STAFF REPORT 05-13-2020 REGULAR MEETING **PREPARED BY:** A. PHILLIPS
APPLICATION NUMBER: 20-6718
ADDRESS: 729 SEWARD AVENUE
HISTORIC DISTRICT: NEW CENTER AREA
APPLICANT: ANDREW JORDAN, LEWAND BUILDING COMPANIES
PROPERTY OWNER: TARA YENGLIN, 700 SEWARD DETROIT LLC
DATE OF COMPLETE APPLICATION: 04-22-2020
STAFF SITE VISIT: N/A

SCOPE: GENERAL REHABILITATION OF BUILDING INCLUDING WINDOW REPLACEMENT

EXISTING CONDITIONS

The building located at 729 Seward Avenue is a 2½-story single-family residence constructed ca. 1907. The structure is clad in red brick which is also painted red in color and features limestone and wood details as well as cedar shake. The asymmetrical façade includes a two-story bay at the right side of the elevation and a raised covered porch at the left side of the elevation which includes the main entrance to the house. The wood double-hung windows are intact. The multi-gabled roof is covered in reddish-brown asphalt shingles and features three dormers (2 at the front elevation and one at the rear elevation). The property includes a parking lot directly adjacent to the house to the east which is accessed via a curb cut onto Seward Avenue. A large garage is located behind the house at the far southwest corner of the lot.


Google Street View Image – June, 2019


Applicant Photo – April, 2020

PROPOSAL

With the current proposal, the applicant is seeking the Commission's approval **to perform a general rehabilitation of the building including the replacement of all existing wood windows, trim, and brick mold with new vinyl window units and trim per the attached drawings and application**. Included in the proposal are the following scope items:

- **Windows and Doors**
  - Remove all existing windows, trim, and brick mold (majority of the existing windows are the original double-hung wood windows) and replace with new vinyl window units and trim (color: black). The proposed new vinyl windows will match the existing in operation. The glass of the proposed replacements will be clear and not tinted.

- Existing security door and entry door at the front (north) façade are to be replaced with a smooth-paneled "Shaker-Style Fiberglass Door" with simulated divided lite panel at the top of the door. Color to comply with Color System B.
- Existing security door and entry door at the rear (south) porch to be replaced with a paneled steel door. Color to comply with Color System B.
- Existing wood door located at grade on the rear (south) elevation to be replaced with a paneled steel door. Color to comply with Color System B.
- Existing door located at grade on side (west) elevation to be replaced with paneled steel door. Color to comply with Color System B.

- **Roof and Dormers**
  - Remove existing reddish-brown asphalt shingles at the roof and replace with new dark gray/black dimensional asphalt shingles.
  - All (3) dormers – 2 in front, 1 in rear – to have wood shake in peaks repaired and repainted. If repair is not possible, the peaks will be clad in new wood shake and painted.
- **Masonry**
  - The existing brick masonry (including the foundation) is to be cleaned with bleach, warm water, and bristle brushes to remove fungus growth. Deteriorated mortar joints are to be raked out by hand and repointed to match existing. The new mortar joints will match the historic mortar joints in color, texture, strength, and joint tooling. The brick is currently painted and will be repainted as needed following cleaning. According to the applicant, if in the cleaning process they determine it's easier to strip the paint off the brick and leave the brick exposed, they may consider that method.
- **Porches**
  - Remove existing concrete steps at front and rear porches and install new wood porch columns, railings, and steps and wood slats at base of stairs. All wood to be painted to comply with Color System B.
- **Gutters and Downspouts**
  - Existing gutters and downspouts to be removed and replaced with new square 5" K-style aluminum gutters and downspouts (color: black). Existing aluminum wrap at the fascia/soffits to be removed, wood beneath to be repaired and painted to comply with Color System B.
- **Mechanical, Electrical, Plumbing**
  - New plumbing and electrical systems
  - New exterior lighting to be installed. At the front a rear porches, the existing ceiling-mounted fixtures are to be replaced with recessed fixtures. The rear basement door is to have a sconce adjacent to the door.
  - A condenser will be located directly adjacent to the house at the southeast (rear) corner of the building.
- **Site Work**
  - The new landscaping and hardscaping is proposed to match what was in place originally.
  - There is no work currently proposed at the garage.

STAFF OBSERVATIONS & RESEARCH

- New Center Area Historic District was designated in 1982.
- Staff observed that the following work items have been completed without a COA:
  - Landscaping removed at the front yard.
  - Chainlink fence and gate around perimeter of property.
  - Removal of small (6'x10') shed at rear yard between house and garage which is shown on the survey drawing of the property.
- There are multiple discrepancies related to proposed window and door types between the drawings and cut sheets, however, staff has confirmed with the applicant that the cut sheets included in the application are what is proposed rather than what is shown on the drawings.

ISSUES

- The wood double-hung windows are character-defining features of the property.

- Vinyl is not considered to be an appropriate material within this historic district and it is staff's opinion that the proposed vinyl replacement windows will detract from the historic character of the site and the district.
- It is staff's opinion that the application does not sufficiently demonstrate that the severity of deterioration of the existing windows requires replacement rather than repair. Furthermore, the estimate for repair (included in the submission package) indicates that repair and restoration of the existing wood windows is possible.
- It is unknown as to whether or not the brick cladding was originally painted. Staff is concerned about the potential stripping of the existing paint on the brick as it could cause damage to the outer face of the brick. If the building was originally painted, it should remain painted. If the building was originally unpainted, it may be able to return to its unpainted finish depending on the condition of the original brick surface.
- If the face surface of the brick is intact and solid and the applicant chooses to remove the existing paint, the paint should be removed using the gentlest means possible to prevent the compromise of the weather-proof surface of the brick. (See attached National Park Services Preservation Briefs and excerpts from the Secretary of the Interior's Standards Illustrated Recommendations for Rehabilitation). If the face surface of the brick is damaged during cleaning/paint removal and the interior material of the brick is exposed, the brick is vulnerable to moisture penetration and deterioration. If the applicant chooses to repaint the brick, it is important to avoid a fully waterproof paint coating such as latex paint as it will prevent the brick from "breathing" properly and will likely cause further deterioration including brick spalling and paint failure as water gets trapped between the brick and the paint coating. (See attached "Paint and Historic Brick" document for more information).
- The proposed location for the condenser is highly visible.

RECOMMENDATION

1. It is staff's opinion that the replacement of the existing wood double-hung windows, trim, and brick mold with new double-hung vinyl units and trim removes historic materials and features that characterize the property. Staff therefore recommends that the Commission deny a Certificate of Appropriateness as the completed work does not meet the Secretary of the Interior's Standards for Rehabilitation, especially:

   #2) The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

   #5) Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

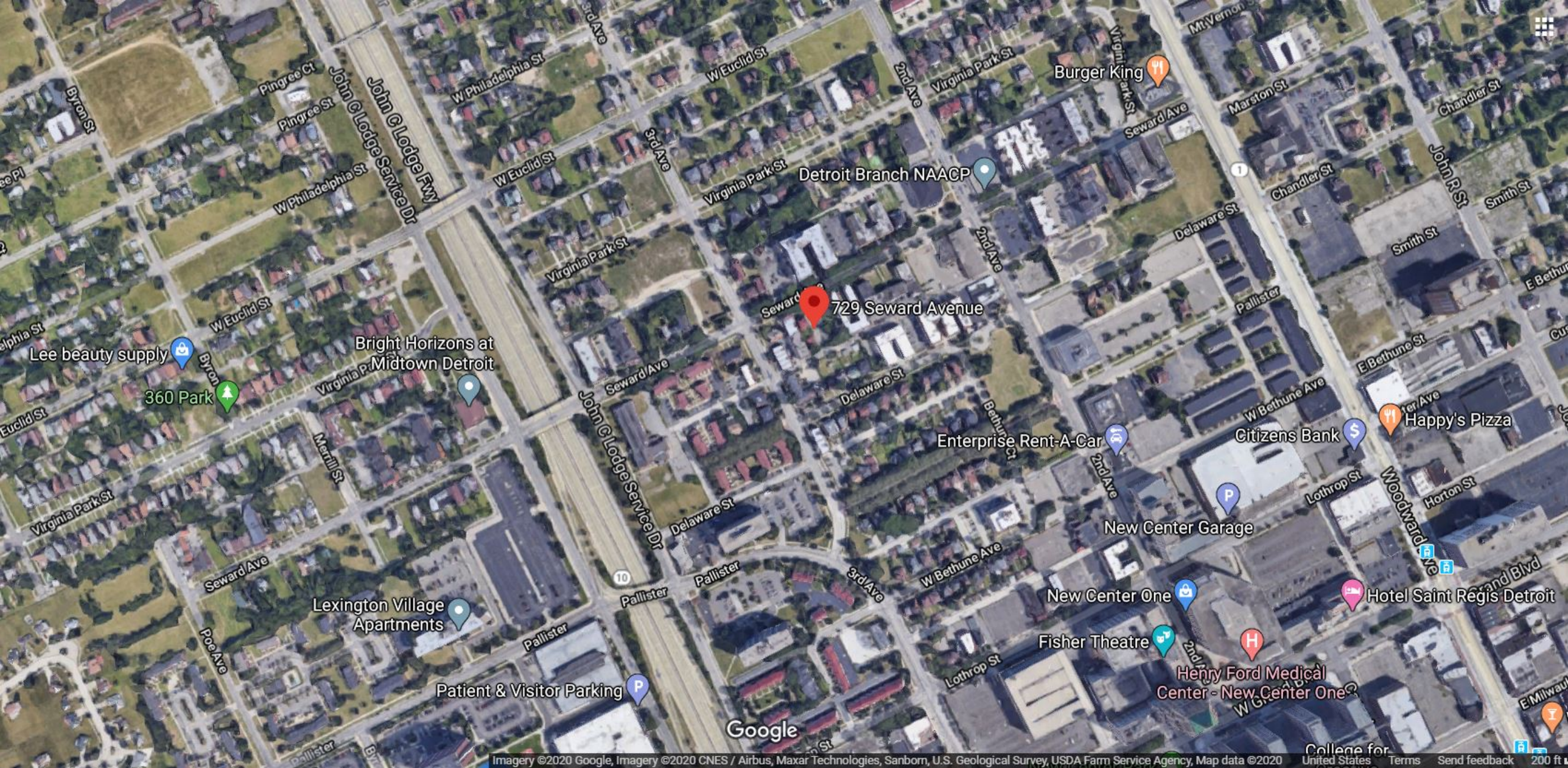
   #6) Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

   #9) New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

2. It is staff's opinion that the remainder of the work items proposed, ***other than the replacement of the existing wood double-hung windows, trim, and brick mold with new double-hung vinyl units and trim***, do not destroy historic materials that characterize the property nor do they alter features or spaces that characterize the property. Staff therefore recommends that the Commission issue a Certificate of Appropriateness as the completed work meets the Secretary of the Interior's Standards for Rehabilitation, especially:

   #2) The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

   #9) New additions, exterior alterations, or related new construction shall not destroy historic materials that


729 Seward Avenue
Detroit Branch NAACP
Burger King
Bright Horizons at Midtown Detroit
Lee beauty supply
360 Park
Enterprise Rent-A-Car
Citizens Bank
Happy's Pizza
New Center Garage
New Center One
Hotel Saint Regis Detroit
Fisher Theatre
Henry Ford Medical Center - New Center One
Lexington Village Apartments
Patient & Visitor Parking
John C Lodge Service Dr
John C Lodge Fwy
W Euclid St
W Philadelphia St
Virginia Park St
Seward Ave
Delaware St
W Bethune Ave
Pallister
Lothrop St
Horton St
Woodward Ave
Merrill St
Poe Ave
Byron St
Pingree Ct
Pingree St
2nd Ave
3rd Ave
Marston St
Chandler St
John R St
Smith St
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United States
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Send feedback
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729 Seward Avenue
Delaware St
3rd Ave
Seward Ave
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United States
Terms
Send feedback
50 ft

729 SEWARD

SEWARD AV.

PARKMAN AV.

DELAWARE AV.

PALLISTER AV.

BETHUNE AV. W.

3RD AV.

Scale of Feet.

VIRGINIA 39 PARK

729 SEWARD

SEWARD AV.

(PARKMAN I AV.)

DELAWARE AV.

PALLISTER AV.

3RD AV.

2ND AV.

33

17

16

Scale of Feet.

729 SEWARD

POST-1950 SANBORN MAP

HISTORIC DISTRICT COMMISSION
PROJECT REVIEW REQUEST

CITY OF DETROIT
PLANNING & DEVELOPMENT DEPARTMENT
2 WOODWARD AVENUE, ROOM 808, DETROIT, MI 48226

DATE: April, 22 2020

PROPERTY INFORMATION

ADDRESS: 729 Seward St **AKA:**

HISTORIC DISTRICT: Zoning District: R2

SCOPE OF WORK: (Check ALL that apply)

- ☑ Windows/ Doors
- ☑ Roof/Gutters/ Chimney
- ☐ Porch/ Deck
- ☐ Landscape/Fence/ Tree/Park
- ☑ General Rehab
- ☐ New Construction
- ☐ Demolition
- ☐ Addition
- ☐ Other:

APPLICANT IDENTIFICATION

- ☐ Property Owner/ Homeowner
- ☑ Contractor
- ☐ Tenant or Business Occupant
- ☐ Architect/Engineer/ Consultant

NAME: Andrew Jordan **COMPANY NAME:** Lewand Building Companies

ADDRESS: 231S. Old Woodward-Suite 220 **CITY:** Birmingham **STATE:** MI **ZIP:** 48009

PHONE: 248-258-6002 **MOBILE:** 810-343-2710 **EMAIL:** andrew.j@buildingcompanie

PROJECT REVIEW REQUEST CHECKLIST

Please attach the following documentation to your request:

PLEASE KEEP FILE SIZE OF ENTIRE SUBMISSION UNDER 30MB

- ☑ **Completed Building Permit Application** (highlighted portions only)
- ☐ **ePLANS Permit Number** (only applicable if you've already applied for permits through ePLANS)
- ☑ **Photographs** of ALL sides of existing building or site
- ☑ **Detailed photographs** of location of proposed work (photographs to show existing condition(s), design, color, & material)
- ☑ **Description of existing conditions** (including materials and design)
- ☑ **Description of project** (if replacing any existing material(s), include an explanation as to why replacement--rather than repair--of existing and/or construction of new is required)
- ☑ **Detailed scope of work** (formatted as bulleted list)
- ☑ **Brochure/cut sheets** for proposed replacement material(s) and/or product(s), as applicable

NOTE:
Based on the scope of work, additional documentation may be required.

See www.detroitmi.gov/hdc for scope-specific requirements.

Upon receipt of this documentation, staff will review and inform you of the next steps toward obtaining your building permit from the Buildings, Safety Engineering and Environmental Department (BSEED) to perform the work.

SUBMIT COMPLETED REQUESTS TO HDC@DETROITMI.GOV

P2 - BUILDING PERMIT APPLICATION

Date: April, 22 2020

PROPERTY INFORMATION

Address: 729 Seward St Floor: ____ Suite#: ____ Stories: 2

AKA: ____ Lot(s): ____ Subdivision: ____

Parcel ID#(s): 04001824 Total Acres: 0.2 Lot Width: 50 Lot Depth: 175

Current Legal Use of Property: Residential Proposed Use: Residential

Are there any existing buildings or structures on this parcel? ☒ Yes ☐ No

PROJECT INFORMATION

Permit Type: ☐ New ☒ Alteration ☐ Addition ☐ Demolition ☐ Correct Violations

☐ Foundation Only ☐ Change of Use ☐ Temporary Use ☐ Other: ____

☐ Revision to Original Permit #: ____ (Original permit has been issued and is active)

Description of Work (Describe in detail proposed work and use of property, attach work list)

Rehabilitation of building without imposing on its historic character.

☐ MBC use change ☐ No MBC use change

Included Improvements (Check all applicable; these trade areas require separate permit applications)

☒ HVAC/Mechanical ☒ Electrical ☒ Plumbing ☐ Fire Sprinkler System ☐ Fire Alarm

Structure Type

☐ New Building ☒ Existing Structure ☐ Tenant Space ☒ Garage/Accessory Building

☐ Other: ____ Size of Structure to be Demolished (LxWxH) ____ cubic ft.

Construction involves changes to the floor plan? ☒ Yes ☐ No

(e.g. interior demolition or construction to new walls)

Use Group: ____ Type of Construction (per current MI Bldg Code Table 601) ____

Estimated Cost of Construction $ $45,000 (By Contractor) $ ____ (By Department)

Structure Use

☒ Residential-Number of Units: 1 ☐ Office-Gross Floor Area ____ ☐ Industrial-Gross Floor Area ____

☐ Commercial-Gross Floor Area: ____ ☐ Institutional-Gross Floor Area ____ ☐ Other-Gross Floor Area ____

Proposed No. of Employees: ____ List materials to be stored in the building: ____

PLOT PLAN SHALL BE submitted on separate sheets and shall show all easements and measurements (must be correct and in detail). SHOW ALL streets abutting lot, indicate front of lot, show all buildings, existing and proposed distances to lot lines. (Building Permit Application Continues on Next Page)

For Building Department Use Only

Intake By: ____ Date: ____ Fees Due: ____ DngBld? ☐ No

Permit Description:

Current Legal Land Use: ____ Proposed Use: ____

Permit#: ____ Date Permit Issued: ____ Permit Cost: $ ____

Zoning District: ____ Zoning Grant(s): ____

Lots Combined? ☐ Yes ☐ No (attach zoning clearance)

Revised Cost (revised permit applications only) Old $ ____ New $ ____

Structural: ____ Date: ____ Notes: ____

Zoning: ____ Date: ____ Notes: ____

Other: ____ Date: ____ Notes: ____

Permit #:

IDENTIFICATION (All Fields Required)

Property Owner/Homeowner ☐ Property Owner/Homeowner is Permit Applicant

Name: Tara Yenglin | Company Name: 700 Seward Detroit LLC

Address: 231 S Old Woodward | City: Birmingham | State: MI | Zip: 48048

Phone: 248-258-6002 | Mobile: | Email: tyenglin@lewandbuilding.com

Driver's License #: | Email:

Contractor ■ Contractor is Permit Applicant

Representative Name: Andrew Jordan | Company Name: Lewand Construction

Address: 231 S. Old Woodward, Suite 220 | City: Birmingham | State: MI | Zip: 48009

Phone: 248-258-6002 | Mobile: 810-342-2710 | Email: andrew.j@lewandbuilding.com

City of Detroit License #:

TENANT OR BUSINESS OCCUPANT ☐ Tenant is Permit Applicant

Name: | Phone: | Email:

ARCHITECT/ENGINEER/CONSULTANT ☐ Architect/Engineer/Consultant is Permit Applicant

Name: Brian Hurttienne | State Registration#: 33302 | Expiration Date: October 2020

Address: 2111 Woodward Ave. #201 | City: Detroit | State: MI | Zip: 48201

Phone: 313-825-2005 | Mobile: | Email: chris@cha-c.com

HOMEOWNER AFFIDAVIT (Only required for residential permits obtained by homeowner.)

I hereby certify that I am the legal owner and occupant of the subject property and the work described on this permit application shall be completed by me. I am familiar with the applicable codes and requirements of the City of Detroit and take full responsibility for all code compliance, fees and inspections related to the installation/work herein described. I shall neither hire nor sub-contract to any other person, firm or corporation any portion of the work covered by this building permit.

Print Name: _____ (Homeowner) Signature: _____ Date: _____

Subscribed and sworn to before me this ____ day of ____ 20 ____ A.D. _____ County, Michigan

Signature: _____ (Notary Public) My Commission Expires: _____

PERMIT APPLICANT SIGNATURE

I hereby certify that the information on this application is true and correct. I have reviewed all deed restrictions that may apply to this construction and am aware of my responsibility thereunder. I certify that the proposed work is authorized by the owner of the record and I have been authorized to make this application as the property owner(s) authorized agent. Further I agree to conform to all applicable laws and ordinances of jurisdiction. **I am aware that a permit will expire when no inspections are requested and conducted within 180 days of the date of issuance or the date of the previous inspection and that expired permits cannot be**

Print Name: Andrew Jordan (Permit Applicant) Signature: _____ Date: 4-22-2020

Driver's License #: J635067429341 | Expiration: 05-04-2023

Subscribed and sworn to before me this ____ day of ____ 20 ____ A.D. _____ County, Michigan

Signature: _____ (Notary Public) My Commission Expires: _____

Section 23a of the state construction code act of 1972, 1972PA230, MCL 125.1523A, prohibits a person from conspiring to circumvent the licensing requirements of this state relating to persons who are to perform work on a residential building or a residential structure. Visitors of Section 23a are subject to civil fines.

This application can also be completed online. Visit detroitmi.gov/bseed/elaps for more information.

LEWAND CONSTRUCTION

729 Seward

Detroit, Michigan

48202

Photographs of all sides of existing building

LEWAND
CONSTRUCTION

729 Seward

Detroit, Michigan

48202

LEWAND
CONSTRUCTION

729 Seward

Detroit, Michigan

48202

LEWAND
CONSTRUCTION

729 Seward

Detroit, Michigan

48202

REPORT

LEWAND CONSTRUCTION

729 Seward

Detroit, Michigan

48202

Description of existing conditions

Windows

The existing windows appear to be the original to the building. All the windows are in very poor condition. All the existing windows appear to be a first growth white pine and have gone years without repair or maintenance.

The existing sashes are in poor condition with many of the sashes falling at the corner joinery locations. Most of the windows are missing critical components such as the sill, sashes, glass etc.

The frames have gone without proper caulking and painting, allowing the joinery to open up and swell. Exposure to the elements has taken a major toll on the sashes and frames. Most of the frames are fissured, cracked and open. The exterior caulk has failed on all windows openings.

Roof

Asphalt shingles are deteriorated over time on the main roof showing thinness from erosion, mildew and mold on the surface, with this saying, it will require replacement.

Foundation

Brick foundation in fair condition. Rising damp, fungus growth, and deteriorated mortar joints in large areas around the downspouts. Foundation otherwise is in good condition, with no evidence of structural movement, settling, insect infiltration, or brick deterioration.

Electrical System

Electrical System includes elements from three different periods. No original fixtures or elements survive. Existing system is clumsy and unsafe. It does not satisfy the requirements of current building codes.

Plumbing

Existing plumbing system includes elements from different periods. Most plumbing lines are poorly installed, with substantial cuts in the floor joists and other supporting timbers, all plumbing fixtures have been removed.

LEWAND CONSTRUCTION

729 Seward

Detroit, Michigan

48202

Description of project

Windows

Full replacement of all the existing windows based on the overall poor condition of the components and the fact that 95% of the windows have failed extensively. The extensive damage to the components will not allow for the restoration of these window frames and sashes.

Roof

Existing roofing will be removed it will be repaired as necessary, maintaining existing configuration. New roofing to be installed to match original configuration. Impact will be the preservation of the original roof configuration and protection of the building's structural integrity.

Foundation

Foundation will be maintained in its existing configuration. Brick will be cleaned with bleach, warm water, and bristle brushes to remove fungus growth. Proper drainage will be provided by downspout repairs, by selected regrading of earth around foundation, and by removal of excessive plant growth adjacent to foundation. Deteriorated mortar joints to be raked out by hand and repointed to match original. New mortar joints will match the historic joints in color, texture, strength, and joint tooling. Impact will be the preservation and protection of the historic foundation.

Electrical System

All aspects of existing system will be removed. New electrical system will be installed to comply with code requirements. All wiring will be suitably located within walls, to avoid visual impact. No removal or alteration of significant historic features will be required. Impact will be upgrading of the electrical system, allowing satisfactory contemporary use of the building, without imposing on its historic character.

Plumbing

Both bathrooms on second floor, will have all new fixtures and lines. All new kitchen fixtures and configuration will be used, as per drawings. All plumbing lines will be inspected and repaired or replaced as necessary. Structural reinforcements will be made to floor joists as necessary. Impact will be upgrading of the plumbing system, allowing satisfactory contemporary use of the building, without imposing on its historic character; and the preservation and reuse of two surviving historic fixtures.

REPORT

LEWAND CONSTRUCTION

729 Seward

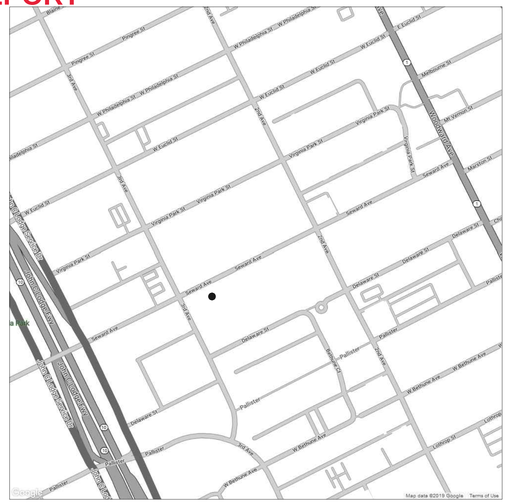
Detroit, Michigan

48202

Detailed scope of work

- Remove and dispose of all existing windows
- Replace all windows
- All windows will be adequately sealed and caulk
- Remove and dispose existing roof system
- Install new roof system
- All electrical system to be removed and dispose
- New electrical system to be installed
- New Lighting fixtures to be installed
- All plumbing to be new (where applies) including new lines
- New plumbing fixtures to be installed

REPORT



N VICINITY PLAN

GENERAL NOTES

1. ANY MENTION OF 'CONTRACTOR' INCLUDES THE GENERAL CONTRACTOR (GC), CONSTRUCTION MANAGER (CM) OR SUBCONTRACTOR(S) AS THEY RELATE TO THE CONTRACTUAL DELIVERY METHOD AGREED TO BY THE OWNER AND ENTITY RESPONSIBLE FOR UNDERTAKING CONSTRUCTED IMPROVEMENTS OF THE PROPERTY. ACCORDINGLY, THE USE OF THE TERM 'CONTRACTOR' IS TO REFER TO ANY AND ALL ENTITIES AND INDIVIDUALS RESPONSIBLE FOR THE MANAGEMENT, COORDIANTION, SUPERVISION, AND PHYSICAL CONSTRUCTION OF EITHER THE COMPLETE JOB (GENERAL CONTRACTOR / CONSTRUCTION MANAGER) AND/OR A SPECIFIC TRADE (SUBCONTRACTOR'S).
2. ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE LOCAL JURISDICTION. UNLESS OTHERWISE AGREED UPON, THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL BUILDING PERMITS AS REQUIRED FOR WORK TO BE PERFORMED AND WILL RETAIN AND PAY FOR ALL REQUIRED INSPECTIONS DURING THE COURSE OF THE WORK.
3. PROVIDE SAFE AND SECURE JOBSITE PRIOR TO, DURING, AND AFTER WORK. PROVIDE ALL NECESSARY SAFETY DEVICES, LIGHTING, AND BARRIERS AS NECESSARY - ESPECIALLY AROUND ALL STAIR, ELEVATOR, AND ROOF PENETRATIONS IN ACCORDANCE WITH LOCAL CODES AND REGULATIONS, AND ANY APPLICABLE OSHA GUIDELINES.
4. THE CONTRACTOR SHALL VISIT THE SITE BEFORE PROVIDING A PRICE AND BE AWARE OF EXISTING CONDITIONS TO THE EXTENT OF INFLUENCE OF THE WORK.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS, METHODS, SEQUENCES, AND PROCEDURES OF CONSTRUCTION.
6. DO NOT SCALE DRAWINGS FOR DIMENSIONS AND / OR SIZES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD MEASURING EXISTING CONDITIONS PRIOR TO THE BEGINNING OF WORK, AND PERIODICALLY DURING PROGRESS OF WORK TO VERIFY ALL CRITICAL DIMENSIONS. ANY DEVIATIONS FROM DIMENSIONS INDICATED ON DRAWINGS ARE TO BE APPROVED BY ARCHITECT, PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR IS TO ALERT THE ARCHITECT OF ANY DISCREPANCIES FOUND IN THE DRAWINGS, DIMENSIONS, EXISTING CONDITIONS, OR ANY APPARENT ERROR IN CLASSIFYING OR SPECIFYING A PRODUCT OR ITS USE PRIOR TO COMMENCEMENT OF WORK. ADDITIONAL INFORMATION, CLARIFICATIONS AND / OR DIRECTIVES WILL BE ISSUED AS NECESSARY AND BROUGHT TO THE ATTENTION OF THE ARCHITECT, IT WILL BE ASSUMED THAT THE CONTRACTOR HAS BID THE MORE EXPENSIVE METHOD OF CONSTRUCTION.
8. THE CONTRACTORS ARE TO VERIFY ALL CONDITIONS PRIOR TO THE BEGINNING OF CONSTRUCTION OF ANY TRADE. NOTIFY ARCHITECT OF ANY DISCREPANCIES, OR OBVIOUS FIELD CONDITIONS WHICH PROHIBIT THE WORK FROM BEING BUILT, AS SHOWN.
9. THE CONTRACTOR IS TO COORDINATE ALL CIVIL, ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, AND STRUCTURAL TRADES.
10. THE CONTRACTOR IS TO PRESERVE, TAKE CARE OF, AND COORDINATE WITH THE UTILITY COMPANIES AND SUB-CONTRACTORS.
11. SHOP DRAWINGS / SUBMITTALS / SAMPLES ARE TO BE SUBMITTED TO THE ARCHITECT FOR APPROVAL BEFORE PROCEEDING WITH ALL ITEMS WHICH REQUIRE FABRICATION, AS DIRECTED AND APPROVED BY THE OWNER. ALL COLOR AND MATERIAL REVIEWS ARE TO BE MADE FROM ACTUAL SAMPLES, NOT FROM REPRODUCTIONS OR FROM NARRATIVE DESCRIPTIONS.
12. CHANGES IN THE WORK SHALL BE INITIATED THROUGH DOCUMENTS ISSUED BY THE ARCHITECT AS REQUESTED / APPROVED BY THE OWNER. THE CONTRACTOR SHALL NOT PROCEED WITH EXECUTION OF CHANGES WITHOUT WRITTEN APPROVAL FROM THE OWNER IN THE FORM OF AN APPROVED A CHANGE ORDER NOTING CHANGES TO CONTRACT PRICE AND TIME.
13. THE STRUCTURE HAS BEEN DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTOR SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURES AND SEQUENCING TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF TEMPORARY BRACING, SHORING, SUPPORT, GUYS, OR TIE-DOWNS IF NECESSARY. MEANS AND METHODS ARE NOT INCLUDED WITHIN THESE DOCUMENTS.
14. ENSURE ALL FIRE AND LIFE SAFETY ITEMS THAT ARE EXISTING AND REQUIRED, REMAIN OPERATIONAL DURING CONSTRUCTION.
15. MAINTAIN ALL REQUIRED FIRE RATINGS / SEPARATIONS AS REQUIRED BY THE APPLICABLE BUILDING CODE, AND RULES PER THE REGULATIONS OF THE LOCAL JURISDICTION.
16. EXECUTE FIRE WATCH AND PREVENTION PROCEDURES ON SITE DURING FIELD CUTTING AND WELDING OPERATIONS MEETING THE OWNER'S REQUIREMENTS.
17. PROVIDE NECESSARY TEMPORARY CONSTRUCTION BARRIERS BETWEEN EXISTING AND NEW CONSTRUCTION SPACES (DEMOLITION AREA). MAINTAIN LEGAL EXISTING SYSTEMS AND EGRESS FOR BOTH SPACES PER LOCAL CODES. PROVIDE SIGNAGE TO DESIGNATE THE EXITS AND SEPARATION OF THE SPACES.
18. EXISTING CONSTRUCTION NOT UNDERGOING ALTERATION IS TO REMAIN UNDISTURBED. WHERE SUCH EXISTING CONDITIONS NOT UNDERGOING ALTERATION ARE DISTURBED AS A RESULT OF THE OPERATIONS OF THIS CONTRACT, ALL ADVERSELY AFFECTED CONDITIONS MUST BE REPAIRED OR REPLACED BY THE CONTRACTOR AS REQUIRED TO THE SATISFACTION OF THE OWNER, ARCHITECT, ADJACENT PROPERTY OWNERS (IF APPLICABLE), AND THE LOCAL JURISDICTION.
19. ANY DAMAGE CAUSED BY NEGLIGENCE OR INADEQUATE PROTECTIVE OR SECURITY MEASURES DURING CONSTRUCTION ARE TO BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
20. DEMOLITION OF ALL PORTIONS OF THE STRUCTURE TO BE REMOVED SHALL BE DONE WITH THE UTMOST CARE, USING TOOLS AND METHODS SUBJECT TO THE OWNER'S APPROVAL. ALL POSSIBLE CARE SHALL BE TAKEN TO AVOID DAMAGING, SHOCK, OR VIBRATION TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN.
21. PROVIDE ADEQUATE SHORING AND SUPPORT OF ALL STRUCTURAL ITEMS TO BE REMOVED IN ACCORDANCE WITH STRUCTURAL ENGINEER'S DOCUMENTS / SPECIFICATIONS, LOCAL CODES AND REGULATIONS, AND ANY APPLICABLE OSHA GUIDELINES.
22. IF DEMOLITION OF AN EXISTING STRUCTURE IS REQUIRED TO ACCESS A SPACE OR COMPLETE CONSTRUCTION, AND IT IS NOT INDICATED ON THE DOCUMENTS, NOTIFY THE ARCHITECT TO HAVE A STRUCTURAL ENGINEER REVIEW THE SCOPE OF DEMOLITION REQUIRED AND PROVIDE EITHER AN APPROVAL OR DOCUMENTS TO INSTRUCT THE METHODS.
23. REMOVE AND / OR RELOCATE ALL MECHANICAL, PLUMBING AND ELECTRICAL ITEMS INCLUDING PIPING, FIXTURES, EQUIPMENT, DUCTWORK, WIRING, DEVICES, PANELS, AND ACCESSORIES AS REQUIRED BACK TO THE POINT OF ORIGIN. REFER TO MECHANICAL, ELECTRICAL, AND PLUMBING DOCUMENTS FOR FURTHER DIRECTION.
24. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES INCLUDING EXISTING WATER, SEWERS / STORM MAINS, DRAINS, ELECTRICAL AND GAS SERVICES, ETC., BEFORE PROCEEDING WITH THE WORK. ALL DISCREPANCIES SHALL BE DOCUMENTED AND REPORTED TO THE ARCHITECT.
25. REMOVE ALL MATERIALS AND DEBRIS CREATED DURING THE CONSTRUCTION PROCESS AND DISPOSE OFF SITE IN A SAFE AND LEGAL MANNER.
26. CAP, PATCH, AND REPAIR ALL HOLES AND SURFACES IN WALLS, FLOORS, AND CEILINGS WHERE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, OR PLUMBING ITEMS ARE NEATLY SAW CUT AND REMOVE CONCRETE AS REQUIRED FOR PLACEMENT OF NEW INSTALLATIONS OR PER MEANS AND METHODS.
27. PREPARE ALL DEMOLITION AREAS FOR NEW FINISHES.
28. IF CONSTRUCTION IS UNDERTAKEN BY A GENERAL CONTRACTOR (GC) FOR A PERIOD OF ONE YEAR FROM THE DATE OF COMPLETION AND ACCEPTANCE BY OWNER, THE GC SHALL ADJUST, REPAIR, OR REPLACE AT NO COST TO THE OWNER ANY ITEM OF EQUIPMENT, MATERIAL, OR WORKMANSHIP FOUND TO BE DEFECTIVE, WITHIN THE SCOPE OF THE CONTRACT.
29. PROVIDE A PORTABLE FIRE EXTINGUISER WITH A RATING NOT LESS THAN 2-A WITHIN 75 FOOT TRAVEL DISTANCE TO ALL PORTIONS OF THE TENANT SPACE AND ADDITIONAL EXTINGUISHERS AS REQUIRED BY 2015 MICHIGAN BUILDING CODE, NFPA 10 AND THE FIRE DEPARTMENT FIELD INSPECTOR OR BUILDING DEPARTMENT INSPECTOR.

