



# WINDOWS

Windows on many historic buildings are a character-defining feature and should be treated respectfully.





# WINDOWS

Significance should be evaluated using the following criteria:



1. Are they original?
2. Do they reflect original design intent for the building?
3. Do they reflect the building's period, regional style, or building practice?
4. Do they reflect changes resulting from major events or later episodes?
5. Are they examples of exceptional craftsmanship or design?





# WINDOWS

The *Secretary of the Interior's Standards for Rehabilitation* call for repairing and retaining them where possible, or where necessary replacing them in kind.





# WINDOWS

This lecture focuses on the issues of significance and repair, with an emphasis on the technical issues of repair, including the following:

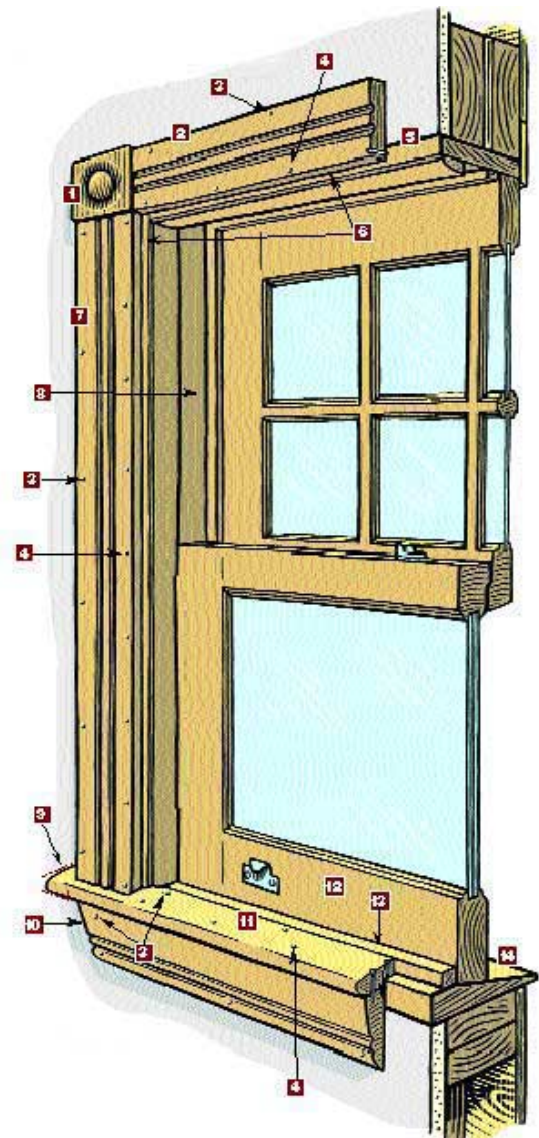
- Evaluation of physical conditions,
- Techniques of repair, and
- Design considerations when replacement is necessary.

Initial material covers these issues specifically applicable to Wood Windows, touching later on their similarity for other materials.





# WOOD



INTERIOR

Match names to parts:

- Head
- Jamb
- Sill
  
- Rails
- Stiles
- Muntins
  
- Exterior brick mold
- Parting stop
- Interior stop
  
- Interior casing
- Stool
- Apron
  
- Sash pull
- Sash lock





# WOOD

## Evaluation of physical conditions:

- Unit-by-unit observations
- Photo-documentation
- Schedule or chart of conditions
- Causes of deterioration
- Recommendations for repair

# WOOD

## Techniques of repair:

### •Level 1 – Routine Maintenance and General Reconditioning

- Remove sash from opening to perform repairs
- Remove paint
- Repair frame
- Reglaze
- Weatherstrip
- Repaint





**Techniques of repair:**

•Level 1 – **Routine Maintenance and General Reconditioning**

- Remove sash from opening to perform repairs
- Remove paint
- Repair frame
- Reglaze (with Sarco vs. DAP)**
- Weatherstrip
- Repaint

**WOOD**





## WOOD

### Techniques of repair:

#### •Level 1 – Routine Maintenance and General Reconditioning

- Remove sash from opening to perform repairs
- Remove paint
- Repaire frame
- Reglaze
- Weatherstrip**
- Repaint**





## WOOD

### Techniques of repair:

- Level 1 – Routine Maintenance and General Reconditioning
- Level 2 – Stabilization

