the baser metal will be much less significant. Cast iron will be attacked and corroded when it is adjacent to more noble metals such as lead or copper.

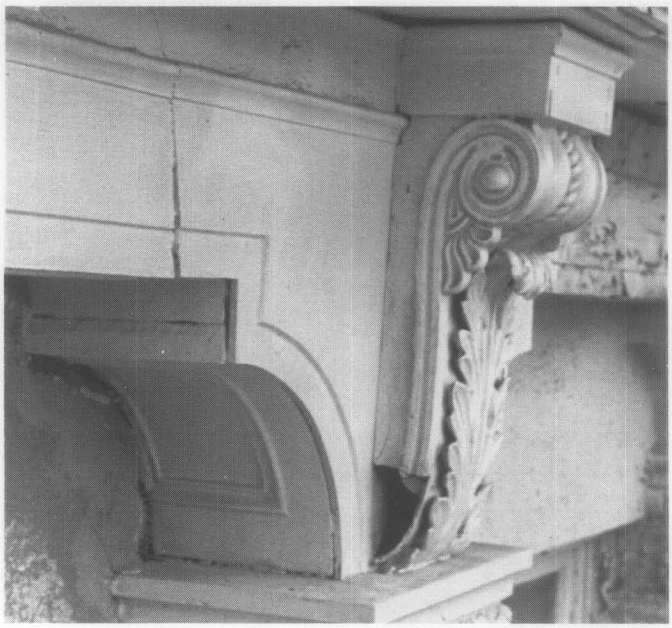

Fig. 8. Structural cracks, gaps at joints between components, and a large opening where part of the console bracket is missing are the problems evident in this cast-iron assembly. Photo: Ford, Powell & Carson.

Fig. 9. Galvanic corrosion occurred where a patch of copper was installed alongside the cast-iron cap at the base of a fountain. The use of terne-coated stainless flashings with appropriate caulking would have been a more suitable repair. Photo: John G. Waite.

Graphitization of cast iron, a less common problem, occurs in the presence of acid precipitation or seawater. As the iron corrodes, the porous graphite (soft carbon) corrosion residue is impregnated with insoluble corrosion products. As a result, the cast-iron element retains its appearance and shape but is weaker structurally. Graphitization occurs where cast iron is left unpainted for long periods or where caulked joints have failed and acidic rainwater has corroded pieces from the backside. Testing and identification of graphitization is accomplished by scraping through the surface with a knife to reveal the crumbling of the iron beneath. Where extensive graphitization occurs, usually the only solution is replacement of the damaged element.

Castings may also be fractured or flawed as a result of imperfections in the original manufacturing process, such as air holes, cracks, and cinders, or cold shuts (caused by the "freezing" of the surface of the molten iron during casting because of improper or interrupted pouring). Brittleness is another problem occasionally found in old cast-iron elements. It may be a result of excessive phosphorus in the iron, or of chilling during the casting process.

Condition Assessment

Before establishing the appropriate treatment for cast-iron elements in a building or structure, an evaluation should be made of the property's historical and architectural significance and alterations, along with its present condition. If the work involves more than routine maintenance, a qualified professional should be engaged to develop a historic structure report which sets forth the historical development of the property, documents its existing condition, identifies problems of repair, and provides a detailed listing of recommended work items

with priorities. Through this process the significance and condition of the cast iron can be evaluated and appropriate treatments proposed. For fences, or for single components of a building such as a facade, a similar but less extensive analytical procedure should be followed.

The nature and extent of the problems with the cast-iron elements must be well understood before proceeding with work. If the problems are minor, such as surface corrosion, flaking paint, and failed caulking, the property owner may be able to undertake the repairs by working directly with a knowledgeable contractor. If there are major problems or extensive damage to the cast iron, it is best to secure the services of an architect or conservator who specializes in the conservation of historic buildings. Depending on the scope of work, contract documents can range from outline specifications to complete working drawings with annotated photographs and specifications

To thoroughly assess the condition of the ironwork, a close physical inspection must be undertaken of every section of the iron construction including bolts, fasteners, and brackets (Fig. 10). Typically, scaffolding or a mechanical lift is employed for close inspection of a cast-iron facade or other large structures. Removal of select areas of paint may be the only means to determine the exact condition of connections, metal fasteners, and intersections or crevices that might trap water.

Fig. 11. Major cracks in the piers of this cast-iron storefront in Galveston, Texas resulted from the transfer of load onto the iron from internal brick piers eroded by rising damp. This crack was inappropriately filled with concrete, which trapped moisture and accelerated internal corrosion, pushing the iron further apart. Photo: Ford, Powell & Carson.

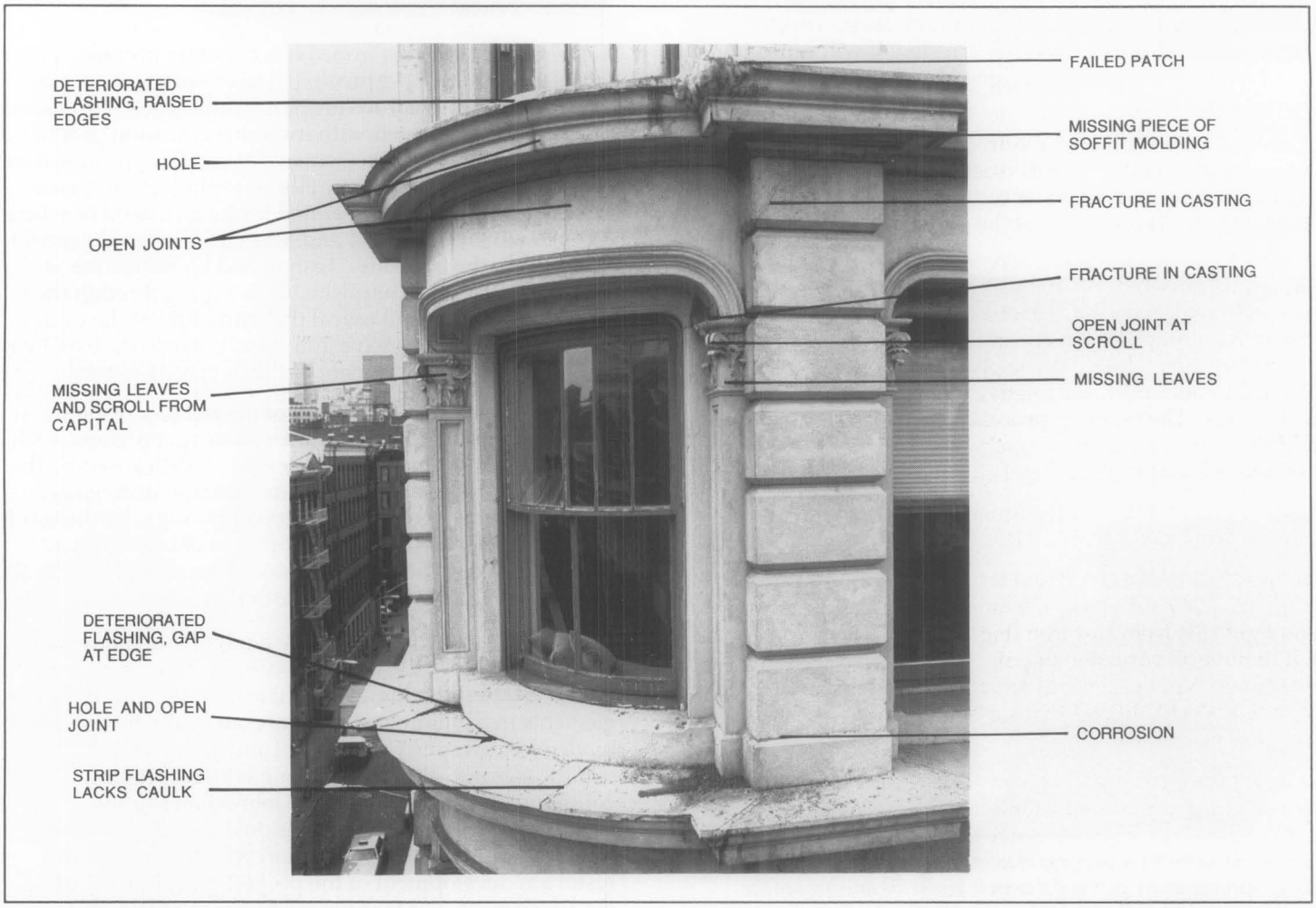

Fig. 10. During close-up inspection of the Gunther Building in New York City, photographs of each bay were taken to use in a survey of existing conditions. Photo: Willcox Dunn.