GENERAL NOTES

30. PROVIDE EXIT SIGNS PER 2015 MICHIGAN BUILDING CODE WITH 6" LETTERS OVER REQUIRED EXITS, WHERE SHOWN ON DRAWINGS, AND ADDITIONAL SIGNS AS REQUIRED BY BUILDING DEPARTMENT INSPECTOR OR FIRE DEPARTMENT FIELD INSPECTOR. CONNECT EXIT SIGNS TO EMERGENCY POWER CIRCUITS. COMPLY WITH BUILDING CODES. PROVIDE GREEN LETTERING.
31. PROVIDE RAISED CHARACTER AND BRAILLE EXIT SIGN, COMPLYING WITH ICC 117.1 ADJACENT TO EACH DOOR TO AN AREA OF REFUGE, EXTERIOR AREA FOR ASSISTED RESCUE, AN EXIT STAIRWAY, AN EXIT RAMP, EXIT PASSAGEWAY, EXIT DISCHARGE, OR OTHERWISE REQUIRED BY FIRE DEPARTMENT FIELD FIELD INSPECTOR OR BUILDING DEPARTMENT INSPECTOR.
32. PROVIDE EMERGENCY LIGHTING LIGHTING OF ONE FOOT-CANDLE AT FLOOR LEVEL. COMPLY WITH BUILDING CODES.
33. EVERY EXIT DOOR SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT. SPECIAL LOCKING DEVICES SHALL BE OF AN APPROVED TYPE. ALL NEW DOORS SHALL HAVE APPROVED LEVER HANDLES.
34. EXIT DOORS SHALL SWING IN THE DIRECTION OF TRAVEL WHEN SERVING 50 OR MORE PERSONS AND IN ANY HAZARDOUS AREA.
35. INTERIOR WALL AND CEILING FINISHES FOR EXIT CORRIDORS SHALL NOT EXCEED AN END POINT FLAME SPREAD RATING PER SECTION 803, BASED UPON OCCUPANCY GROUP SPECIFIED IN TABLE 803.9 P. 199 OF THE 2015 MI BUILDING CODE.
36. DECORATIONS (PRIVACY CURTAINS, DRAPES, SHADES, HANGINGS, WALL COVERINGS, ETC.) SHALL CONFORM TO THE REQUIREMENTS OF SECTION 803 OF 2015 MICHIGAN BUILDING CODE.
37. WOOD BLOCKING SHALL BE FIRE TREATED IN ACCORDANCE WITH APPLICABLE CODE REQUIREMENTS.

LEGEND

- CONCRETE MASONRY UNIT
- BRICK
- CONCRETE
- INSULATION (BATT, CELLULOSE, SPRAY-FAOM)
- RIGID INSULATION
- PLYWOOD
- METAL
- FINISHED WOOD
- WOOD (ROUGH CONTINUOUS)
- WOOD (ROUGH NON-CONTINUOUS / BLOCKING)
- GLASS
- ALIGN
- (H) COLUMN LINE IDENTIFICATION
- (A) PARTITION TYPE
- D001 DEMOLITION KEYNOTE
- F001 FOUNDATION KEYNOTE
- A001 ARCHITECTURAL KEYNOTE
- R001 ROOF KEYNOTE
- CP01 CEILING PLAN KEYNOTE
- S001 STRUCTURAL KEYNOTE
- EL01 ELEVATION KEYNOTE
- +23'-0" VERTICAL HEIGHT ELEVATION
- W1 WINDOW TYPE/SCHEDULE NUMBER
- 000 DOOR TYPE/SCHEDULE NUMBER
- 000000.00 MATERIAL SPECIFICATION NUMBER
- 3 REVISION NUMBER
- PLAN DETAIL TAG — 2 / A1-01 — DETAIL NUMBER / SHEET NUMBER
- ELEVATION TAG — 2 / A1-01 — ELEVATION NUMBER / SHEET NUMBER
- SECTION TAG — 3 / A1-01 — SECTION NUMBER / SHEET NUMBER
- SHEET IDENTIFICATION NUMBER
- DISCIPLINE DESIGNATOR — A-ARCHITECTURAL SHEET
- A0-01 — SHEET SEQUENCE NUMBER — NUMBER IDENTIFYING EACH SHEET IN SET
- SHEET TYPE DESIGNATOR
  - 0 - GENERAL (SYMBOLS, LEGEND NOTES)
  - 1 - PLANS (HORIZONTAL VIEWS)
  - 2 - ELEVATIONS (VERTICAL VIEWS)
  - 3 - SECTIONS, DETAILS, DIAGRAMS, NOTES

SIGNATURE BLOCK

NAME OF AUTHORIZED REPRESENTATIVE

(Owner)

(Architect) Christian Hurttienne Architects, LLC

(General Contractor)

PROJECT INFORMATION

PROJECT ADDRESS:
729 SEWARD AVE., DETROIT, MI 48202

PARCEL NUMBER: 04001824

LEGAL DESCRIPTION:
TBD.

PROJECT DESCRIPTION
EXISTING HOUSE EXTERIOR RENOVATION

APPLICABLE CODES:
ALL WORK SHALL CONFORM TO ALL GOVERNING RULES, LAWS, CODES, RESTRICTIONS, ORDINANCES, BUT NO LIMITED TO:
1. 2015 MICHIGAN RESIDENTIAL CODE

HANDICAP REQUIREMENTS:
1. NONE REQUIRED

ZONING DATA
ZONING DISTRICT: R2

BUILDING DATA:

STORIES :
1. 2 STORIES ABOVE GRADE

SPRINKLERED
NO

BUILDING AREAS

BUILDING (GROSS)	BUILDING
BASEMENT LEVEL	1,122 SQFT
FIRST LEVEL	1,378 SQFT
SECOND LEVEL	1,080 SQFT
SUBTOTAL	3,580 SQFT

ISSUANCE

	OWNER'S REVIEW	PERMIT REVIEW	HDC RESUBMITTAL				
	7.25.2019	9.11.2019	4.27.2020	,	,	,	,
GENERAL SHEETS							
G-100 COVER	●	●	●				
SITE AND CIVIL ENGINEERING SHEETS							
C-100 EXISTING LAND SURVEY AND SITE PLAN	●	●	●				
ARCHITECTURAL SHEETS							
A-100 ARCHITECTURE PLAN	●	●	●				
A-200 EXTERIOR ELEVATIONS	●	●	●				
A-300 PORCH DETAILS	●	●	●				

DRAWING LIST

ISSUED FOR:

HDC RESUBMITTAL 04.27.2020

729 SEWARD AVE.

729 Seward Ave Detroit, MI 48202

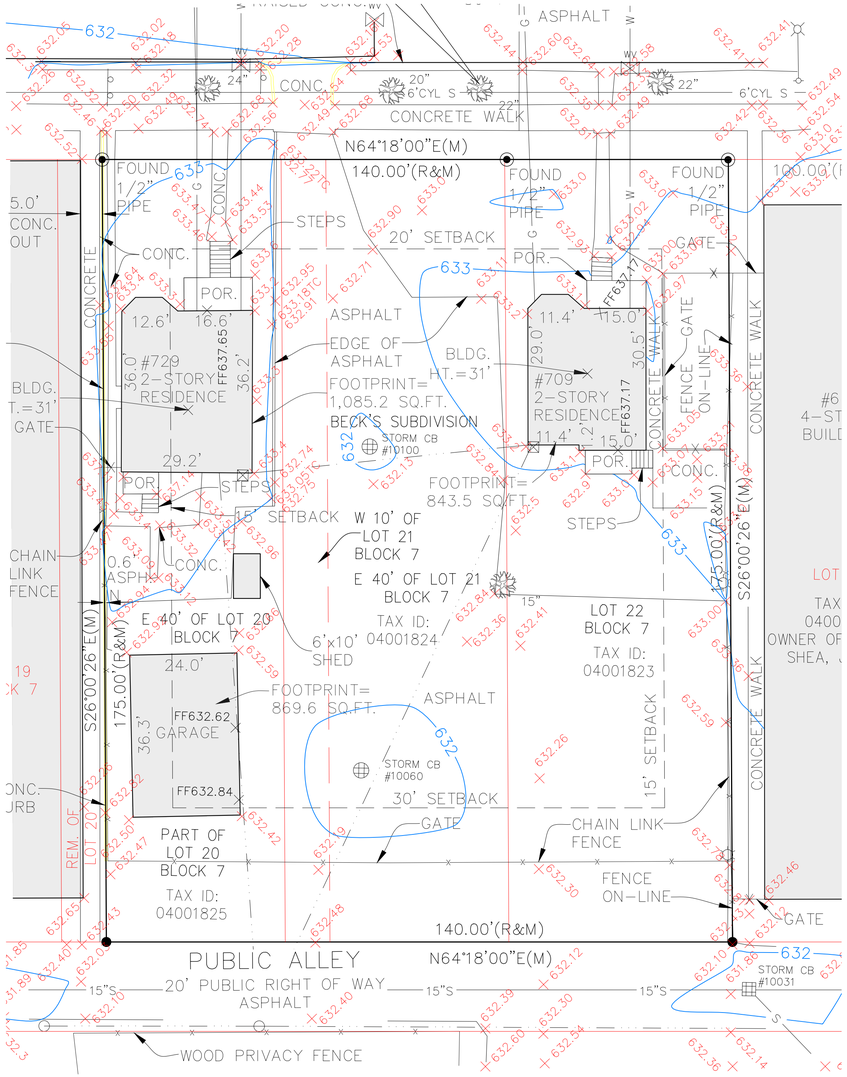
DEVELOPER
700 Seward , LLC
700 Seward Ave., Detroit, MI 48202 248.258.6002 klewand@lewandbuilding.com

ARCHITECT
Christian Hurttienne Architects, LLC
2111 Woodward Ave., Suite #201, Detroit, MI 48201 313.825.2005x101 Chris@cha-c.com

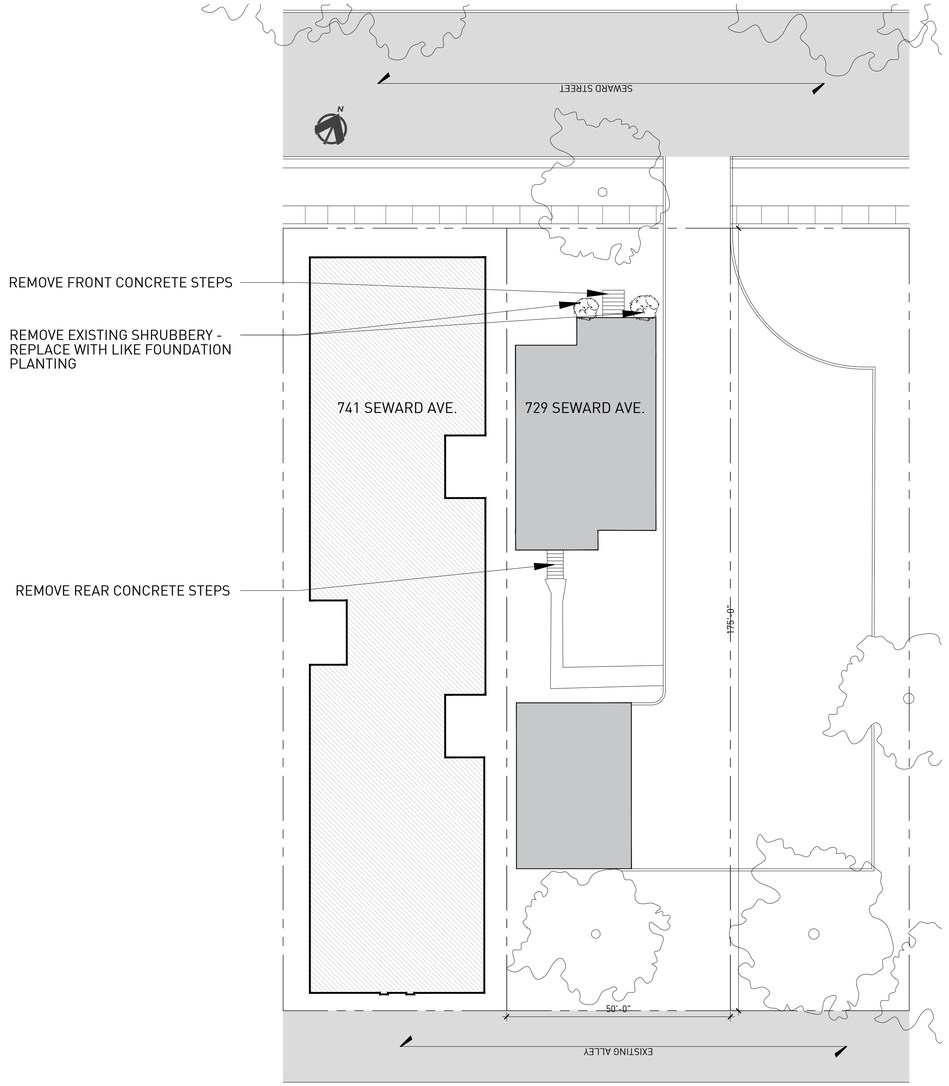
LAND SURVEYOR
KEM-TEC
22556 Gratiot Ave., Eastpointe, MI 48021 586.772.2222 rgarbarino@kemtec-survey.com

GENERAL CONTRACTOR
Lewand Building Companies
231 S. Old Woodward, Suite #220, Birmingham, MI 48009 248.258.6002 klewand@lewandbuilding.com

REPORT



1 SURVEY
ORIGINAL DRAWING SCALE: 1/16" = 1'-0"



2 ARCHITECTURAL SITE PLAN
ORIGINAL DRAWING SCALE: 1/16" = 1'-0"

CHRISTIAN HURTTIENNE ARCHITECTS
2111 WOODWARD AVENUE, #201, MI 48201
313.825.2005 CHA-C.COM

CONTRACTOR NOTE

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STRUCTURAL ENGINEER

CIVIL ENGINEER

729 SEWARD AVE.
729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

	DESCRIPTION	DATE
1.	OWNER REVIEW	07.25.2019
2.	PERMIT REVIEW	09.11.2019
3.	HDC RESUBMITTAL	04.27.2020

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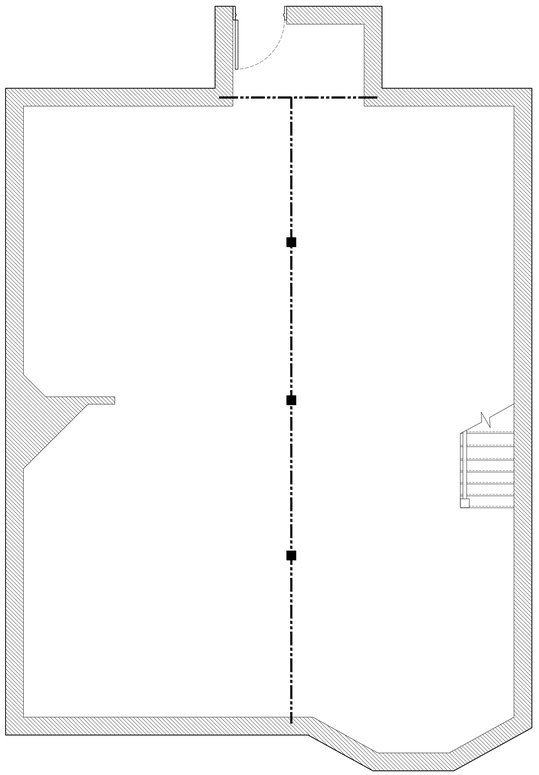
EXISTING LAND SURVEY AND SITE PLAN

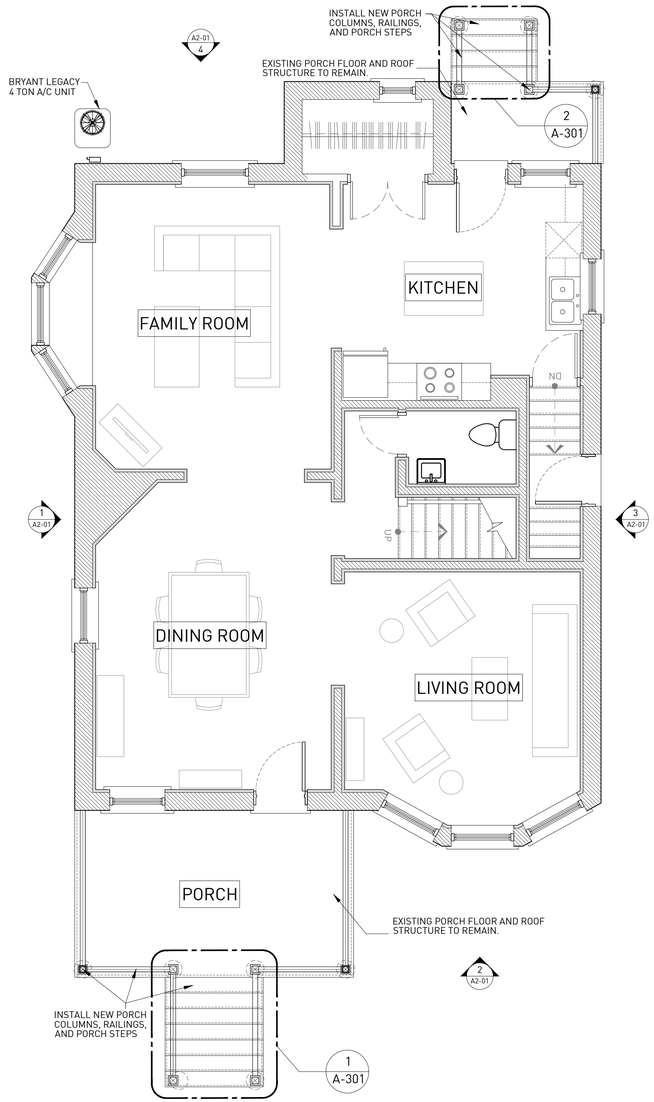
DRAWING NO.

C-100

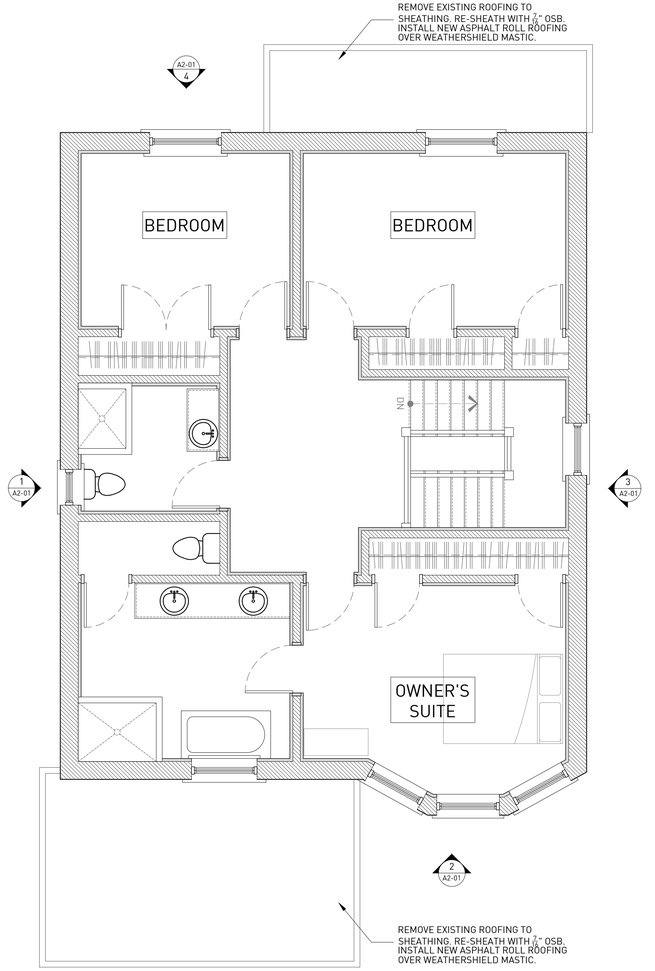
REPORT



1 BASEMENT FLOOR
ORIGINAL DRAWING SCALE: 1/4" = 1'-0"



2 FIRST FLOOR
ORIGINAL DRAWING SCALE: 1/4" = 1'-0"



3 SECOND FLOOR
ORIGINAL DRAWING SCALE: 1/4" = 1'-0"

CHRISTIAN HURTTIENNE ARCHITECTS
2111 WOODWARD AVENUE, #201, MI 48201
313.825.2005 CHA-C.COM

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STRUCTURAL ENGINEER

CIVIL ENGINEER

729 SEWARD AVE.

729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

	DESCRIPTION	DATE
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2.	PERMIT REVIEW	09.11.2019
3.	HDC RESUBMITTAL	04.27.2020

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ARCHITECTURAL FLOOR PLANS

DRAWING NO.

A-100

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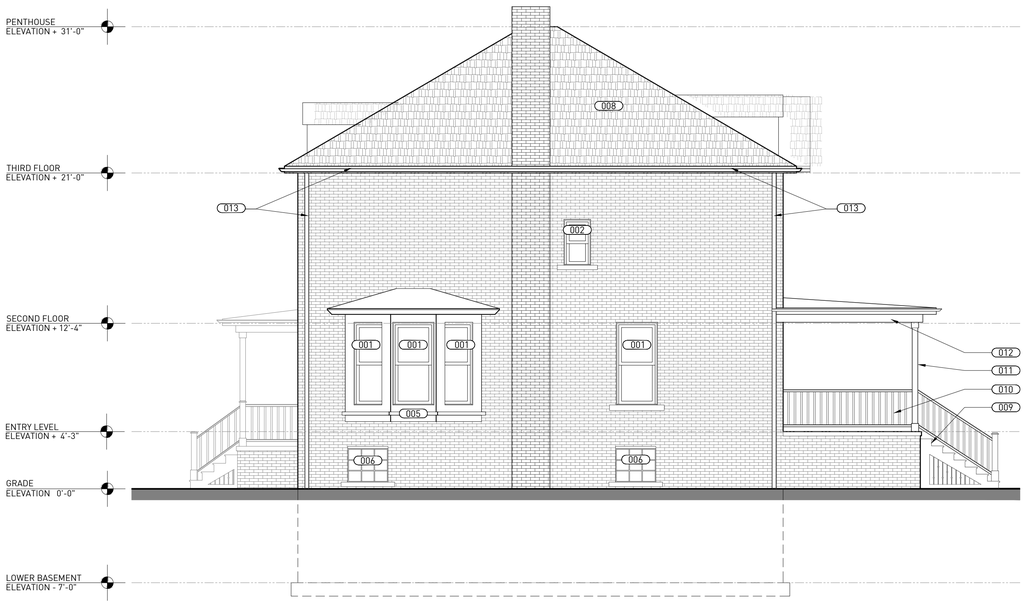
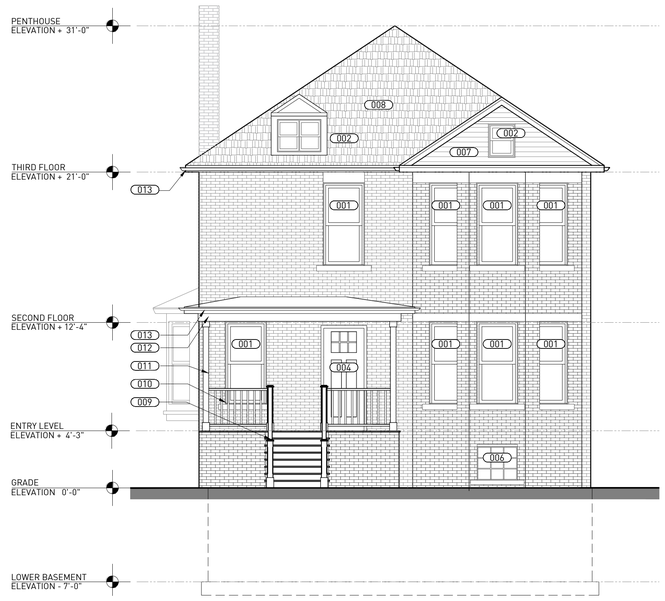
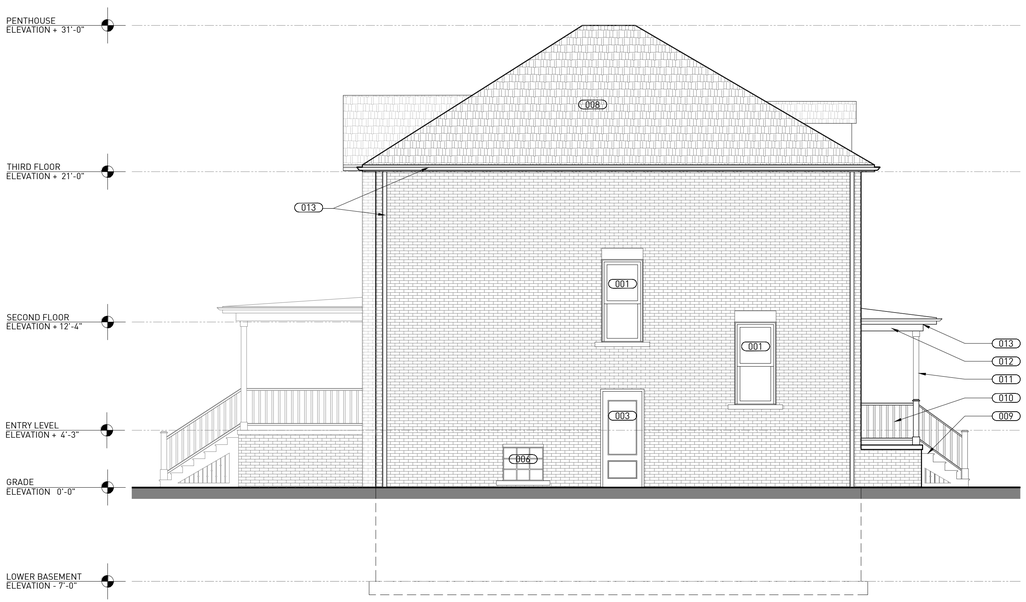
REPORT



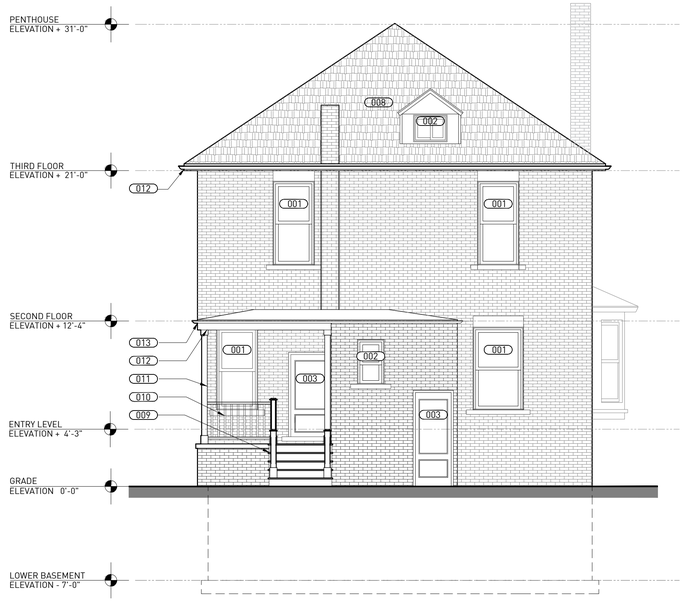
1 EAST ELEVATION FLOOR
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"



2 NORTH ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"



3 WEST ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"



4 SOUTH ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"

ARCHITECTURE GENERAL NOTES

1. ALL WINDOWS WILL BE REPLACED.
2. ALL DOORS WILL BE REPLACED.

ELEVATION KEY NOTES

001 REPLACE AND INSTALL JELD WEN BUILDERS ATLANTIC™ ALUMINUM SINGLE-HUNG WINDOWS. TRIM COLOR TO MATCH EXISTING .

002 REPLACE AND INSTALL JELD WEN W-2500™ CLAD-WOOD WINDOW; TRADITIONAL DOUBLE-HUNG.TRIM COLOR TO MATCH EXISTING .

003 INSTALL THERMATRU STEEL 1/2 - LITE DOOR.

004 INSTALL THERMATRU STAINED WOOD DOOR.

005 1X6 WOOD SILL AND TRIM PAINT TO MATCH EXISTING.

006 EXISTING GLASS BLOCK INFILL TO REMAIN.

007 AREA OF ALUMINUM SIDING TO BE REMOVED. REPAIR EXISTING WOOD DECORATIVE SIDING. PAINT.

008 REMOVE ROOF SHINGLE TO EXISTING SHEATHING. INSTALL NEW BLACK GAF TIMBERLINE HD SHINGLES.

009 NEW STAIRS. SEE DETAILS A-301.

010 NEW PORCH RAILINGS. SEE DETAILS A-301

011 NEW PORCH COLUMNS. SEE DETAILS A-301.

012 EXISTING PORCH ROOF STRUCTURE TO REMAIN. REMOVE ALL ALUMINUM SIDING. SAND AND PAINT EXISTING WOOD. REPLACE WOOD TRIM WITH WOOD TRIM TO MATCH ADJACENT IN ORIGINAL CONDITION.

013 INSTALL NEW GUTTERS AND DOWNSPOUTS. BLACK B:19 MS: NO .51 SQUARE ALUMINUM.

CH ARCHITECTS
CHRISTIAN HURTTIENNE ARCHITECTS
2111 WOODWARD AVENUE, #201, MI 48201
313.825.2005 CHA-C.COM

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STRUCTURAL ENGINEER

CIVIL ENGINEER

729 SEWARD AVE.
729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

	DESCRIPTION	DATE
1.	OWNER REVIEW	07.25.2019
2.	PERMIT REVIEW	09.11.2019
3.	HDC RESUBMITTAL	04.27.2020

SEAL
NOT FOR CONSTRUCTION

EXTERIOR ELEVATION

DRAWING NO.
A-200

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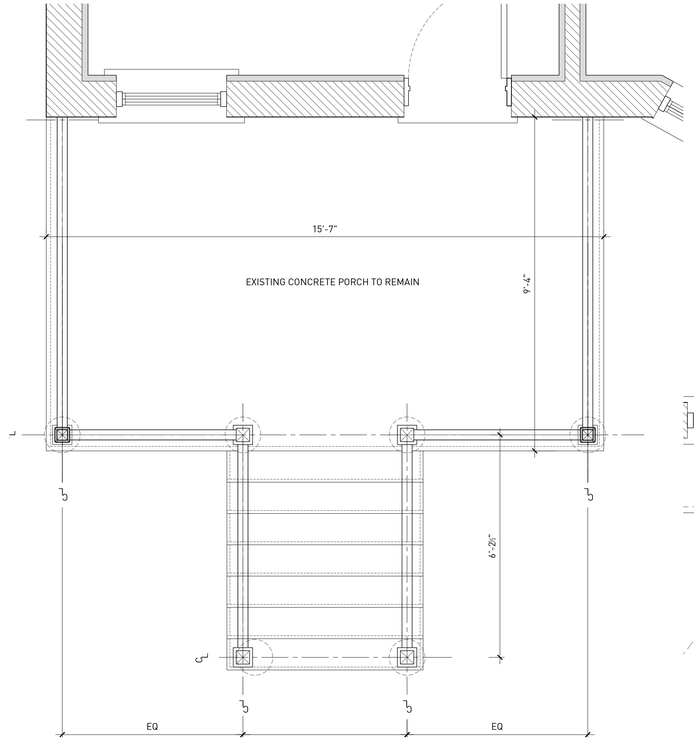
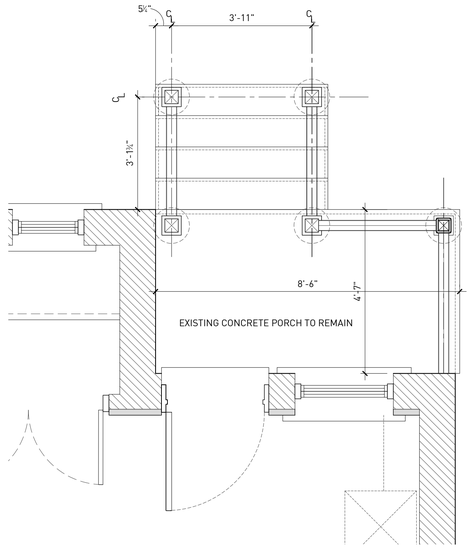
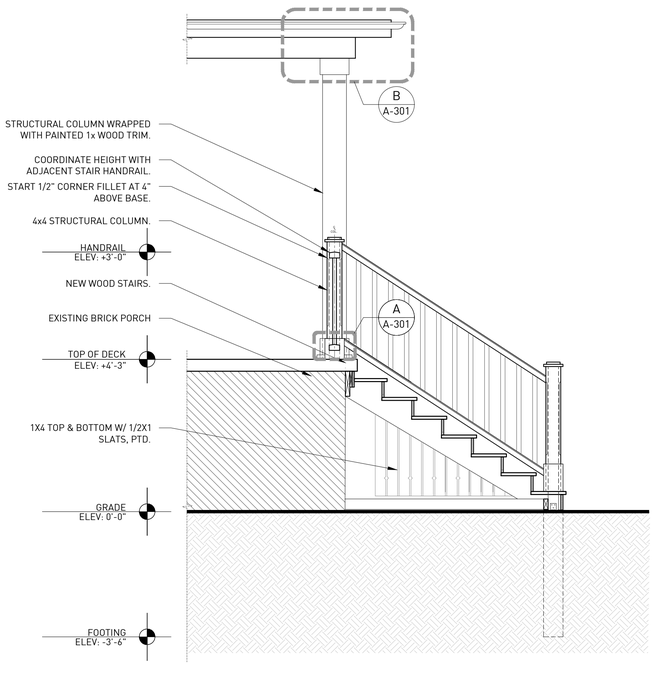
REPORT



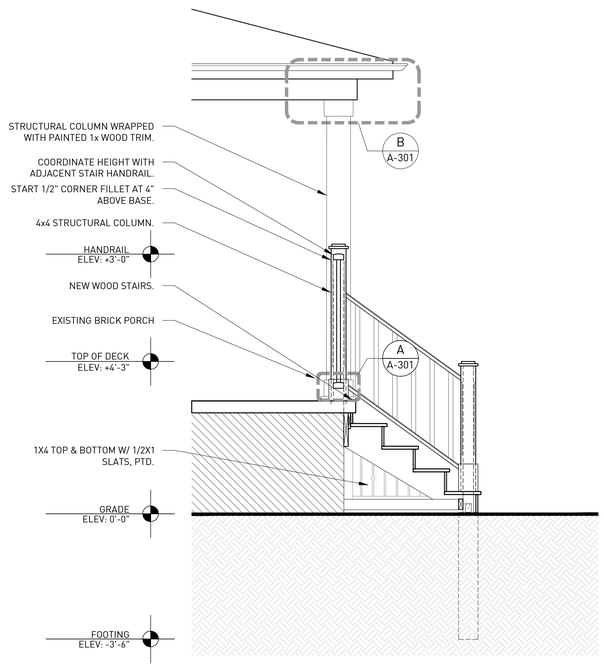
1 NORTH PORCH PLAN
ORIGINAL DRAWING SCALE: 1/2" = 1'-0"



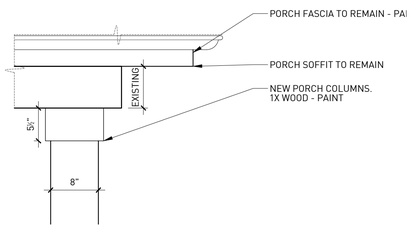
2 SOUTH PORCH PLAN
ORIGINAL DRAWING SCALE: 1/2" = 1'-0"



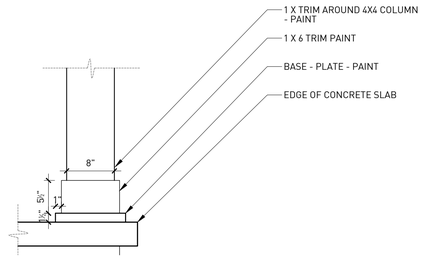
3 SOUTH PORCH STAIR SECTION
ORIGINAL DRAWING SCALE: 1/2" = 1'-0"



4 NORTH STAIR SECTION
ORIGINAL DRAWING SCALE: 1/2" = 1'-0"



B COLUMN HEAD DETAIL
ORIGINAL DRAWING SCALE: 1" = 1'-0"



A COLUMN BASE DETAIL
ORIGINAL DRAWING SCALE: 1" = 1'-0"

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2111 WOODWARD AVENUE, #201, MI 48201
313.825.2005 CHA-C.COM

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STRUCTURAL ENGINEER

CIVIL ENGINEER

729 SEWARD AVE.
729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

	DESCRIPTION	DATE
1.	OWNER REVIEW	07.25.2019
2.	PERMIT REVIEW	09.11.2019
3.	HDC RESUBMITTAL	04.27.2020

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ENLARGED PORCH PLANS AND DETAILS

DRAWING NO.