- Repair decayed wood





## WOOD

### Techniques of repair:

- Level 1 – Routine Maintenance and General Reconditioning
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## WOOD

### Techniques of repair:

- Level 1 – Routine Maintenance
- Level 2 – Stabilization
- Level 3 – Splicing and Selective Parts Replacement

- Custom mill pieces to match





# WOOD

When replacement is necessary, consider the following:

- Pattern and size of openings
- Proportion of frame and sash
- Window panes
- Muntin profile
- Glass characteristics
- Paint color
- Other details



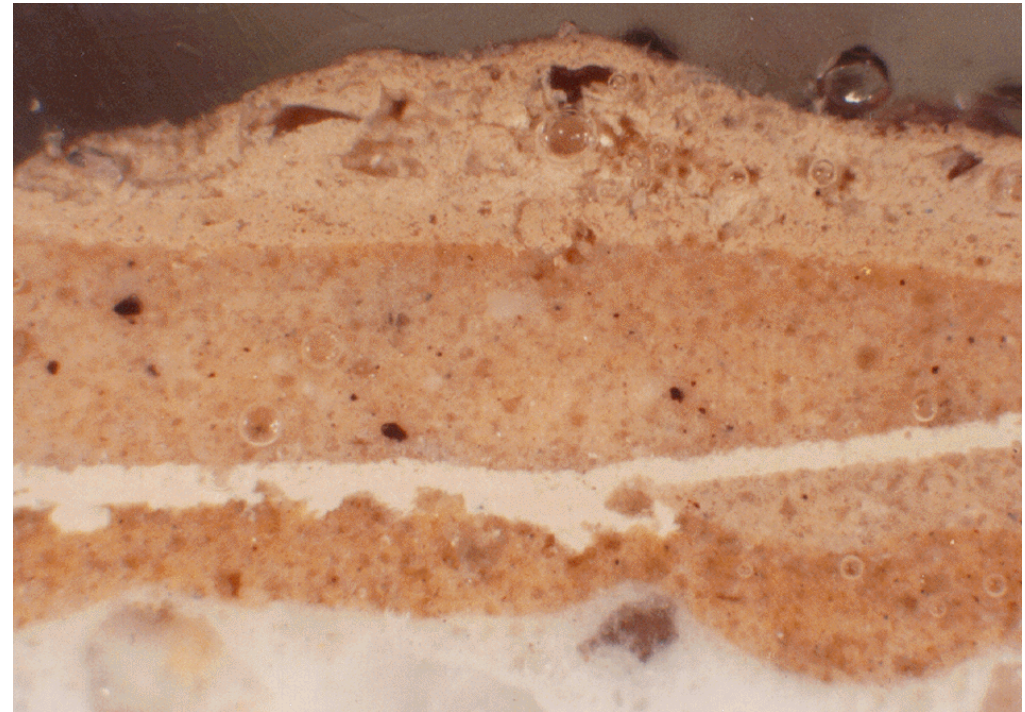
# STEEL



## STEEL

Various types of steel windows dominated the metal window market from 1890-1950.

- Mass production of rolled steel sections became possible
- Fire-resistant construction was often required



## ALUMINUM



Why are the windows a character-defining feature of this historic building?