An investigation of load-bearing elements, such as columns and beams, will establish whether these components are performing as they were originally designed, or the stress patterns have been redistributed. Areas that are abnormally stressed must be examined to ascertain whether they have suffered damage or have been displaced (Fig. 11). Damage to a primary structural member is obviously critical to identify and evaluate; attention should not be given only to decorative features.

The condition of the building, structure, or object; diagnosis of its problems; and recommendations for its repair should be recorded by drawings, photographs, and written descriptions, to aid those who will be responsible for its conservation in the future.

Whether minor or major work is required, the retention and repair of historic ironwork is the recommended preservation approach over replacement. All repairs and restoration work should be reversible, when possible, so that modifications or treatments that may turn out to be harmful to the long-term preservation of the iron can be corrected with the least amount of damage to the historic ironwork.

Cleaning and Paint Removal

When there is extensive failure of the protective coating and/or when heavy corrosion exists, the rust and most or all of the paint must be removed to prepare the surfaces for new protective coatings. The techniques available range from physical processes, such as wire brushing and grit blasting, to flame cleaning and chemical methods. The selection of an appropriate technique depends upon how much paint failure and corrosion has occurred, the fineness of the surface detailing, and the type of new protective coating to be applied. Local environmental regulations may restrict the options for cleaning and paint removal methods, as well as the disposal of materials.

Many of these techniques are *potentially dangerous* and should be carried out only by experienced and qualified workers using proper eye protection, protective clothing, and other workplace safety conditions. Before selecting a process, test panels should be prepared on the iron to be cleaned to determine the relative effectiveness of various techniques. The cleaning process will most likely expose additional coating defects, cracks, and corrosion that have not been obvious before (Fig. 12).

There are a number of techniques that can be used to remove paint and corrosion from cast iron:

Hand scraping, chipping, and wire brushing are the most common and least expensive methods of removing paint and light rust from cast iron (Fig. 13a, b). However, they do not remove all corrosion or paint as effectively as other methods. Experienced craftsmen should carry out the work to reduce the likelihood that surfaces may be scored or fragile detail damaged.

Low-pressure grit blasting (commonly called abrasive cleaning or sandblasting) is often the most effective approach to removing excessive paint build-up or substantial corrosion. Grit blasting is fast, thorough, and economical, and it allows the iron to be cleaned in place. The aggregate can be iron slag or sand; copper slag should not be used on iron because of the potential for electrolytic

Fig. 12. Paint stripping exposed a large defect under a faulty patch at a joint of this wide cast-iron watertable. The damage can be repaired mechanically by splicing in a cast-iron replacement piece. Photo: Peter Jensen, Kapell and Kostow Architects.

reactions. Some sharpness in the aggregate is beneficial in that it gives the metal surface a "tooth" that will result in better paint adhesion. The use of a very sharp or hard aggregate and/or excessively high pressure (over 100 pounds per square inch) is unnecessary and should be avoided. Adjacent materials, such as brick, stone, wood, and glass, must be protected to prevent damage. Some local building codes and environmental authorities prohibit or limit dry sandblasting because of the problem of airborne dust.

Wet sandblasting is more problematic than dry sandblasting for cleaning cast iron because the water will cause instantaneous surface rusting and will penetrate deep into open joints. Therefore, it is generally not considered an effective technique. Wet sandblasting reduces the amount of airborne dust when removing a heavy paint build-up, but disposal of effluent containing lead or other toxic substances is restricted by environmental regulations in most areas.

Flame cleaning of rust from metal with a special multi-flame head oxyacetylene torch requires specially skilled operators, and is expensive and potentially dangerous. However, it can be very effective on lightly to moderately corroded iron. Wire brushing is usually neccessary to finish the surface after flame cleaning.

Chemical rust removal, by acid pickling, is an effective method of removing rust from iron elements that can be easily removed and taken to a shop for submerging in vats of dilute phosphoric or sulfuric acid. This method does not damage the surface of iron, providing that the iron is neutralized to pH level 7 after cleaning. Other chemical rust removal agents include ammonium citrate, oxalic acid, or hydrochloric acid-based products.

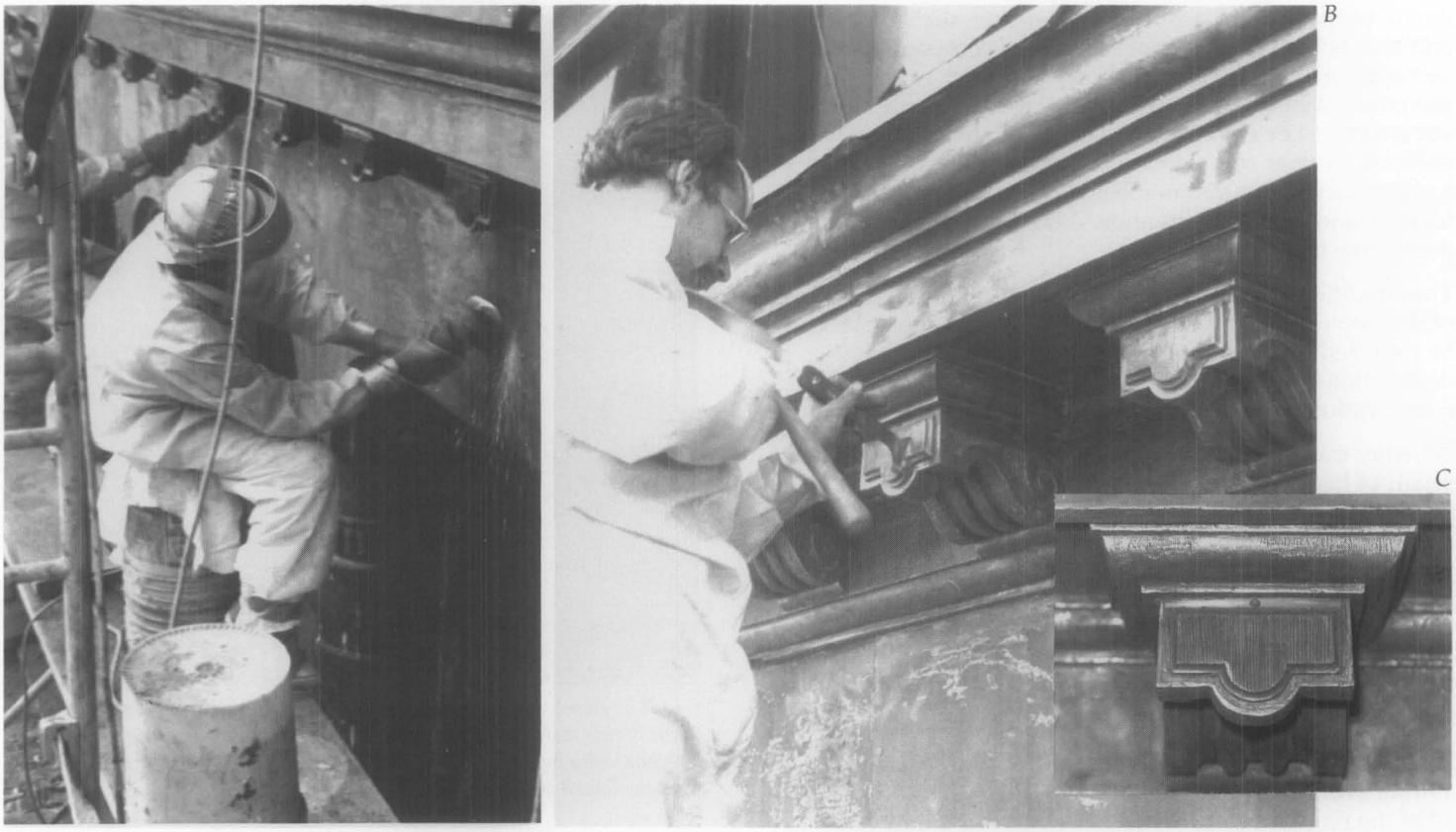

Fig. 13. Surface preparation may involve several different techniques. Where chemical paint stripping is involved, careful planning of the sequence of work and inspection by an architect or conservator to ensure strict compliance with the contract documents is important to minimize the risk of problems. After the chemical paste and paint was scraped off, the remaining paint and chemical residue were removed with a wire brush (a) and scrapers selected or cut to fit the shape of the iron surfaces (b). The surface was then wiped with solvent to create a completely clean surface prior to repainting (c). Photos: Raymond M. Pepi, Building Conservation Associates.