A-300

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REPORT

ARCHITECTURE GENERAL NOTES

1. ALL WINDOWS WILL BE REPLACED.
2. ALL DOORS WILL BE REPLACED.

ELEVATION KEY NOTES

Existing Family room window

10 1271 1 Double Hung Tilt
Brickmold Size: 23 Even x 39 Even
R.O. : 21 Even x 37 Even
Tempered LoE 366 Top (.520 Air)
Tempered LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
BATH 2
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Bathroom window

Existing Bathroom window

2 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 77 Even
R.O. : 33 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
FAMILY ROOM
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Family room window

1 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 77 Even
R.O. : 33 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
DINING ROOM
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Dining room window

Existing Dining room window

PENTHOUSE ELEVATION + 31'-0"
THIRD FLOOR ELEVATION + 21'-0"
ENTRY LEVEL ELEVATION + 4'-3"
GRADE ELEVATION 0'-0"
LOWER BASEMENT ELEVATION - 7'-0"

1 EAST ELEVATION FLOOR
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"

Existing Attic window

13 1271 1 Double Hung Tilt
Brickmold Size: 25 Even x 29 Even
R.O. : 23 Even x 27 Even
LoE 366 Top (.520 Air)
LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
ATTIC
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Attic window
X (2) to fill double hung pair

Existing Master Bathroom window

9 1271 1 Double Hung Tilt
Brickmold Size: 41 Even x 77 Even
R.O. : 39 Even x 75 Even
Tempered LoE 366 Top (.520 Air)
Tempered LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
MASTER BATH
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Master Bathroom window

Existing Dining room window

1 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 77 Even
R.O. : 33 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
DINING ROOM
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Dining room window

PENTHOUSE ELEVATION + 31'-0"
THIRD FLOOR ELEVATION + 21'-0"
ENTRY LEVEL ELEVATION + 4'-3"
GRADE ELEVATION - 7'-0"

2 NORTH ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"

Existing Attic window

13 1271 1 Double Hung Tilt
Brickmold Size: 25 Even x 29 Even
R.O. : 23 Even x 27 Even
LoE 366 Top (.520 Air)
LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
ATTIC
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Attic window

Existing Owners suite windows

LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
OWNERS SUITE
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Owners suite windows

Existing Living room windows

6 1271 3 Double Hung Tilt
Brickmold Size: 41 Even x 77 Even
R.O. : 39 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
LIVING ROOM
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Living room windows

Existing Stairs window

7 1271 1 Double Hung Tilt
Brickmold Size: 35 Even x 77 Even
R.O. : 33 Even x 75 Even
Tempered LoE 366 Top (.520 Air)
Tempered LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
STAIRS
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Stairs window

Existing Kitchen window

5 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 65 Even
R.O. : 33 Even x 63 Even
LoE 366 Top
LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
KITCHEN
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Kitchen window

PENTHOUSE ELEVATION + 31'-0"
THIRD FLOOR ELEVATION + 21'-0"
GRADE ELEVATION 0'-0"
LOWER BASEMENT ELEVATION - 7'-0"

3 WEST ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"

Existing Bedroom window

Brickmold Size: 45 Even x 77 Even
R.O. : 43 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
BED 3
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Bedroom window

Existing Kitchen window

5 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 65 Even
R.O. : 33 Even x 63 Even
LoE 366 Top
LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
KITCHEN
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Kitchen window

Existing Pantry window

4 1271 1 Double Hung Tilt
Brickmold Size: 23 Even x 39 Even
R.O. : 21 Even x 37 Even
LoE 366 Top
LoE 366 Bottom (.520 Air)
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
PANTRY

Proposed Pantry window

Existing Attic window

14 1372 2 Single Slider Lift (L-R)
Brickmold Size: 29 Even x 27 Even
R.O. : 27 Even x 25 Even
LoE 366 Left
LoE 366 Right
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Single Slider Screen
ATTIC
ER: 18 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.5

Proposed Attic window

Existing Bedroom window

11 1271 1 Double Hung Tilt
Brickmold Size: 45 Even x 77 Even
R.O. : 43 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
BED 2
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Bedroom window

Existing Family room window

2 1271 2 Double Hung Tilt
Brickmold Size: 35 Even x 77 Even
R.O. : 33 Even x 75 Even
LoE 366 Top
Tempered LoE 366 Bottom
Argon
1 1/2" Brickmold, Fin Removed
Primed Jamb Ext.
Total Jamb Depth?=6.5625
Double Hung Full Screen
FAMILY ROOM
ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48

Proposed Family room window

4 SOUTH ELEVATION
ORIGINAL DRAWING SCALE: 3/16" = 1'-0"

Proposed Kitchen window

CH ARCHITECTS
CHRISTIAN HURTTIENNE ARCHITECTS
1249 WOODWARD AVENUE, #201, MI 48201
313.965.2005 CHA-C.COM

CONTRACTOR NOTE

ALL CONTRACTORS (GENERAL CONTRACTOR, SUB-CONTRACTORS, MEMBERS OR AGENTS OF EITHER OR BOTH) ARE TO VERIFY AND COORDINATE ALL CONDITIONS, DIMENSIONS, QUANTITIES AND DETAILS, STATED OR NOT, WITHIN THESE DRAWINGS AND WITHIN THE SPECIFICATIONS BEFORE COMMENCING WITH THE WORK. IF A DIMENSIONAL ERROR OR CONFLICT OCCURS BETWEEN THESE DRAWINGS, THE SPECIFICATIONS OR THE EXISTING / PROPOSED CONDITIONS, IT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT, BEFORE PROCEEDING WITH THE WORK. ANY PARTY (GENERAL CONTRACTOR, SUB-CONTRACTORS, MEMBERS OR AGENTS OF EITHER OR BOTH) WHO FAIL TO DO SO TAKE FULL RESPONSIBILITY OF ANY ERRORS, CONFLICTS, SCHEDULE AND COST IMPLICATIONS.

STRUCTURAL

729 SEWARD AVE.

729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

	DESCRIPTION	DATE
1.	OWNER REVIEW	07.25.2019
2.	PERMIT REVIEW	09.11.2019
3.	HDC RESUBMITTAL	04.27.2020

SEAL

NOT FOR CONSTRUCTION

EXTERIOR ELEVATION

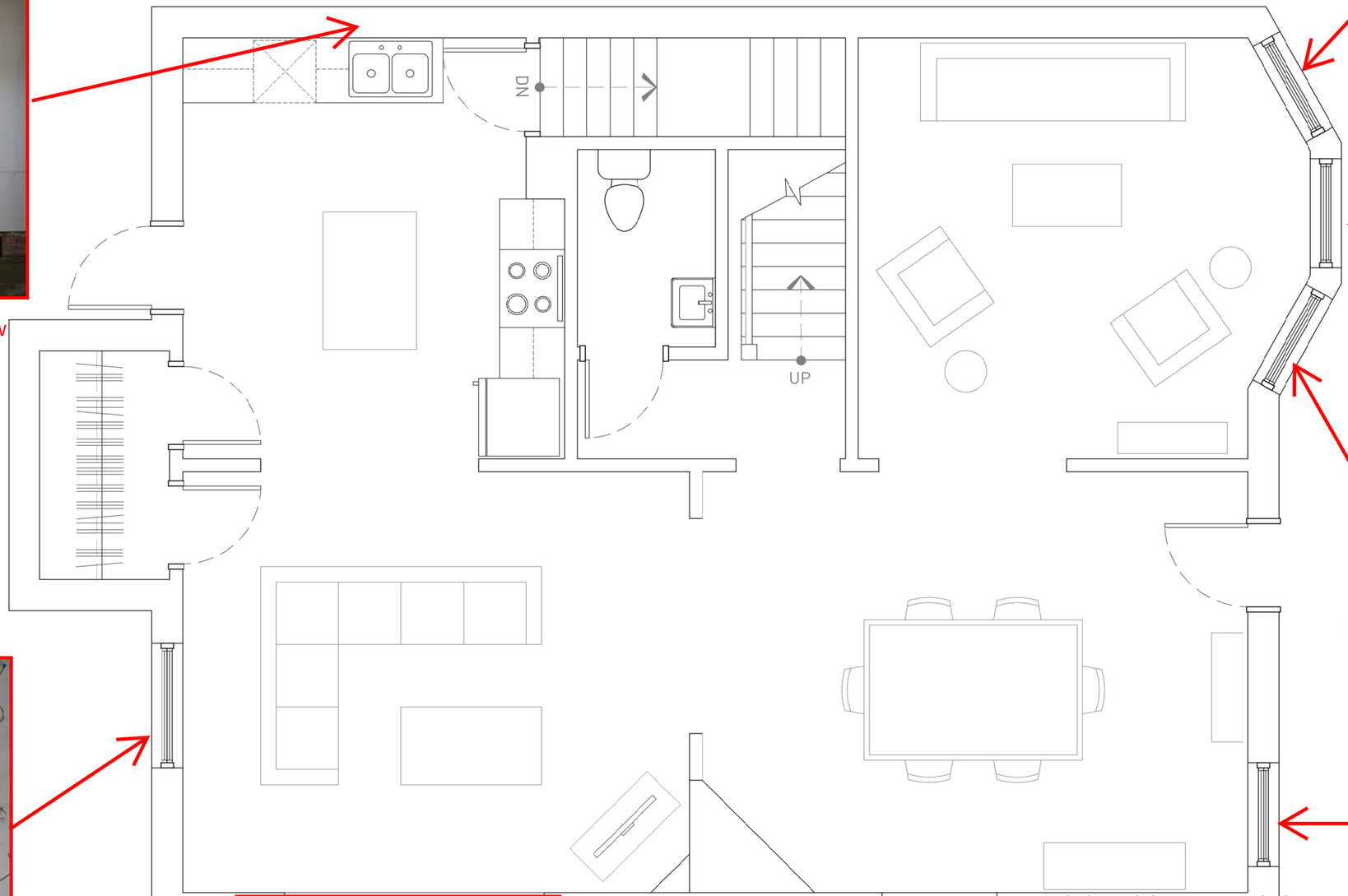
DRAWING NO.

A-200

4/27/2020 3:39:53 PM

REPORT

Existing Kitchen window



Existing Living Room windows

Existing Living Room window

Existing Family Room window

Existing Family Room windows

Existing Dining Room window

Existing Dining Room window

CH ARCHITECTS

729 SEWARD

LEVEL 01

ISSUED: 2019.03.26

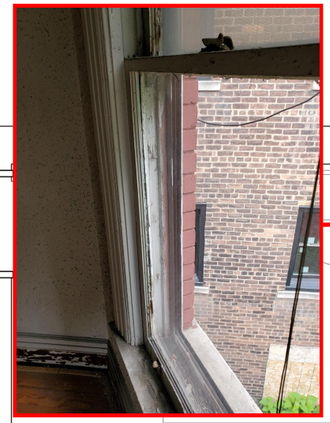
 2111 WOODWARD AVE. #201 DETROIT, MI 313.825.2005

1/4"=1'

A-100a

REPORT

Existing Bedroom window



Existing Owner's Suite window

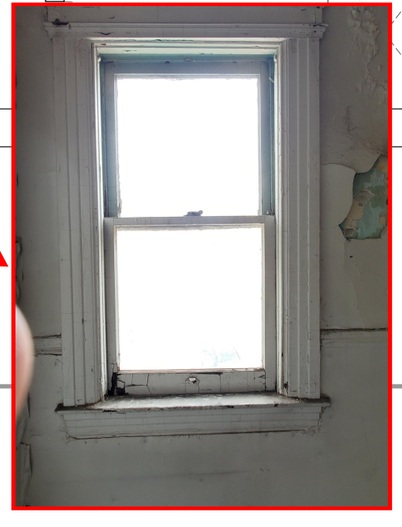
Existing Owner's Suite windows

Existing Stair window

Existing Bedroom window

Existing Bathroom window

Existing Bathroom window



CH ARCHITECTS

729 SEWARD

LEVEL 02

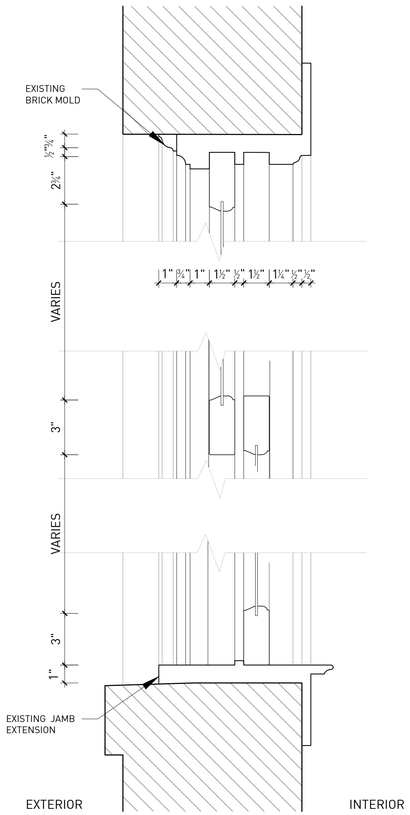
ISSUED: 2019.03.26

 2111 WOODWARD AVE. #201 DETROIT, MI 313.825.2005 CHA-C.COM

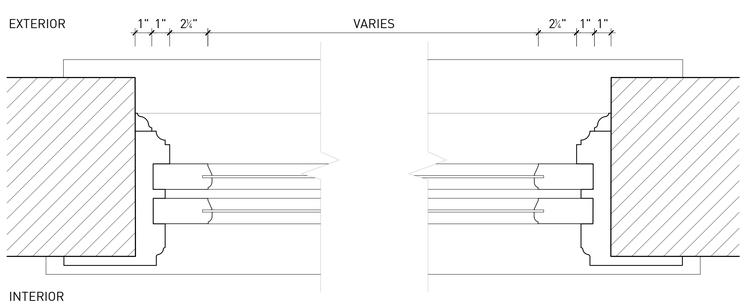
1/4"=1'

A-101a

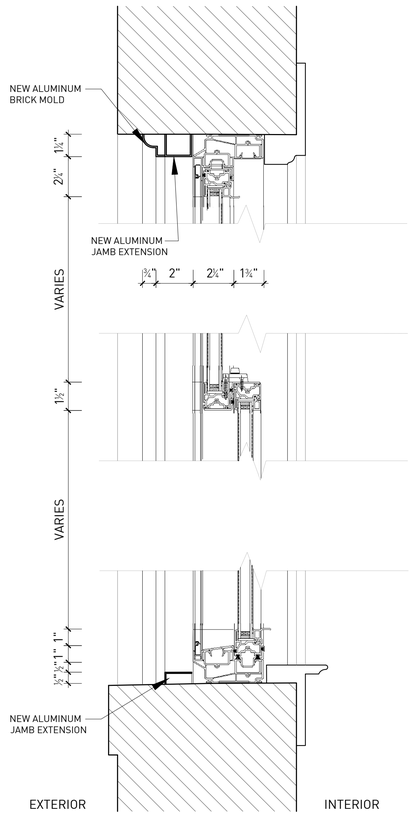
REPORT



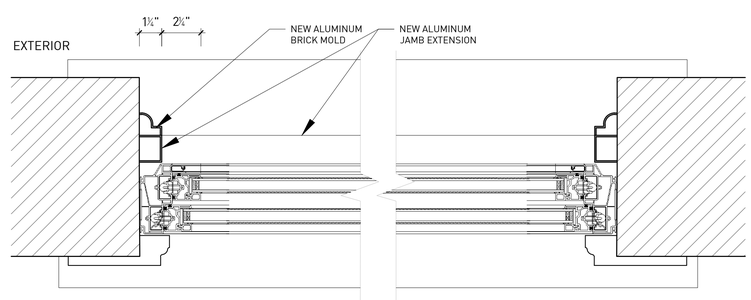
1 EXISTING VERTICAL SECTION
ORIGINAL IMAGE SCALE: 3" = 1'-0"



2 EXISTING HORIZONTAL SECTION
ORIGINAL IMAGE SCALE: 3" = 1'-0"



3 PROPOSED VERTICAL SECTION
ORIGINAL IMAGE SCALE: 3" = 1'-0"



4 PROPOSED HORIZONTAL SECTION
ORIGINAL IMAGE SCALE: 3" = 1'-0"

PROPOSED WINDOWS
NORTH STAR WINDOWS
SERIES 1000 - #1271

DETAILS GENERAL NOTES

1. IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL, OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.
2. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO APPROVAL BY THE ARCHITECT.THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL SAFETY PRECAUTIONS AND REGULATIONS DURING THE WORK.
3. ALL ASTM AND OTHER REFERENCES ARE PER THE LATEST EDITIONS OF THESE STANDARDS, UNLESS OTHERWISE NOTED.
4. THE ARCHITECT AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE DESIGN OR PROPER INSTALLATION OF TEMPORARY BUILDING BRACING OR SHORING REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR AND HIS ENGINEER ARE RESPONSIBLE FOR THE DESIGN AND PROPER INSTALLATION OF ALL TEMPORARY SHORING REQUIRED FOR A SAFE AND STRUCTURALLY SOUND PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES INCURRED DUE TO IMPROPER SHORING AND BRACING DURING THE CONSTRUCTION PROJECT.
5. WHERE A NEW ASSEMBLY IS TO COORDINATE WITH AN EXISTING ASSEMBLY, MAKE ALL NECESSARY PREPARATIONS TO ENSURE SMOOTH, CONSISTENT AND UN-NOTICABLE FINISH ACROSS ENTIRE SURFACE.
6. ALL LOCATIONS OF CEMENTITIOUS TILE BACKER BOARD ARE TO BE COORDINATED WITH THE OWNER AND SCHEDULED WALL ASSEMBLY. MAINTAIN ALL REQUIRED FIRE RATINGS ACCORDING TO WALL ASSEMBLY DETAILS, ASSOCIATED UL RATINGS AND SPECIFICATIONS.
7. GENERAL CONTRACTOR PROVIDE BLOCKING WHERE REQUIRED TO SUPPORT MILLWORK, EQUIPMENT OR OTHER FINISHES.

CH ARCHITECTS
CHRISTIAN HURTTIENNE ARCHITECTS
2111 WOODWARD AVENUE, #201, MI 48201
313.825.2005 CHA-C.COM

CONTRACTOR NOTE
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STRUCTURAL ENGINEER

CIVIL ENGINEER

729 SEWARD AVE.
729 Seward Ave Detroit, MI 48202

RESIDENTIAL RESTORATION

REVISIONS

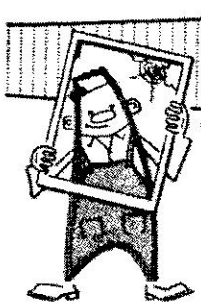
	DESCRIPTION	DATE
1.	OWNER REVIEW	NOT ISSUED
2.	PERMIT REVIEW	NOT ISSUED
3.	HDC RESUBMITTAL	05.08.2020

SEAL
NOT FOR CONSTRUCTION

WINDOW PROFILES

DRAWING NO.
A-500

REPORT



H-R WINDOW
Repair Company
SINCE 1957

- 23641 John R.
- Hazel Park, Michigan 48030
- Phone: (248) 544-8282
- FAX: (248) 544-8122
- www.hrwindowrepair.com

ESTIMATE

TO: LEWAND BUILDING COMPANIES
231 S. OLD WOODWARD STE. #220
BIRMINGHAM, MI 48009

DATE: 3/3/2020

ATTENTION: ANDREW JORDAN

JOB LOCATION: 729 SEWARD ST.
DETROIT, MI

QTY	DESCRIPTION	TOTAL
	REPAIRS TO EXISTING WOOD WINDOWS AS FOLLOWS: PAGE #1	
	REAR ELEVATION	
	1ST FLOOR	
1	SET OF UPPER AND LOWER SASH AND GLASS REPLACE INTO EXISTING WOOD WINDOW MAIN FRAMING - PRIME PAINTED PINE EXTERIOR / NATURAL UNFINISHED PINE INTERIOR - SINGLE PANE CLEAR GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE - NEW PARTING STOP IN MAIN FRAME (PRIME PAINT ONLY)	$551.40
2	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$790.00
2	EXISTING WOOD SASH REGLAZE USING SINGLE PANE CLEAR GLASS	$142.34
	2ND FLOOR	
2	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$790.00
2	EXISTING WOOD SASH REGLAZE USING SINGLE PANE CLEAR GLASS	$130.30
	WEST ELEVATION	
	1ST FLOOR	
1	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$395.00
2	EXISTING WOOD SASH REGLAZE USING SINGLE PANE CLEAR GLASS	$130.30
	STAIRWAY	
1	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$395.00

REPORT

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ESTIMATE

TO: LEWAND BUILDING COMPANIES
231 S. OLD WOODWARD STE. #220
BIRMINGHAM, MI 48009

DATE: 3/3/2020

ATTENTION: ANDREW JORDAN

JOB LOCATION: 729 SEWARD ST.
DETROIT, MI

QTY	DESCRIPTION	TOTAL
	REPAIRS CONT FROM PAGE #1 PAGE #2	
	WEST ELEVATION (CONT)	
	STAIRWAY (CONT)	
2	EXISTING WOOD SASH REGLAZE USING SINGLE PANE CLEAR **TEMPERED** GLASS (CODE)	$186.70
	FRONT ELEVATION	
	1ST FLOOR	
4	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$1,580.00
1	EXISTING WOOD SASH REGLAZE USING SINGLE PANE CLEAR GLASS	$56.02
	2ND FLOOR	
4	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$1,580.00
	3RD FLOOR	
3	SET OF EXISTING SASH REMOVE / REINSTALL FROM EXISTING FRAMING - STRIP PAINT FROM EXISTING SASH - PRIME PAINT SASH ONLY - REPUTTY EXISTING GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$1,185.00
	EAST ELEVATION	
	1ST FLOOR	
2	SET OF UPPER AND LOWER SASH AND GLASS REPLACE INTO EXISTING WOOD WINDOW MAIN FRAMING - PRIME PAINTED PINE EXTERIOR / NATURAL UNFINISHED PINE INTERIOR - SINGLE PANE CLEAR GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$1,076.00
1	NEW WOOD WINDOW MAIN FRAME, SASH, AND GLASS INSTALLED INTO EXISTING WALL OPENING REPLICATE EXISTING SASH AND FRAME AS BEST POSSIBLE	$889.30
	2ND FLOOR	
1	SET OF UPPER AND LOWER SASH AND GLASS REPLACE INTO EXISTING WOOD WINDOW MAIN FRAMING - PRIME PAINTED PINE EXTERIOR / NATURAL UNFINISHED PINE INTERIOR - SINGLE PANE CLEAR GLASS - INSTALL NEW LOWER SASH CORD ONLY / SECURE UPPER IN PLACE	$395.00

REPORT

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ESTIMATE

TO: LEWAND BUILDING COMPANIES
231 S. OLD WOODWARD STE. #220
BIRMINGHAM, MI 48009

DATE: 3/3/2020

ATTENTION: ANDREW JORDAN

JOB LOCATION: 729 SEWARD ST.
DETROIT, MI

QTY	DESCRIPTION	TOTAL
	REPAIRS CONT FROM PAGE #2 **PAGE #3**	
	TOTAL FOR REPAIRS AS LISTED	**$10,272.36**
	NOTES: H&R ASSUMES NO LIABILITY FOR CONDITION OF EXISTING WINDOW FRAMING H&R ASSUMES NO WARRANTY FOR EXISTING WINDOW FRAMING ANY / ALL PAINTING BY OTHERS ANY / ALL INTERIOR TRIM BY OTHERS ANY / ALL STRUCTURAL REPAIRS BY OTHERS SECURE OF EXISTING OPENINGS BY OTHERS ANY / ALL FINAL CLEANING BY OTHERS **50% DEPOSIT REQUIRED TO APPROVE THIS WORK**	
	STORM WINDOW INSTALL AS FOLLOWS: **FRONT ELEVATION** **1ST FLOOR**	
2	32" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$649.32
2	28" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR STANDARD PAINTED ALUMINUM COLOR FRAME CLEAR GLASS / STANDARD SCREEN MESH (NO SUN EXPOSURE)	$623.66
	2ND FLOOR	
2	32" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$649.32
2	28" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR STANDARD PAINTED ALUMINUM COLOR FRAME CLEAR GLASS / STANDARD SCREEN MESH (NO SUN EXPOSURE)	$623.66
	WEST ELEVATION **1ST FLOOR**	
1	36" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR STANDARD PAINTED ALUMINUM COLOR FRAME CLEAR GLASS / STANDARD SCREEN MESH (NO SUN EXPOSURE)	$384.97
	STAIRWAY	
1	36" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR STANDARD PAINTED ALUMINUM COLOR FRAME CLEAR GLASS / STANDARD SCREEN MESH (NO SUN EXPOSURE)	$384.97

REPORT

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- Hazel Park, Michigan 48030
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ESTIMATE

TO: LEWAND BUILDING COMPANIES
231 S. OLD WOODWARD STE. #220
BIRMINGHAM, MI 48009

DATE: 3/3/2020

ATTENTION: ANDREW JORDAN

JOB LOCATION: 729 SEWARD ST.
DETROIT, MI

QTY	DESCRIPTION	TOTAL
	STORM WINDOW INSTALL CONT FROM PAGE #3 **PAGE #4**	
	EAST ELEVATION	
	1ST FLOOR	
1	36" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$401.92
1	32" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$344.66
2	24" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$683.94
	ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR	
	STANDARD PAINTED ALUMINUM COLOR FRAME	
	CLEAR LOW E GLASS / STANDARD SCREEN MESH (SUN EXPOSURE)	
	2ND FLOOR	
1	28" X 54" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$348.34
	ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR	
	STANDARD PAINTED ALUMINUM COLOR FRAME	
	CLEAR LOW E GLASS / STANDARD SCREEN MESH (SUN EXPOSURE)	
	REAR ELEVATION	
	1ST FLOOR	
1	36" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$401.92
1	40" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$401.92
1	24" X 46" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$341.78
	ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR	
	STANDARD PAINTED ALUMINUM COLOR FRAME	
	CLEAR LOW E GLASS / STANDARD SCREEN MESH (SUN EXPOSURE)	
	2ND FLOOR	
2	32" X 70" 3 TRACK DOUBLE HUNG ALUMINUM STORM WINDOW INSTALLED	$689.32
	ONTO EXISTING WOOD WINDOW MAIN FRAME EXTERIOR	
	STANDARD PAINTED ALUMINUM COLOR FRAME	
	CLEAR LOW E GLASS / STANDARD SCREEN MESH (SUN EXPOSURE)	
	TOTAL FOR STORM WINDOW INSTALL AS LISTED	**$6,929.70**

NOTES:
H&R ASSUMES NO LIABILITY FOR EXISTING WOOD WINDOW FRAMING
ANY / ALL FINAL CLEANING BY OTHERS
4 - 6 WEEK LEAD TIME ON NEW STORM WINDOWS
STORM WINDOW MANUFACTURER WEBSITE INFO: www.foxweldoor.com (snow bird)
- COLOR SELECTIONS FOUND IN STORM DOORS
50% DEPOSIT REQUIRED TO APPROVE THIS WORK

REPORT

Customer Quotation

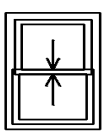
From
Clarkston Window & Door
151 Cesar E. Chavez Ave.
Pontiac, MI 48342

248-338-6781

Customer
Lewand Building-729 Seward Ave

Ref # 644991
PO #
Date 9/27/2019
Ord Type C35

Line	Mdl	Qty	Description	Color	Width	Height	Unit Cost	Net	Wty
1	1271	2	Double Hung Tilt	Espresso	**32 Even**	**74 Even**	322.53	645.06	
	Brickmold Size: 35 Even x 77 Even								
	R.O. : 33 Even x 75 Even								
			LoE 366 Top				5.29	10.58	
			Tempered LoE 366 Bottom				86.95	173.90	
			Argon				10.58	21.16	
			1 1/2" Brickmold, Fin Removed				73.91	147.82	
			Primed Jamb Ext.	White			44.29	88.58	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
	DINING ROOM								
	ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total		543.55	1,087.10	
2	1271	2	Double Hung Tilt	Espresso	**32 Even**	**74 Even**	322.53	645.06	
	Brickmold Size: 35 Even x 77 Even								
	R.O. : 33 Even x 75 Even								
			LoE 366 Top				5.29	10.58	
			Tempered LoE 366 Bottom				86.95	173.90	
			Argon				10.58	21.16	
			1 1/2" Brickmold, Fin Removed				73.91	147.82	
			Primed Jamb Ext.	White			44.29	88.58	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
	FAMILY ROOM								
	ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total		543.55	1,087.10	
3	1271	2	Double Hung Tilt	Espresso	**38 Even**	**74 Even**	379.43	758.86	
	Brickmold Size: 41 Even x 77 Even								
	R.O. : 39 Even x 75 Even								
			LoE 366 Top				6.22	12.44	
			Tempered LoE 366 Bottom				102.30	204.60	
			Argon				12.45	24.90	
			1 1/2" Brickmold, Fin Removed				78.02	156.04	
			Primed Jamb Ext.	White			46.75	93.50	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
	FAMILY ROOM								
	ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total		625.17	1,250.34	
4	1271	1	Double Hung Tilt	Espresso	**20 Even**	**36 Even**	172.94	172.94	
	Brickmold Size: 23 Even x 39 Even								
	R.O. : 21 Even x 37 Even								
			LoE 366 Top				1.55	1.55	
			LoE 366 Bottom (.520 Air)				1.55	1.55	
			Argon				3.12	3.12	
			1 1/2" Brickmold, Fin Removed				41.07	41.07	
			Primed Jamb Ext.	White			24.61	24.61	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
	PANTRY								



By: 6781 on 10/01/19 at 11:33

Customer Quotation

From
Clarkston Window & Door
151 Cesar E. Chavez Ave.
Pontiac, MI 48342

248-338-6781

Customer
Lewand Building-729 Seward Ave

Ref # 644991
PO #
Date 9/27/2019
Ord Type C35

Line	Mdl	Qty	Description	Color	Width	Height	Unit Cost	Net	Wty
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		244.84	244.84	
5	1271	2	Double Hung Tilt	Espresso	**32 Even**	**62 Even**	265.61	531.22	
			Brickmold Size: 35 Even x 65 Even						
			R.O. : 33 Even x 63 Even						
			LoE 366 Top				4.36	8.72	
			LoE 366 Bottom (.520 Air)				4.36	8.72	
			Argon				8.72	17.44	
			1 1/2" Brickmold, Fin Removed				65.69	131.38	
			Primed Jamb Ext.	White			39.37	78.74	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			KITCHEN						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		388.11	776.22	
6	1271	3	Double Hung Tilt	Espresso	**38 Even**	**74 Even**	379.43	1,138.29	
			Brickmold Size: 41 Even x 77 Even						
			R.O. : 39 Even x 75 Even						
			LoE 366 Top				6.22	18.66	
			Tempered LoE 366 Bottom				102.30	306.90	
			Argon				12.45	37.35	
			1 1/2" Brickmold, Fin Removed				78.02	234.06	
			Primed Jamb Ext.	White			46.75	140.25	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			LIVING ROOM						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		625.17	1,875.51	
7	1271	1	Double Hung Tilt	Espresso	**32 Even**	**74 Even**	322.53	322.53	
			Brickmold Size: 35 Even x 77 Even						
			R.O. : 33 Even x 75 Even						
			Tempered LoE 366 Top (.520 Air)				86.95	86.95	
			Tempered LoE 366 Bottom (.520 Air)				86.95	86.95	
			Argon				10.58	10.58	
			1 1/2" Brickmold, Fin Removed				73.91	73.91	
			Primed Jamb Ext.	White			44.29	44.29	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			STAIRS						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		625.21	625.21	
8	1271	3	Double Hung Tilt	Espresso	**38 Even**	**74 Even**	379.43	1,138.29	
			Brickmold Size: 41 Even x 77 Even						
			R.O. : 39 Even x 75 Even						

Customer Quotation

From
Clarkston Window & Door
151 Cesar E. Chavez Ave.
Pontiac, MI 48342

248-338-6781

Customer
Lewand Building-729 Seward Ave

Ref # 644991
PO #
Date 9/27/2019
Ord Type C35

Line	Mdl	Qty	Description	Color	Width	Height	Unit Cost	Net	Wty
			LoE 366 Top				6.22	18.66	
			Tempered LoE 366 Bottom				102.30	306.90	
			Argon				12.45	37.35	
			1 1/2" Brickmold, Fin Removed				78.02	234.06	
			Primed Jamb Ext.	White			46.75	140.25	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			OWNERS SUITE						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total	625.17	1,875.51
9	1271	1	Double Hung Tilt	Espresso	**38 Even**	**74 Even**	379.43	379.43	
			Brickmold Size: 41 Even x 77 Even						
			R.O. : 39 Even x 75 Even						
			Tempered LoE 366 Top (.520 Air)				102.30	102.30	
			Tempered LoE 366 Bottom (.520 Air)				102.30	102.30	
			Argon				12.45	12.45	
			1 1/2" Brickmold, Fin Removed				78.02	78.02	
			Primed Jamb Ext.	White			46.75	46.75	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			MASTER BATH						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total	721.25	721.25
10	1271	1	Double Hung Tilt	Espresso	**20 Even**	**36 Even**	172.94	172.94	
			Brickmold Size: 23 Even x 39 Even						
			R.O. : 21 Even x 37 Even						
			Tempered LoE 366 Top (.520 Air)				25.57	25.57	
			Tempered LoE 366 Bottom (.520 Air)				25.57	25.57	
			Argon				3.12	3.12	
			1 1/2" Brickmold, Fin Removed				41.07	41.07	
			Primed Jamb Ext.	White			24.61	24.61	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			BATH 2						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total	292.88	292.88
11	1271	1	Double Hung Tilt	Espresso	**42 Even**	**74 Even**	417.38	417.38	
			Brickmold Size: 45 Even x 77 Even						
			R.O. : 43 Even x 75 Even						
			LoE 366 Top				6.84	6.84	
			Tempered LoE 366 Bottom				112.52	112.52	
			Argon				13.69	13.69	
			1 1/2" Brickmold, Fin Removed				82.12	82.12	
			Primed Jamb Ext.	White			49.21	49.21	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			BED 2						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48				Line Item Total	681.76	681.76
12	1271	1	Double Hung Tilt	Espresso	**42 Even**	**74 Even**	417.38	417.38	

Customer Quotation

From
Clarkston Window & Door
151 Cesar E. Chavez Ave.
Pontiac, MI 48342

248-338-6781

Customer
Lewand Building-729 Seward Ave

Ref # 644991
PO #
Date 9/27/2019
Ord Type C35

Line	Mdl	Qty	Description	Color	Width	Height	Unit Cost	Net	Wty
			Brickmold Size: 45 Even x 77 Even						
			R.O. : 43 Even x 75 Even						
			LoE 366 Top				6.84	6.84	
			Tempered LoE 366 Bottom				112.52	112.52	
			Argon				13.69	13.69	
			1 1/2" Brickmold, Fin Removed				82.12	82.12	
			Primed Jamb Ext.	White			49.21	49.21	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			BED 3						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		681.76	681.76	
13	1271	1	Double Hung Tilt	Espresso	**22 Even**	**26 Even**	172.94	172.94	
			Brickmold Size: 25 Even x 29 Even						
			R.O. : 23 Even x 27 Even						
			LoE 366 Top (.520 Air)				1.24	1.24	
			LoE 366 Bottom (.520 Air)				1.24	1.24	
			Argon				2.48	2.48	
			1 1/2" Brickmold, Fin Removed				32.85	32.85	
			Primed Jamb Ext.	White			19.68	19.68	
			Total Jamb Depth?=6.5625						
			Double Hung Full Screen						
			ATTIC						
			ER: 17 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.48		Line Item Total		230.43	230.43	
14	1372	2	Single Slider Lift (L-R)	Espresso	**26 Even**	**24 Even**	139.97	279.94	
			Brickmold Size: 29 Even x 27 Even						
			R.O. : 27 Even x 25 Even						
			LoE 366 Left				1.55	3.10	
			LoE 366 Right				1.55	3.10	
			Argon				3.12	6.24	
			1 1/2" Brickmold, Fin Removed				36.95	73.90	
			Primed Jamb Ext.	White			22.14	44.28	
			Total Jamb Depth?=6.5625						
			Single Slider Screen						
			ATTIC						
			ER: 18 Energy Star Qualified for Zone 1, U: 0.27 SHGC: 0.21 VT: 0.5		Line Item Total		205.28	410.56	

Other Charges

8.0	Field applied wocd for SH/SSL	50.00	400.00

Sub Total	12,240.47
Sales Tax	734.43
Deposit	0.00
Grand Total	12,974.90

Windows Manufactured by North Star Manufacturing (London) Ltd.