*Burton Memorial Tower, U of M, Ann Arbor, 1936*

## ALUMINUM



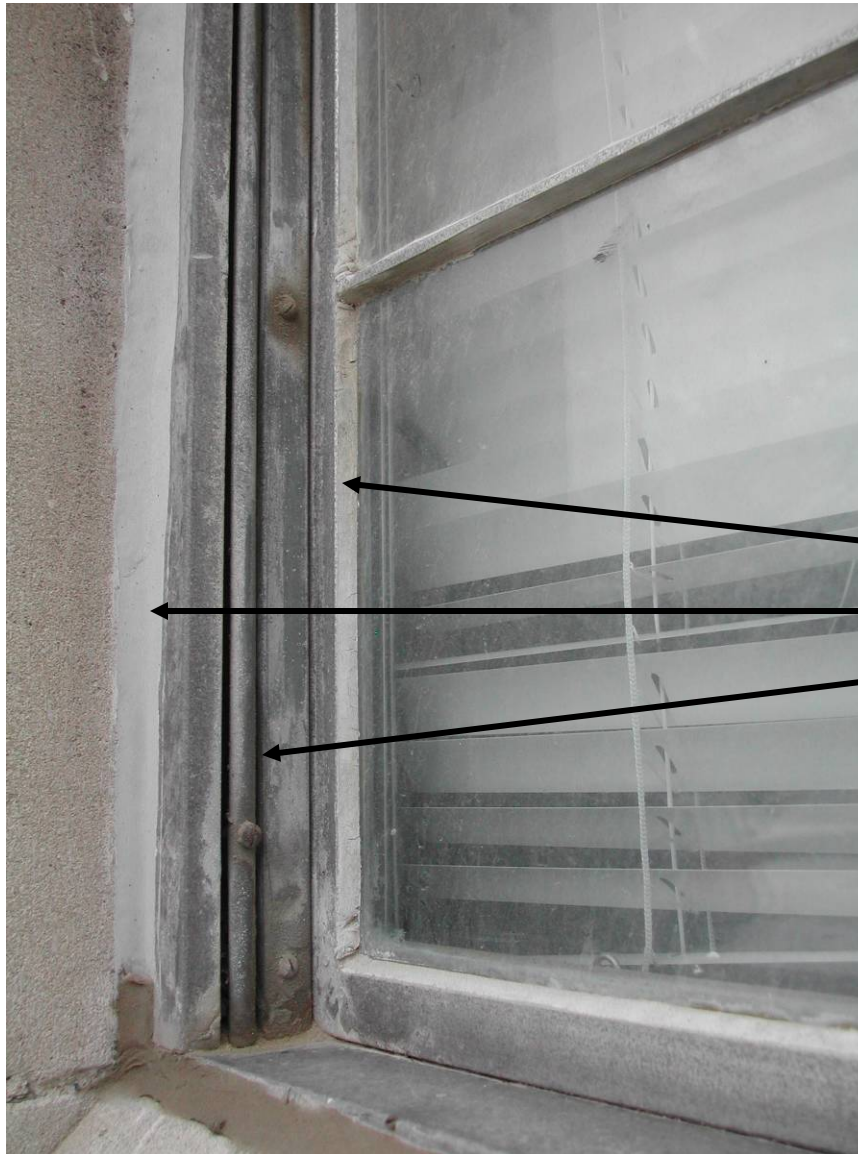
What is distinctive about this early and unusual use of aluminum?

- Double hung operation
- Narrow frame and sash
- Thin muntins

*Burton Memorial Tower, U of M, Ann Arbor, 1936*



## ALUMINUM



How can the useful life and function of the original windows be extended?

- Reglaze
- New perimeter sealant
- Lubricate the track

*Burton Memorial Tower, U of M, Ann Arbor, 1936*

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Lecture # **10: Windows and Doors**