Chemical paint removal using alkaline compounds, such as methylene chloride or potassium hydroxide, can be an effective alternative to abrasive blasting for removal of heavy paint build-up (Fig. 13). These agents are often available as slow-acting gels or pastes. Because they can cause burns, protective clothing and eye protection must be worn. Chemicals applied to a non-watertight facade can seep through crevices and holes, resulting in damage to the building's interior finishes and corrosion to the backside of the iron components. If not thoroughly neutralized, residual traces of cleaning compounds on the surface of the iron can cause paint failures in the future (Fig. 14). For these reasons, field application of alkaline paint removers and acidic cleaners is not generally recommended.

Following any of these methods of cleaning and paint removal, the newly cleaned iron should be painted immediately with a corrosion-inhibiting primer before new rust begins to form. This time period may vary from minutes to hours depending on environmental conditions. If priming is delayed, any surface rust that has developed should be removed with a clean wire brush just before priming, because the rust prevents good bonding between the primer and the cast iron surface and prevents the primer from completely filling the pores of the metal.

Painting and Coating Systems

The most common and effective way to preserve architectural cast iron is to maintain a protective coating of paint on the metal. Paint can also be decorative, where historically appropriate .

Before removing paint from historic architectural cast iron, a microscopic analysis of samples of the historic paint sequencing is recommended. Called paint seriation analysis, this process must be carried out by an experienced architectural conservator. The analysis will identify the historic paint colors, and other conditions, such as whether the paint was matte or gloss, whether sand was added to the paint for texture, and whether the building was polychromed or marbleized. Traditionally many cast-iron elements were painted to resemble other materials, such as limestone or sandstone. Occasionally, features were faux-painted so that the iron appeared to be veined marble.

Thorough surface preparation is necessary for the adhesion of new protective coatings. All loose, flaking, and deteriorated paint must be removed from the iron, as well as dirt and mud, water-soluble salts, oil, and grease. Old paint that is tightly adhered may be left on the surface of the iron if it is compatible with the proposed coatings. The retention of old paint also preserves the historic paint sequence of the building and avoids the hazards of removal and disposal of old lead paint.

It is advisable to consult manufacturer's specifications or technical representatives to ensure compatibility between the surface conditions, primer and finish coats, and application methods.

For the paint to adhere properly, the metal surfaces must be absolutely dry before painting. Unless the paint selected is

specifically designed for exceptional conditions, painting should not take place when the temperature is expected to fall below 50 degrees Fahrenheit within 24 hours or when the relative humidity is above 80 per cent; paint should not be applied when there is fog, mist, or rain in the air. Poorly prepared surfaces will cause the failure of even the best paints, while even moderately priced paints can be effective if applied over well-prepared surfaces.

Selection of Paints and Coatings

The types of paints available for protecting iron have changed dramatically in recent years due to federal, state, and local regulations that prohibit or restrict the manufacture and use of products containing toxic substances such as lead and zinc chromate, as well as volatile organic compounds and substances (VOC or VOS). Availability of paint types varies from state to state, and manufacturers continue to change product formulations to comply with new regulations.

Fig. 14. Major problems can result if work is undertaken without proper sequencing and precautions. On this building, a strong alkaline paint remover was used, and apparently was not adequately rinsed or neutralized. Over a period of months, the newly applied paint began to peel and streaks of rust appeared on the iron. Photo: Kim Lovejoy.

Traditionally, red lead has been used as an anti-corrosive pigment for priming iron. Red lead has a strong affinity for linseed oil and forms lead soaps, which become a tough and elastic film impervious to water that is highly effective as a protective coating for iron. At least two slow-drying linseed oil-based finish coats have traditionally been used over a red lead primer, and this combination is effective on old or partially-deteriorated surfaces. Today, in most areas, the use of paints containing lead is prohibited, except for some commercial and industrial purposes.

Today, alkyd paints are very widely used and have largely replaced lead-containing linseed-oil paints. They dry faster than oil paint, with a thinner film, but they do not protect the metal as long. Alkyd rust-inhibitive primers contain pigments such as iron oxide, zinc oxide, and zinc phosphate. These primers are suitable for previously painted surfaces cleaned by hand tools. At least two coats of primer should be applied, followed by alkyd enamel finish coats.

Latex and other water-based paints are not recommended for use as primers on cast iron because they cause immediate oxidation if applied on bare metal. Vinyl acrylic latex or acrylic latex paints may be used as finish coats over alkyd rust-inhibitive primers, but if the primer coats are imperfectly applied or are damaged, the latex paint will cause oxidation of the iron. Therefore, alkyd finish coats are recommended.

High-performance coatings, such as zinc-rich primers containing zinc dust, and modern epoxy coatings, can be used on cast iron to provide longer-lasting protection. These coatings typically require highly clean surfaces and special application conditions which can be difficult to achieve in the field on large buildings (Fig. 13c). These coatings are used most effectively on elements which have been removed to a shop, or newly cast iron.

One particularly effective system has been first to coat commercially blast-cleaned iron with a zinc-rich primer, followed by an epoxy base coat, and two urethane finish coats. Some epoxy coatings can be used as primers on clean metal or applied to previously-painted surfaces in sound condition. Epoxies are particularly susceptible to degradation under ultraviolet radiation and must be protected by finish coats which are more resistant. There have been problems with epoxy paints which have been shop-applied to iron where the coatings have been nicked prior to installation. Field touching-up of epoxy paints is very difficult, if not impossible. This is a concern since iron exposed by imperfections in the base coat will be more likely to rust and more frequent maintenance will be required.

A key factor to take into account in selection of coatings is the variety of conditions on existing and new materials on a particular building or structure. One primer may be needed for surfaces with existing paint; another for newly cast, chemically stripped, or blast-cleaned cast iron; and a third for flashings or substitute materials; all three followed by compatible finish coats.

Application Methods

Brushing is the traditional and most effective technique for applying paint to cast iron. It provides good contact between the paint and the iron, as well as the effective filling of pits, cracks, and other blemishes in the metal. The use of spray guns to apply paint is economical, but does not always produce adequate and uniform coverage. For best results, airless sprayers should be used by skilled operators. To fully cover fine detailing and reach recesses, spraying of the primer coat, used in conjunction with brushing, may be effective.

Rollers should never be used for primer coat applications on metal, and are effective for subsequent coats only on large, flat areas. The appearance of spray-applied and roller-applied finish coats is not historically appropriate and should be avoided on areas such as storefronts which are viewed close at hand.

Caulking, Patching, and Mechanical Repairs

Most architectural cast iron is made of many small castings assembled by bolts or screws (Fig. 16a). Joints between pieces were caulked to prevent water from seeping in and causing rusting from the inside out. Historically, the seams were often caulked with white lead paste and sometimes backed with cotton or hemp rope; even the bolt and screw heads were caulked to protect them from the elements and to hide them from view. Although old caulking is sometimes found in good condition, it is typically crumbled from weathering, cracked from the structural settlement, or destroyed by mechanical cleaning. It is essential to replace deteriorated caulking to prevent water penetration. For good adhesion and performance, an architectural-grade polyurethane sealant or traditional white lead paste is preferred.

Water that penetrates the hollow parts of a cast-iron architectural element causes rust that may streak down over other architectural elements. The water may freeze, causing the ice to crack the cast iron. Cracks reduce the strength of the total cast-iron assembly and provide another point of entry for water. Thus, it is important that cracks be made weathertight by using caulks or fillers, depending on the width of the crack.

Filler compounds containing iron particles in an epoxy resin binder can be used to patch superficial, non-structural cracks and small defects in cast iron. The thermal expansion rate of epoxy resin alone is different from that of iron, requiring the addition of iron particles to ensure compatibility and to control shrinkage. Although the repaired piece of metal does not have the same strength as a homogeneous piece of iron, epoxy-repaired members do have some strength. Polyester-based putties, such as those used on auto bodies, are also acceptable fillers for small holes.

In rare instances, major cracks can be repaired by brazing or welding with special nickel-alloy welding rods. Brazing or welding of cast iron is very difficult to carry out in the field and should be undertaken only by very experienced welders.

In some cases, mechanical repairs can be made to cast iron using iron bars and screws or bolts. In extreme cases, deteriorated cast iron can be cut out and new cast iron spliced in place by welding or brazing. However, it is frequently less expensive to replace a deteriorated cast-iron section with a new casting rather than to splice or reinforce it. Cast-iron structural elements that have failed must either be reinforced with iron and steel or replaced entirely.

A wobbly cast-iron balustrade or railing can often be fixed by tightening all bolts and screws. Screws with stripped threads and seriously rusted bolts must be replaced. To compensate for corroded metal around the bolt or screw holes, new stainless steel bolts or screws with a larger diameter need to be used. In extreme cases, new holes may need to be tapped.