By: 6781 on 10/01/19 at 11:33

North Star Brochure

Casement/Awning Series

IMPRESSIVE FEATURES, UNEQUALED PERFORMANCE

Whether you're building a new home or upgrading to today's standards, North Star has an extensive range of quality, energy-efficient and full-featured windows that are not only beautiful, but offer exceptional value.

Standard Features For All Of Our Energy-Efficient Quality Windows

OPTIONAL TRIPLE PANE

The addition of a third glass pane provides a secondary chamber for optimal insulation and comfort. For unparalleled performance and superior energy efficiency, ask for North Star's optional triple pane windows.

1. SUPER SPACER®
The Quanex Premium Super Spacer between glass panes resists condensation, reduces noise and boosts R-values by up to 30%.

3. FUSION WELDED
The corners on all North Star frames and sashes are fusion welded for added strength and a perfect seal.

Quality Options and Accessories

VIRTUALLY MAINTENANCE-FREE EXTERIORS

Pilkington Activ™ Self-Cleaning Glass is available in every North Star window.

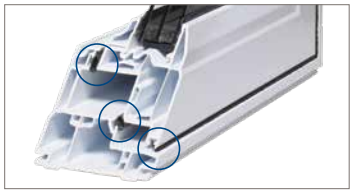
This optional self-cleaning glass features a unique treatment that allows the glass to break down organic dirt that collects on the surface. Dirt then washes away with the next rain.

STYLISH ACCESSORIES

North Star offers a range of accessory options, including wood or vinyl jamb extensions which make a seamless transition from the window frame to your interior finish. Exterior accessories include brickmold with built in siding J-channel and nail fins for ease of installation, and a weather-tight seal to the outdoors.

SEALS OUT THE WEATHER

Long lasting protection against water and air infiltration is a benefit of Triple Weatherstripping in our casement and awning windows.



North Star Brochure

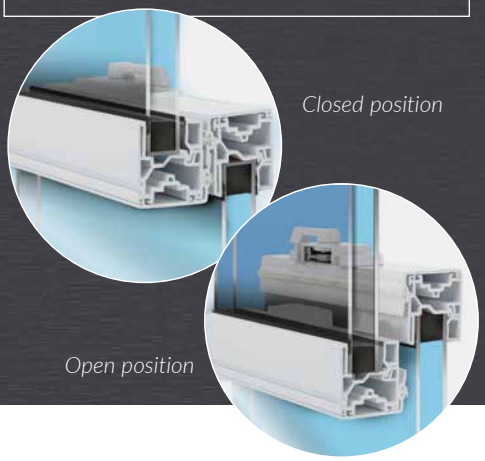
Single/Double Hung Series

A more energy efficient glass product will improve your home's energy performance in every season, so you'll save energy – and money – year-round.

2. ENERGY ADVANTAGE™ LOW-E Energy Advantage Low-e is a high performance, energy-efficient glass that features a near-invisible coating that reduces the amount of heat lost while letting in light. Where solar heat gain protection is required, LoE366 upgrade is available.

4. ENERGY EFFICIENT EXTRUSIONS North Star's multi-chambered vinyl extrusions save energy and money, resist warping, cracking and peeling.

INTERLOCK
Interlocking meeting rail design adds strength and durability while keeping out air and water.



Closed position

Open position

POCKET SILL
Standard pocket sill for maximum energy efficiency. This proven design with four weatherstrip contacts ensures wind and water remain outside

Open position

Closed position

Our products are tested and certified by Energy Star and comply with American Architectural Manufacturers Association (AAMA) standards. We're so confident in our windows and doors that we back them with a transferable, limited lifetime warranty.

Learn more at:
energystar.gc.ca (Canada) ***energystar.gov (USA)***

Built in Canada

ENVIRO MADE™

ENERGY STAR HIGH EFFICIENCY HAUTE EFFICACITÉ

REPORT

Clarkston Window and Door
Address: 151 Cesar E Chavez Ave

PONTIAC, MI 48342
Phone: 2483386781
Fax: 2483388167

Quote

Quote Number: **Date:** 9/27/2019

Customer Information

Name: Lewand Building-Seward
Address: 729 Seward Ave
Phone 1:
Phone 2:
Fax:
Contact:

Job Name:

Specifications

U.D. = 33-1/2" x 81-5/8"; R.O. = 34-1/4" x 82"

O.M. Of Exterior Trim = 36" x 82-7/8"

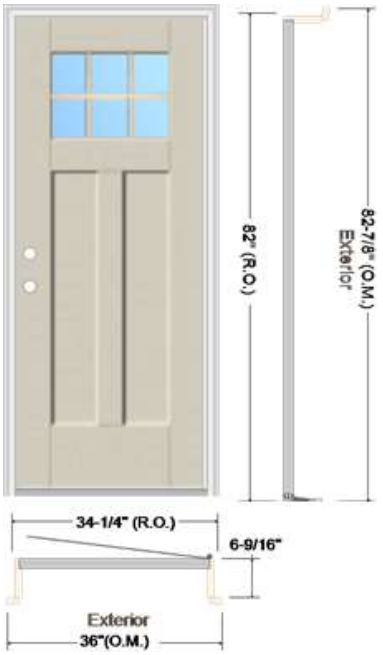


Image is viewed from Exterior!

Lead Time: Special Order

Comment: Entry

Item Description	Qty	Price	Extended
2' 8" x 6' 8" S4816-SDLF1LE Smooth-Star Shaker-Style Fiberglass Door w/Simulated Divided Lite Low E Glass - Right Hand Inswing (Flat 1-1/8" SDL)	1	706.12	$706.12
2-3/8" Backset - Double Bore (2-1/8" Dia. Bore w/Standard 5-1/2" Spacing) w/Faceplate Lockset Latch Prep w/Standard Strike Prep w/Deadbolt Kwikset 1" x 2-1/4" Strike Prep	1	11.88	$11.88
Set of Ball Bearing - Oil Rubbed Bronze Hinges	1	17.82	$17.82
Primed Dura-Frame - 6-9/16" Jamb w/Dura-Frame Brickmould Exterior Trim (Applied) w/(1)Oil Rubbed Bronze Adjustable Security Strike Plate (for Lockset only)	1	37.87	$37.87
Bronze Compression Weatherstrip	1	0.00	$0.00
Tru-Defense Composite Adj. w/Dark Cap - Satin Nickel Sill	1	20.79	$20.79
Item Total			**$794.48**

Front Door

REPORT

Clarkston Window and Door
Address: 151 Cesar E Chavez Ave

PONTIAC, MI 48342
Phone: 2483386781
Fax: 2483388167

Quote

Quote Number: **Date:** 9/27/2019

Customer Information

Name: Lewand Building-Seward
Address: 729 Seward Ave
Phone 1:
Phone 2:
Fax:
Contact:

Job Name:

Specifications

U.D. = 33-1/2" x 81-5/8"; R.O. = 34-1/4" x 82"

O.M. Of Exterior Trim = 36" x 82-7/8"

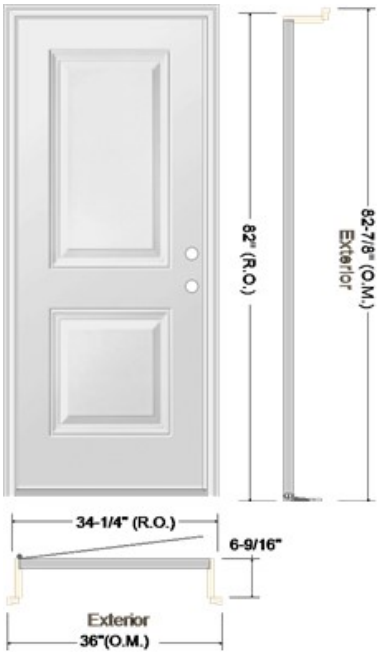


Image is viewed from Exterior!

Lead Time: Special Order

Comment: Back Door & Others

Item Description	Qty	Price	Extended
2' 8" x 6' 8" 978HD Profiles High Definition Steel Door - Left Hand Inswing	3	265.07	$795.21
2-3/8" Backset - Double Bore (2-1/8" Dia. Bore w/Standard 5-1/2" Spacing) w/Faceplate Lockset Latch Prep w/Standard Strike Prep w/No Deadbolt Strike Prep	3	6.68	$20.04
Set of Standard - Oil Rubbed Bronze Hinges	3	13.36	$40.08
Primed Dura-Frame - 6-9/16" Jamb w/Dura-Frame Brickmould Exterior Trim (Applied) w/(1)Oil Rubbed Bronze Adjustable Security Strike Plate (for Lockset only)	3	37.87	$113.61
Bronze Compression Weatherstrip	3	0.00	$0.00
Tru-Defense Composite Adj. w/Dark Cap - Satin Nickel Sill	3	20.79	$62.37
Item Total			**$1,031.31**

All exterior doors except Front door

Order Sub Total:	**$1,825.79**
Tax:	**$109.55**
Order Total:	**$1,935.34**

THERMA-TRU DOORS

Version #: 2.42-O
Version Date: 8/14/2019

SPECIFICATIONS

AWARDS & RECOGNITION	Good Housekeeping Rated
DIMENSIONS (SP)	13 1/4" x 39 3/8"(336.55 mm x 1 m)
STAINGUARD®	Yes
ALGAE STAIN PROTECTION	StainGuard
APPROX. NAILS/SQ	256
$ - $$$$	$$$
DURABILITY & TOUGHNESS	Advanced Protection® Shingle with GAF Dura Grip™ Adhesive
EXPOSURE	5 5/8" (144 mm)
FIRE RATING	Highest Rating - Class A
MATERIAL	Fiberglass Asphalt Construction
WIND WARRANTY	130 mph
WIND RATING	130 mph
SHINGLE STYLE	Wood-Shake Look
SHINGLE TYPE	Architectural Shingles

REPORT

COLOR SYSTEM B

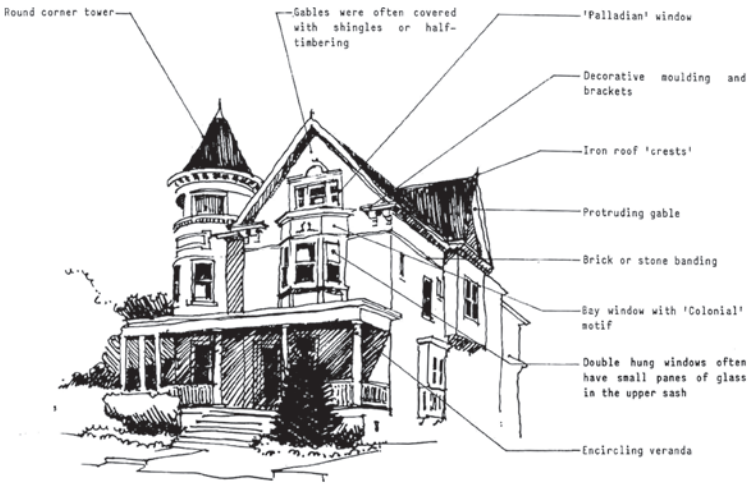
ASSOCIATED ARCHITECTURAL STYLES: (2) ITALIANATE, (3) SECOND EMPIRE, (4) GOTHIC REVIVAL, (5) STICK, (6) SHINGLE, (7) EASTLAKE, (8) QUEEN ANNE, (9) ROMANESQUE REVIVAL, (10) QUEEN ANNE/ROMANESQUE, (11) FRENCH RENAISSANCE, (12) COMPOSITE VICTORIAN

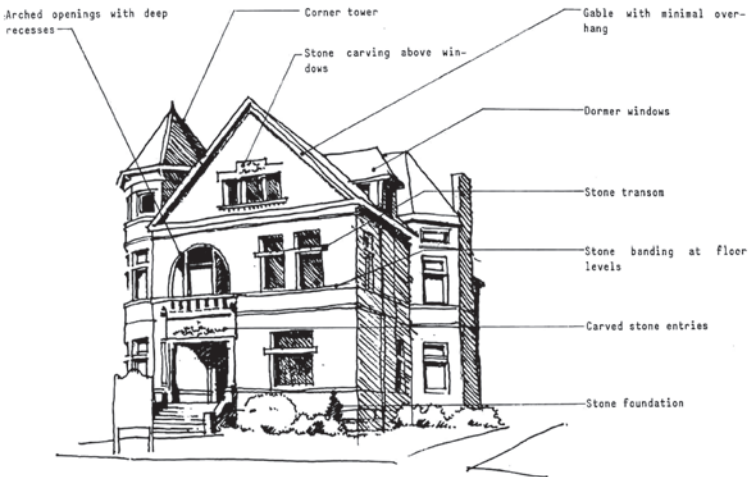
The explosion of styles in the High and Late Victorian periods required a deeper palette of colors to unify the diverse elements of these designs and to highlight the variety of materials and textures used by Detroit's architects and builders. At the same time, paint manufacturers such as the Acme White Lead Works in Detroit and other national firms with a strong market in the region, such as the Sherwin Williams Company, developed ready-mixed paints in resealable cans in every-richer and darker colors. Deep olives, browns, and greens in a wide variety of shades became readily available for the first time. While the light colors of the mid-century were manufactured throughout the High and Late Victorian periods (and consequently could, historically, be used on the later styles), the lighter colors were generally used on simple frame buildings. The more imposing High and Late Victorian structures, especially when erected of brick or stone, require the darker colors to bring out their best features, particularly the window frames and sash which almost universally were painted darker than the main body color to make the windows appear to recede into the facade.

The trim color for masonry buildings of this period should always be selected with the color of the brick or stone in mind. Because the natural materials have already determined the overall body color of the house - red, brown, or yellow brick, green or gray stone, for example - the trim color should tend towards the earth tones: browns, yellows, greens, olives, and grays. Modern pastels, especially pale yellows, blues, and pinks, simply are historically incorrect. Occasionally black was suggested as a sash color to provide contrast to one of the browns or greens used for the window frames. This was a logical consequence of trimming a brick or stone building in a color darker than the masonry and then seeking an even darker color for the sash.

If the structure has stone detailing (above windows and doors, for example) it would be appropriate to paint the cornice or porch a color that matches the stone, selecting a darker color for the window frames and sash. If the structure has iron crestings, railings, or brackets they should be painted black, dark brown, or green. Often such details were painted to look like weathered bronze.

Shingle Style houses or those with shingles in the gables pose a special problem. Normally it was recommended that these surfaces be stained, although most surviving examples have long since been painted. The colors of this stain (or, if repainting, the paint) should follow the colors given, with the darker greens, olives, browns and yellows (in that order) being the most popular.





COLOR SYSTEM B

ACCEPTABLE COLOR COMBINATIONS *MS = MUNSELL STANDARD

BODY	TRIM	SASH	CORNICE/ PORCH	IRON CRESTING
Any System B Color ***EXCEPT*** A:7, A:8, A:9, B:19	Any System B Color	Match trim color or A:9, B:12, B:18, B:19	Match trim color or stone detailing	A:8, B:8, B:11 or B:19
Shingles: Stained or painted any System B Color ***ESPECIALLY*** Dark Greens, Olives, Browns and Yellows ***EXCEPT*** A:7, A:8, B:19	Any System B Color	Match trim color or A:9, B:12, B:18, B:19	Match trim color or stone detailing	A:8, B:8, B:11 or B:19
Existing brick or stone	Any System B Color darker than the brick or stone body, ***ESPECIALLY*** B:6, B:8, B:11, B:18	Match trim color or A:9, B:12, B:18, B:19	Match trim color or stone detailing	A:8, B:8, B:11 or B:19

A:7 Bluish Gray
MS: 10B 5/1

A:8 Blackish Green
MS: 2.5BG 2/2

A:9 Moderate Reddish Brown
MS: 7.5R 3/6

B:1 Light Yellowish Brown
MS: 10YR 6/4

B:2 Dark Yellow
MS: 5Y 6/6

B:3 Light Yellow
MS: 2.5Y 8/6

B:4 Moderate Yellow
MS: 2.5Y 7/6

B:5 Light Brown
MS: 7.5YR 5/4

B:6 Moderate Brown
MS: 7.5YR 4/4

B:7 Moderate Yellowish Brown
MS: 10YR 5/4

B:8 Grayish Brown
MS: 5YR 3/2

B:9 Moderate Yellow Green
MS: 2.5GY 6/4

B:10 Grayish Green
MS: 10G 5/2

B:11 Grayish Olive Green
MS: 5GY 4/2

B:12 Grayish Green
MS: 10G 4/2

B:13 Moderate Olive Brown
MS: 2.5Y 4/4

B:14 Dark Grayish Olive
MS: 10Y 2/2

B:15 Dark Grayish Yellow
MS: 5Y 6/4

B:16 Light Grayish Olive
MS: 7.5Y 6/2

B:17 Light Olive
MS: 10Y 5/4

B:18 Dark Reddish Brown
MS: 2.5YRG 2/4

B:19 Black
MS: N 0.5/

FIND OUT MORE!
www.detroitmi.gov/hdc

STANDARDS FOR REHABILITATION & GUIDELINES FOR REHABILITATING HISTORIC BUILDINGS

Rehabilitation

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will 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 elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

GUIDELINES FOR REHABILITATING HISTORIC BUILDINGS

INTRODUCTION

In **Rehabilitation,** historic building materials and character-defining features are protected and maintained as they are in the treatment Preservation. However, greater latitude is given in the **Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings** to replace extensively deteriorated, damaged, or missing features using either the same material or compatible substitute materials. Of the four treatments, only **Rehabilitation** allows alterations and the construction of a new addition, if necessary for a continuing or new use for the historic building.

Identify, Retain, and Preserve Historic Materials and Features

The guidance for the treatment **Rehabilitation** begins with recommendations to identify the form and detailing of those architectural materials and features that are important in defining the building's historic character and which must be retained to preserve that character. Therefore, guidance on ***identifying, retaining, and preserving*** character-defining features is always given first.

Protect and Maintain Historic Materials and Features

After identifying those materials and features that are important and must be retained in the process of **Rehabilitation** work, then ***protecting and maintaining*** them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. Protection includes the maintenance of historic materials and features as well as ensuring that the property is protected before and during rehabilitation work. A historic building undergoing rehabilitation will often require more extensive work. Thus, an overall evaluation of its physical condition should always begin at this level.

Repair Historic Materials and Features

Next, when the physical condition of character-defining materials and features warrants additional work, ***repairing*** is recommended. **Rehabilitation** guidance for the repair of historic materials, such as masonry, again begins with the least degree of intervention possible. In rehabilitation, repairing also includes the limited replacement in kind or with a compatible substitute material of extensively deteriorated or missing components of features when there are surviving prototypes features that can be substantiated by documentary and physical evidence. Although using the same kind of material is always the preferred option, a substitute material may be an acceptable alternative if the form, design, and scale, as well as the substitute material itself, can effectively replicate the appearance of the remaining features.

Replace Deteriorated Historic Materials and Features

Following repair in the hierarchy, **Rehabilitation** guidance is provided for ***replacing*** an entire character-defining feature with new material because the level of deterioration or damage of materials precludes repair. If the missing feature is character defining or if it is critical to the survival of the building (e.g., a roof), it should be replaced to match the historic feature based on physical or his-

toric documentation of its form and detailing. As with repair, the preferred option is always replacement of the entire feature in kind (i.e., with the same material, such as wood for wood). However, when this is not feasible, a compatible substitute material that can reproduce the overall appearance of the historic material may be considered.

It should be noted that, while the National Park Service guidelines recommend the replacement of an entire character-defining feature that is extensively deteriorated, the guidelines never recommend removal and replacement with new material of a feature that could reasonably be repaired and, thus, preserved.

Design for the Replacement of Missing Historic Features

When an entire interior or exterior feature is missing, such as a porch, it no longer plays a role in physically defining the historic character of the building unless it can be accurately recovered in form and detailing through the process of carefully documenting the historic appearance. If the feature is not critical to the survival of the building, allowing the building to remain without the feature is one option. But if the missing feature is important to the historic character of the building, its replacement is always recommended in the **Rehabilitation** guidelines as the first, or preferred, course of action. If adequate documentary and physical evidence exists, the feature may be accurately reproduced. A second option in a rehabilitation treatment for replacing a missing feature, particularly when the available information about the feature is inadequate to permit an accurate reconstruction, is to ***design*** a new feature that is compatible with the overall historic character of the building. The new design should always take into account the size, scale, and material of the building itself and should be clearly differentiated from the authentic historic features. For properties that have changed over time, and where those changes have acquired significance, reestablishing missing historic features generally should not be undertaken if the missing features did not coexist with the features currently on the building. Juxtaposing historic features that did not exist concurrently will result in a false sense of the building's history.

Alterations

Some exterior and interior alterations to a historic building are generally needed as part of a **Rehabilitation** project to ensure its continued use, but it is most important that such alterations do not radically change, obscure, or destroy character-defining spaces, materials, features, or finishes. Alterations may include changes to the site or setting, such as the selective removal of buildings or other features of the building site or setting that are intrusive, not character defining, or outside the building's period of significance.

Code-Required Work: Accessibility and Life Safety

Sensitive solutions to meeting code requirements in a **Rehabilitation** project are an important part of protecting the historic character of the building. Work that must be done to meet accessibility and life-safety requirements must also be assessed for its potential impact on the historic building, its site, and setting.

Resilience to Natural Hazards

Resilience to natural hazards should be addressed as part of a **Rehabilitation** project. A historic building may have existing characteristics or features that help to address or minimize the impacts of natural hazards. These should always be used to best advantage when considering new adaptive treatments so as to have the least impact on the historic character of the building, its site, and setting.

Sustainability

Sustainability should be addressed as part of a **Rehabilitation** project. Good preservation practice is often synonymous with sustainability. Existing energy-efficient features should be retained and repaired. Only sustainability treatments should be considered that will have the least impact on the historic character of the building.

The topic of sustainability is addressed in detail in *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings.*

New Exterior Additions and Related New Construction

Rehabilitation is the only treatment that allows expanding a historic building by enlarging it with an addition. However, the **Rehabilitation** guidelines emphasize that new additions should be considered only after it is determined that meeting specific new needs cannot be achieved by altering non-character-defining interior spaces. If the use cannot be accommodated in this way, then an attached exterior addition may be considered. New additions should be designed and constructed so that the character-defining features of the historic building, its site, and setting are not negatively impacted. Generally, a new addition should be subordinate to the historic building. A new addition should be compatible, but differentiated enough so that it is not confused as historic or original to the building. The same guidance applies to new construction so that it does not negatively impact the historic character of the building or its site.

Rehabilitation as a Treatment. *When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular time is not appropriate, Rehabilitation may be considered as a treatment. Prior to undertaking work, a documentation plan for Rehabilitation should be developed.*

MASONRY: STONE, BRICK, TERRA COTTA, CONCRETE, ADOBE, STUCCO, AND MORTAR

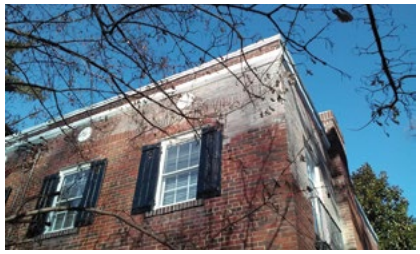
RECOMMENDED	NOT RECOMMENDED
Identifying, retaining and preserving masonry features that are important in defining the overall historic character of the building (such as walls, brackets, railings, cornices, window and door surrounds, steps, and columns) and decorative ornament and other details, such as tooling and bonding patterns, coatings, and color.	Removing or substantially changing masonry features which are important in defining the overall historic character of the building so that, as a result, the character is diminished. Replacing or rebuilding a major portion of exterior masonry walls that could be repaired, thereby destroying the historic integrity of the building. Applying paint or other coatings (such as stucco) to masonry that has been historically unpainted or uncoated to create a new appearance. Removing paint from historically-painted masonry.
Protecting and maintaining masonry by ensuring that historic drainage features and systems that divert rainwater from masonry surfaces (such as roof overhangs, gutters, and downspouts) are intact and functioning properly.	Failing to identify and treat the causes of masonry deterioration, such as leaking roofs and gutters or rising damp.
Cleaning masonry only when necessary to halt deterioration or remove heavy soiling.	Cleaning masonry surfaces when they are not heavily soiled to create a "like-new" appearance, thereby needlessly introducing chemicals or moisture into historic materials.
Carrying out masonry cleaning tests when it has been determined that cleaning is appropriate. Test areas should be examined to ensure that no damage has resulted and, ideally, monitored over a sufficient period of time to allow long-range effects to be predicted.	Cleaning masonry surfaces without testing or without sufficient time for the testing results to be evaluated.

[1] An alkaline-based product is appropriate to use to clean historic marble because it will not damage the marble, which is acid sensitive.

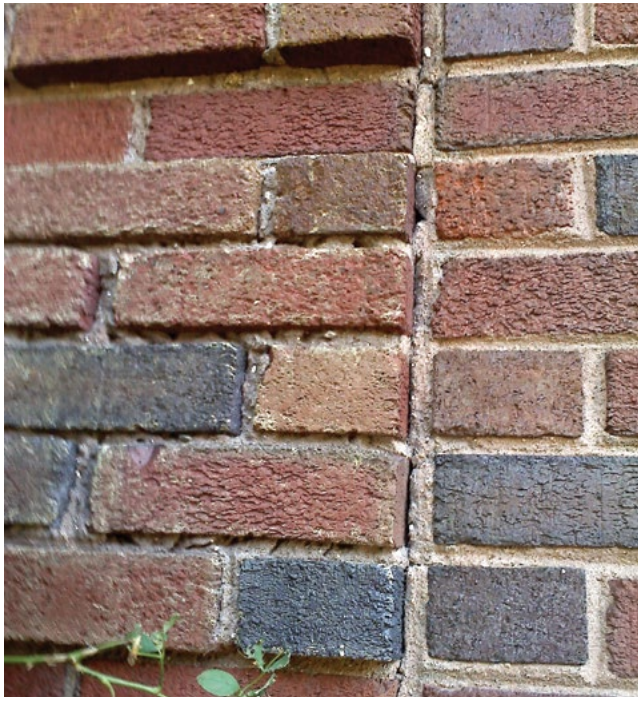
[2] Mid-century modern building technology made possible the form of this parabola-shaped structure and its thin concrete shell construction. Built in 1961 as the lobby of the La Concha Motel in Las Vegas, it was designed by Paul Revere Williams, one of the first prominent African-American architects. It was moved to a new location and rehabilitated to serve as the Neon Museum, and is often cited as an example of Googie architecture. *Credit: Photographed with permission at The Neon Museum, Las Vegas, Nevada.*

MASONRY: STONE, BRICK, TERRA COTTA, CONCRETE, ADOBE, STUCCO, AND MORTAR

RECOMMENDED	NOT RECOMMENDED
Cleaning soiled masonry surfaces with the gentlest method possible, such as using low-pressure water and detergent and natural bristle or other soft-bristle brushes.	Cleaning or removing paint from masonry surfaces using most abrasive methods (including sandblasting, other media blasting, or high-pressure water) which can damage the surface of the masonry and mortar joints. Using a cleaning or paint-removal method that involves water or liquid chemical solutions when there is any possibility of freezing temperatures. Cleaning with chemical products that will damage some types of masonry (such as using acid on limestone or marble), or failing to neutralize or rinse off chemical cleaners from masonry surfaces.



[3] **Not Recommended:** The white film on the upper corner of this historic brick row house is the result of using a scrub or slurry coating, rather than traditional repointing by hand, which is the recommended method.



[4] **Not Recommended:** The quoins on the left side of the photo show that high-pressure abrasive blasting used to remove paint can damage even early 20th-century, hard-baked, textured brick and erode the mortar, whereas the same brick on the right, which was not abrasively cleaned, is undamaged.

MASONRY: STONE, BRICK, TERRA COTTA, CONCRETE, ADOBE, STUCCO, AND MORTAR

RECOMMENDED	NOT RECOMMENDED
Using biodegradable or environmentally-safe cleaning or paint-removal products.	
Using paint-removal methods that employ a poultice to which paint adheres, when possible, to neatly and safely remove old lead paint.	
Using coatings that encapsulate lead paint, when possible, where the paint is not required to be removed to meet environmental regulations.	
Allowing only trained conservators to use abrasive or laser-cleaning methods, when necessary, to clean hard-to-reach, highly-carved, or detailed decorative stone features.	
Removing damaged or deteriorated paint only to the next sound layer using the gentlest method possible (e.g., hand scraping) prior to repainting.	Removing paint that is firmly adhered to masonry surfaces, unless the building was unpainted historically and the paint can be removed without damaging the surface.
Applying compatible paint coating systems to historically-painted masonry following proper surface preparation.	Failing to follow manufacturers' product and application instructions when repainting masonry features.
Repainting historically-painted masonry features with colors that are appropriate to the historic character of the building and district.	Using paint colors on historically-painted masonry features that are not appropriate to the historic character of the building and district.
Protecting adjacent materials when cleaning or removing paint from masonry features.	Failing to protect adjacent materials when cleaning or removing paint from masonry features.
Evaluating the overall condition of the masonry to determine whether more than protection and maintenance, such as repairs to masonry features, will be necessary.	Failing to undertake adequate measures to ensure the protection of masonry features.
Repairing masonry by patching, splicing, consolidating, or otherwise reinforcing the masonry using recognized preservation methods. Repair may include the limited replacement in kind or with a compatible substitute material of those extensively deteriorated or missing parts of masonry features when there are surviving prototypes, such as terra-cotta brackets or stone balusters.	Removing masonry that could be stabilized, repaired, and conserved, or using untested consolidants and unskilled personnel, potentially causing further damage to historic materials. Replacing an entire masonry feature, such as a cornice or balustrade, when repair of the masonry and limited replacement of deteriorated or missing components are feasible.

MASONRY: STONE, BRICK, TERRA COTTA, CONCRETE, ADOBE, STUCCO, AND MORTAR

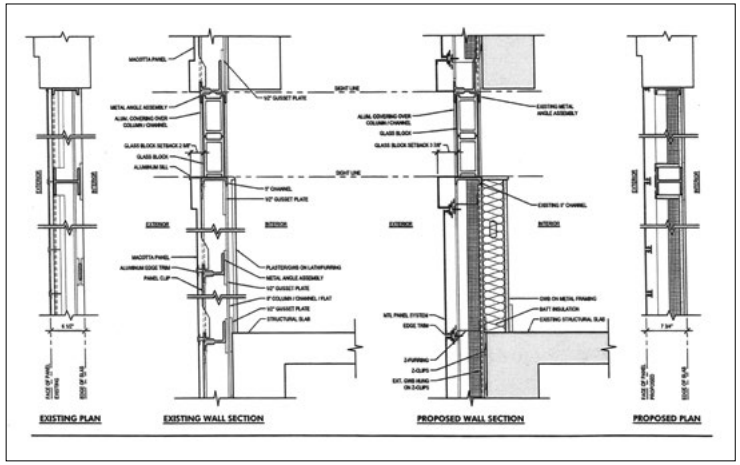
RECOMMENDED	NOT RECOMMENDED
Repairing masonry walls and other masonry features by repointing the mortar joints where there is evidence of deterioration, such as disintegrating mortar, cracks in mortar joints, loose bricks, or damaged plaster on the interior.	Removing non-deteriorated mortar from sound joints and then repointing the entire building to achieve a more uniform appearance.
Removing deteriorated lime mortar carefully by hand raking the joints to avoid damaging the masonry.	
Using power tools only on horizontal joints on brick masonry in conjunction with hand chiseling to remove hard mortar that is deteriorated or that is a non-historic material which is causing damage to the masonry units. Mechanical tools should be used only by skilled masons in limited circumstances and generally not on short, vertical joints in brick masonry.	Allowing unskilled workers to use masonry saws or mechanical tools to remove deteriorated mortar from joints prior to repointing.
Duplicating historic mortar joints in strength, composition, color, and texture when repointing is necessary. In some cases, a lime-based mortar may also be considered when repointing Portland cement mortar because it is more flexible.	Repointing masonry units with mortar of high Portland cement content (unless it is the content of the historic mortar). Using "surface grouting" or a "scrub" coating technique, such as a "sack rub" or "mortar washing," to repoint exterior masonry units instead of traditional repointing methods. Repointing masonry units (other than concrete) with a synthetic caulking compound instead of mortar.
Duplicating historic mortar joints in width and joint profile when repointing is necessary.	Changing the width or joint profile when repointing.
Repairing stucco by removing the damaged material and patching with new stucco that duplicates the old in strength, composition, color, and texture.	Removing sound stucco or repairing with new stucco that is different in composition from the historic stucco. Patching stucco or concrete without removing the source of deterioration. Replacing deteriorated stucco with synthetic stucco, an exterior finish and insulation system (EFIS), or other non-traditional materials.

MASONRY: STONE, BRICK, TERRA COTTA, CONCRETE, ADOBE, STUCCO, AND MORTAR

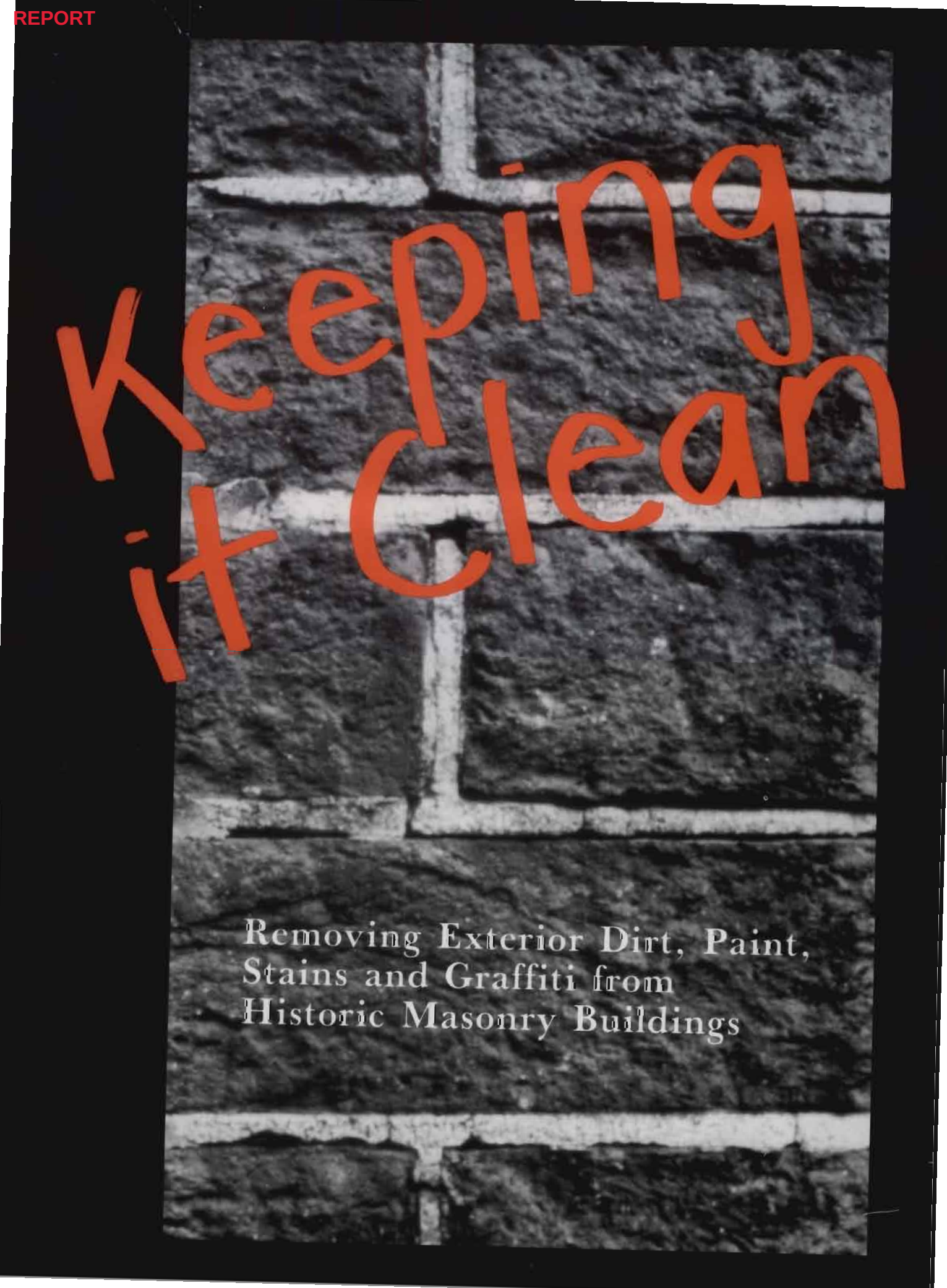
RECOMMENDED	NOT RECOMMENDED
Using mud plaster or a compatible lime-plaster adobe render, when appropriate, to repair adobe.	Applying cement stucco, unless it already exists, to adobe.
Sealing joints in concrete with appropriate flexible sealants and backer rods, when necessary.	
Cutting damaged concrete back to remove the source of deterioration, such as corrosion on metal reinforcement bars. The new patch must be applied carefully so that it will bond satisfactorily with and match the historic concrete.	Patching damaged concrete without removing the source of deterioration.