ALUMINUM  
and  
STEEL

ALUMINUM



ALUMINUM





ALUMINUM





ALUMINUM





ALUMINUM



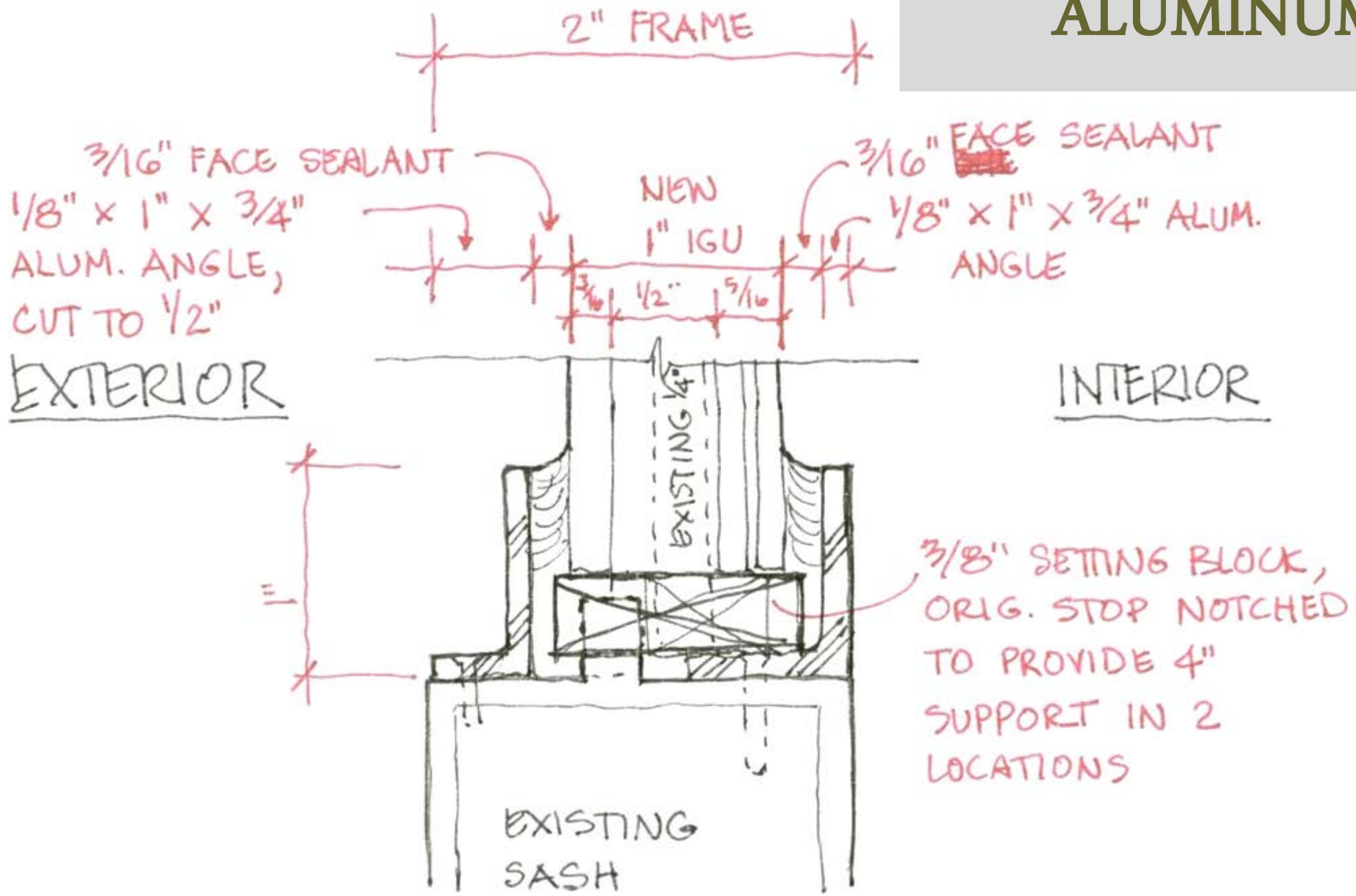


ALUMINUM





# ALUMINUM





# ALUMINUM



STEEL



STEEL





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STEEL





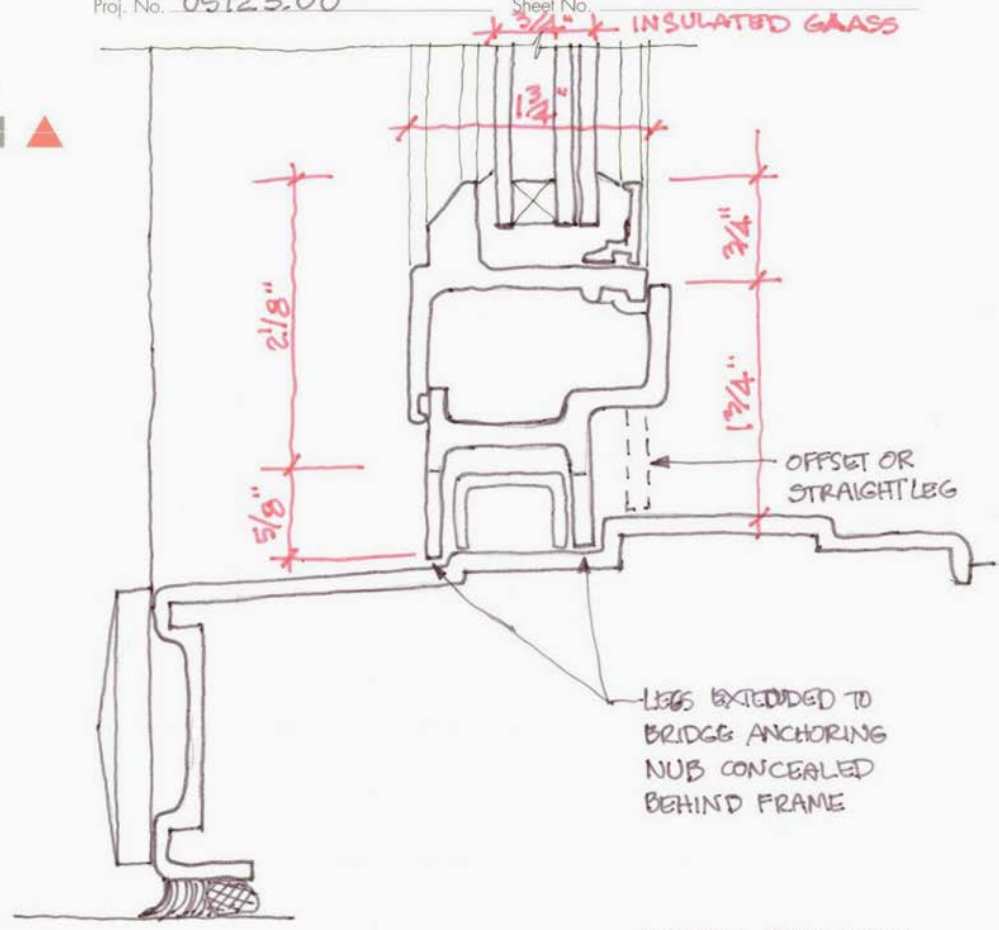
STEEL



# STEEL

MEMORANDUM | SURVEY SHEET

Date: 2/2/2007 Subject: "F" WINDOW (STEEL)  
Project: POTTER STEWART From / By: IRT  
Proj. No. 05123.00 Sheet No. \_\_\_\_\_



DETAIL BASED ON  
HOPE'S UNIVERSITY  
SERIES STEEL  
WINDOWS  
FULL SCALE

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Lecture # **10: Windows and Doors**

STEEL





STEEL  
mockup





STEEL  
mockup



STEEL  
mockup