The internal voids of balusters, newel posts, statuary, and other elements should not be filled with concrete; it is an inappropriate treatment that causes further problems (Fig. 15). As the concrete cures, it shrinks, leaving a space between the concrete and cast iron. Water penetrating this space does not evaporate quickly, thus promoting further rusting. The corrosion of the iron is further accelerated by the alkaline nature of concrete. Where cast-iron elements have been previously filled with concrete, they need to be taken apart, the concrete and rust removed, and the interior surfaces primed and painted before the elements are reassembled.

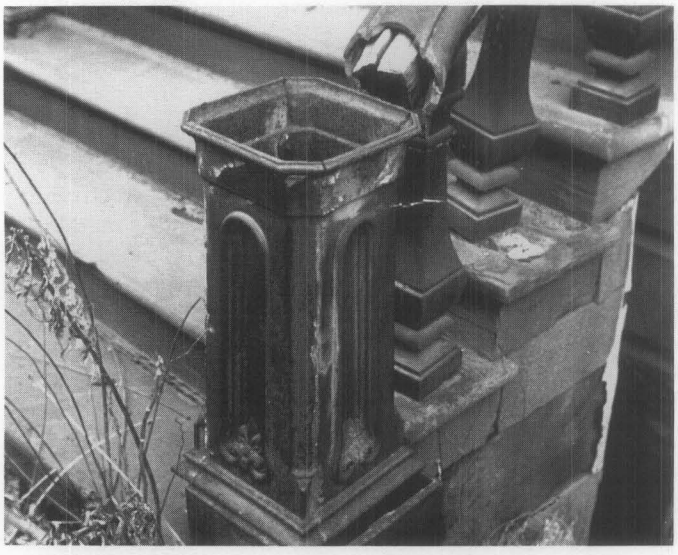

Fig. 15. In an effort to repair this stair railing, concrete was poured around the wood spacer inside the railing casting. Water penetrated the railing and reacted with the concrete to accelerate the corrosion of the iron. Photo: John G. Waite.

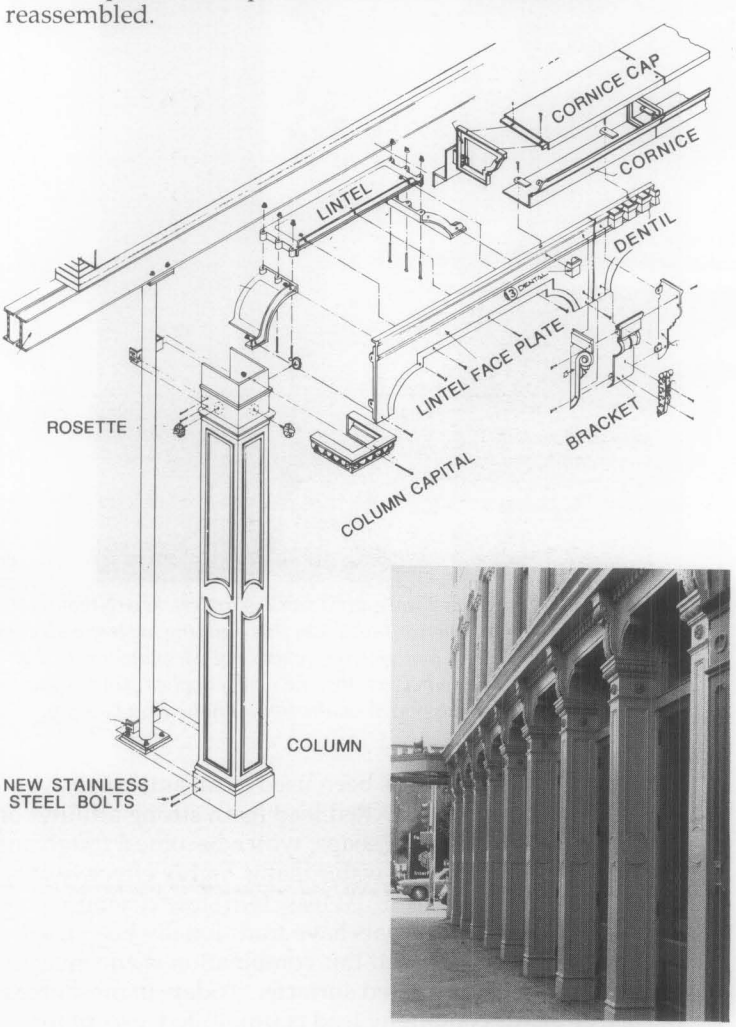

Fig. 16. Architectural cast iron is made of many small components bolted and screwed together. (a) This exploded view of a storefront illustrates the variety of elements, including brackets, fasteners, and holes for bolts. (b) The storefront was replicated in cast iron because of the extensive damage and structural failure, a detail of which is shown in Fig. 11. Drawing and photo: Historical Arts & Casting, Inc.

Duplication and Replacement

The replacement of cast-iron components is often the only practical solution when such features are missing, severely corroded, or damaged beyond repair, or where repairs would be only marginally useful in extending the functional life of an iron element (Fig. 16).

Sometimes it is possible to replace small, decorative, non-structural elements using intact sections of the original as a casting pattern. For large sections, new patterns of wood or plastic made slightly larger in size than the original will need to be made in order to compensate for the shrinkage of the iron during casting (cast iron shrinks approximately 1/8 inch per foot as it cools from a liquid into a solid). Occasionally, a matching replacement can be obtained from the existing catalogs of iron foundries. Small elements can be custom cast in iron at small local foundries, often at a cost comparable to substitute materials. Large elements and complex patterns will usually require the skills and facilities of a larger firm that specializes in replication.

The Casting Process

Architectural elements were traditionally cast in sand molds. The quality of the special sands used by foundries is extremely important; unlike most sands they must be moist. Foundries have their own formulas for sand and its admixtures, such as clay, which makes the sand cohesive even when the mold is turned upside down.

A two-part mold (with a top and a bottom, or cope and drag) is used for making a casting with relief on both sides, whereas an open-top mold produces a flat surface on one side (Fig. 17a). For hollow elements, a third pattern and mold are required for the void. Many hollow castings are made of two or more parts that are later bolted, screwed, or welded together, because of the difficulty of supporting an interior core between the top and bottom sand molds during the casting process.

The molding sand is compacted into flasks, or forms, around the pattern. The cope is then lifted off and the pattern is removed, leaving the imprint of the pattern in the small mold. Molten iron, heated to a temperature of approximately 2700 degrees Fahrenheit, is poured into the mold and then allowed to cool (Fig. 17b). The molds are then stripped from the casting; the tunnels to the mold (sprues) and risers that allowed release of air are cut off; and ragged edges (called "burrs") on the casting are ground smooth.

The castings are shop-primed to prevent rust, and laid out and preassembled at the foundry to ensure proper alignment and fit. When parts do not fit, the pieces are machined to remove irregularities caused by burrs, or are rejected and recast until all of the cast elements fit together properly. Most larger pieces then are taken apart before shipping to the job site, while some small ornamental parts may be left assembled.

Fig. 17. (a) A two-part mold, consisting of a cope (top) and drag (bottom) for a newel post. Photo: Architectural Iron Company, Inc. (b) Molten iron being poured into a mold containing sand at a foundry. The iron casting process has changed little in the past two centuries. Photo: Karen Huebner.

Fig. 18. This cast-iron storefront cornice was corroded beyond the point of repair, and could not be removed easily for replacement. Terne-coated stainless steel, the most durable metal for flashing cast iron, was applied to the cornice and fitted as closely as possible to the historic profile. Although painting is not necessary to protect terne-coated stainless steel, the cornice should be painted to be consistent with the historic character of the building. A primer which is compatible with the terne coating should be used. Photo: Dean Koga, Robert E. Meadows, P.C., Architects.

Dismantling and Assembly of Architectural Components

It is sometimes necessary to dismantle all or part of a cast-iron structure during restoration, if repairs cannot be successfully carried out in place. Dismantling should be done only under the direction of a preservation architect or architectural conservator who is experienced with historic cast iron. Extreme care must be taken since cast iron is very brittle, especially in cold weather.

Dismantling should follow the reverse order of construction and re-erection should occur, as much as possible, in the exact order of original assembly. Each piece should be numbered and keyed to record drawings. When work must be carried out in cold weather, care needs to be taken to avoid fracturing the iron elements by uneven heating of the members.

Both new castings and reused pieces should be painted with a shop-applied prime coat on all surfaces. All of the components should be laid out and preassembled to make sure that the alignment and fit are proper. Many of the original bolts, nuts, and screws may have to be replaced with similar fasteners of stainless steel.