[5] Rebars in the reinforced concrete ceiling have rusted, causing the concrete to spall. The rebars must be cleaned of rust before the concrete can be patched.

[6] Some areas of the concrete brise soleil screen on this building constructed in 1967 are badly deteriorated. If the screen cannot be repaired, it may be replaced in kind or with a composite substitute material with the same appearance as the concrete.



[7] (a) J.W. Knapp's Department Store, built 1937-38, in Lansing, MI, was constructed with a proprietary material named "Maul Macotta" made of enameled steel and cast-in-place concrete panels. Prior to its rehabilitation, a building inspection revealed that, due to a flaw in the original design and construction, the material was deteriorated beyond repair. The architects for the rehabilitation project devised a replacement system (b) consisting of enameled aluminum panels that matched the original colors (c). Photos and drawing (a-b): Quinn Evans Architects; *Photo (c): James Haefner Photography.*



Keeping it Clean

Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings

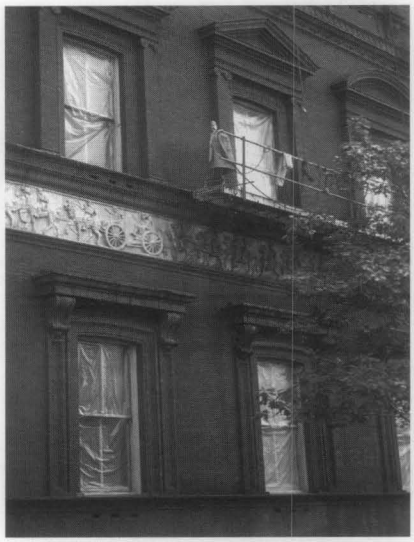
1 PRESERVATION BRIEFS

Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings

Robert C. Mack, AIA
Anne Grimmer

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

Heritage Preservation Services



Inappropriate cleaning and coating treatments are a major cause of damage to historic masonry buildings. While either or both treatments may be appropriate in some cases, they can be very destructive to historic masonry if they are not selected carefully. Historic masonry, as considered here, includes stone, brick, architectural terra cotta, cast stone, concrete and concrete block. It is frequently cleaned because cleaning is equated with improvement. Cleaning may sometimes be followed by the application of a water-repellent coating. However, unless these procedures are carried out under the guidance and supervision of an architectural conservator, they may result in irrevocable damage to the historic resource.

The purpose of this Brief is to provide information on the variety of cleaning methods and materials that are available for use on the *exterior* of historic masonry buildings, and to provide guidance in selecting the most appropriate method or combination of methods. The difference between water-repellent coatings and waterproof coatings is explained, and the purpose of each, the suitability of their application to historic masonry buildings, and the possible consequences of their inappropriate use are discussed.

The Brief is intended to help develop sensitivity to the qualities of historic masonry that makes it so special, and to assist historic building owners and property managers in working cooperatively with architects, architectural conservators and contractors (Fig. 1). Although specifically intended for historic buildings, the information is applicable to all masonry buildings. This publication updates and expands *Preservation Brief 1: The Cleaning and Waterproof Coating of Masonry Buildings.* The Brief is not meant to be a cleaning manual or a guide for preparing specifications. Rather, it provides general information to raise awareness of the many factors involved in selecting cleaning and water-repellent treatments for historic masonry buildings.

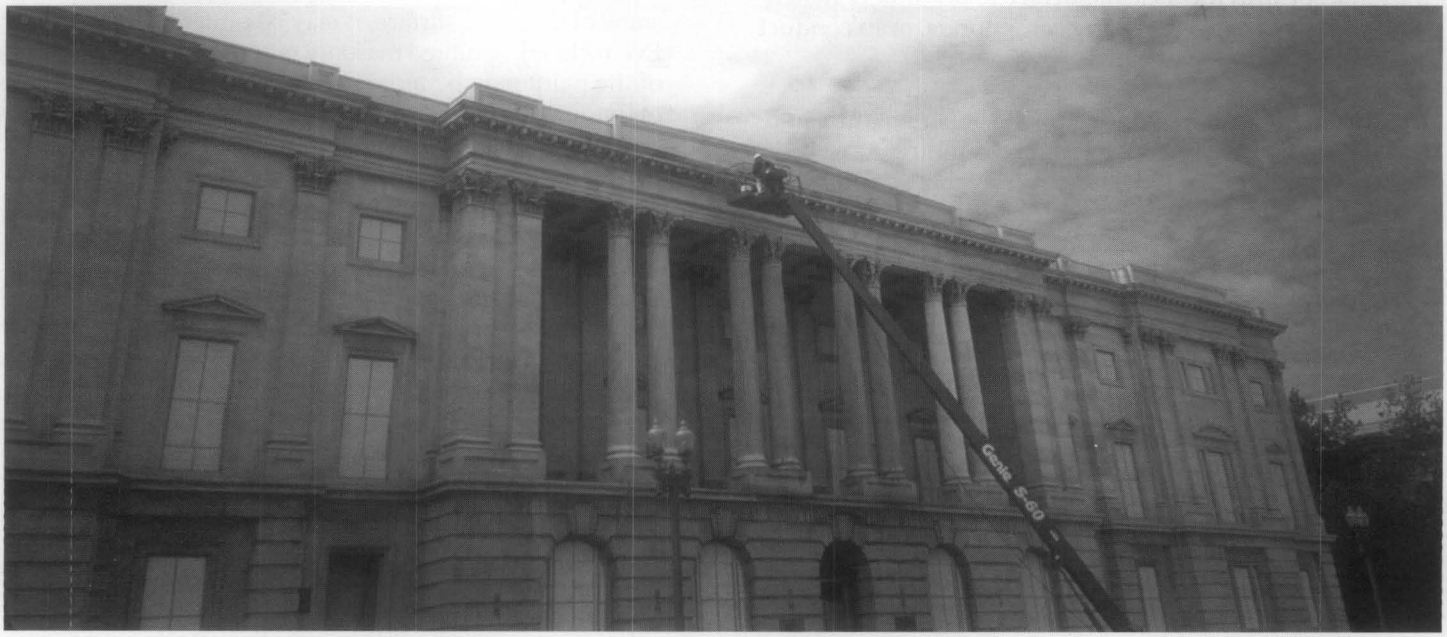


Figure 1. Low-to medium-pressure steam (hot-pressurized water washing), is being used to clean the exterior of the U.S. Tariff Commission Building, the first marble building constructed in Washington, D.C., in 1839. This method was selected by an architecural conservator as the "gentlest means possible" to clean the marble. Steam can soften heavy soiling deposits such as those on the cornice and column capitals, and facilitate easy removal. Note how these deposits have been removed from the right side of the cornice which has already been cleaned.

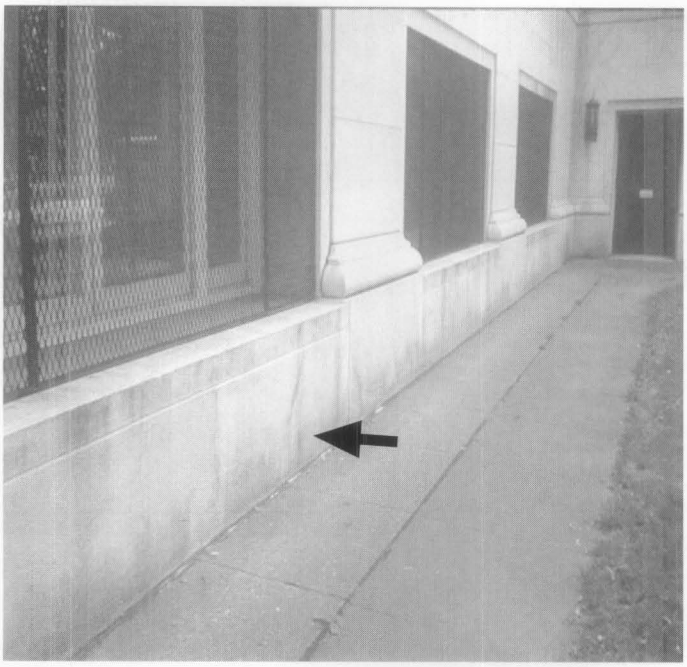


Figure 2. Biological growth as shown on this marble foundation can usually be removed using a low-pressure water wash, possibly with a non-ionic detergent added to it, and scrubbing with a natural or synthetic bristle brush.

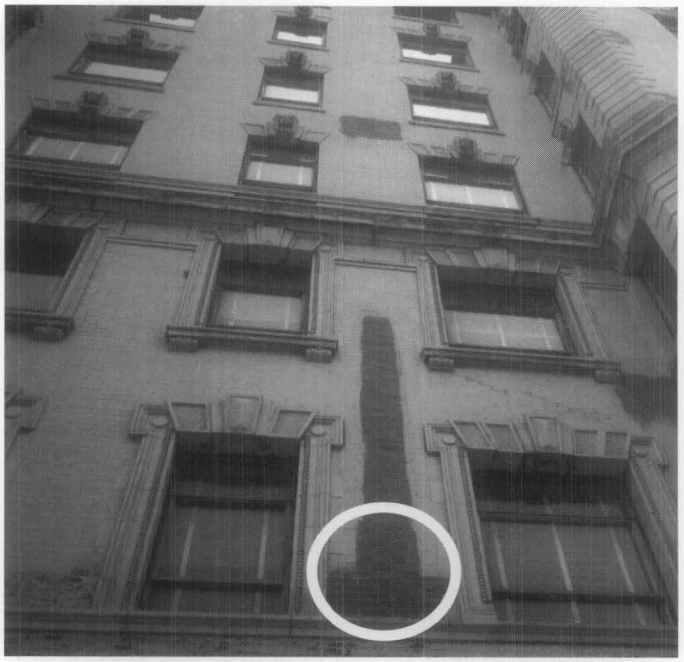


Figure 3. This small test area has revealed a red brick patch that does not match the original beige brick. This may explain why the building was painted, and may suggest to the owner that it may be preferable to keep it painted.

Preparing for a Cleaning Project

Reasons for cleaning. First, it is important to determine whether it is appropriate to clean the masonry. The objective of cleaning a historic masonry building must be considered carefully before arriving at a decision to clean. There are several major reasons for cleaning a historic masonry building: **improve the appearance of the building** by removing unattractive dirt or soiling materials, or non-historic paint from the masonry; **retard deterioration** by removing soiling materials that may be damaging the masonry; or **provide a clean surface** to accurately match repointing mortars or patching compounds, or to conduct a condition survey of the masonry.

Identify what is to be removed. The general nature and source of dirt or soiling material on a building must be identified to remove it in the *gentlest means possible* — that is, in the most effective, yet least harmful, manner. Soot and smoke, for example, require a different cleaning agent to remove than oil stains or metallic stains. Other common cleaning problems include biological growth such as mold or mildew, and organic matter such as the tendrils left on masonry after removal of ivy (Fig. 2).

Consider the historic appearance of the building. If the proposed cleaning is to remove paint, it is important in each case to learn whether or not unpainted masonry is historically appropriate. And, it is necessary to consider why the building was painted (Fig. 3). Was it to cover bad repointing or unmatched repairs? Was the building painted to protect soft brick or to conceal deteriorating stone? Or, was painted masonry simply a fashionable treatment in a particular historic period? Many buildings were painted at the time of construction or shortly thereafter; retention of the paint, therefore, may be more appropriate historically than removing it. And, if the building appears to have been painted for a long time, it is also important to think about whether the paint is part of the character of the historic building and if it has acquired significance over time.

Consider the practicalities of cleaning or paint removal. Some gypsum or sulfate crusts may have become integral with the stone and, if cleaning could result in removing some of the stone surface, it may be preferable not to clean. Even where unpainted masonry is appropriate, the retention of the paint may be more practical than removal in terms of long range preservation of the masonry. In some cases, however, removal of the paint may be desirable. For example, the old paint layers may have built up to such an extent that removal is necessary to ensure a sound surface to which the new paint will adhere.

Study the masonry. Although not always necessary, in some instances it can be beneficial to have the coating or paint type, color, and layering on the masonry researched before attempting its removal. Analysis of the nature of the soiling or of the paint to be removed from the masonry, as well as guidance on the appropriate cleaning method, may be provided by professional consultants, including architectural conservators, conservation scientists and preservation architects. The State Historic Preservation Office (SHPO), local historic district commissions, architectural review boards and preservation-oriented websites may also be able to supply useful information on masonry cleaning techniques.

Understanding the Building Materials

The construction of the building must be considered when developing a cleaning program because inappropriate cleaning can have a deleterious effect on the masonry as well as on other building materials. The masonry material or materials must be correctly identified. It is sometimes difficult to distinguish one type of stone from another; for example, certain sandstones can be easily confused with limestones. Or, what appears to be natural stone may not be stone at all, but cast stone or concrete. Historically, cast stone and architectural terra cotta were frequently used in combination with natural stone, especially for trim elements or on upper stories of a building where, from a distance, these substitute materials looked like real stone (Fig. 4). Other features on historic buildings that appear to be stone, such as decorative cornices, entablatures and window hoods, may not even be masonry, but metal.

Identify prior treatments. Previous treatments of the building and its surroundings should be researched and building maintenance records should be obtained, if available. Sometimes if streaked or spotty areas do not seem to get cleaner following an initial cleaning, closer inspection and analysis may be warranted. The discoloration may turn out not to be dirt but the remnant of a water-repellent coating applied long ago which has darkened the surface of the masonry over time (Fig. 5). Successful removal may require testing several cleaning agents to find something that will dissolve and remove the coating. Complete removal may not always be possible. Repairs may have been stained to match a dirty building, and cleaning may make these differences apparent. De-icing salts used near the building that have dissolved can migrate into the masonry. Cleaning may draw the salts to the surface, where they will appear as efflorescence (a powdery, white substance), which may require a second treatment to be removed. Allowances for dealing with such unknown factors, any of which can be a potential problem, should be included when investigating cleaning methods and materials. Just as more than one kind of masonry on a historic building may necessitate multiple cleaning approaches, unknown conditions that are encountered may also require additional cleaning treatments.

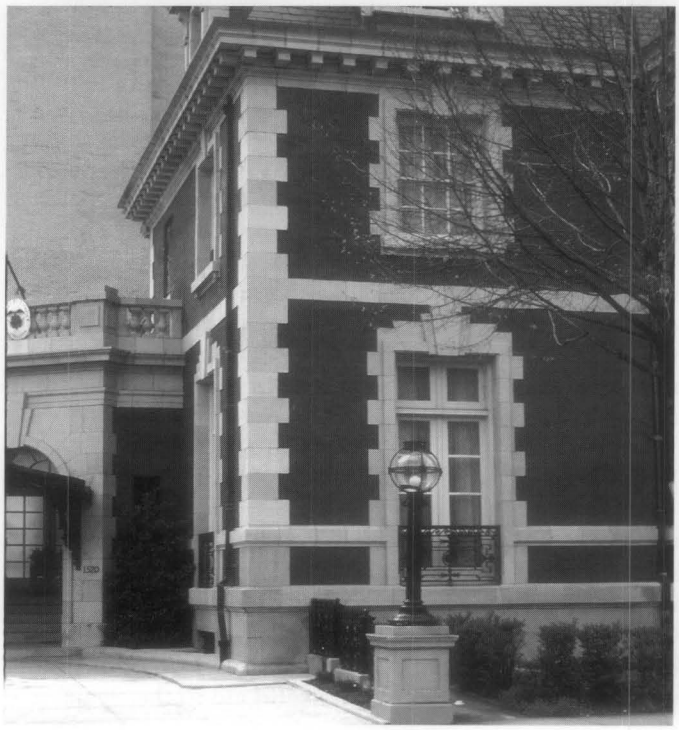


Figure 4. The foundation of this brick building is limestone, but the decorative trim above is architectural terra cotta intended to simulate stone.

Figure 5. Repeated water washing did not remove the staining inside this limestone porte cochere. Upon closer examination, it was determined to be a water-repellent coating that had been applied many years earlier. An alkaline cleaner may be effective in removing it.

Choose the appropriate cleaner. The importance of testing cleaning methods and materials cannot be over emphasized. Applying the wrong cleaning agents to historic masonry can have disastrous results. Acidic cleaners can be extremely damaging to acid-sensitive stones, such as marble and limestone, resulting in etching and dissolution of these stones. Other kinds of masonry can also be damaged by incompatible cleaning agents, or even by cleaning agents that are usually compatible. There are also numerous kinds of sandstone, each with a considerably different geological composition. While an acid-based cleaner may be safely used on some sandstones, others are acid-sensitive and can be severely etched or dissolved by an acid cleaner. Some sandstones contain water-soluble minerals and can be eroded by water cleaning. And, even if the stone type is correctly identified, stones, as well as some bricks, may contain unexpected impurities, such as iron particles, that may react negatively with a particular cleaning agent and result in staining. Thorough understanding of the physical and chemical properties of the masonry will help avoid the inadvertent selection of damaging cleaning agents.

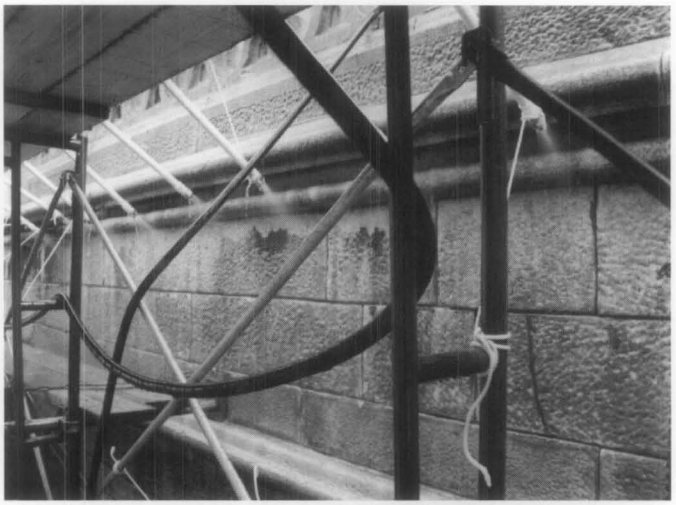


Figure 6. Timed water soaking can be very effective for cleaning limestone and marble as shown here at the Marble Collegiate Church in New York City. In this case, a twelve-hour water soak using a multi-nozzle manifold was followed by a final water rinse. Photo: Diane S. Kaese, Wiss, Janney, Elstner Associates, Inc., N.Y., N.Y.

Other building materials also may be affected by the cleaning process. Some chemicals, for example, may have a corrosive effect on paint or glass. The portions of building elements most vulnerable to deterioration may not be visible, such as embedded ends of iron window bars. Other totally unseen items, such as iron cramps or ties which hold the masonry to the structural frame, also may be subject to corrosion from the use of chemicals or even from plain water. The only way to prevent problems in these cases is to study the building construction in detail and evaluate proposed cleaning methods with this information in mind. However, due to the very likely possibility of encountering unknown factors, any cleaning project involving historic masonry should be viewed as unique to that particular building.

Cleaning Methods and Materials

Masonry cleaning methods generally are divided into three major groups: water, chemical, and abrasive. *Water methods* soften the dirt or soiling material and rinse the deposits from the masonry surface. *Chemical cleaners* react with dirt, soiling material or paint to effect their removal, after which the cleaning effluent is rinsed off the masonry surface with water. *Abrasive methods* include blasting with grit, and the use of grinders and sanding discs, all of which mechanically remove the dirt, soiling material or paint (and, usually, some of the masonry surface). Abrasive cleaning is also often followed with a water rinse. *Laser cleaning*, although not discussed here in detail, is another technique that is used sometimes by conservators to clean small areas of historic masonry. It can be quite effective for cleaning limited areas, but it is expensive and generally not practical for most historic masonry cleaning projects.

Although it may seem contrary to common sense, masonry cleaning projects should be carried out starting at the bottom and proceeding to the top of the building always keeping all surfaces wet below the area being cleaned. The rationale for this approach is based on the principle that dirty water or cleaning effluent dripping from cleaning in progress above will leave streaks on a dirty surface but will not streak a clean surface as long as it is kept wet and rinsed frequently.

Water Cleaning

Water cleaning methods are generally the *gentlest means possible*, and they can be used safely to remove dirt from all types of historic masonry.* There are essentially four kinds of water-based methods: soaking; pressure water washing; water washing supplemented with non-ionic detergent; and steam, or hot-pressurized water cleaning. Once water cleaning has been completed, it is often necessary to follow up with a water rinse to wash off the loosened soiling material from the masonry.

Soaking. Prolonged spraying or misting with water is particularly effective for cleaning limestone and marble. It is also a good method for removing heavy accumulations of soot, sulfate crusts or gypsum crusts that tend to form in protected areas of a building not regularly washed by rain. Water is distributed to lengths of punctured hose or pipe with non-ferrous fittings hung from moveable scaffolding or a swing stage that continuously mists the surface of the masonry with a very fine spray (Fig. 6). A timed on-off spray is another approach to using this cleaning technique. After one area has been cleaned, the apparatus is moved on to another. Soaking is often used in combination with water washing and is also followed by a final water rinse. Soaking is a very slow method — it may take several days or a week—but it is a very gentle method to use on historic masonry.

Water Washing. Washing with low-pressure or medium-pressure water is probably one of the most commonly used methods for removing dirt or other pollutant soiling from historic masonry buildings (Fig. 7). Starting with a very low pressure (100 psi or below), even using a garden hose, and progressing as needed to slightly higher pressure —generally no higher than 300-400 psi—is always the recommended way to begin. Scrubbing with natural bristle or synthetic bristle brushes—never metal which can abrade the surface and leave metal particles that can stain the masonry—can help in cleaning areas of the masonry that are especially dirty.

Water Washing with Detergents. Non-ionic detergents –which are not the same as soaps –are synthetic organic compounds that are especially effective in removing oily soil. (Examples of some of the numerous proprietary non-ionic detergents include Igepal by GAF, Tergitol by Union Carbide and Triton by Rohm & Haas.) Thus, the addition of a non-ionic detergent, or surfactant, to a low- or medium-pressure water wash can be a useful aid in the cleaning

*Water cleaning methods may not be appropriate to use on some badly deteriorated masonry because water may exacerbate the deterioration, or on gypsum or alabaster which are very soluble in water.

process. (A non-ionic detergent, unlike most household detergents, does not leave a solid, visible residue on the masonry.) Adding a non-ionic detergent and scrubbing with a natural bristle or synthetic bristle brush can facilitate cleaning textured or intricately carved masonry. This should be followed with a final water rinse.

Steam/Hot-Pressurized Water Cleaning. Steam cleaning is actually low-pressure hot water washing because the steam condenses almost immediately upon leaving the hose. This is a gentle and effective method for cleaning stone and particularly for acid-sensitive stones. Steam can be especially useful in removing built-up soiling deposits and dried-up plant materials, such as ivy disks and tendrils. It can also be an efficient means of cleaning carved stone details and, because it does not generate a lot of liquid water, it can sometimes be appropriate to use for cleaning interior masonry (Figs. 8-9).

Potential hazards of water cleaning. Despite the fact that water-based methods are generally the most gentle, even they can be damaging to historic masonry. Before beginning a water cleaning project, it is important to make sure that all mortar joints are sound and that the building is watertight. Otherwise water can seep through the walls to the interior, resulting in rusting metal anchors and stained and ruined plaster.

Some water supplies may contain traces of iron and copper which may cause masonry to discolor. Adding a chelating or complexing agent to the water, such as EDTA (ethylene diamine tetra-acetic acid), which inactivates other metallic ions, as well as softens minerals and water hardness, will help prevent staining on light-colored masonry.

Any cleaning method involving water should never be done in cold weather or if there is any likelihood of frost or freezing because water within the masonry can freeze, causing spalling and cracking. Since a masonry wall may take over a week to dry after cleaning, no water cleaning should be permitted for several days prior to the first average frost date, or even earlier if local forecasts predict cold weather.

Most essential of all, it is important to be aware that using water at too high a pressure, a practice common to "power washing" and "water blasting", is very abrasive and can easily etch marble and other soft stones, as well as some types of brick (Figs. 10-11). In addition, the distance of the nozzle from the masonry surface and the type of nozzle, as well as gallons per minute (gpm), are also important variables in a water cleaning process that can have a significant impact on the outcome of the project. This is why it is imperative that the cleaning be closely monitored to ensure that the cleaning operators do not raise the pressure or bring the nozzle too close to the masonry in an effort to "speed up" the process. The appearance of grains of stone or sand in the cleaning effluent on the ground is an indication that the water pressure may be too high.

Figure 7. Glazed architectural terra cotta often may be cleaned successfully with a low-pressure water wash and hand scrubbing supplemented, if necessary, with a non-ionic detergent. Photo: National Park Service Files.

Chemical Cleaning

Chemical cleaners, generally in the form of proprietary products, are another material frequently used to clean historic masonry. They can remove dirt, as well as paint and other coatings, metallic and plant stains, and graffiti. Chemical cleaners used to remove dirt and soiling include **acids**, **alkalies** and **organic compounds.** Acidic cleaners, of course, should not be used on masonry that is acid sensitive. Paint removers are **alkaline**, based on **organic solvents** or other chemicals.

Chemical Cleaners to Remove Dirt

Both alkaline and acidic cleaning treatments include the use of water. Both cleaners are also likely to contain surfactants (wetting agents), that facilitate the chemical reaction that removes the dirt. Generally, the masonry is wet first for both types of cleaners, then the chemical cleaner is sprayed on at very low pressure or brushed onto the surface. The cleaner is left to dwell on the masonry for an amount of time recommended by the product manufacturer or, preferably, determined by testing, and rinsed off with a low- or moderate-pressure cold, or sometimes hot, water wash. More than one application of the cleaner may be necessary, and it is always a good practice to test the product manufacturer's recommendations concerning dilution rates and dwell times. Because each cleaning situation is unique, dilution rates and dwell times can vary considerably. The masonry surface may be scrubbed lightly with natural or synthetic bristle brushes prior to rinsing. After rinsing, pH strips should be applied to the surface to ensure that the masonry has been neutralized completely.

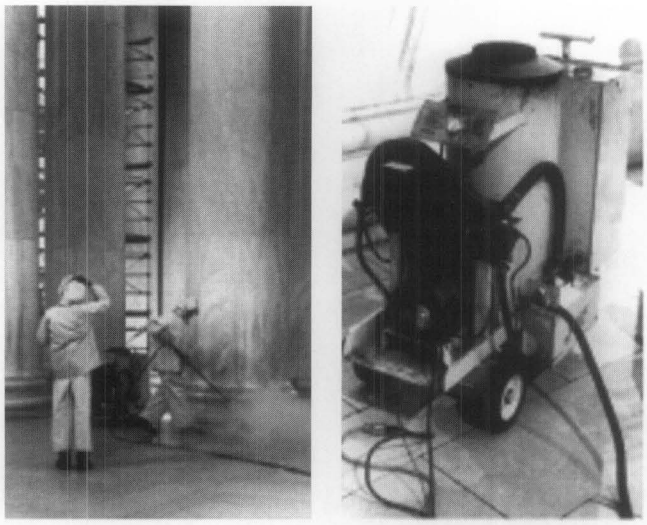


Figure 8. (Left) Low-pressure (under 100 psi) steam cleaning (hot-pressurized water washing), is part of the regular maintenance program at the Jefferson Memorial, Washington, D.C. The white marble interior of this open structure is subject to constant soiling by birds, insects and visitors. (Right) This portable steam cleaner enables prompt cleanup when necessary. Photos: National Park Service Files.

Acidic Cleaners. Acid-based cleaning products may be used on **non-acid sensitive** masonry, which generally includes: granite, most sandstones, slate, unglazed brick and unglazed architectural terra cotta, cast stone and concrete (Fig. 12). Most commercial acidic cleaners are composed primarily of hydrofluoric acid, and often include some phosphoric acid to prevent rust-like stains from developing on the masonry after the cleaning. Acid cleaners are applied to the pre-wet masonry which should be kept wet while the acid is allowed to "work", and then removed with a water wash.

Alkaline Cleaners. Alkaline cleaners should be used on **acid-sensitive** masonry, including: limestone, polished and unpolished marble, calcareous sandstone, glazed brick and glazed architectural terra cotta, and polished granite. (Alkaline cleaners may also be used sometimes on masonry materials that are not acid sensitive—after testing, of course—but they may not be as effective as they are on acid-sensitive masonry.) Alkaline cleaning products consist primarily of two ingredients: a non-ionic detergent or surfactant; and an alkali, such as potassium hydroxide or ammonium hydroxide. Like acidic cleaners, alkaline products are usually applied to pre-wet masonry, allowed to dwell, and then rinsed off with water. (Longer dwell times may be necessary with alkaline cleaners than with acidic cleaners.) Two additional steps are required to remove alkaline cleaners after the initial rinse. First the masonry is given a slightly acidic wash—often with acetic acid–to neutralize it, and then it is rinsed again with water.

Chemical Cleaners to Remove Paint and Other Coatings, Stains and Graffiti

Removing paint and some other coatings, stains and graffiti can best be accomplished with alkaline paint removers, organic solvent paint removers, or other cleaning compounds. The removal of layers of paint from a masonry surface usually involves applying the remover either by brush, roller or spraying, followed by a thorough water wash. As with any chemical cleaning, the manufacturer's recommendations regarding application procedures should always be tested before beginning work.

Alkaline Paint Removers. These are usually of much the same composition as other alkaline cleaners, containing potassium or ammonium hydroxide, or trisodium phosphate. They are used to remove oil, latex and acrylic paints, and are effective for removing multiple layers of paint. Alkaline cleaners may also remove some acrylic, water-repellent coatings. As with other alkaline cleaners, both an acidic neutralizing wash and a final water rinse are generally required following the use of alkaline paint removers.

Organic Solvent Paint Removers. The formulation of organic solvent paint removers varies and may include a combination of solvents, including methylene chloride, methanol, acetone, xylene and toluene.

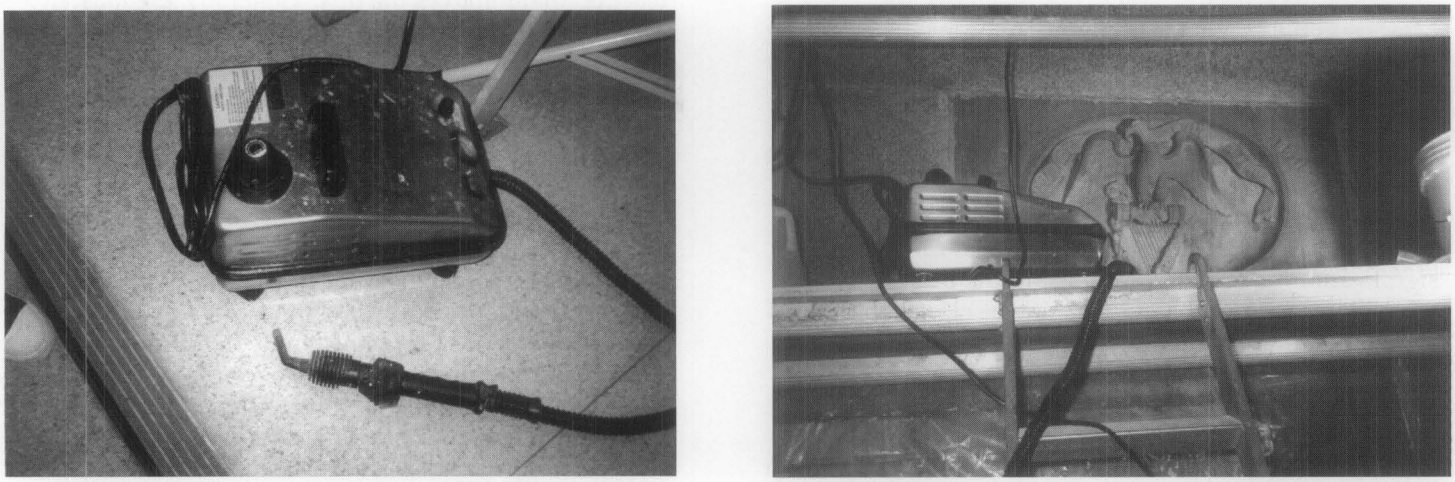


Figure 9. (Left) This small steam cleaner—the size of a vacuum cleaner—offers a very controlled and gentle means of cleaning limited, or hard-to-reach areas or carved stone details. (Right) It is particularly useful for interiors where it is important to keep moisture to a minumum, such as inside the Washington Monument, Washington, D.C., where it was used to clean the commemorative stones. Photos: Audrey T. Tepper.

Figure 10. High-pressure water washing too close to the surface has abraded and, consequently, marred the limestone on this early-20th century building.

Other Paint Removers and Cleaners. Other cleaning compounds that can be used to remove paint and some painted graffiti from historic masonry include paint removers based on N-methyl-2-pyrrolidone (NMP), or on petroleum-based compounds. Removing stains, whether they are industrial (smoke, soot, grease or tar), metallic (iron or copper), or biological (plant and fungal) in origin, depends on carefully matching the type of remover to the type of stain (Fig. 13). Successful removal of stains from historic masonry often requires the application of a number of different removers before the right one is found. The removal of layers of paint from a masonry surface is usually accomplished by applying the remover either by brush, roller or spraying, followed by a thorough water wash (Fig. 14).

Potential hazards of chemical cleaning. Since most chemical cleaning methods involve water, they have many of the potential problems of plain water cleaning. Like water methods, they should not be used in cold weather because of the possibility of freezing. Chemical cleaning should never be undertaken in temperatures below 40 degrees F (4 degrees C), and generally not below 50 degrees F. In addition, many chemical cleaners simply do not work in cold temperatures. Both acidic and alkaline cleaners can be dangerous to cleaning operators and, clearly, there are environmental concerns associated with the use of chemical cleaners.

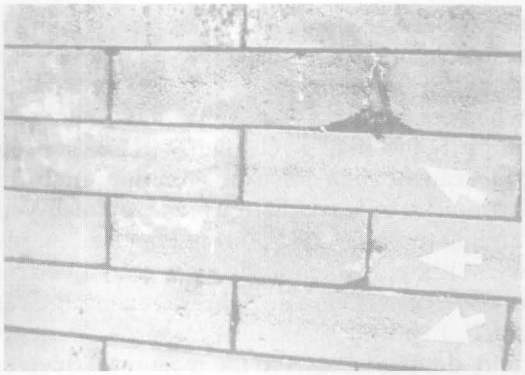


Figure 11. Rinsing with high-pressure water following chemical cleaning has left a horizontal line of abrasion across the bricks on this late-19th century row house.