# ALUMINUM

Various types of aluminum windows became available after WWII, and totally transformed the windows industry.

- Extruded aluminum sections - lighter than steel
- Fire-resistant construction
- Low maintenance finishes



*Alcoa Building, 1953, Pittsburgh*



# ALUMINUM



# ALUMINUM

# mockup





## LEADED GLASS

Stained and leaded glass is found throughout America, paralleling other historical developments in the glass industry and in society.



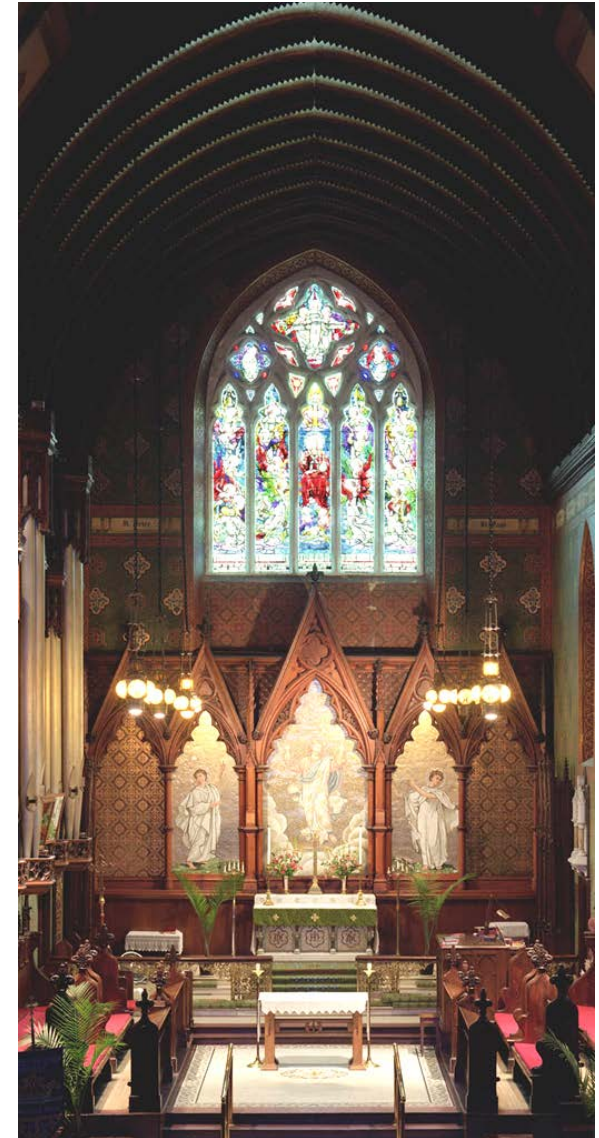
FACETED GLASS





## LEADED GLASS

*Preservation Brief 33: The  
Preservation and Repair of  
Historic Stained and Leaded Glass,  
by Neal A. Vogel and Rolf Achilles*





# LEADED GLASS



# DOORS

Similar to windows, doors contribute to a building's overall significance, and suffer from similar types of deterioration.