After assembly at the site, joints that were historically caulked should be filled with an architectural-grade polyurethane sealant or the traditional white lead paste White lead has the advantage of longevity, although its use is restricted in many areas.

Flashings

In some instances, it may be necessary to design and install flashings to protect areas vulnerable to water penetration. Flashings need to be designed and fabricated carefully so that they are effective, as well as unobtrusive in appearance. The most durable material for flashing iron is terne-coated stainless steel (Fig. 18). Other compatible materials are terne-coated steel and galvanized steel; however, these require more frequent maintenance and are less durable. Copper and lead-coated copper are not recommended for use as flashings in contact with cast iron because of galvanic corrosion problems. Galvanic problems can also occur with the use of aluminum if certain types of electrolytes are present.

Substitute Materials

In recent years, a number of metallic and non-metallic materials have been used as substitutes for cast iron, although they were not used historically with cast iron. The most common have been cast aluminum, epoxies, reinforced polyester (fiberglass), and glass fiber-reinforced concrete (GFRC). Factors to consider in using substitute materials are addressed in **Preservation Briefs 16**, which emphasizes that "every means of repairing deteriorating historic materials or replacing them with identical materials should be examined before turning to substitute materials."

Cast aluminum has been used recently as a substitute for cast iron, particularly for ornately-detailed decorative elements. Aluminum is lighter in weight, more resistant to corrosion, and less brittle than cast iron. However, because it is dissimilar from iron, its placement in contact with or near cast iron may result in galvanic corrosion, and thus should be avoided. Special care must be taken in the application of paint coatings, particularly in the field. It is often difficult to achieve a durable coating after the original finish has failed. Because aluminum is weaker than iron, careful analysis is required whenever aluminum is being considered as a replacement material for structural cast-iron elements.

Epoxies are two-part, thermo-setting, resinous materials which can be molded into virtually any form. When molded, the epoxy is usually mixed with fillers such as sand, glass balloons, or stone chips. Since it is not a metal, galvanic corrosion does not occur. When mixed with sand or stone, it is often termed epoxy concrete or polymer concrete, a misnomer because no cementitious materials are included. Epoxies are particularly effective for replicating small, ornamental sections of cast iron. Since it is not a metal, galvanic corrosion does not occur. Epoxy elements must have a protective coating to shield them from ultraviolet degradation. They are also flammable and cannot be used as substitutes for structural cast-iron elements.

Reinforced polyester, commonly known as ***fiberglass***, is often used as a lightweight substitute for historic materials, including cast iron, wood, and stone. In its most common form, fiberglass is a thin, rigid, laminate shell formed by pouring a polyester resin into a mold and then adding fiberglass for reinforcement. Like epoxies, fiberglass is non-

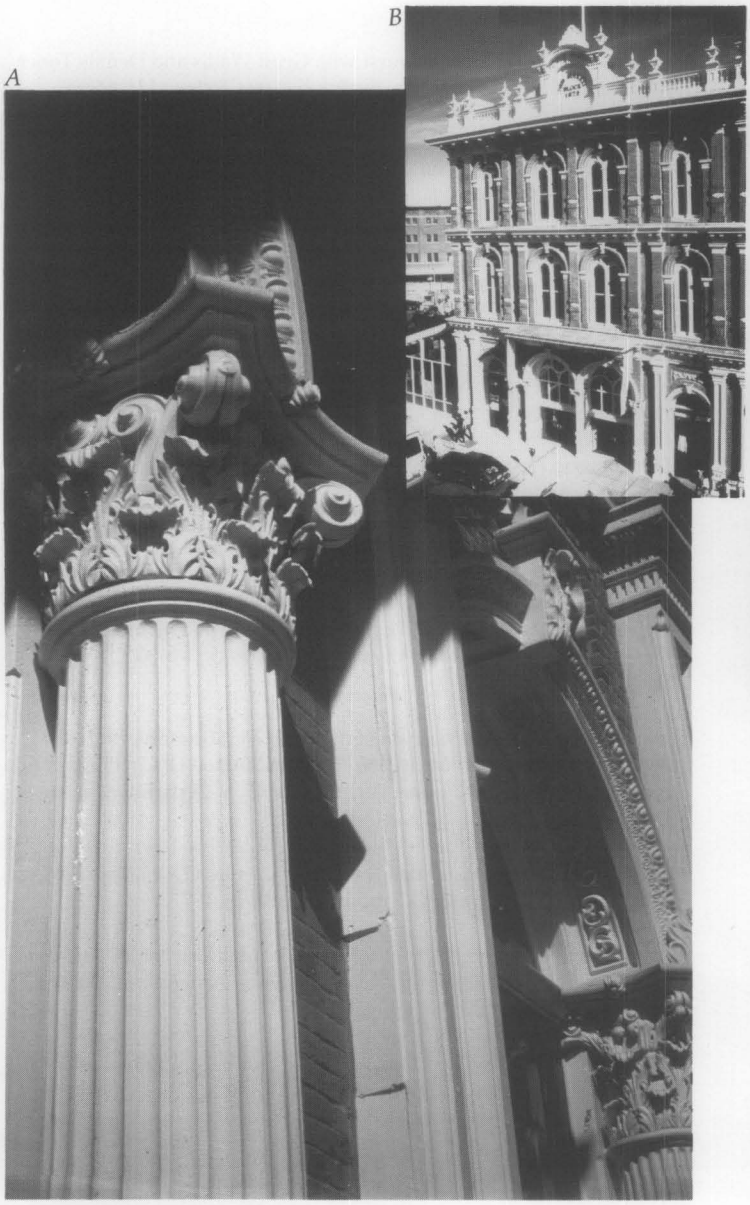

Fig. 19. (a) Fiberglass columns and aluminum capitals were installed to replicate the ornamental features on the east facade of the New Market Theater in Portland, Oregon, that had been destroyed by previous occupants. Like cast iron, crisp ornamental details can be achieved with cast aluminum. Although aluminum may be in contact with fiberglass, galvanic corrosion may result when aluminum is in direct contact with cast iron. Photo: William J. Hawkins, III . (b) The west facade of the theatre retains its original cast iron features. Photo: George McMath.

corrosive, but is susceptible to ultraviolet degradation. Because of its rather flimsy nature, it cannot be used as a substitute for structural elements, cannot be assembled like cast iron and usually requires a separate anchorage system. It is unsuitable for locations where it is susceptible to damage by impact (Fig. 20), and is also flammable.

Glass fiber-reinforced concrete, known as *GFRC*, is similar to fiberglass except that a lightweight concrete is substituted for the resin. GFRC elements are generally fabricated as thin shell panels by spraying concrete into forms. Usually a separate framing and anchorage system is required. GFRC elements are lightweight, inexpensive, and weather resistant. Because GFRC has a low shrinkage coefficient, molds can be made directly from historic elements.

Fig. 20. The location of the feature must be taken into account if a substitute replacement material is being considered. This lightweight fiberglass column at street level sustained damage from impact within a few years of installation. The great strength of cast iron makes it ideal for storefronts and elements that must withstand heavy use. Photo: Building Conservation Associates.

However, GFRC is very different physically and chemically from iron. If used adjacent to iron, it causes corrosion of the iron and will have a different moisture absorption rate. Also, it is not possible to achieve the crisp detail that is characteristic of cast iron.

Maintenance

A successful maintenance program is the key to the long-term preservation of architectural cast iron. Regular inspections and accurate record-keeping are essential. Biannual inspections, occurring ideally in the spring and fall, include the identification of major problems, such as missing elements and fractures, as well as minor items such as failed caulking, damaged paint, and surface dirt.

Records should be kept in the form of a permanent maintenance log which describes routine maintenance tasks and records the date a problem is first noted, when it was corrected, and the treatment method. Painting records are important for selecting compatible paints for touch-up and subsequent repainting. The location of the work and the type, manufacturer, and color of the paint should be noted in the log. The same information also should be assembled and recorded for caulking.

Superficial dirt can be washed off well-painted and caulked cast iron with low-pressure water. Non-ionic detergents may be used for the removal of heavy or tenacious dirt or stains, after testing to determine that they have no adverse effects on the painted surfaces. Thick grease deposits and residue can be removed by hand scraping. Water and detergents or non-caustic degreasing agents can be used to clean off the residue. Before repainting, oil and grease must be removed so that new coatings will adhere properly.

The primary purpose of the maintenance program is to control corrosion. As soon as rusting is noted, it should be carefully removed and the protective coating of the iron renewed in the affected area. Replacement of deteriorated caulking, and repair or replacement of failed flashings are also important preventive maintenance measures.