If not carefully chosen, chemical cleaners can react adversely with many types of masonry. Obviously, acidic cleaners should not be used on acid-sensitive materials; however, it is not always clear exactly what the composition is of any stone or other masonry material. For, this reason, testing the cleaner on an inconspicuous spot on the building is always necessary. While certain acid-based cleaners may be appropriate if used as directed on a particular type of masonry, if left too long or if not adequately rinsed from the masonry they can have a negative effect. For example, hydrofluoric acid can etch masonry leaving a hazy residue (whitish deposits of silica or calcium fluoride salts) on the surface. While this efflorescence may usually be removed by a second cleaning—although it is likely to be expensive and time-consuming—**hydrofluoric acid** can also leave calcium fluoride salts or a colloidal silica deposit on masonry which may be impossible to remove (Fig. 15). Other acids, particularly **hydrochloric (muriatic) acid**, which is very powerful, should not be used on historic masonry, because it can dissolve lime-based mortar, damage brick and some stones, and leave chloride deposits on the masonry.

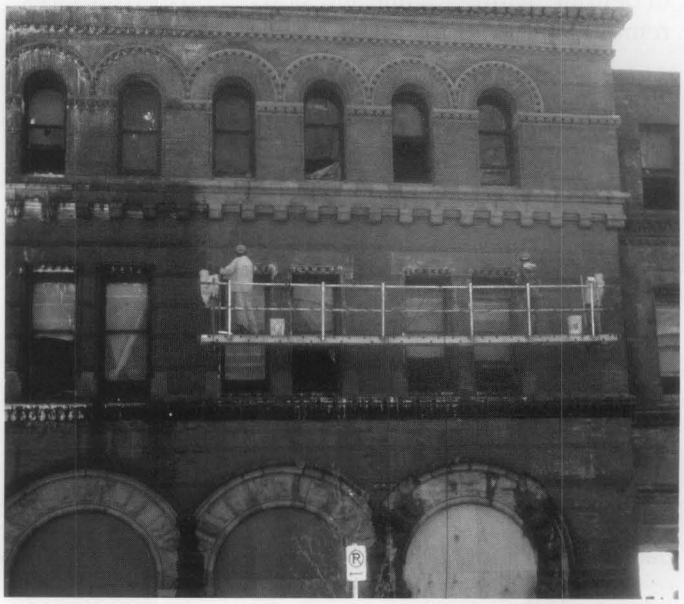


Figure 12. A mild acidic cleaning agent is being used to clean this heavily soiled brick and granite building. Additional applications of the cleaner and hand-scrubbing, and even poulticing, may be necessary to remove the dark stains on the granite arches below. Photo: Sharon C. Park, FAIA.

Alkaline cleaners can stain sandstones that contain a ferrous compound. Before using an alkaline cleaner on sandstone it is always important to test it, since it may be difficult to know whether a particular sandstone may contain a ferrous compound. Some alkaline cleaners, such as **sodium hydroxide (caustic soda or lye)** and **ammonium bifluoride**, can also damage or leave disfiguring brownish-yellow stains and, in most cases, should not be used on historic masonry. Although alkaline cleaners will not etch a masonry surface as acids can, they are caustic and can burn the surface. In addition, alkaline cleaners can deposit potentially damaging salts in the masonry which can be difficult to rinse thoroughly.

Abrasive and Mechanical Cleaning

Generally, abrasive cleaning methods are not appropriate for use on historic masonry buildings. Abrasive cleaning methods are just that—abrasive. Grit blasters, grinders, and sanding discs all operate by *abrading* the dirt or paint off the surface of the masonry, rather than *reacting* with the dirt and the masonry which is how water and chemical methods work. Since the abrasives do not differentiate between the dirt and the masonry, they can also remove the outer surface of the masonry at the same time, and result in permanently damaging the masonry. Brick, architectural terra cotta, soft stone, detailed carvings, and polished surfaces are especially susceptible to physical and aesthetic damage by abrasive methods. Brick and architectural terra cotta are fired products which have a smooth, glazed surface which can be removed by abrasive blasting or grinding (Figs. 18-19). Abrasively-cleaned masonry is damaged aesthetically as well as physically, and it has a rough surface which tends to hold dirt and the roughness will make future cleaning more difficult. Abrasive cleaning processes can also increase the likelihood of subsurface cracking of the masonry. Abrasion of carved details causes a rounding of sharp corners and other loss of delicate features, while abrasion of polished surfaces removes the polished finish of stone.

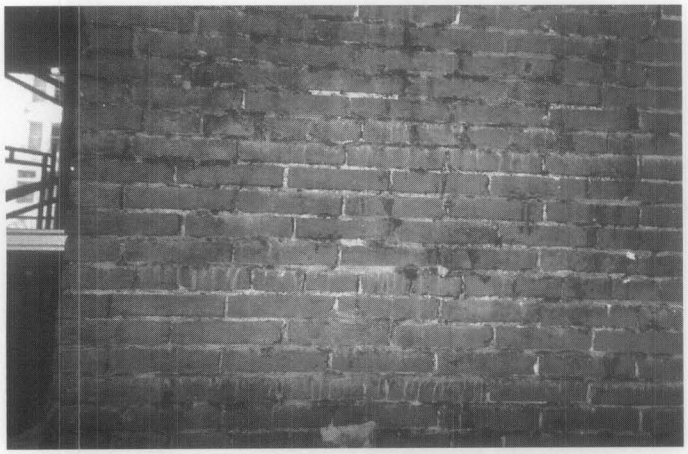


Figure 13. Sometimes it may be preferable to paint over a thick asphaltic coating rather than try to remove it, because it can be difficult to remove completely. However, in this case, many layers of asphaltic coating were removed through multiple applications of a heavy duty chemical cleaner. Each application of the cleaner was left to dwell following the manufacturer's reccommendations, and then rinsed thoroughly. (As much as possible of the asphalt was first removed with wooden scrapers.) Although not all the asphalt was removed, this was determined to be an acceptable level of cleanliness for the project.

Figure 14. Chemical removal of paint from this brick building has revealed that the cornice and window hoods are metal rather than masonry.

Mortar joints, especially those with lime mortar, also can be eroded by abrasive or mechanical cleaning. In some cases, the damage may be visual, such as loss of joint detail or increased joint shadows. As mortar joints constitute a significant portion of the masonry surface (up to 20 per cent in a brick wall), this can result in the loss of a considerable amount of the historic fabric. Erosion of the mortar joints may also permit increased water penetration, which will likely necessitate repointing.

Figure 15. The whitish deposits left on the brick by a chemical paint remover may have resulted from inadequate rinsing or from the chemical being left on the surface too long and may be impossible to remove.

Poulticing to Remove Stains and Graffiti

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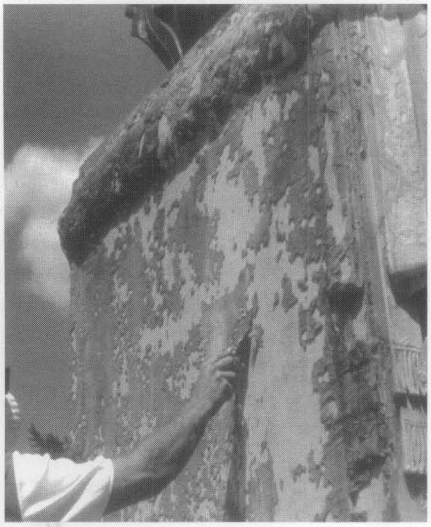

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Figure 16. (a) The limestone base was heavily stained by runoff from the bronze statue above. (b) A poultice consisting of copper stain remover and ammonia mixed with fuller's earth was applied to the stone base and covered with plastic sheeting to keep it from drying out too quickly. (c) As the poultice dried, it pulled the stain out of the stone. (d) The poultice residue was removed carefully from the stone surface with wooden scrapers and the stone was rinsed with water. Photos: John Dugger.

Graffiti and stains, which have penetrated into the masonry, often are best removed by using a poultice. A poultice consists of an absorbent material or clay powder (such as kaolin or fuller's earth, or even shredded paper or paper towels), mixed with a liquid (solvent or other remover) to form a paste which is applied to the stain (Figs. 16-17). As it dries, the paste absorbs the staining material so that it is not redeposited on the masonry surface. Some commercial cleaning products and paint removers are specially formulated as a paste or gel that will cling to a vertical surface and remain moist for a longer period of time in order to prolong the action of the chemical on the stain. Pre-mixed poultices are also available as a paste or in powder form needing only the addition of the appropriate liquid. The masonry must be pre-wet before applying an alkaline cleaning agent, but not when using a solvent. Once the stain has been removed, the masonry must be rinsed thoroughly.

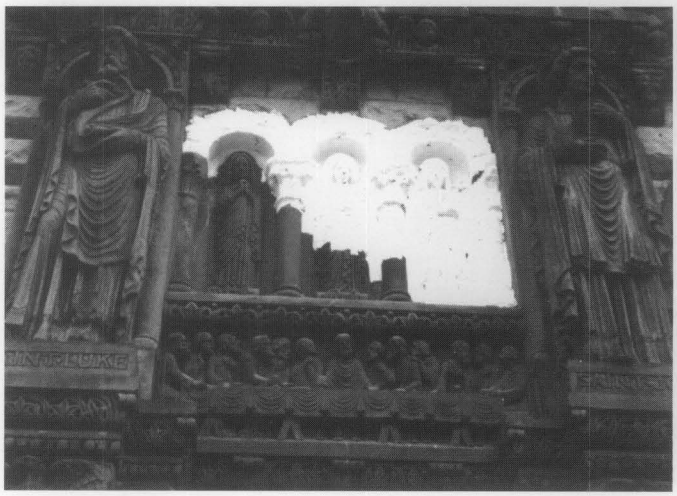

Figure 17. A poultice is being used to remove salts from the brownstone statuary on the facade of this late-19th century stone church. Photo: National Park Service Files.

Figure 18. The glazed bricks in the center of the pier were covered by a signboard that protected them being damaged by the sandblasting which removed the glaze from the surrounding bricks.

Figure 19. A comparison of undamaged bricks surroundng the electrical conduit with the rest of the brick facade emphasizes the severity of the erosion caused by sandblasting.

Abrasive Blasting. Blasting with abrasive grit or another abrasive material is the most frequently used abrasive method. *Sandblasting* is most commonly associated with abrasive cleaning. Finely ground silica or glass powder, glass beads, ground garnet, powdered walnut and other ground nut shells, grain hulls, aluminum oxide, plastic particles and even tiny pieces of sponge, are just a few of the other materials that have also been used for abrasive cleaning. Although abrasive blasting is not an appropriate method of cleaning historic masonry, it can be safely used to clean some materials. Finely-powdered walnut shells are commonly used for cleaning monumental bronze sculpture, and skilled conservators clean delicate museum objects and finely detailed, carved stone features with very small, micro-abrasive units using aluminum oxide.

A number of current approaches to abrasive blasting rely on materials that are not usually thought of as abrasive, and not as commonly associated with traditional abrasive grit cleaning. Some patented abrasive cleaning processes—one dry, one wet —use finely-ground glass powder intended to "erase" or remove dirt and surface soiling only, but not paint or stains (Fig. 20). Cleaning with baking soda (sodium bicarbonate) is another patented process. Baking soda blasting is being used in some communities as a means of quick graffiti removal. However, it should not be used on historic masonry which it can easily abrade and can permanently "etch" the graffiti into the stone; it can also leave potentially damaging salts in the stone which cannot be removed. Most of these abrasive grits may be used either dry or wet, although dry grit tends to be used more frequently.

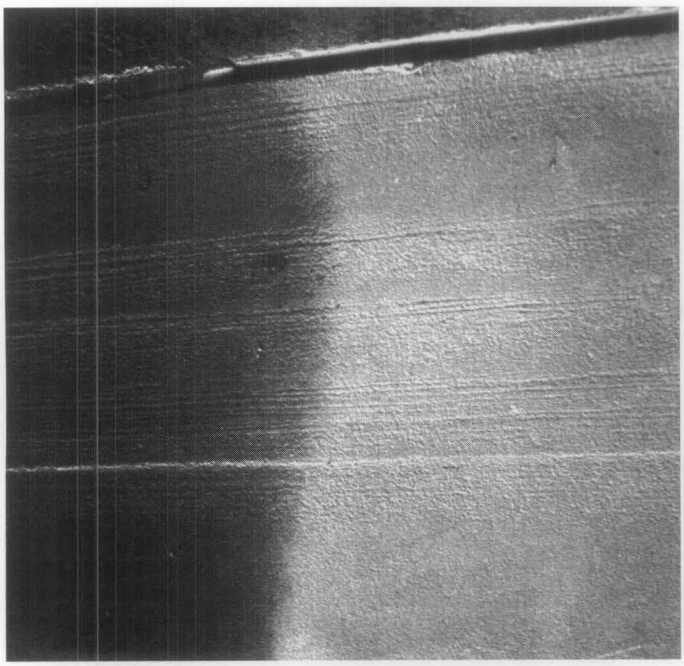

Figure 20. (Left) A comparison of the limestone surface of a 1920s office building before and after "cleaning" with a proprietary abrasive process using fine glass powder clearly shows the effectiveness of this method. But this is an abrasive technique and it has "cleaned" by removing part of the masonry surface with the dirt. Because it is abrasive, it is generally not recommended for large-scale cleaning of historic masonry, although it may be suitable to use in certain, very limited cases under controlled circumstances. (Right) A vacum chamber where the used glass powder is collected for environmentally safe disposal is a unique feature of this particular process. The specially-trained operators in the chamber wear protective clothing, masks and breathing equipment. Photos: Tom Keohan.

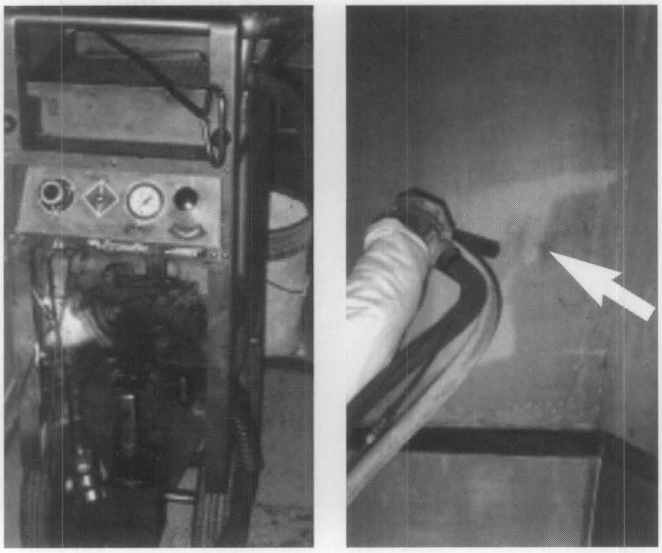

Figure 21. Low-pressure blasting with ice pellets or ice crystals (left) is an abrasive cleaning method that is sometimes recommended for use on interior masonry because it does not involve large amounts of water. However, like other abrasive materials, ice crystals "clean" by removing a portion of the masonry surface with the dirt, and may not remove some stains that have penetrated into the masonry without causing further abrasion (right). Photos: Audrey T. Tepper.

Ice particles, or pelletized dry ice (carbon dioxide or CO_2), are another medium used as an abrasive cleaner (Fig. 21). This is also too abrasive to be used on most historic masonry, but it may have practical application for removing mastics or asphaltic coatings from some substrates.

Some of these processes are promoted as being more environmentally safe and not damaging to historic masonry buildings. However, it must be remembered that they are abrasive and that they "clean" by removing a small portion of the masonry surface, even though it may be only a minuscule portion. The fact that they are essentially abrasive treatments must always be taken into consideration when planning a masonry cleaning project. *In general, abrasive methods should not be used to clean historic masonry buildings.* In some, very limited instances, highly-controlled, gentle abrasive cleaning may be appropriate on selected, hard-to-clean areas of a historic masonry building if carried out under the watchful supervision of a professional conservator. But, abrasive cleaning should never be used on an entire building.

Grinders and Sanding Disks. Grinding the masonry surface with mechanical grinders and sanding disks is another means of abrasive cleaning that should not be used on historic masonry. Like abrasive blasting, grinders and disks do not really clean masonry but instead grind away and abrasively remove and, thus, damage the masonry surface itself rather than remove just the soiling material.

Planning A Cleaning Project

Once the masonry and soiling material or paint have been identified, and the condition of the masonry has been evaluated, planning for the cleaning project can begin.

Testing cleaning methods. In order to determine the *gentlest means possible*, several cleaning methods or materials may have to be tested prior to selecting the best one to use on the building. Testing should always begin with the gentlest and least invasive method proceeding gradually, if necessary, to more complicated methods, or a combination of methods. All too often simple methods, such as low-pressure water wash, are not even considered, yet they frequently are effective, safe, and not expensive. Water of slightly higher pressure or with a non-ionic detergent additive also may be effective. It is worth repeating that these methods should always be tested prior to considering harsher methods; they are safer for the building and the environment, often safer for the applicator, and relatively inexpensive.

The level of cleanliness desired also should be determined prior to selection of a cleaning method. Obviously, the intent of cleaning is to remove most of the dirt, soiling material, stains, paint or other coating. A "brand new" appearance, however, may be inappropriate for an older building, and may require an overly harsh cleaning method to be achieved. When undertaking a cleaning project, it is important to be aware that some stains simply may not be removable. It may be wise, therefore, to agree upon a slightly lower level of cleanliness that will serve as the standard for the cleaning project. The precise amount of residual dirt considered acceptable may depend on the type of masonry, the type of soiling and difficulty of total removal, and local environmental conditions.

Cleaning tests should be carried out in an area of sufficient size to give a true indication of their effectiveness. It is preferable to conduct the test in an inconspicuous location on the building so that it will not be obvious if the test is not successful. A test area may be quite small to begin, sometimes as small as six square inches, and gradually may be increased in size as the most appropriate methods and cleaning agents are determined. Eventually the test area may be expanded to a square yard or more, and it should include several masonry units and mortar joints (Fig. 22). It should be remembered that a single building may have several types of masonry and that even similar materials may have different surface finishes. Each material and different finish should be tested separately. Cleaning tests should be evaluated only after the masonry has dried completely. *The results of the tests may indicate that several methods of cleaning should be used on a single building.*

When feasible, test areas should be allowed to weather for an extended period of time prior to final evaluation. A waiting period of a full year would be ideal in order to expose the test patch to a full range of seasons. If this is not possible, the test patch should weather for at least a month or two. For any building which is considered historically important, the delay is insignificant compared to the potential damage and disfigurement which may result from using an incompletely tested method. *The successfully cleaned test patch should be protected as it will serve as a standard against which the entire cleaning project will be measured.*

Environmental considerations. The potential effect of any method proposed for cleaning historic masonry should be evaluated carefully. Chemical cleaners and paint removers may damage trees, shrubs, grass, and plants. A plan must be provided for environmentally safe removal and disposal of the cleaning materials and the rinsing effluent before beginning the cleaning project. Authorities from the local regulatory agency—usually under the jurisdiction of the federal or state Environmental Protection Agency (EPA) should be consulted prior to beginning a cleaning project, especially if it involves anything more than plain water washing. This advance planning will ensure that the cleaning effluent or run-off, which is the combination of the cleaning agent and the substance removed from the masonry, is handled and disposed of in an environmentally sound and legal manner. Some alkaline and acidic cleaners can be neutralized so that they can be safely discharged into storm sewers. However, most solvent-based cleaners cannot be neutralized and are categorized as pollutants, and must be disposed of by a licensed transport, storage and disposal facility. Thus, it is always advisable to consult with the appropriate agencies before starting to clean to ensure that the project progresses smoothly and is not interrupted by a stop-work order because a required permit was not obtained in advance.

Vinyl guttering or polyethylene-lined troughs placed around the perimeter of the base of the building can serve to catch chemical cleaning waste as it is rinsed off the building. This will reduce the amount of chemicals entering and polluting the soil, and also will keep the cleaning waste contained until it can be removed safely. Some patented cleaning systems have developed special equipment to facilitate the containment and later disposal of cleaning waste.

Concern over the release of volatile organic compounds (VOCs) into the air has resulted in the manufacture of new, more environmentally responsible cleaners and paint removers, while some materials traditionally used in cleaning may no longer be available for these same reasons. Other health and safety concerns have created additional cleaning challenges, such as lead paint removal, which is likely to require special removal and disposal techniques.

Cleaning can also cause damage to non-masonry materials on a building, including glass, metal and wood. Thus, it is usually necessary to cover windows and doors, and other features that may be vulnerable to chemical cleaners. They should be covered with plastic or polyethylene, or a masking agent that is applied as a liquid which dries to form a thin protective film on glass, and is easily peeled off after the cleaning is finished. Wind drift, for example, can also damage other property by carrying cleaning chemicals onto nearby automobiles, resulting in etching of the glass or spotting of the paint finish. Similarly, airborne dust can enter surrounding buildings, and excess water can collect in nearby yards and basements.

Safety considerations. Possible health dangers of each method selected for the cleaning project must be considered before selecting a cleaning method to avoid harm to the

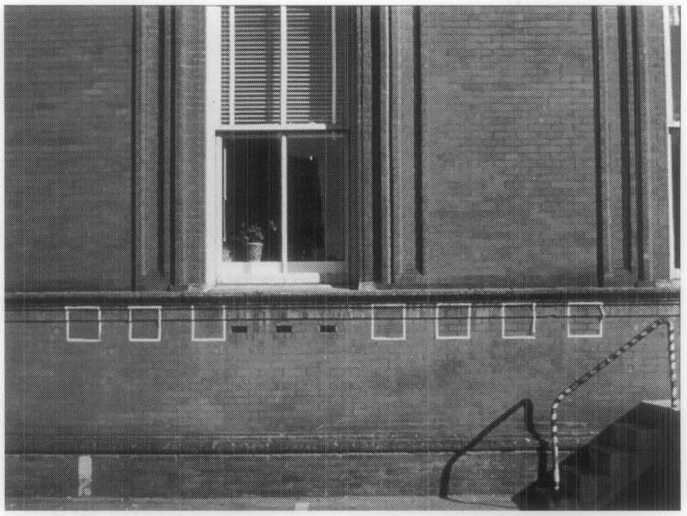

Figure 22. Cleaning test areas may be quite small at first and gradually increase in size as testing determines the "gentlest means possible". Photo: Frances Gale.

cleaning applicators, and the necessary precautions must be taken. The precautions listed in Material Safety Data Sheets (MSDS) that are provided with chemical products should always be followed. Protective clothing, respirators, hearing and face shields, and gloves must be provided to workers to be worn at all times. Acidic and alkaline chemical cleaners in both liquid and vapor forms can also cause serious injury to passers-by (Fig. 23). It may be necessary to schedule cleaning at night or weekends if the building is located in a busy urban area to reduce the potential danger of chemical overspray to pedestrians. Cleaning during non-business hours will allow HVAC systems to be turned off and vents to be covered to prevent dangerous chemical fumes from entering the building which will also ensure the safety of the building's occupants. Abrasive and mechanical methods produce dust which can pose a serious health hazard, particularly if the abrasive or the masonry contains silica.

Water-Repellent Coatings and Waterproof Coatings

To begin with, it is important to understand that waterproof coatings and water-repellent coatings are not the same. Although these terms are frequently interchanged and commonly confused with one another, they are completely different materials. **Water-repellent coatings** —often referred to incorrectly as "sealers", but which do not or should not seal— are intended to keep liquid water from penetrating the surface but to allow water vapor to enter and leave, or pass through, the surface of the masonry (Fig. 24). Water-repellent coatings are generally *transparent*, or clear, although once applied some may darken or discolor certain types of masonry while others may give it a glossy or shiny appearance. **Waterproof coatings** seal the surface from liquid water and from water vapor. They are usually *opaque*, or pigmented, and include bituminous coatings and some elastomeric paints and coatings.

Water-Repellent Coatings

Water-repellent coatings are formulated to be vapor permeable, or "breathable". They do not seal the surface completely to water vapor so it can enter the masonry wall as well as leave the wall. While the first water-repellent coatings to be developed were primarily acrylic or silicone resins in organic solvents, now most water-repellent coatings are water-based and formulated from modified siloxanes, silanes and other alkoxysilanes, or metallic stearates. While some of these products are shipped from the factory ready to use, other waterborne water repellents must be diluted at the job site. Unlike earlier water-repellent coatings which tended to form a "film" on the masonry surface, modern water-repellent coatings actually penetrate into the masonry substrate slightly and, generally, are almost invisible if properly applied to the masonry. They are also more vapor permeable than the old coatings, yet they still reduce the vapor permeability of the masonry. Once inside the wall, water vapor can condense at cold spots producing liquid water which, unlike water vapor, cannot escape through a water-repellent coating. The liquid water within the wall, whether from condensation, leaking gutters, or other sources, can cause considerable damage.

Water-repellent coatings are not consolidants. Although modern water repellents may penetrate slightly beneath the masonry surface, instead of just "sitting" on top of it, they do not perform the same function as a consolidant which is to "consolidate" and replace lost binder to strengthen deteriorating masonry. Even after many years of laboratory study and testing few consolidants have proven very effective. The composition of fired products such as brick and architectural terra cotta, as well as many types of building stone, does not lend itself to consolidation.

Some modern water-repellent coatings which contain a binder intended to replace the natural binders in stone that have been lost through weathering and natural erosion are described in product literature as both a water repellent and a consolidant. The fact that newer water-repellent coatings penetrate beneath the masonry surface instead of just forming a layer on top of the surface may indeed convey at least some consolidating properties to certain stones. However, a water-repellent coating cannot be considered a consolidant. In some instances, a water-repellent or "preservative" coating, if applied to already damaged or spalling stone, may form a surface crust which, if it fails, may exacerbate the deterioration by pulling off even more of the stone (Fig. 25).

Is a Water-Repellent Treatment Necessary?

Water-repellent coatings are frequently applied to historic masonry buildings for the wrong reason. They also are often applied without an understanding of what they are and what they are intended to do. And these coatings can be very difficult, if not impossible, to remove from the masonry if they fail or become discolored. Most importantly, the application of water-repellent coatings to historic masonry is usually unnecessary.

Figure 23. A tarpaulin protects and shields pedestrians from potentially harmful spray while chemical cleaning is underway on the granite exterior of the U.S. Treasury Building, Washington, D.C.

Most historic masonry buildings, unless they are painted, have survived for decades without a water-repellent coating and, thus, probably do not need one now. Water penetration to the interior of a masonry building is seldom due to porous masonry, but results from poor or deferred maintenance. Leaking roofs, clogged or deteriorated gutters and downspouts, missing mortar, or cracks and open joints around door and window openings are almost always the cause of moisture-related problems in a historic masonry building. **If historic masonry buildings are kept watertight and in good repair, water-repellent coatings should not be necessary.**

Rising damp (capillary moisture pulled up from the ground), or condensation can also be a source of excess moisture in masonry buildings. A water-repellent coating will not solve this problem either and, in fact, may be likely to exacerbate it. Furthermore, a water-repellent coating should never be applied to a damp wall. Moisture in the wall would reduce the ability of a coating to adhere to the masonry and to penetrate below the surface. But, if it did adhere, it would hold the moisture inside the masonry because, although a water-repellent coating is permeable to water vapor, liquid water cannot pass through it. In the case of rising damp, a coating may force the moisture to go even higher in the wall because it can slow down evaporation, and thereby retain the moisture in the wall.

Excessive moisture in masonry walls may carry waterborne soluble salts from the masonry units themselves or from the mortar through the walls. If the water is permitted to come to the surface, the salts may appear on the masonry surface as efflorescence (a whitish powder) upon evaporation. However, the salts can be potentially dangerous if they remain in the masonry and crystallize

Figure 24. Although the application of a water-repellent coating was probably not needed on either of these buildings, the coating on the brick building (above), is not visible and has not changed the character of the brick. But the coating on the brick column (below), has a high gloss that is incompatible with the historic character of the masonry.

beneath the surface as subflorescence. Subflorescence eventually may cause the surface of the masonry to spall, particularly if a water-repellent coating has been applied which tends to reduce the flow of moisture out from the subsurface of the masonry. Although many of the newer water-repellent products are more breathable than their predecessors, they can be especially damaging if applied to masonry that contains salts, because they limit the flow of moisture through masonry.

When a Water-Repellent Coating May be Appropriate

There are some instances when a water-repellent coating may be considered appropriate to use on a historic masonry building. Soft, incompletely fired brick from the 18th- and early-19th centuries may have become so porous that paint or some type of coating is needed to protect it from further deterioration or dissolution. When a masonry building has been neglected for a long period of time, necessary repairs may be required in order to make it watertight. If, following a reasonable period of time after the building has been made watertight and has dried out completely, moisture appears actually to be penetrating through the repointed and repaired masonry walls, then the application of a water-repellent coating may be considered *in selected areas only*. This decision should be made in consultation with an architectural conservator. And, if such a treatment is undertaken, it should not be applied to the entire exterior of the building.

Anti-graffiti or barrier coatings are another type of clear coating—although barrier coatings can also be pigmented—that may be applied to exterior masonry, but they are not formulated primarily as water repellents. The purpose of these coatings is to make it harder for graffiti to stick to a masonry surface and, thus, easier to clean. But, like water-repellent coatings, in most cases the application of anti-graffiti coatings is generally not recommended for historic masonry buildings. These coatings are often quite shiny which can greatly alter the appearance of a historic masonry surface, and they are not always effective (Fig. 26). Generally, other ways of discouraging graffiti, such as improved lighting, can be more effective than a coating. However, the application of anti-graffiti coatings may be appropriate in some instances on vulnerable areas of historic masonry buildings which are frequent targets of graffiti that are located in out-of-the-way places where constant surveillance is not possible.

Some water-repellent coatings are recommended by product manufacturers as a means of keeping dirt and pollutants or biological growth from collecting on the surface of masonry buildings and, thus, reducing the need for frequent cleaning. While this at times may be true, in some cases a coating may actually retain dirt more than uncoated masonry. Generally, the application of a water-repellent coating is not recommended on a historic masonry building as a means of preventing biological growth. Some water-repellent coatings may actually encourage biological growth on a masonry wall. Biological growth on masonry buildings has traditionally been kept at bay through regularly-scheduled cleaning as part of a maintenance plan. Simple cleaning of the masonry with low-pressure water using a natural- or synthetic-bristled scrub brush can be very effective if done on a regular basis. Commercial products are also available which can be sprayed on masonry to remove biological growth.

In most instances, a water-repellent coating is not necessary if a building is watertight. The application of a water-repellent coating is not a recommended treatment for historic masonry buildings unless there is a specific

Figure 25. The clear coating applied to this limestone molding has failed and is taking off some of the stone surface as it peels. Photo: Frances Gale.

problem which it may help solve. If the problem occurs on only part of the building, it is best to treat only that area rather than an entire building. Extreme exposures such as parapets, for example, or portions of the building subject to driving rain can be treated more effectively and less expensively than the entire building. Water-repellent coatings are not permanent and must be reapplied periodically although, if they are truly invisible, it can be difficult to know when they are no longer providing the intended protection.

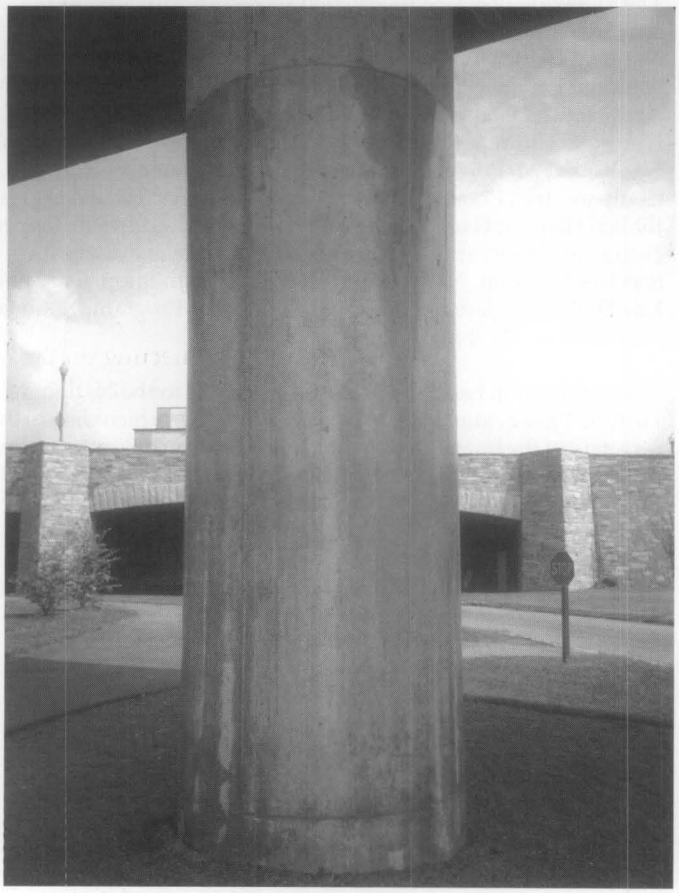

Figure 26. The anti-graffiti or barrier coating on this column is very shiny and would not be appropriate to use on a historic masonry building. The coating has discolored as it has aged and whitish streaks reveal areas of bare concrete where the coating was incompletely applied.

Testing a water-repellent coating by applying it in one small area may not be helpful in determining its suitability for the building because a limited test area does not allow an adequate evaluation of such a treatment. Since water may enter and leave through the surrounding untreated areas, there is no way to tell if the coated test area is "breathable." But trying a coating in a small area may help to determine whether the coating is visible on the surface or if it will otherwise change the appearance of the masonry.

Waterproof Coatings

In theory, waterproof coatings usually do not cause problems as long as they exclude all water from the masonry. If water does enter the wall from the ground or from the inside of a building, the coating can intensify the damage because the water will not be able to escape. During cold weather this water in the wall can freeze causing serious mechanical disruption, such as spalling.

In addition, the water eventually will get out by the path of least resistance. If this path is toward the interior, damage to interior finishes can result; if it is toward the exterior, it can lead to damage to the masonry caused by built-up water pressure (Fig. 27).

In most instances, waterproof coatings should not be applied to historic masonry. The possible exception to this might be the application of a waterproof coating to below-grade exterior foundation walls as a last resort to stop water infiltration on interior basement walls. **Generally, however, waterproof coatings, which include *elastomeric paints*, should almost never be applied above grade to historic masonry buildings.**

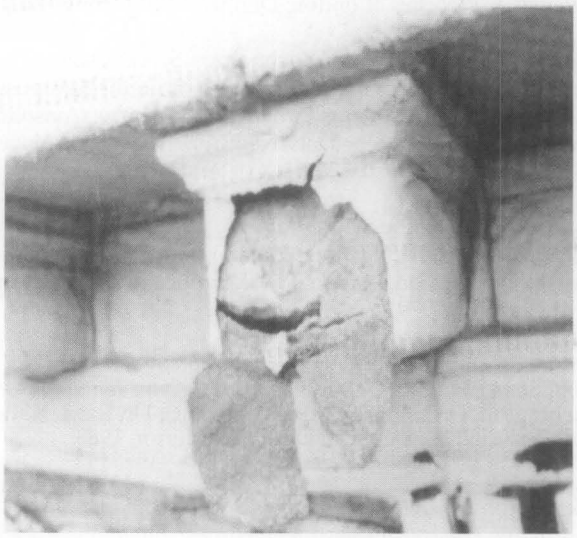

Figure 27. Instead of correcting the roof drainage problems, an elastomeric coating was applied to the already saturated limestone cornice. An elastomeric coating holds moisture in the masonry because it does not "breathe" and does not allow liquid moisture to escape. If the water pressure builds up sufficiently it can cause the coating to break and pop off as shown in this example, often pulling pieces of the masonry with it. Photo: National Park Service Files.