*Publications Building, U of M*



*Milwaukee City Hall*

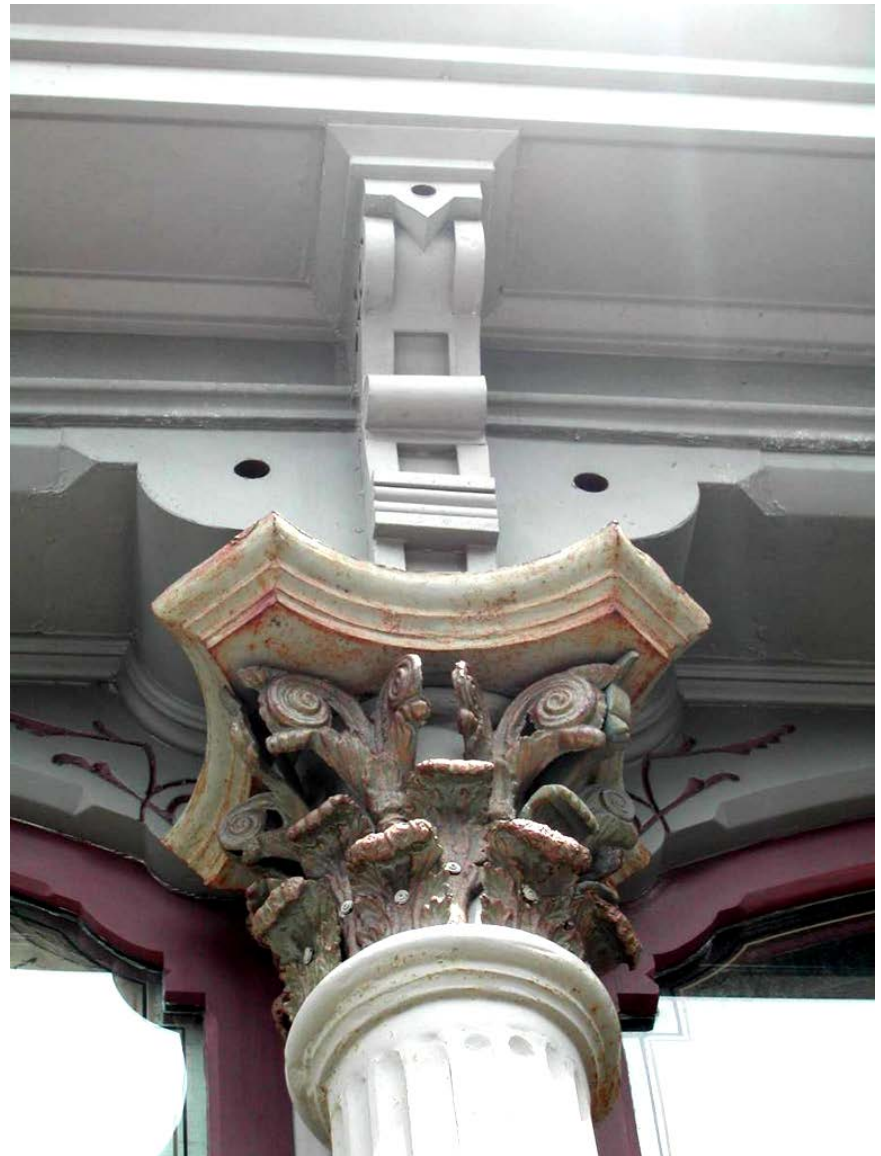
# STOREFRONTS



## STOREFRONTS



*Nobel Bank Building, Lexington, MI*



# STOREFRONTS



# SKYLIGHTS



*1895 City Hall  
Bay City,  
Michigan*

# SKYLIGHTS



*1895 City Hall  
Bay City,  
Michigan*

# SKYLIGHTS



*1895 City Hall  
Bay City,  
Michigan*