Summary

The successful conservation of cast-iron architectural elements and objects is dependent upon an accurate diagnosis of their condition and the problems affecting them, as well as the selection of appropriate repair, cleaning, and painting procedures. Frequently, it is necessary to undertake major repairs to individual elements and assemblies; in some cases badly damaged or missing components must be replicated. The long-term preservation of architectural cast iron is dependent upon both the undertaking of timely, appropriate repairs and the commitment to a regular schedule of maintenance.

Detail of polychromed cast-iron facade at 23 Petaluma Boulevard, Petaluma, Calif. (1886; O'Connell and Lewis, Architectural Iron Work, San Francisco). Photo: Don Meacham.

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Acknowledgements

This Preservation Brief was developed by the New York Landmarks Conservancy's Technical Preservation Services Center under a cooperative agreement with the National Park Service's Preservation Assistance Division, and with partial funding from the New York State Council on the Arts. The following individuals are to be thanked for their technical assistance: Robert Baird, Historical Arts & Casting; Willcox Dunn, Architect and Cast Iron Consultant; William Foulks, Mesick Cohen Waite Architects; Elizabeth Frosch, New York City Landmarks Preservation Commission; William Hawkins, III, FAIA, McMath Hawkins Dortignacq; J. Scott Howell, Robinson Iron Company; David Look, AIA, National Park Service; Donald Quick, Architectural Iron Company; Maurice Schickler, Facade Consultants International; Joel Schwartz, Schwartz and Schwartz Metalworks; and Diana Waite, Mount Ida Press. Kim Lovejoy was project coordinator and editor for the Conservancy; Charles Fisher was project coordinator and editor for the National Park Service.

This publication has been prepared pursuant to the National Historic Preservation Act amendments of 1980, which direct the Secretary of the Interior to develop and make available information concerning historic properties. Comments on the usefulness of this information and information on how to obtain copies may be directed either to the Chief, Preservation Assistance Division, National Park Service, U.S. Department of the Interior, P.O. Box 37127, Washington, D.C. 20013-7127, or to the Director, Technical Preservation Services Center, New York Landmarks Conservancy, 141 Fifth Avenue, New York, NY 10010.

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PROMPT DELIVERY AND FIRST-CLASS WORK WARRANTED AT LOWEST RATES.

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6th and Market Street Cars going South,
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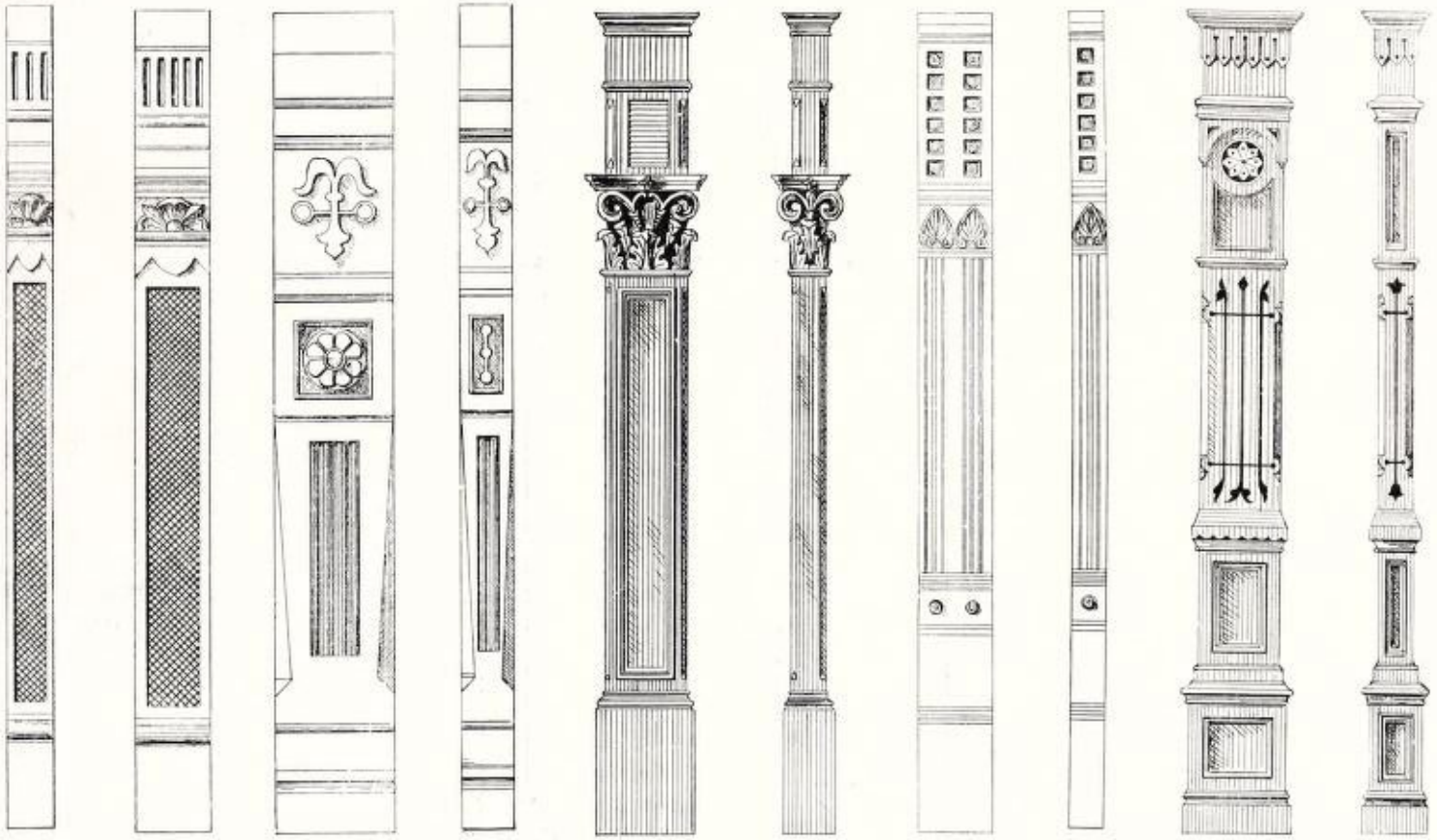
Union Depot Cars on Pine St. going West and South.

ST. LOUIS, NEW YORK AND CHICAGO.
AUGUST GAST BANK NOTE AND LITHOGRAPHING COMPANY.
1887.



No. 117.
8 inch face.
Sides any depth.
Any length.

No. 118.
13 inch face.
Sides any depth.
Any length.

No. 119.
21 inch face.
Sides any depth.
Any length.

No. 120.
9 inch face.
Sides any depth.
Any length.

No. 121.
13 inch face.
Sides any depth.
Any length.

No. 122.
6 inch face.
Sides any depth.
Any length.

No. 123.
12 and 18 in. face.
Sides any depth.
Any length.

No. 124.
6, 7 and 8 in. face.
Sides any depth.
Any length.

No. 125.
13 and 18 in. face.
Sides any depth.
Any length.

No. 126.
6 inch face.
Sides any depth.
Any length.

TABLE OF STRENGTH OF WROUGHT IRON BEAMS.

As given by "Union Iron Mills."

The weight is given in tons of 2,000 pounds avoirdupois, and is supposed to be equally distributed over the whole Beam.