Summary

A well-planned cleaning project is an essential step in preserving, rehabilitating or restoring a historic masonry building. Proper cleaning methods and coating treatments, when determined necessary for the preservation of the masonry, can enhance the aesthetic character as well as the structural stability of a historic building. Removing years of accumulated dirt, pollutant crusts, stains, graffiti or paint, if done with appropriate caution, can extend the life and longevity of the historic resource. Cleaning that is carelessly or insensitively prescribed or carried out by inexperienced workers can have the opposite of the intended effect. It may scar the masonry permanently, and may actually result in hastening deterioration by introducing harmful residual chemicals and salts into the masonry or causing surface loss. Using the wrong cleaning method or using the right method incorrectly, applying the wrong kind of coating or applying a coating that is not needed can result in serious damage, both physically and aesthetically, to a historic masonry building. Cleaning a historic masonry building should always be done using the *gentlest means possible* that will clean, but not damage the building. It should always be taken into consideration before applying a water-repellent coating or a waterproof coating to a historic masonry building whether it is really necessary and whether it is in the best interest of preserving the building.

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Acknowledgments

Robert C. Mack, FAIA, is a principal in the firm of MacDonald & Mack Architects, Ltd., an architectural firm that specializes in historic buildings in Minneapolis, Minnesota.
Anne Grimmer is a Senior Architectural Historian in the Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, Washington, D.C.

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The following historic preservation specialists provided technical review of this publication: Frances Gale, Training Director, National Center for Preservation Technology and Training, National Park Service, Natchitoches, LA; Judith M. Jacob, Architectural Conservator, Building Conservation Branch, Northeast Cultural Resources Center, National Park Service, N.Y., NY; Robert M. Powers, Architectural Conservator, Powers and Company, Inc., Philadelphia, PA; Antonio Aguilar, Kaaren Dodge, JoEllen Hensley, Gary Sachau, John Sandor and Audrey T. Tepper, Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, Washington, D.C.; and Kay D. Weeks, Heritage Preservation Services Program, National Park Service, Washington, D.C.

This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Comments on the usefulness of this publication may be directed to: Sharon C. Park, FAIA, Chief, Technical Preservation Services Branch, Heritage Preservation Services Program, National Park Service, 1849 C Street, N.W., Suite NC200, Washington, D.C. 20240 (www2.cr.nps.gov/tps).

Front Cover: Chemical cleaning of the brick and architectural terra cotta frieze on the 1880s Pension Building, Washington, D.C. (now the National Building Museum), is shown here in progress. Photo: Christina Henry.

Photographs used to illustrate this Brief were taken by Anne Grimmer unless otherwise credited.

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REPORT

Keeping it Clean

Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings

Anne E. Grimmer

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

Heritage Preservation Services

REPORT

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Preface

Despite the inherent hazards, cleaning historic masonry,which includes stone, brick, architectural terra cotta, and cast stone, stucco and concrete, is one of the most common—and most visible—undertakings when rehabilitating or restoring historic masonry structures. Yet basic information and good technical advice may be hard to find. As a result, those responsible for the care of historic buildings frequently must rely upon the recommendations of a cleaning contractor or a cleaning product manufacturer who may not be completely objective, or familiar with all the cleaning options currently available. The cleaning of historic masonry should thus always be carried out under the supervision and guidance of a preservation or conservation specialist.

The purpose of this technical report is to provide information on removing dirt, stains, paint and related coatings, graffiti, and other disfiguring or potentially harmful substances from exterior masonry. First, however, there is a general discussion on all aspects of planning and carrying out a cleaning project, including anticipating potential problems; correctly identifying what is to be removed; identifying all building materials to be cleaned as well as other materials that might be affected by cleaning; and testing cleaning procedures to ensure the most successful project. The report also includes warnings about using certain techniques on specific building materials, as well as possible dangers to project personnel and the building's environment.

Unless otherwise credited, photographs were taken by the author.

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Part I
What to Consider Before Cleaning

Reasons for Cleaning

There are two primary reasons for cleaning a historic masonry building: 1) to improve the appearance of the structure; and 2) to remove dirt, stains, coatings, efflorescence (salts) and pollutants that may be causing deterioration of the masonry. Generally, the two are intertwined, but the most common motivation for cleaning masonry is the desire for cosmetic improvement. It is easy to understand this rationale, especially considering the positive visual impact of a clean building.

Cosmetic Improvement

A most important factor to consider before cleaning a historic masonry building is its patina—the color and surface texture, or the appearance which only time can impart. Patina usually includes a combination of surface stains, deposits, discoloration, and changes to the surface texture that may result from atmospheric dissolution and erosion. Naturally, patina includes a certain amount of dirt. As long as it does not contribute to, or conceal deterioration, patina is indeed part of the character of a historic building, and careful consideration should be given to its preservation. Determining when patina may be harmful or disfiguring must be done on a building-by-building basis, and will depend on the *type of masonry, the type and degree of soiling, and how much it might be obscuring damage to the masonry units themselves or to the mortar joints.* Careful removal of dirt and pollutant crusts can restore many aspects of the original appearance of the masonry—the color, texture and carved detailing that might have been hidden for years.

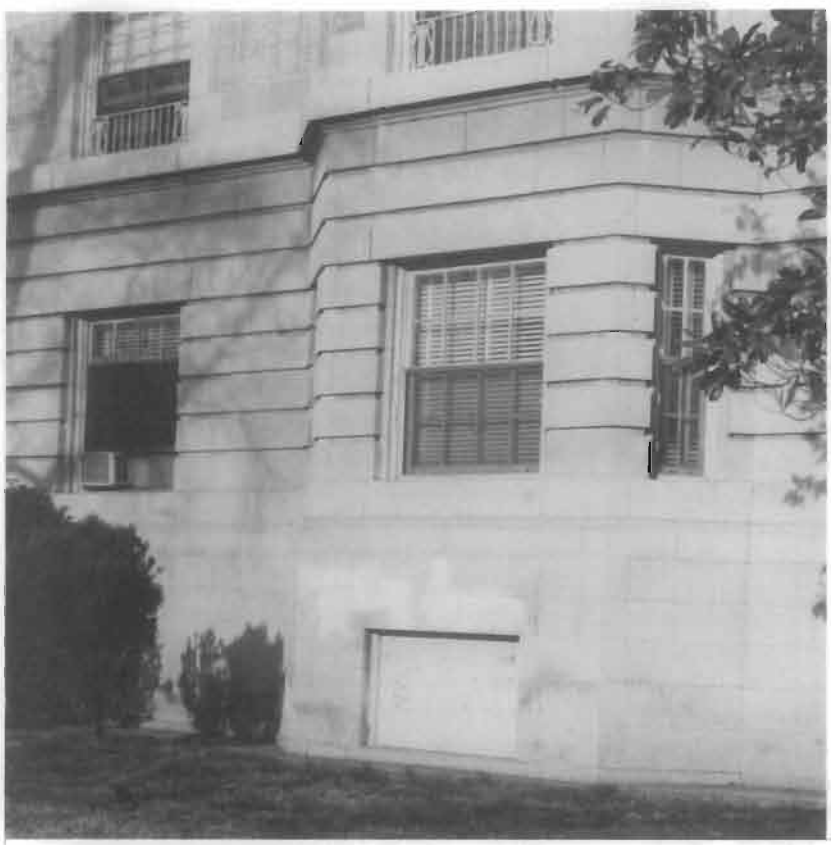


Figure 1. When an inappropriate chemical cleaner was used to remove graffiti, it resulted in permanently bleaching the limestone foundation, and left a mark as unsightly as the graffiti.

The unwelcome presence of graffiti usually triggers an urgent need for cosmetic improvement. An owner or building manager would likely want to remove graffiti as quickly as possible after it appears. Prompt removal is, in itself, a logical approach to the problem because it tends to discourage the incidence of more graffiti. On the other hand, if cleaning is undertaken too hastily, the results may be less than satisfactory (figure 1).

Removing paint from masonry, particularly from brick, is another common "cleaning" treatment, although it may not always be an appropriate or successful treatment for the building. Often, it may be preferable to retain the paint. Painted brick buildings were very popular throughout several historic periods. Many, in fact, were painted immediately after construction. Decorative treatments, such as the penciling of mortar joints, should be carefully examined; they may be original or may have acquired significance over the years. Paint may also have been applied as a protective coating, usually on

some of the more porous types of brick and sandstone; or applied to camouflage alterations or incompatible masonry repairs. All of these factors should be taken into consideration before paint removal is begun. If all nondamaging methods of paint removal have been tried and proven ineffective, it may be best to leave the masonry painted. Or, if the paint is in poor condition, the best approach may be to remove only the loose and peeling paint to a sound surface, and then repaint.

Slowing the Processes of Deterioration

The strongest practical argument in support of masonry cleaning is that it may slow the processes of deterioration and decay. Heavy layers of dirt not only interfere with natural weathering and washing patterns, but also obscure deterioration (figure 2). Cleaning is often necessary to help the architect or building conservator detect problems, and correctly interpret them, in order to take corrective measures, and to prepare a regular maintenance schedule for the building. The cleaning process itself, as well as the close-range view of historic masonry afforded by the scaffolding or other access equipment, also provides an important opportunity to evaluate the condition of the building. Once rid of dirt and pollutant crusts, the conditon of the masonry will be more clearly revealed.

One of the best reasons for a regular cleaning program is that it may remove efflorescent salts from the masonry, thereby reducing potentially harmful salt buildup within the masonry,which can cause spalling or delamination. Regular cleaning or washing can help control plant or other biological growth on a building; it is a safer and gentler approach than applying herbicides that are potentially harmful to the masonry.

Generally, regular cleaning or washing is good preservation and maintenance practice for calcareous stones such as limestone and marble. But it is not as necessary for the less soluble siliceous stones, such as granite and some sandstones, nor for some brick and some glazed architectural terra cotta, all of which have a harder, more impervious outer layer, and are thus better protected from dirt penetration than calcareous stones.

Figure 2. The building on the left is an obvious candidate for cleaning, as the heavy black crust may be concealing or contributing to deterioration of the stone. Despite its more recent cleaning, the stone facade of the house on the right exhibits the same distinctive, and hard-to-eliminate rainwater wash patterns under the eaves and window sills, as its unwashed neighbor.

Identifying the Masonry Substrate

Avoiding Damage

The first and most important step to be taken before beginning any masonry cleaning project is to identify the masonry. When dealing with stone, it is important to select a cleaning method or chemical solution best suited for the kind of stone—that is, one that will not dissolve or etch it. It is also useful to have information about the chemical and geological characteristics of the stone. (For example, although most sandstones may be safely cleaned using acidic cleaners, some sandstones are calcareous, and thus may be damaged by acid.) Gathering detailed geological data is not always possible if the factors of time and cost are prohibitive. However, it *is* essential that the generic stone be identified (i.e., whether it is limestone, marble, sandstone, or granite) because of the differing properties of porosity, solubility and hardness, and mineralogical composition. It is these properties that determine which cleaning methods can be used without adversely affecting the stone.

Tricks of the Eye

Another potential problem is that what might appear to be one type of masonry may actually be another. For example, architectural terra cotta, artificial cast stone, or pre-cast concrete were often manufactured to imitate natural stone. Pre-cast concrete or "cast stone" was being used imitatively as early as the late eighteenth century and still is to this day. Architectural terra cotta was used with this intent in the mid-to-late nineteenth century, and through the early twentieth century. Both materials were popular for decorative features such as window and door moldings. Terra cotta, in particular, was applied on upper floors of tall buildings where distance enhanced the illusion of stone.

Clearly, it is important to identify the material, since the best cleaning method for one type of masonry may not be as effective on another type, and may even cause damage. Many buildings feature a combination of materials. It is not unusual for a building or even a single facade to be composed of more than one type of masonry (brick with stone trim is particularly common), which may mean that more than one cleaning method will be necessary. If, after careful examination, there is any doubt about the type of masonry, a 3 percent solution of hydrochloric (muriatic) acid dropped from an eyedropper on an inconspicuous spot will quickly clarify the situation. This solution will bubble on calcareous stone, and on other acid-sensitive masonry, but will have no reaction on siliceous stone and acid-resistant masonry.

Indeed, some parts of a building, particularly decorative features, may not be masonry at all (figure 3). Frequently, such features as window hoods, cornices and balustrades may be metal, such as cast iron, galvanized sheet iron or zinc. When painted, they give an intentional appearance of masonry. Some features may have been fabricated of wood, then coated with a sanded paint to give the illusion of sandstone. Thus, the need to correctly identify the type of masonry, or other non-masonry materials on a building cannot be over-emphasized when planning a cleaning project.

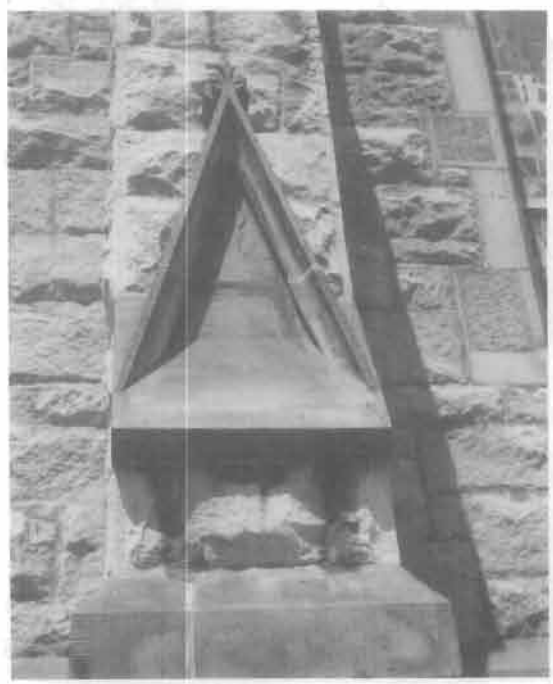
Figure 3. Know what you are cleaning. If the painted surfaces of the projecting bay window on this once elegant Second Empire brick mansion were still intact, it would not be easy to identify the beltcourse as sandstone, the windows and window frames as wood, and the cornice and all of the window hoods as pressed metal. Cleaning so many different building materials may require a variety of techniques and treatments.

Identifying the Substance to be Removed

After the masonry substrate has been identified, the next step is to identify the substance or substances to be removed. The more information available about the substance to be removed, the more successful the cleaning effort will be. For example, the cleaning project can be greatly facilitated by knowing the composition of each paint layer, the cause or source of the stains, the primary components of the dirt, or the probable source of the efflorescence. And it is not uncommon to discover that all or part of a building has been treated with water-repellent coating. Unless the coating has caused discoloration or streaking, the fact that such a coating exists at all may be known only if cleaning test patches fail to react as they would on uncoated masonry.

Dirt and Pollutant Crusts

Dirt or "soiling" on masonry buildings may consist of particles of dust, sand or grit, or tarry soot (resulting from incomplete combustion of fuels). The exact composition of the dirt will vary according to the geographic location of the building, as well as its use. A building in an urban, or heavily industrial area, is likely to exhibit a completely different type of soiling from a building in a rural or agricultural area—or a building near the seacoast or in the desert. While dirt and dust on one building may result from heavy vehicular traffic in the area, soiling on another building may result from human traffic.



Figures 4a-4b. Decorative architectural features that project from a wall surface, such as this granite belt course above an intricately-tooled limestone lintel, and this sandstone pinnacle topping a limestone buttress, may shield or protect masonry surfaces beneath them. But they are also responsible for creating unusual "wash" patterns and black crusts that form underneath them, further complicating cleaning projects.

Dirt or soiling may include disfiguring pollutant or sulfate crusts, which usually build up in sheltered or protected areas not regularly washed by the natural action of rain. It is particularly common under cornices, window sills, or other projecting decorative features (figures 4a - 4b). Some pollutant crusts resulting from a chemical reaction of stone to airborne particulate matter, or particules in which cementing material of the stone has actually incorporated itself, indicate the beginning of dissolution of the stone and incipient decay. Removing these crusts will necessarily involve a loss of a small amount of stone (figure 5). While removal is generally recommended because pollutant crusts hasten stone dissolution, extreme care must nonetheless be exercised to ensure that loss of the stone is minimized.

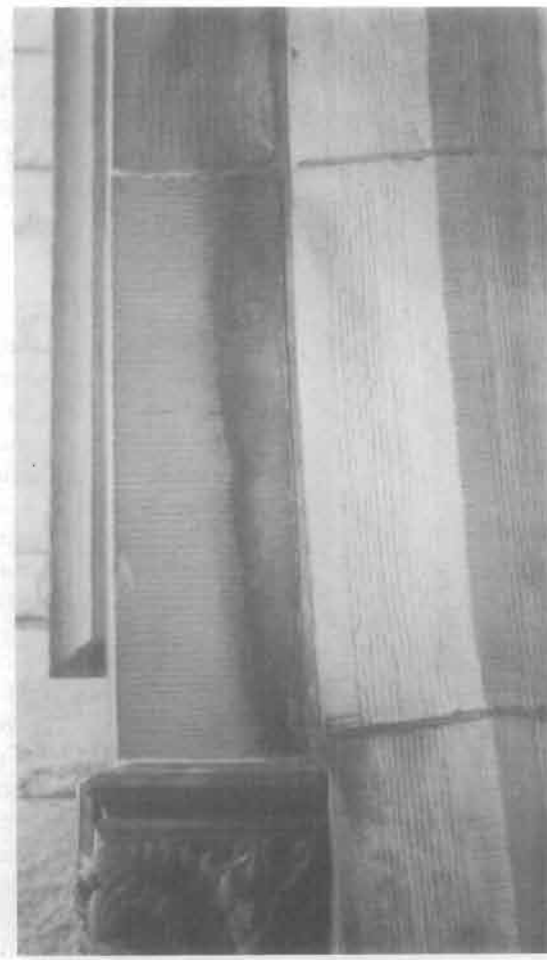


Figure 5. It is unlikely that this blackened crust can be removed without some loss of the tooled sandstone surface, because the sulfate crust has become integral with the stone.

Stains

Unlike particulate dirt, which tends to lie on the surface, stains in masonry are discolorations produced by foreign matter that has penetrated into—or permeated—the masonry. Stains can also result from a chemical reaction between the masonry and the foreign matter, or from impurities in the masonry itself. Common masonry stains include metallic stains caused by iron (rust) or copper, industrial stains of grease, oil, and tar, and biological and plant stains caused by lichens, mosses, algae, and fungal growth such as mildew. Even after removal of the vines themselves, ivy and Virginia Creeper can leave their "marks" on the masonry, which may also have to be removed by cleaning. Discloration can also occur when mineral inclusions or impurities which occur naturally in some stones, or in the clay of some bricks, react to water or chemical cleaners.

Graffiti

Graffiti created with paint or another medium may also be considered a stain. If graffiti is sprayed-on, it is generally likely to permeate the masonry (unless glazed or polished) in the same manner as most other stains. Thus, its removal must usually be carried out in the same manner as other stain removal.

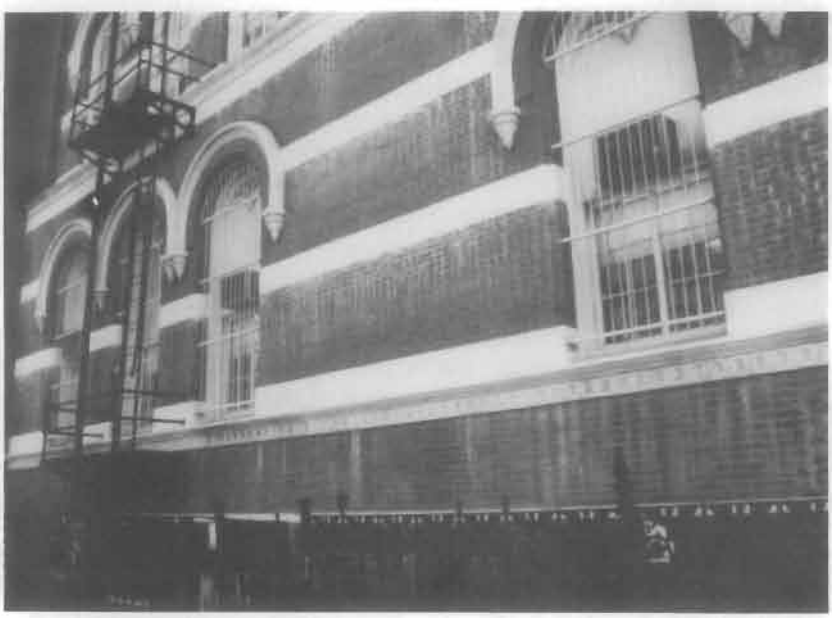


Figure 6. Chalking white paint from decorative metal and stone stringcourses has "bled" and run down the unpainted brick walls. Unlike efflorescence, for which it might be mistaken, chalking generally cannot be washed off, and paint remover will be required.

Paint and Other Coatings

Removal of paint or other coatings will, of course, be facilitated by knowledge about the kind or kinds of paint, and the number of layers to be removed. For example, it is useful, if at all possible, to know whether the paint is oil-based, water-based, or, as is often the case, whether it consists of a variety of paints and coatings, which might include layers of cementitious masonry paint, whitewash or limewash. In some cases, the pigment might be incorporated into the substrate, as is often typical of stucco and traditional limewashes.

Questions may arise about each layer or coating, further complicating the overriding need to remove the offending substance while not damaging the historic masonry. For example, if there is more than one layer of paint, is it consistent over all of the building surface? Or is there an "invisible" water-repellent coating or a wax coating, or perhaps even worse (from the standpoint of removal), an asphalt or bituminous waterproof coating on some areas? If so, will it come off successfully, or might it be better to camouflage it by repainting?

Efflorescence

Efflorescence, the result of capillary action pulling soluble salts up from the ground into the masonry, usually appears as a whitish haze on the exterior surface of masonry. Sulfate deposits may result from carbonates in lime mortar and airborne or water-deposited pollutants in the atmosphere. Another common source of efflorescence in brick is the firing process itself.

Efflorescence may also appear on a masonry surface after chemical cleaning. Some efflorescence is temporary, and will be removed by rain. Other types may disappear for awhile, but return periodically, and some require considerable and repeated efforts to eliminate. It is therefore always necessary to ascertain the source or sources of efflorescence, and it may even be useful to identify the salts that comprise the efflorescence. Further complicating the identification process, white paint from a painted surface above that has "bled" onto a

masonry surface below (particularly common under window sills) might be mistaken for efflorescence (figure 6). In short, it is very easy to misinterpret what is on the surface.

Combination Problems

Often, a cleaning project will involve removal of more than one substance. What first appears to be a straightforward task of paint removal may be complicated by the discovery of multiple layers of different types of paints and coatings on another elevation of the same building, or perhaps on only the first floor of the building. Moreover, what may initially appear to be one substance may, upon closer examination, turn out to be another, or often a combination of substances.

Project Personnel

Once the masonry and the substance to be removed have been identified, the next step is to match potentially appropriate cleaning methods with the particular project at hand.

Role of the Preservation Consultant

To ensure the best possible job, a professional preservation consultant should be retained, preferably someone with a technical or scientific background (an architectural conservator, a restoration architect, or a chemist or geologist). The advice of cleaning contractors or product representatives may be prejudiced by familiarity with only one or two cleaning techniques, or a desire to sell a particular product. Generally, their recommendations should not be substituted for the experience and impartiality of a technical preservation specialist or scientific consultant.

Basically, the consultant should supervise all aspects of the cleaning project—planning, identifying the masonry, identifying what is to be removed, selecting the cleaning methods and materials, selecting the contractor, and supervising the actual cleaning to ensure consistent quality and to minimize any possible damage to the surface.

Role of the Preservation Consultant

- Identify the building's materials.
- Evaluate condition of the masonry materials.
- Identify what is to be removed.
- Supervise the testing of the cleaning methods.
- Analyze the test patches.
- Based on the test patches, select the cleaning methods that most effectively clean the masonry without causing damage.
- Prepare specifications based on these test results (if they have not been prepared already prior to testing).
- Select cleaning contractor (if not already chosen).
- If possible, have cleaning test repeated by cleaning personnel who will do cleaning.
- Supervise actual cleaning process to ensure consistent quality.

Selecting a Cleaning Contractor

A carefully executed cleaning job requires the experience of a reputable cleaning contractor who specializes in cleaning and restoring historic masonry buildings. Negotiating a fair price with one qualified contractor may be preferable to asking several contractors to bid on the cleaning job. The bids and final contract should be based on specifications prepared by the independent preservation consultant. A good contractor should be willing to provide information on the cleaning process, and on the product ingredients, and also provide references in the form of completed cleaning projects.

It is important that a consultant, who is experienced in such evaluations, visit at least one or two projects in order to inspect the quality of the work. A well-executed cleaning project should not show any signs of mechanical or chemical abrasion, nor should it exhibit areas or patches of efflorescence, which might indicate the use of too strong a chemical or improper or inadequate rinsing. (Sometimes efflorescence on a very recently cleaned building is only temporary, and will gradually wash away. It may be the result of salt-laden moisture *within* the masonry

suddenly being released when surface dirt or a coating is cleaned off.)

A responsibly and sensitively cleaned historic masonry building should retain some of its before-cleaning patina, perhaps appearing slightly "dirty," as if it had not been overcleaned. Clearly, however, there may be some aspects of a recently cleaned surface that are not so easy to explain. Sometimes an abraded or eroded surface is the result of natural weathering or a "flaw" in the original materials, or damage from an earlier, harsh cleaning treatment. Or what appears to be a stain may, in fact, be the result of an unexpected reaction of a natural impurity in the stone to a chemical cleaner. In short, as will be repeated again and again, it is not always possible to predict the exact outcome of a cleaning project because of the many variables associated with historic masonry. But despite some unavoidable uncertainty, a cautious, conscientious approach by the consultant, building owner or manager, and the contractor will always result in a better cleaning project—one that does not damage the historic masonry.

Although cost is often a factor in a cleaning project, the contractor should not be selected solely on the basis of a low bid, but rather on the quality of previous work, as well as *on* the basis of test patch results. Local historic district commissions and review boards, State Historic Preservation Offices, regional offices of the National Trust for Historic Preservation, local chapters of the American Institute of Architects (AIA) and the Association for Preservation Technology (APT), may be able to suggest reliable consultants and cleaning contractors experienced in cleaning historic buildings.

What to Require in a Contract and Specifications

Because cleaning a historic masonry building involves so many unexpected and unknown factors, each project is unique. It would be impractical to try to provide a standard set of specifications to cover *all* of the potential situations that might be encountered. But, while the actual specifications will vary from project to project, there are certain principles that should govern any cleaning project to ensure the best possible outcome.

1. The specifications should be very precise. The more specific they are, the less chance there is for mistakes.
2. Qualifications of project personnel should be included in the specifications.
3. If specifications are prepared before testing, they should clearly state that mock-up test areas will serve as quality-control for the project.
4. If testing has already been carried out, the specifications should state the exact cleaning method (technique and materials) to be used based on the testing.
5. If a specific product is to be used, it should be clearly stated so that the contractor is aware that *no* other product may be substituted, unless it is with the prior approval of the preservation consultant or supervising architect—and of course, only after it has been tested on the building. A building may often require more than one cleaning method or cleaning product. If so, each method to be applied to a different material and in a different location on the building should be identified.
6. The cleaning process should take place only under the careful supervision of a qualified professional preservation consultant or preservation architect. The cleaning method outlined in the specifications will have been prescribed only after careful testing on the building with time allowed for weathering. Any unforeseen problems that might arise during the course of the cleaning should be brought to the attention of the consultant (and the owner), and the cleaning halted until the problem is solved.
7. Finally, even a well-written specification is of no use if it is not read and followed.

Testing

Because of the wide variety of unforeseeable factors, the cleaning method or methods should always be tested on an inconspicuous area of the building and preferably in more than one location (figure 7). Such tests must be carried out before attempting any large-scale masonry cleaning project. Failure to do so may have disastrous consequences for the outcome of the cleaning as well as the long-term preservation of the historic building material. Testing should be carried out by the consultant or conservation specialist, or by the contractor, under the consul-

Figure 7. A contractor prepares equipment before testing a low-pressure water wash on a Roman brick and terra cotta building. Photograph: Sharon C. Park, AIA

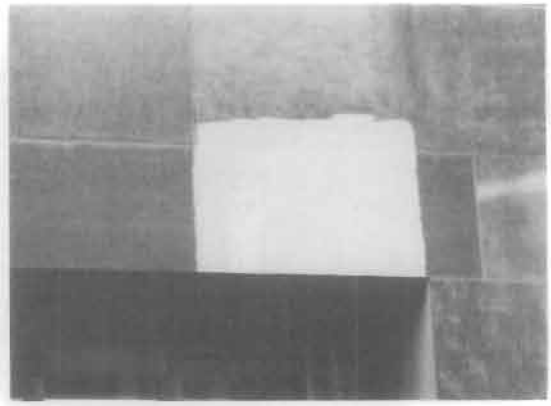


Figure 8. A test cleaning patch (unfortunately in a rather prominent location) on limestone discolored by urban grime and pollution reveals a marked color difference between the cleaned and the uncleaned stone as well as an unexpected discoloration (probably caused by a substance splashed on the wall at an earlier time). Removal of this spot may require a special cleaning treatment. Photograph: Sharon C. Park, AIA

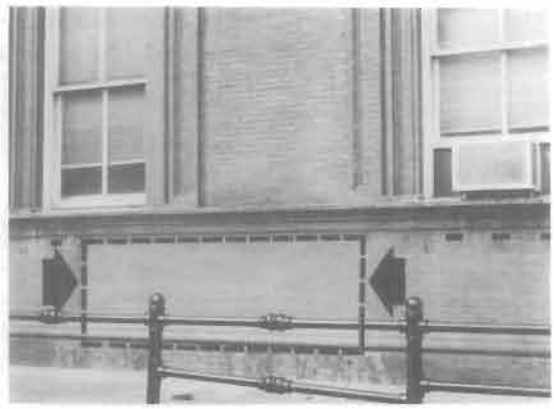


Figure 9. A test patch on brick to remove a century of dirt reveals only a slight difference in appearance between the cleaned and the uncleaned brick. The hard-baked outer skin of the brick provides a surface that is not only impervious to dirt penetration, but resists dirt accumulation. Photograph: Christina Henry

tant's careful supervision. Carefully controlled testing is probably the only reliable way to determine the best or most appropriate cleaning techniques and pressures to be used in a particular project (figures 8-9).

Selecting an "Appropriate" Water Pressure

The process of selecting the most appropriate water pressure should always begin with the lowest pressure, or the "gentlest means possible," proceeding gradually to a higher pressure, as needed. Although that philosophy is certainly sound, its application in a practical sense is very much more difficult. The difficulty lies in the fact that, although the terms "low," "medium" and "high" pressure have traditionally been used in cleaning specifications, they are general terms and subject to wide interpretation. Because of incalculable or unpredictable factors associated with pressure equipment—combined with different types of historic masonry itself—it is virtually impossible to define the categories of low, medium and high in a manner that would apply equally to all cleaning projects.

Precise definition of these pressures is further complicated by the fact that pressure measurement, or psi (pounds per square inch) varies according to the following: pressure as measured by a gauge at the pump; the volume of water (or other liquid cleaning agents) delivered per minute; the size of the nozzle or spray head opening; and the distance between the spray head and the masonry surface. But since most psi measurements are taken at only one location, these seemingly precise measurements may bear little or no relationship to the actual pressure reaching the building. As the variables multiply, it becomes more and more obvious that psi numbers do not really mean very much, or at least do not mean the same thing to all who employ them in cleaning. Thus, although exact pressures may sound precise, the fact that they are not must be kept in mind.

For this reason, until a system can be perfected that will allow greater certainty or precision, selecting a cleaning method and pressure should be done only after careful testing has produced a satisfactorily cleaned test patch to serve as a standard by which the rest of the project can be measured. *Thus, references here to specific pressures are provided only for comparative purposes, and should be considered only as general guidance.*

Choosing Representative Types of Masonry

Finding the appropriate cleaning method can be further complicated when dealing with especially fragile, damaged or deteriorated masonry. These are factors that must be taken into consideration when planning to clean historic masonry.

Areas of the building chosen as test spots should accurately represent the types of masonry material to be cleaned. As noted earlier, another masonry material may have been used to simulate stone. Also, a harder, higher quality brick or "face brick" was often used on the facade, while the less visible side and rear elevations were often covered with a cheaper, usually softer "common brick" as an economy measure. Results from a cleaning test performed on common brick, or a heavily textured brick, would probably not be applicable to smooth, face brick. Likewise, tests on upper parts of a building may not accurately reflect conditions on other areas, such as the foundation or horizontal surfaces that may have been treated with a waterproof or water-repellent coating.

Choosing Representative Soiling

The area or areas selected for testing should represent both the amount and type of the dirt deposits, surface pollutant crusts, stains, efflorescence, or paint on the majority of the building surface. For example, a prominent area of the facade may be stained, disfigured with a heavy coating of soot, or covered by heavy paint buildup. Another area of the building may be only lightly soiled or have only one coat of paint. These might require very different cleaning procedures. A project that proceeds after testing a limited area only might produce very unsatisfactory results.

To ensure the most accurate test results, as much as possible of the dirt, bird droppings, or problem substances should be removed from the surface by hand-scraping or brushing with non-metallic brushes *before* test cleaning. (This same practice should, of course, be followed when the actual cleaning is undertaken.)

Evaluating the Test Patches

Althought a somewhat larger area is preferable, an area approximately one square meter or approximately one square yard will generally serve as an adequate test patch. If there are different types of masonry, or widely dissimilar substances to be removed, several test patches may be necessary. Representative, but inconspicuous areas should be chosen in case any of the tests are not successful, or in case the project does not progress beyond the testing stage.

One building, regardless of size, may require a variety or combinations of cleaning methods. If the type of scaffolding allows, it is advisable to clean the entire building using the gentlest technique to remove the prevailing substance. Then, localized stains on decorative features can be addressed individually. Too strong a cleaner for overall cleaning may harm the masonry. Instead, a milder cleaning solution should be used and augmented, if necessary, by additional applications on hard-to-clean areas or difficult stains. *Always underclean, rather than overclean.*

Test patches can be evaluated accurately only after they are dry. If chemical cleaning is being tested, non-staining pH papers should be held on the surface of the test patch area before and after cleaning to determine if any acidic or alkaline residues remain on the surface. If residues are detected, additional water rinsing or application of a neutralizing solution should be carried out until pH tests indicate that all residues have been removed.

A test patch should be allowed to weather as long as possible before the cleaning project is begun to give ample opportunity for an accurate evaluation of the results. One year is the preferred amount of time; this allows the patch to be exposed to a complete weathering cycle (figures 10a-10b). If this is not feasible, it is a good idea to

Figures 10a-10b. This test cleaning patch on brick and sandstone was allowed to weather over a full year, while other aspects of the rehabilitation were carried out. Finally the entire building was cleaned with a proprietary paint remover sprayed-on under low-pressure and then rinsed by workmen from a truck-mounted hydraulic platform lift.

wait as long as possible, and at least one month at a minimum. Once a cleaning project is begun, the work should proceed in clearly defined areas (preferably delineated by structural or architectural features), since it is difficult to match cleaned areas, especially if the project is halted for several days or more.

Reasonable Expectations

Tests are usually carried out under optimum conditions, and may therefore show better results than the actual cleaning project. For example, a cleaning contractor bidding on the job will naturally try to achieve the best possible result in a sample cleaning area in order to obtain the contract. It is also easier to clean a small area at ground level within a specified amount of time than to achieve the same results several stories above ground by workers who are tired after a long day's work. Overly optimistic estimates of time and costs supplied by a contractor based on the results of a test patch can be misleading.

But an experienced and reputable contractor will be aware of these inherent problems and should be able to provide a reasonable estimate based on the testing.

The test patches serve as a "standard of clean" and will provide guidance regarding the best cleaning method for the job; for example, how many applications of the cleaning material will be necessary if a chemical product is used, the dwell time (the length of time an application should remain on the surface), and what pressures should be used for the cleaning and the final rinse.

Scheduling the Cleaning Project

One of the most important considerations in a cleaning project is scheduling. Since the cleaning method cannot be selected until several techniques have been tested, it follows that the test patches should be done at the start of a rehabilitation or restoration project. And, because of the need for adequate time for the cleaning tests to weather before selecting one, the actual cleaning itself should be the last, or one of the last things to be done in the project.