HEIGHT OF BEAMS.		FEET BETWEEN BEARINGS.															
		10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 inches	Light	.82	.69	.59													
	Heavy	.94	.79	.67													
4 inches	Light	1.24	1.03	.89	.78	.69											
	Heavy	1.40	1.17	1.00	.88	.78											
5 inches	Light	1.98	1.65	1.41	1.24	1.10	.99	.90	.82								
	Heavy	2.28	1.90	1.63	1.42	1.26	1.14	1.03	.95								
6 inches	Light	3.26	2.72	2.33	2.04	1.81	1.63	1.48	1.36	1.26	1.17						
	Heavy	3.79	3.16	2.71	2.37	2.11	1.90	1.72	1.58	1.46	1.35						
7 inches	Light	5.24	4.37	3.74	3.28	2.91	2.62	2.38	2.18	2.02	1.87						
	Heavy	6.20	5.17	4.43	3.88	3.44	3.10	2.82	2.58	2.38	2.21						
8 inches	Light	7.00	5.83	5.00	4.38	3.89	3.50	3.18	2.92	2.69	2.50	2.33	2.19	2.06			
	Heavy	9.04	7.53	6.46	5.65	5.02	4.52	4.11	3.77	3.48	3.23	3.01	2.83	2.66			
9 inches	Light	8.68	7.23	6.20	5.43	4.82	4.34	3.95	3.62	3.34	3.10	2.89	2.71	2.55	2.41	2.28	
	Heavy	10.40	8.67	7.43	6.50	5.78	5.20	4.73	4.33	4.00	3.71	3.47	3.25	3.06	2.89	2.74	
10 inches	Light	12.00	10.00	8.57	7.50	6.67	6.00	5.45	5.00	4.62	4.29	4.00	3.75	3.53	3.33	3.16	
	Heavy	15.00	12.50	10.71	9.38	8.33	7.50	6.82	6.25	5.77	5.36	5.00	4.69	4.41	4.17	3.95	
10½ inches	Light	12.56	10.47	8.97	7.85	6.98	6.28	5.71	5.23	4.83	4.49	4.19	3.93	3.69	3.49	3.31	
	Heavy	15.32	12.77	10.94	9.58	8.51	7.66	6.96	6.38	5.89	5.47	5.11	4.78	4.51	4.26	4.03	
12 inches	Light	18.36	15.30	13.11	11.48	10.20	9.18	8.35	7.65	7.06	6.56	6.12	5.74	5.40	5.10	4.83	
	Heavy	22.68	18.90	16.20	14.18	12.60	11.34	10.31	9.45	8.72	8.10	7.56	7.09	6.67	6.30	5.97	
15 inches	Light	28.24	23.53	20.17	17.65	15.69	14.12	12.84	11.77	10.86	10.09	9.41	8.83	8.31	7.84	7.43	
	Heavy	36.12	30.10	25.80	22.58	20.07	18.06	16.42	15.05	13.89	12.90	12.04	11.29	10.62	10.03	9.51	
	Extra Heavy	40.00	33.33	28.57	25.00	22.22	20.00	18.18	16.67	15.38	14.29	13.33	12.50	11.76	11.11	10.53	
20 inches	Light	49.15	41.25	35.36	30.94	27.50	24.75	22.50	20.63	19.04	17.68	16.50	15.47	14.55	13.75	13.02	12.38
	Heavy	66.00	55.00	47.65	41.25	36.66	33.00	30.00	27.50	25.38	23.83	22.00	20.63	17.94	18.33	17.36	16.50

WEIGHTS OF VARIOUS MATERIALS

Used in Construction of Buildings.

Loose Common Cement	Per Cubic Foot,	54	Lbs.
Loose Portland Cement	" "	96	"
Earth, Loose	" "	75	"
Clay	" "	128	"
Clay and Stones	" "	160	"
Common Window Glass	" "	157	"
Limestone	" "	156	"
Marble	" "	172	"
Quick Lime	" "	95	"
Masonry, Fresh	" "	160	"
Masonry, Dry	" "	125	"
Brickwork	" "	125	"
Sand, Dry	" "	98	"
Sand, Wet	" "	130	"
Slate	" "	175	"
Ash Timber	" "	38	"
Chestnut	" "	41	"
Hickory	" "	53	"
Maple	" "	49	"
Oak, Common	" "	59	"
Oak, White	" "	51	"
Oak, Red	" "	38	"
Pine, White	" "	25	"
Pine, Yellow	" "	34½	"
Walnut	" "	38	"
Spruce	" "	25	"

Green Timber One-Half Heavier Than Dry.

Chapter 405. Zoning Regulations

ARTICLE XVI. "H-1" Historic Preservation District

Division 5. Certificates of Appropriateness

Section 405.455. Standards For Review.

[Ord. No. 1825, 5-13-1991]

In considering an application for a building or demolition permit for a certificate of appropriateness, the Historic Preservation Commission shall be guided by the following general standards in addition to any design guidelines in the ordinance designating the landmark or historic district:

A. Every reasonable effort shall be made to provide a compatible use for a property which requires minimal alteration of the building structure or site and its environment or to the use of the property for its originally intended purpose.

B. The distinguishing original qualities or character of a building, structure or site and its environment shall not be destroyed. The removal or alteration of any historic material or distinctive architectural feature should be avoided when possible.

C. All buildings, structures and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged.

D. Changes which may have taken place in the course of time are evidence of the history and development of a building, structure or site and its environment. These changes may have acquired significance in their own rank and this significance should be recognized and respected.

E. Distinctive stylistic features or examples of skilled craftsmanship which characterize a building, structure or site shall be treated with sensitivity.

F. Deteriorated architectural features shall be repaired rather than replaced, whenever possible. In the event replacement is necessary, the new material shall match the material being replaced in composition, design, color, texture and other visual qualities. Repairs or replacement of missing architectural features should be based on accurate duplication of features substantiated by historic, physical or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures.

G. The surface cleaning of structures shall be undertaken with the gentlest means possible. Cleaning methods that will damage the historic building shall not be undertaken.

H. Contemporary design for alteration and additions to existing properties and for new construction may be permitted when such alterations, additions or new construction do not destroy significant historical or architectural or cultural material and such design is compatible with the size, scale, color, material and character of the property neighborhood and environment.

I. Whenever possible, new additions or alterations to structures shall be done in a manner that if such additions or alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.

J. New buildings do not need to duplicate older styles of architecture, but must be compatible with the architecture within the district. However, the scale, placement on lots and street setback must conform with the scale, placement and setback of adjacent structures, especially in the context of rows of buildings and streetscapes. Styles of architecture will be controlled only to insure that their exterior design, materials and color are in harmony with neighboring structures.

K. The Commission may consider economic hardship and other factors that may affect an owner's ability to undertake or complete rehabilitation or other work under consideration.

THE CITY OF HARRISONVILLE
WHERE TRADITION MEETS INNOVATION
300 E. Pearl Street, P.O. Box 367 • Tel: 816-380-8900 • Fax: 816-380-8906 • Harrisonville, MO 64701

To: **Historic Preservation Commission**

From: **Christina Stanton, AICP, Community Development Director**

Date: **July 1, 2026**

Re: **Code Amendments to Divisions 7 - 10, Article XVI**

GENERAL INFORMATION

Requested Actions: Approval of the proposed Code Amendments

PROPOSAL

The following proposed Code Amendments seek to:

- **Review and update Divisions 7 - 10 of Article XVI.**

PREVIOUS ACTIONS

- **January 11, 1993—The Board of Aldermen approved Ordinance #1928, which established the Historic Preservation Regulations.**
- **July 26, 1993—The Board of Aldermen approved Ordinance #1989, which amended certain parts of the Historic Preservation Regulations; however, after thoroughly researching the matter staff cannot find that these amendments were ever actually incorporated into the Historic Preservation Regulations and as such are referenced in this review.**
- **May 7, 2018—The Board of Aldermen approved Ordinance #3437, which reduced the number of Commissioners required for quorum from five (5) to four (4) and added an alternate voting member.**
- **July 5, 2022—The Board of Aldermen approved Ordinance #3592, which amended the residency requirement to allow Commission members to either be residents of the City of Harrisonville or reside within the 64071-zip code.**
- **May 1, 2023—The Board of Aldermen approved Ordinance #3650, which removed specific fees, fines, and penalty amounts from City Code.**
- **March 4, 2024—The Board of Aldermen approved Ordinance #3685, which included several Code Amendments many removing "Code Enforcement" and replacing with "Community Development".**

KEY ISSUES

- **As previously stated:**
  - **The SHPO has recommended that HPC and staff review and update our Historic Preservation Regulations as appropriate.**
  - **The 2021 Historic Preservation Plan recommends the districtwide Design-Review Guidelines be reviewed and updated as necessary. The update of the Regulations is a obvious place to start.**

ANALYSIS

The proposed code amendments continue the process of review and updating of Article XVI—"H-1" Historic Preservation Overlay District, by looking at Division 7—Maintenance of Properties; Division 8—Appeals; Division 9—Fees and Penalties and Division 10—Guidelines for Landmarks and Preservation Districts.

Staff recommends the removal of Subpart B, as the definition for Ordinary Maintenance was added to the Definitions Section, 405.345, in Division I. This change eliminates redundancy. Staff also recommends striking the current list of defects for the "Minimum Maintenance Requirement" and replacing the list with those recommended in the SHPO Model Ordinance. Several items from the current list cannot be reasonably observed from any street right-of-way and are internal to the structure. Additionally, staff is recommending moving present-day Section 405.465.E up under the language for "Minimum Maintenance Requirement" to better align with the SHPO Model Ordinance.

STAFF RECOMMENDATION

Staff recommends *approval* of the proposed Code Amendments.

ATTACHMENTS

1. **Staff Commentary and Mark-ups**
2. **Table Summarizing Changes Approved by Ordinance #1989 (7/26/1993)**

THE CITY OF
HARRISONVILLE
WHERE TRADITION MEETS INNOVATION
300 E. Pearl Street, P.O. Box 367 • Harrisonville, MO 64701•Tel: 816-380-8900 • Fax: 816-380-8906

Existing Municipal Code in black.
~~**Removals in red.**~~
Additions in green.
Highlights = Discussion.
CS commentary in blue.

Staff Commentary
The proposed code amendments are based upon a review of the historic preservation regulations of ten (10) other Missouri jurisdictions with a historic downtown square and the Model Ordinance from the State Historic Preservation Office (SHPO) as well as changes that were approved in July of 1993, that didn't make it into the Code (See attached Changes Approved by Ordinance #1989 (7/261993) Table). The July 1993, Code Amendments proposed changing "Preservation Commission" to "Codes Enforcement Department" in the first sentence of present-day Section 405.465.E, staff is recommending a similar change.

Staff is recommends the removal of Subpart B, as the definition for Ordinary Maintenance was added to the Definitions Section, 405.345, in Division I. This change eliminates redundancy. Staff also recommends striking the current list of defects for the "Minimum Maintenance Requirement" and replacing the list with those recommended in the SHPO Model Ordinance. Several items from the current list cannot be reasonably observed from any street right-of-way and are internal to the structure. Additionally, staff is recommending moving present-day Section 405.465.E up under the language for "Minimum Maintenance Requirement" to better align with the SHPO Model Ordinance.

Division 7. Maintenance of Properties

Section 405.465. Maintenance of Historic Properties.

[Ord. No. ~~1825, 5-13-1991~~1928, 1-11-1993; Ord. No. 1989, 7-26-1993]

A. *Ordinary Maintenance Exclusion*. Nothing in this Section shall be construed to prevent the ordinary maintenance or repair of any exterior elements of any building or structure designated as a landmark or within a historic preservation district.
~~**B. *Definition Of Ordinary Maintenance*. Any work for which a building permit is not required by law, where the purpose and the affect of such work is to correct any deterioration or decay or damage to a structure or any part thereof and to restore the same as nearly as may be practical to its condition prior to the occurrence of such deterioration, decay or damage.**~~
~~C~~ B. *Minimum Maintenance Requirement*. All buildings and structures designated by ~~the~~ City ordinance as "H~~-1~~" shall be preserved against decay and deterioration and free from certain structural defects in the following manner, by the owner thereof or such other person or persons who may have legal custody and control thereof. The owner(s) or other person(s) having legal custody thereof shall repair such building if it is found to have any of the following defects:

~~**1. Those which have parts thereof which are so attached that they may fall and injure members of the public or property.**~~

~~2. Deteriorated or inadequate foundation.~~
~~3. Defective or deteriorated flooring or flooring supports or floor supports of insufficient size to carry imposed loads with safety.~~
~~4. Members of walls, partitions or other vertical support that split, lean, list or buckle due to defective material or deterioration.~~
~~5. Members of walls, partitions or other vertical supports that are insufficient size to carry imposed loads with safety.~~
~~6. Members of ceilings, roofs, ceiling and roof supports or other horizontal members which sag, split or buckle due to defective material or deterioration.~~
~~7. Members of ceilings, roofs, ceiling and roof supports or other horizontal members that are of insufficient size to carry imposed loads with safety.~~
~~8. Fireplace or chimneys which list, bulge or settle due to defective material or deterioration.~~
~~9. Fireplace or chimneys which are of insufficient size or strength to carry imposed loads with safety.~~
~~10. Deteriorated, crumbling or loose plaster.~~
~~11. Deteriorated or ineffective waterproofing of exterior walls, roofs, foundations or walls, including broken windows or doors.~~
~~12. Defective or lack of weather protection for exterior wall coverings, including lack of paint or weathering due to lack of paint or other protective coating.~~
~~13. Any fault or defect in a building which renders the same structurally unsafe or not properly watertight.~~

1. The deterioration of exterior walls or other vertical supports;
2. The deterioration of roofs or other horizontal members;
3. The deterioration of external chimneys;
4. The deterioration or crumbling of plasters or mortar;
5. The deterioration or ineffective waterproofing of exterior walls, roofs, and foundations, including broken windows or doors;
6. The peeling of paint, rotting, holes, and other forms of decay;
7. The lack of maintenance of surrounding environment, e.g., fences, gates, sidewalks, steps, signs, accessory structures, and landscaping'
8. The deterioration of any feature so as to create or permit the creation of any hazardous or unsafe condition or conditions.

[Ord. No. 3685, 3-4-2024]

C. If minimum maintenance is not being maintained, the owner of the property or other person having legal custody thereof shall be notified thereof by the Building and Code Enforcement Division. The notice shall be by certified mail and shall specify each item in the property or Landmark that fails to meet with minimum maintenance requirements. The owner or other person having custody of the property shall have thirty (30) days from the receipt of the notice to comply with minimum maintenance requirements. The Building Inspector, for good cause shown, may grant an additional extension of thirty (30) days. If, after the original thirty (30) day period or any extension granted, the owner or person having legal custody of the property should fail to meet the minimum maintenance requirements, the owner or person having legal custody of

the property shall be in violation of this Section and punished subject to the punishment set forth in this Chapter.

D. *Public Safety Exclusion*. None of the provisions of this Chapter shall be construed to prevent any measures of construction, alteration or demolition necessary to correct or abate the unsafe or dangerous condition of any structure, other feature or part thereof, where such condition has been declared unsafe or dangerous by the Codes Enforcement Division or Building Official of the City of Harrisonville and where the proposed measures have been declared necessary by such Division to correct the said condition; provided, however, that only such work as is reasonably necessary to correct the unsafe or dangerous condition may be performed pursuant to this Section. In the event any structure or other feature shall be damaged by fire or other calamity or by an act of God or by public enemy to such an extent that, in the opinion of the aforesaid Division, it cannot reasonably be repaired or restored, it may be removed in conformity with normal permit procedures and applicable laws.

~~**[Ord. No. 3685, 3-4-2024]**~~

~~**E. If minimum maintenance is not being maintained, the owner of the property or other person having legal custody thereof shall be notified thereof by the Preservation Commission. The notice shall be by certified mail and shall specify each item in the property or landmark that fails to meet with minimum maintenance requirements. The owner or other person having custody of the property shall have thirty (30) days from the receipt of the notice to comply with minimum maintenance requirements. The Preservation Commission, for good cause shown, may grant an additional extension of thirty (30) days. If, after the original thirty (30) day period or any extension granted, the owner or person having legal custody of the property should fail to meet the minimum maintenance requirements, the owner or person having legal custody of the property shall be in violation of this Section and punished subject to the punishment set forth in this Chapter.**~~

Division 8. Appeals

Section 405.470. Appeals.

[Ord. No. ~~1825, 5-13-1991~~1928, 1-11-1993]

If the Preservation Commission denies an application for a certificate of appropriateness, the applicant may, within thirty (30) days ~~after the post-marked date of the notice of the determination~~ of the date of denial, file with the City ~~Clerk~~ a written appeal to the Harrisonville Board of ~~Aldermen~~ Zoning Adjustment specifying the grounds thereof. In acting on the appeal, the Board of ~~Aldermen~~ Zoning Adjustment may grant a variance from the strict interpretation of this Chapter when such will not materially affect the health or safety of the applicant and the general public.

Division 9. Fees and Penalties

Section 405.475. Fees and Penalties.
[Ord. No. ~~1825, 5-13-1991~~1928, 1-11-1993]

The Harrisonville Preservation Commission may establish an appropriate system of processing fees for review of nominations and certificates of appropriateness. An application must be filed through City of Harrisonville City Hall. Any person who undertakes or causes an alteration, construction, demolition or removal of nominated or designated landmark or property within a nominated or designated historic district without a certificate of appropriateness shall be guilty of a misdemeanor and upon conviction thereof shall be punished in accordance with the penalties set forth in the Harrisonville Code of Ordinances. Every person who violates this Chapter concerning the maintenance of a structure within a historic district shall be guilty of a misdemeanor and upon conviction thereof shall be punishable in accordance with the penalties set forth in the Harrisonville Code of Ordinances.

Division 10. Guidelines For Landmarks and Preservation Districts

Section 405.480. Guidelines For Landmarks and Preservation Districts.
[Ord. No. ~~1825, 5-13-1991~~1928, 1-11-1993]

See Appendix A to this Article of the Zoning ~~Code~~ Regulations, "Harrisonville's Guidebook for Landmarks and Preservation Districts", which is on file in the City offices.

Changes Approved by Ordinance #1989 (7/26/1993)			
Change	**Implemented**	**Not Implemented**	**Notes**
Changed "Preservation Commission" to "Codes Enforcement Department" in the first sentence of present day Section 405.465.E.		**x**	Staff is recommending similar changes.