Never begin cleaning when there is any likelihood of frost or freezing, as most cleaning operations involve the use of water. When the water penetrates the masonry pores during cleaning, the interior of the masonry retains moisture for

some time before it evaporates, even though the exterior surface may appear dry. If a frost occurs, the moisture inside the masonry units will freeze, which could eventually cause the masonry surface to spall. The presence of salts within the masonry wall may exacerbate the process.

The best times to clean a historic masonry building (other than in tropical or arid climates) are late spring, early summer and early fall when there is no danger of freezing. While warmer temperatures contribute to a faster chemical reaction, too much sun and too high temperatures do not result in a good cleaning project either. If cleaning is done in very hot weather, the masonry should be shielded from excessive heat by hanging protective netting or tarpulins around it.

Repointing, if necessary, should generally be carried out before cleaning to prevent damage to interior surfaces caused by liquid cleaning materials penetrating through open joints in the masonry.

Minimizing Hazards of Cleaning

Although most large-scale cleaning projects should be carried out by qualified cleaning professionals accustomed to working with historic buildings, it is still important to keep in mind all of the precautionary guidelines associated with masonry cleaning. Potential harm to the historic masonry and other building materials often used in conjunction with stone and brick, as well as potential harm to the environment and cleaning personnel must be carefully evaluated before initiating a cleaning project.

Protecting the Historic Building

Mortars, especially those of the traditional lime-based formulations, are among the most vulnerable substances to be considered when preparing to clean a historic masonry building. Deteriorated mortar joints can lead to major problems with water washing and other aqueous techniques. The entry of large amounts of water through spraying or prolonged misting may result in damage to interior plaster and other finishes, and in exterior staining as well. Water pressures for cleaning and rinsing operations should be monitored carefully to minimize physical damage to the masonry. Loose mortar can be dislodged by rinsing at too high a pressure, permitting deep penetration of water within the building.

The acidity or alkalinity of cleaning chemicals must be controlled to suit the chemistry of the individual masonry materials. Because chemical cleaning with acidic products is always potentially dangerous to acid-sensitive masonry and lime mortars, acidic cleaners must therefore be diluted carefully, in keeping with the sensitivity of the masonry. To accomplish this successfully, accurate identification of the masonry is essential. This may not be easy. Limestone and some cast stone, or other types of artificial stone, can look very similar.

Many other historic building materials can be damaged by chemical cleaning agents. Glass, glazed brick, and architectural terra cotta will be etched by strong solutions of hydrofluoric acid if not covered adequately. Metal, wood and paint can all be damaged by chemical cleaners, and must be shielded. Such materials can be temporarily protected by plastic sheeting or peelable coatings specifically made for this purpose (figure 11).

Figure 11. Removal of 100 years of grime from the brick and terra cotta facade of the Pension Building (now the National Building Museum), Washington, D.C., was accomplished by workmen on a swing stage using a chemical cleaning product. Note the polyethylene covering the windows to prevent damage. Also note the protective clothing for the workmen which hangs on the platform while not in use. Photograph: Christina Henry

Protecting the Environment

Damage to property, shrubs, trees and ground vegetation in the immediate vicinity can be avoided by using proper controls to avoid overspraying and by covering or shielding plants and property. Site drainage must always be considered when using an acqueous cleaning method, and disposal of toxic chemical runoff and dissolved paint may pose an even greater problen. Lead paint sludge should be placed in suitable containers and disposed of in accordance with enviromental regulations. In the case of organic solvents, a well-designed storage location is necessary to prevent explosion and fire. Use of many of these cleaning materials may require special permits or approval from local authorities, especially if run-off is to be channeled into city storm sewers.

Protecting Cleaning Personnel

Cleaning compounds pose many safety and health hazards, and working personnel must be equipped with protective clothing, gloves and toxic vapor masks. Strong cleaning agents can cause skin burns and irritation, and adequate eye protection is essential at all times. Hydrofluoric acid can cause severe burns and can also penetrate the skin, resulting in bone damage. Organic chemicals are equally health-threatening, because they are absorbed systemically through the skin and are carcinogenic. When using spray equipment containing acid cleaners, extreme caution must be taken to release the pressure slowly so that the contents do not spray or splash the operator.

Part II
Choosing the "Gentlest Means Possible"

Most cleaning techniques suitable for use on historic masonry buildings rely on aqueous or water-based systems, and chemicals. Water-based solutions (which can include detergents) and chemical solutions can be successfully applied separately or in combination, aided by a variety of hand-scraping methods. Properly used, these techniques can safely remove dirt, stains, graffiti, paint or other surface coatings, efflorescences (salts), and plant and fungal growth and stains from historic masonry buildings.

Water Cleaning to Remove Dirt

all types of masonry

Water-based cleaning can be the gentlest and simplest operation, causing the least amount of damage, if certain precautions are followed. It may also be the least expensive cleaning procedure. It is probably the most versatile technique available for sensitive cleaning and removal of dirt and pollutant crusts from *all* types of historic masonry materials, and it is generally the *simplest* method for cleaning limestone and marble. While there are several cleaning methods in which water is the sole ingredient, water is also the principle cleaning agent in other methods which utilize detergents and chemicals.

There are four principal types of water washing: soaking (misting and spraying); low-pressure and medium-pressure water washing; low-pressure and medium-pressure water washing supplemented with non-ionic detergents; and steam cleaning, by itself, or supplemented with non-ionic detergents.

Soaking (Misting or Spraying)

Prolonged spraying with a fine mist is a relatively simple washing method. This technique provides maxium wetting using a minimal amount of water. A mist is produced by inserting fine mesh filters over hose nozzles. Continuous soaking of the surface is then accomplished by running lengths of punctured hose (or a moveable pipe, or one supported on scaffolding) hung under the eaves or along the cornice line of the building. Water pumped up through a compressor at ground level slowly trickles down or sprays the building facade.

Low-pressure, low-volume misting devices with a wide angle of coverage may be the most efficient of the soaking techniques. They can also be set up to handle selected areas of heavy dirt or soot encrustation such as black sulphate or gypsum crusts that form in protected areas (especially under moldings and eaves not washed by rainwater) on limestone, marble and other calcareous stones. The effectiveness of this method relies on the fact that the sulfate crust, in which the dirt is incorporated, is several times more water soluble than the stone. Thus, water loosens the gypsum crust by partial dissolution, along with the material trapped within the network. As the description implies, this is a slow process and may take from four to six hours up to a week or more to soften heavy crusts or dirt deposits. After the dirt has softened, its removal can be facilitated by hand-scrubbing with non-metallic brushes or by using a moderate-pressure water wash; a wooden scraper may help in removing heavy sulfate crusts. A variation of this method is a timed schedule, or pulsed spray, which alternates periods of soaking (misting or spraying) with dry cycles, using a timer to regulate the intervals so the masonry does not dry out. This approach is also good for loosening dirt and pollutant crusts, although its use has been fairly limited in the United States. Before deciding to use any aqueous system, stone should be tested for free iron (iron not completely bound) to avoid the possibility of iron staining.

Low-Pressure and Medium-Pressure Water Washing

Another water-based cleaning method is low and medium-pressure "power" washing. It is always best to start with the lowest pressure possible, and to increase

the pressure only as much as necessary to loosen the dirt and adequately clean the building. Low-pressure water washing can be carried out with a common garden hose in a small-scale cleaning project, that is, one limited to a two-story structure that can be reached conveniently with a ladder. Again, removal of heavy grime can be facilitated by hand-brushing and scraping prior to washing. This is a very effective, gentle, and easily controlled method, unlikely to cause any harm to the building.

Low-pressure washing may also be successfully used for some large-scale cleaning projects, requiring scaffolding, or perhaps a "man lift" to provide access. Deteriorated areas will need specialized treatment, possibly by hand. After cleaning a building with heavy dirt encrustation, a final rinsing or a second cleaning using chemicals may be necessary in order to remove dirt already loosened by the initial washing.

Low-Pressure and Medium-Pressure Water Washing with Detergent Supplement

The best combination of prolonged spraying or dripping, low-to-medium-pressure washing, and brushing and hand-scraping, must be determined experimentally and on a case-by-case basis. While polished surfaces such as polished granite or glazed architectural terra cotta may sometimes be cleaned effectively of dirt simply with a low-to-medium-pressure wash, adding a non-ionic detergent that does not deposit a solid, visible residue, may often hasten cleaning. (Examples of non-ionic detergents include Tergitol by Union Carbide, Triton by Rohm & Haas and Igepal by GAF). Non-ionic detergents will also be needed to clean most textured masonry such as rusticated stonework, rough-surfaced brick, and intricately carved ornamental details; textured surfaces that hold dirt will require additional cleaning effort by hand-brushing with non-metallic brushes. After cleaning, it is important that the surface be carefully rinsed because, while not visible, a "gummy" detergent film tends to attract dirt.

With the exception of steam cleaning, which utilizes heated water, most water-based cleaning methods discussed here can be carried out successfully with cold water. Under certain circumstances however, warm or hot water may facilitate the cleaning process when removing greasy or oily dirt or stains, and sometimes in paint removal.

Steam

Steam cleaning is another water-based cleaning method. Although once used extensively, it is no longer as popular, possibly due to the increased sophistication of chemical methods. In this procedure, steam is generated in a flash boiler and directed against the masonry surface with the use of a very low-pressure (10-30 psi) nozzle, generally with a ½ inch diameter aperture. The heat of the steam swells and softens dirt deposits enough so that the low pressure of the steam is generally sufficient to remove the loosened dirt from the masonry surface. However, the density of the steam makes it difficult for the operator to see or monitor the cleaning process, and because the steam is heated to such a high temperature, it is not only a potential hazard to the operator, but may damage the stone as well.

Steam cleaning is most useful today as a method of removing vine disks and other vegetation clinging to masonry surfaces, and for cleaning small, hard-to-reach or highly carved or ornamented areas without causing mechanical damage. In such instances, it may be necessary to precede the steam cleaning with manual scrubbing using a non-ionic detergent or a low concentrate chemical-based cleaner, or to follow steam cleaning with a low-pressure water rinse. Steam cleaning may also be a suitably gentle method for cleaning damaged or friable stone. Steam cleaning is a technique that, under careful supervision, may occasionally be used for specialized interior cleaning because it does not produce large quantities of water, and therefore reduces the possibility of damaging fine finishes.

Cautions and Precautions. Despite the fact that water washing methods may be the gentlest of all cleaning methods they are not without hazards. Even these methods can be abrasive. Water pressure should always be kept at the lowest level that will clean the masonry without damage. Too highly pressurized water can etch or otherwise scar masonry, and may penetrate through the masonry walls (figure 12).

Figure 12. Water at too high a pressure from a pinpoint nozzle has etched this white Vermont granite. Photograph: David A. Look, AIA

With any aqueous cleaning system it is generally recommended that a masonry building be repointed, if necessary, before cleaning (allowing ample time for the pointing to cure adequately before cleaning, as the water may dislodge green mortar). Another possibility is to use caulking compound to fill in some of the larger gaps in the mortar joints temporarily to prevent water infiltration during cleaning. Before embarking on an aqueous cleaning project, it is important to make sure that the flashing around chimneys is tight, and that there are no open joints around doors and windows where water may enter.

Long periods of soaking or spraying may result in excessive moisture penetration of masonry walls, possibly leading to corrosion of metal anchors, and consequent exterior staining, or damage to interior plaster and paint finishes. To avoid these problems, cleaning personnel should inspect the interior periodically to check for moisture penetration. Prolonged soaking or spraying may also irreversibly weaken the masonry itself, since masonry, like other porous materials, tends to decrease significantly in mechanical strength when saturated.

Water cleaning of a moderate size building can require several million gallons of water. When such large amounts of water are involved, it is important to have a good drainage system available for the run off. Additionally, many city water systems may be heavily chlorinated or have a high mineral content. If this is the case, the water used for cleaning should be purified or distilled to avoid introducing chloride salts into the masonry or mineral deposits onto the masonry surface. In addition, water should be pumped through plastic, rather than copper, pipes to avoid possible staining of the masonry. Water cleaning may be rather time-consuming and expensive, particularly if the removal of heavy crusts requires much hand-scrubbing.

It is important to realize that although some types of masonry may benefit from frequent water washing, others do not. While useful as a method of revealing sources of potential deterioration covered by dirt, frequent washing of some of the harder siliceous stones including granite and some sandstones, as well as brick, probably does not aid in their preservation. But the opposite is generally true of calcareous stones such as limestone and marble, whose long-term preservation may be enhanced by regularly scheduled water washing. Regular cleaning of calcareous stones (perhaps every seven to ten years in heavily polluted urban areas) can remove potentially harmful absorbed salts. On the other hand, calcareous stones also tend to be highly soluble and *too* frequent washing may result in accelerated dissolution and loss of surface caused by the slightly acidic water of some city water systems. In general, washing procedures for these stones should not be overly long to avoid excessive exposure of the stone to the dissolving nature of the water. The use of distilled water may further minimize dissolution.

To prevent possible staining of light-colored limestone or marble in areas where the local water supply has a high iron content, it may be useful to add a chelating or complexing agent such as EDTA (ethylene diamine tetra-acetic acid), to the wash water; this will combine with any metal ions present in the water and keep them in solution to avoid metal stains on light-colored stone.

Chemical Cleaning to Remove Dirt

If water-based cleaning is the gentlest and least damaging method of removing dirt from historic masonry, chemical cleaners represent the next level of intervention. Chemical cleaners may be required to remove heavy dirt buildup or layers of paint. Chemical-based cleaners for

masonry are generally one of three types: acidic cleaners, alkaline cleaners, or organic solvents. Acidic or alkaline cleaners are used for regular cleaning or dirt removal; alkaline cleaners or organic solvents are used for paint removal. All of these cleaners rely on water and most contain surfactants ("surface active" agents)—organic compounds that concentrate at oil-water interfaces, and exert emulsifying actions, and thus aid in removing soiling. (Sometimes the term "surfactant" is used interchangeably with "detergent.")

Pre-wetting masonry surfaces is generally recommended for both acidic and alkaline products. In addition to loosening the dirt, this reduces the amount of the cleaning agent and the dirt-laden rinse water that can soak into the masonry and the contiguous mortar joints. Chemicals are then brushed or sprayed on under low pressure—brushing the chemicals on may actually help loosen surface dirt. When surfactant products are used, spraying or brushing generates suds that boost cleaning efficiency by lengthening contact time of the active chemicals with the masonry. Manual scrubbing with a non-metallic brush can have the same effect, and also assists in loosening dirt. After a few minutes (as indicated in the product literature or determined by testing), the cleaner is washed off by flooding the surface with a moderate-to-high (400-600 psi) water spray at a rate of three to four gallons per minute, rinsing from top to bottom. Extremely heavy dirt accumulations or many layers of paint may require repeated applications of the chemical cleaner. A hot water rinse may also facilitate paint removal.

Acidic Cleaners

most granites, most sandstones, slate, unglazed brick, unglazed architectural terra cotta, concrete

Acidic products can be used on unglazed brick and terra cotta, and most granites, sandstones, slate and other non-calcareous or siliceous stones. But acid-based cleaners generally should never be used on acid-sensitive materials that might be etched or abraded by acid. This includes masonry with a glazed or polished surface (glazed architectural terra cotta, glazed brick, polished stone or glass) as well as acid-sensitive stone such as limestone, marble, or calcareous sandstone.

Acidic cleaning is a two-part process: first, the acid cleansing solution is applied to the pre-wet masonry surface. After completing its action, the acid solution is then removed from the masonry by a thorough water rinse. Hydrofluoric acid is the most commonly used acid cleaner for historic masonry, usually with some phosphoric acid added to prevent development of rust-like stains that may appear after cleaning. Hydrofluoric acid specifically dissolves carbonaceous pollutant products, or dirt, and in most cases does not leave water-soluble salts in the masonry if the cleaning is properly carried out. It should preferably be used at a concentration 0.5 percent, but may be used at concentrations as high as 5 percent.

Hydrofluoric acid works on granite, slate, sandstone and brick by dissolving a minute amount of their surface, thus releasing the dirt. In this way, the introduction of potentially harmful residual salts into the masonry is kept to a minimum. The masonry should be kept moist throughout the cleaning operation to avoid silica deposition (efflorescence or the formation of a whitish powder). As most chemical cleaners (both acidic and alkaline) must remain on the surface for several minutes, keeping the masonry moist will also maximize cleaning efficiency. A second or third application of the cleaning agent may be necessary to remove particularly heavy dirt deposits.

Most commercially available products contain thickening agents to form gels or pastes that improve the cleaning agent's ability to cling to vertical surfaces. They also contain secondary solvents of a lower evaporation rate than water, such as glycerine to enable the cleaner to remain moist longer on the masonry surface. However, care must be taken to avoid exposing the masonry to cleaners containing hydrofluoric or other acids for more than five to seven minutes.

A variety of commercially prepared acid-based cleaners for masonry is available: products for granite, brick and sandstone, afterwash products, concrete cleaners and mortar removal products. The principal ingredient in granite products (restoration cleaners) is hydrofluoric acid. The afterwash products contain weak organic acids such as acetic acid. The mortar removers and concrete cleaners are based on

hydrochloric acid. Many of these commercial products are very effective on historic masonry buildings if used according to the manufacturer's directions and under the supervision of a preservation consultant.

It may be difficult to obtain a list of all the ingredients or their exact proportions for most of these products, since they are usually of a proprietary nature, and not patented. However, the Occupational Safety and Health Administration (OSHA), requires that Material Safety Data Sheets be supplied by manufacturers to distributors upon request; the provide information about all hazardous contents in commercially available cleaning products.

Cautions and Precautions. Hydrofluoric acid-based cleaners can sometimes leave whitish deposits of silica, or calcium fluoride salts (efflorescence). These deposits are generally not harmful to the masonry but may be disfiguring, especially on darker masonry. Since this efflorescence is soluble in hydrofluoric acid, it can usually be removed by a second chemical treatment, followed immediately by a thorough cold water rinse. It should be noted that hydrofluoric-based cleaners left too long on the masonry may result in a colloidal silica deposit that may be almost impossible to remove (figure 13).

Figure 13. While hydrofluoric acid-based cleaners are often appropriate for cleaning unglazed brick, they may form hard-to-remove whitish silica deposits if left too long on the surface.

Although cleaning non acid-sensitive masonry with hydrofluoric acid-based products is generally a relative safe undertaking—using proper precautions—hydrofluoric acid may lighten the color of some sandstones containing iron. This is another reason why it is always important to test the product on the masonry before beginning a full-scale cleaning project. Hydrofluoric acid can also severely etch aluminum and glass; therefore, these materials must be covered with acid-resistant coatings for protection during cleaning.

Hydrochloric (muriatic) acid is a very strong acid and thus should generally not be used as a cleaning agent on historic masonry (even when diluted). Rather than cleaning or dissolving dirt, it dissolves lime-based mortars and even some stones, and leaves chloride deposits on the masonry surface. *The fact that it dissolves lime-based mortar as well as lime contained in some stones clearly illustrates that its use on historic masonry is generally inappropriate, since many historic mortars have a high lime content.*

When used as a cleaning agent, hydrochloric acid also tends to result in the formation of water soluble salts in the masonry itself, which even thorough surface rinsing is unable to remove. Some of these salts deposited within the masonry will probably appear on the exterior surface of the masonry as efflorescence, which may be washed off or brushed off by hand. However, not all of these chloride sales will migrate to the exterior surface. Salts remaining within the masonry may eventually cause spalling of the masonry units themselves. Furthermore, the use of hydrochloric acid may also result in the formation of yellow ferrous chloride stains on some types of masonry.

Commercially available acid-based cleaners usually contain varying combinations of hydrofluoric, phosphoric, hydrochloric (muriatic), sufuric, acetic, and oxalic acid. As a final caution, it should be noted that despite the manufacturer's recommendations, commercially available "all purpose" cleaners that contain hydrochloric acid should not be used on limestone.

Generally, the only appropriate application of diluted hydrochloric acid to historic masonry is to remove excess mortar that

may have been splashed over the stone or brick while repointing, to remove white-wash or other lime or cement-based coating, or sometimes to clean concrete.

Alkaline Cleaners

limestone, marble, calcareous sandstone, glazed brick, glazed architectural terra cotta, polished marble, polished granite

Alkaline cleaners should be used on acid-sensitive masonry materials that would be damaged by acidic cleaners: limestone and marble, calcareous sandstone, glazed brick and glazed architectural terra cotta, and polished marble and polished granite.

Alkaline cleaners consist of two major ingredients: 1) a detergent (or surfactant), and 2) some type of alkali, usually potassium hydroxide. Following their application to the pre-wet masonry, alkaline cleaners are rinsed off with water; then the masonry is given a slightly acidic wash (for example, acetic acid) to neutralize the alkaline solution. The final step is to rinse the masonry with water a second time. Both potassium hydroxide and ammonium hydroxide (ammonia) are suitable alkaline cleaners for historic masonry. (Ammonia cleaners are especially effective in removing soil of a slightly greasy nature.) For lighter-colored calcareous masonry, a more uniform final appearance may require the addition of complexing agents (such as EDTA) and organic bleaches, but only under careful professional supervision. The effectiveness of alkaline cleaners, particularly for removing paint, wax coatings, grease and oil stains, may be increased by a hot water rinse (not over 160°F). Alkaline paint removers as well as alkaline cleaners for dirt removal from calcareous stones are used undiluted.

Cautions and Precautions. Sodium hydroxide (caustic soda or lye) generally should not be used on older or historic masonry. It is extremely harsh and can cause efflorescence and subflorescence, and may also cause physical abrasion and loss of small amounts of a brick surface (figure 14). Ammonium bifluoride is another alkaline cleaner that is commonly recommended as an "all-purpose" cleaner, but in general, ammonium bifluoride solutions are also not suitable for use on limestones, marbles, calcareous sandstones, or unglazed brick because of the likelihood of leaving ammonium salts on the surface or within the masonry.

Figure 14. Although the sodium hydroxide-based test cleaning patch on the right side of this wall of common brick appears to have been successfully cleaned, closer inspection reveals that a minute portion of the brick surface has been dissolved and removed by the cleaner. As a result, considerable brick dust can be seen in the cracks of the pavement beneath the wall.

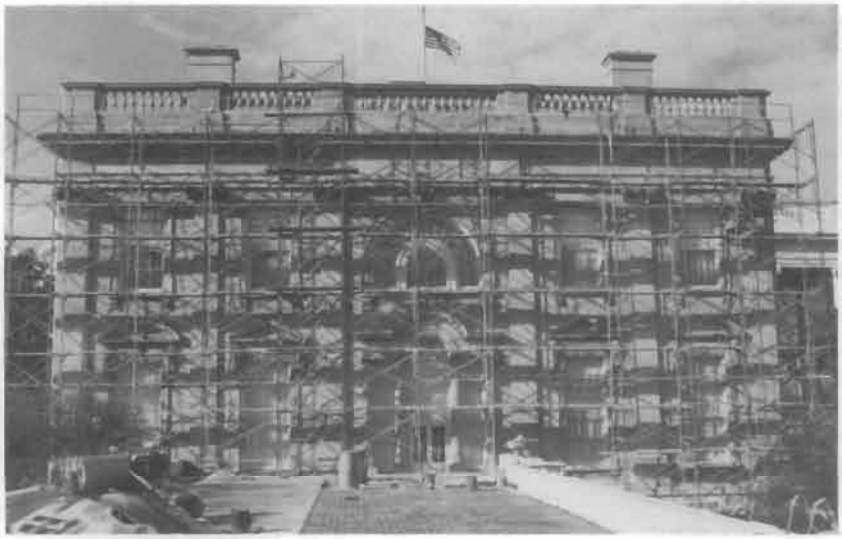
Surfactants and Detergents

polished granite, glazed brick, architectural terra cotta

Surfactants (without acids or alkalies) can be used on polished granite, glazed brick, and architectural terra cotta without risk of etching. Scrubbing with non-metallic brushes (or sometimes even hand-sponging) with a detergent is another effective method of cleaning these smooth surfaces. (However, it may not be possible to remove discoloration caused by dirt that has penetrated a crazed terra cotta glaze.) Non-ionic surfactants can be especially effective in removing oily or greasy dirt.

Chemical Cleaning to Remove Paint and Other Coatings

Large-scale paint removal from historic masonry buildings can best be accomplished with chemical paint removers, based either on organic solvents or alkaline solutions. Commercial paint removers are



Figures 15a-15b. If a highly articulated facade is being cleaned it may be necessary to scaffold the building, one elevation at a time. When the monumental task of chemically removing all the paint from the White House was begun, each side was scaffolded in preparation for repainting. Removal of the many layers of paint that had obscured the stone tooling marks for almost a century, without damaging the historic sandstone, required much painstaking hand work. Photograph: National Park Service

generally formulated to remove most types of paint (except cementitious or lime-based paints such as whitewash) from all types of masonry. But it is always preferable to use an alkaline paint remover on acid-sensitive masonry (figures 15a-15b).

Alkaline Paint Removers

limestone, marble, calcareous sandstone, glazed brick, glazed architectural terra cotta, polished marble, polished granite

One type of paint remover is based on ammonium hydroxide (ammonia), potassium hydroxide, or trisodium phosphate. This alkaline-based paint remover is best used on calcareous and other acid-sensitive masonry, and is particularly useful for removing oil, latex and acrylic paint. (Many paint removers are composed primarily of sodium hydroxide—caustic soda or lye—which, as explained earlier, should not be used on historic masonry because of the likelihood of depositing harmful salts.)

Organic Solvent Paint Removers

A second type of paint remover is composed of a combination of organic solvents, which almost always includes methylene chloride, and others such as methanol (wood alcohol), acetone, xylene, and toluene. Organic solvent-based cleaners are particularly effective in removing more recently developed coatings, including epoxy and urethane-type coatings. However, methylene chloride-based cleaners may also tend to spread some stains deeper into the masonry, so they must be applied with caution, and of course, only after testing. Both types of paint removers are applied either with a brush or sprayed on the masonry surface. The addition of gels, thickeners and waxes prevents paint removers, which evaporate rapidly, from drying out so that they may remain active on the surface for several hours.

The softened paint is then washed off using a water rinse that may range from as low as 200 psi to possibly as high as 800 psi. Efficiency of the paint removal differs from project to project. Multiple layers of paint may require two or more applications of paint remover, or the use of several types. An intricately carved, rough or damaged masonry surface will also take more time and may not result in a surface completely free of paint. If the paint has penetrated into the masonry, total paint removal may be impossible to achieve without damaging the surface.

Removing Other Coatings

Traditional lime-based whitewash or color washes that have deteriorated and no longer bond to the substrate, may be removed with hydrochloric (muriatic) acid—which will dissolve the lime *(and also the masonry substrate if it is not applied with caution)*—or sometimes with acetic acid, and hand-scrubbing with non-metallic

brushes. Sometimes prolonged wet poulticing may also be necessary. Twentieth-century cement-based, or textured coatings, may be very difficult to remove without damaging the masonry. They are not likely to be soluble in paint remover, although occasionally hydrochloric acid may be effective, and sometimes they can be removed by hand-scraping. Removal of acrylic water-repellent coatings may usually be accomplished with an alkaline, possibly potasium hydroxide, solution.

Cautions and Precautions. In particular, those paint removers based on organic solvents should be handled with extra caution. Most organic solvents are flammable. Their vapors, easily absorbed through the skin and the lungs, are carcinogenic, and some are irritating to the skin.

It should be noted that the use of heat (applied with a propane torch or similar device) is *never* an acceptable method of paint removal from historic masonry. Not only is heat ineffective, it may actually damage the masonry, and cause softened paint to permeate porous masonry. Furthermore, use of a propane torch also introduces the hazard of fire to historic materials. Finally, the use of high-pressure water in itself is also not an effective or acceptable method of paint removal from historic masonry.

Poulticing to Remove Stains

The first step in stain removal is to identify the stain; the next step is to try to prevent recurrence of the problem by getting at its source. This source may be integral to the configuration of building materials in a historic structure, and as such, may not be feasible to eliminate. For example, copper flashing will often stain light-colored stone or brick. And the more porous the masonry, the greater the tendency for the masonry to become stained. Thus, while glazed brick and architectural terra cotta are generally resistant to penetrating stains, limestone and marble are considerably more likely to stain because of their porous nature. The fact that acids should not be used on acid-sensitive materials frequently means that, while an acid might indeed be capable of removing a certain stain from brick or a siliceous stone, an alternative, non-acidic cleaner must be substituted when dealing with a calcareous or otherwise acid-sensitive masonry type. There are many premixed poultices commercially available that are based on much the same composition as those described here.

Frequently stains will be removed during a general cleaning of the masonry. But the removal of disfiguring stains, graffiti, and efflorescent salt deposits from masonry is often a complex and challenging undertaking. It is complicated by the fact that, unlike particulate dirt which tends to sit on the surface, stains generally penetrate into and permeate the masonry.

For this reason, poulticing is generally the most effective means of removing stains from historic masonry. Efficient stain removal requires that a cleaning solution (selected according to the type of stain) be kept in contact with the stained area for as long as possible, and that the cleaning solution pull out the staining material without redepositing or spreading it on the masonry itself (figure 16). Poulticing methods meet all these requirements.

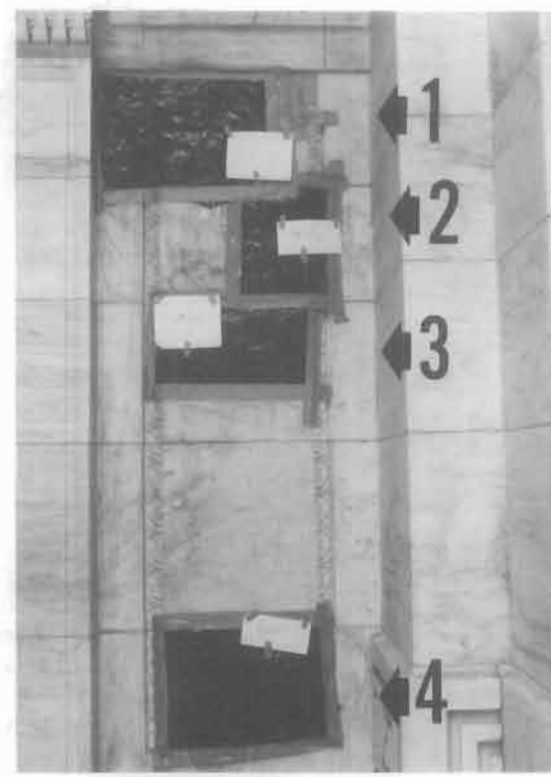


Figure 16. Four different poultice mixtures were tested to remove metal stains from this marble wall. From top to bottom, they included a commercial poultice, as well as formulations of peroxide and hydrated lime, ammonia and hydrated lime, and sodium citrate and glycerine with hydrated lime. Photograph: The Ehrenkrantz Group

Simply stated, a poultice is composed of an absorbent material or powder, mixed with a liquid to form a paste or slurry. The absorbent powders or chemically inert fillers used to make up the poultice not only slow the rate of evaporation or reaction, allowing adequate time for the solvent to dissolve the stain, but also provide a vehicle to accept the staining material after it has been pulled from the masonry. Among the powders commonly used for poulticing are clays (such as attapulgite, kaolin and fuller's earth), talc, chalk (whiting), sepiolite (hydrous magnesium silicate), diatomaceous earth (kieselguhr) and methyl cellulose. While absorbent clays and diatomaceous earth are the most efficient, whiting and kaolin are the cheapest. It should be noted that the absorbent material for a poultice does not always have to be powdered, but can consist of shredded acid-free paper or absorbent cotton or cotton pads. (Generally, whiting, or iron-containing clay such as fuller's earth, should not be used as the absorbent ingredient if an acid is used as the solvent; they will react with, and thus, negate the effectiveness of the acid.)

Next, the type of solvent (liquid) is chosen to match the requirements of the stain to be removed. It will either be water for a chemical poultice or an organic solvent for stains that are soluble only in solvents. A heavy or thick poultice may require additional support on vertical surfaces in the form of a non-ferrous, or plastic mesh which can be held against the wall with non-staining fasteners. The poultice will clean more effectively if kept wet throughout the dwell period. It can be covered with plastic to prevent it from drying out too rapidly, and can also be rewetted if it dries too quickly without having removed the stain. If a single poulticing operation is not effective, a second application can be made. After removing and discarding the poultice material, the area should be thoroughly rinsed with clean water to cleanse the masonry of any chemical residue (figure 17a - 17d).

The poultice is applied as follows: a ¼-¾ inch layer of the paste is applied to the masonry surface, and the liquid is absorbed into the masonry to act upon the stain. As the poultice dries out, the liquid is re-absorbed back into it, drawing out the stain. The poultice is allowed to dry completely, and is removed gently by

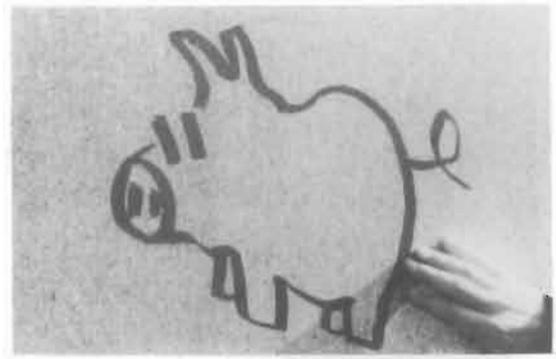


Figure 17(a). This graffiti was applied with a wide felt-tipped marker to a polished granite wall. To facilitate removal and to prevent the image from penetrating further into the stone, the masonry surface was first wetted with denatured alcohol.

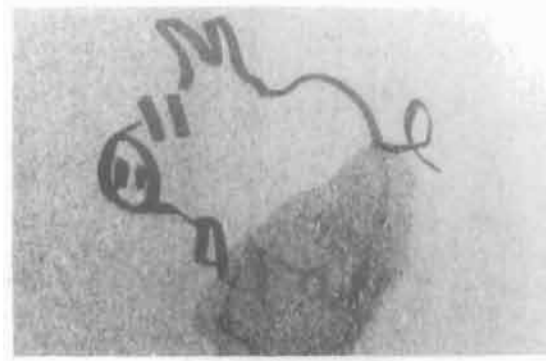


Figure (b) Most of the image was removed using a rag saturated with a mixture of solvents, including acetone, lacquer thinner and N-methy-2-pyrrolidone.

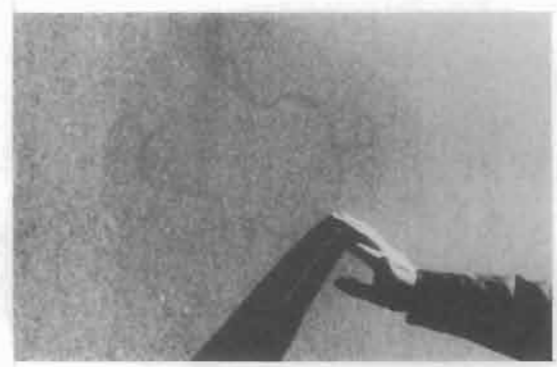


Figure (c-d) The slight ghost outline remaining was easily removed with the solvent mixture in a poultice composed of attapulgite and Kaolin clays and whiting, and followed by a thorough detergent and water wash. Photographs: Nicholas F. Veloz

hand with a wooden scraper or non-metallic brush.

Metallic Stains

In general, metallic stains on siliceous or acid-resistant surfaces can be removed effectively with a weak acid solution. Metallic stains on acid-sensitive masonry should be removed using an alkaline salt of the appropriate acid (for example, ammonium oxalate to remove rust stains). Metal compounds are responsible for a great number of stains on historic masonry structures. Of these, rust stains from *iron* are probably the most common. The orange color is caused by small particles of hydrous iron oxide. Most rust stains are directly related to the corrosion of exterior ironwork such as porch railings and grillwork, or concealed interior support mechanisms such as iron anchors and tie rods. Corrosion is usually initiated by water penetration into the building, primarily via cracks and open mortar joints, and the stains will continue to reappear if these leaks are not repaired. However, some rust stains are due to certain iron-containing minerals, such as pyrite, that may occur naturally in the stone and, as such, cannot be removed.

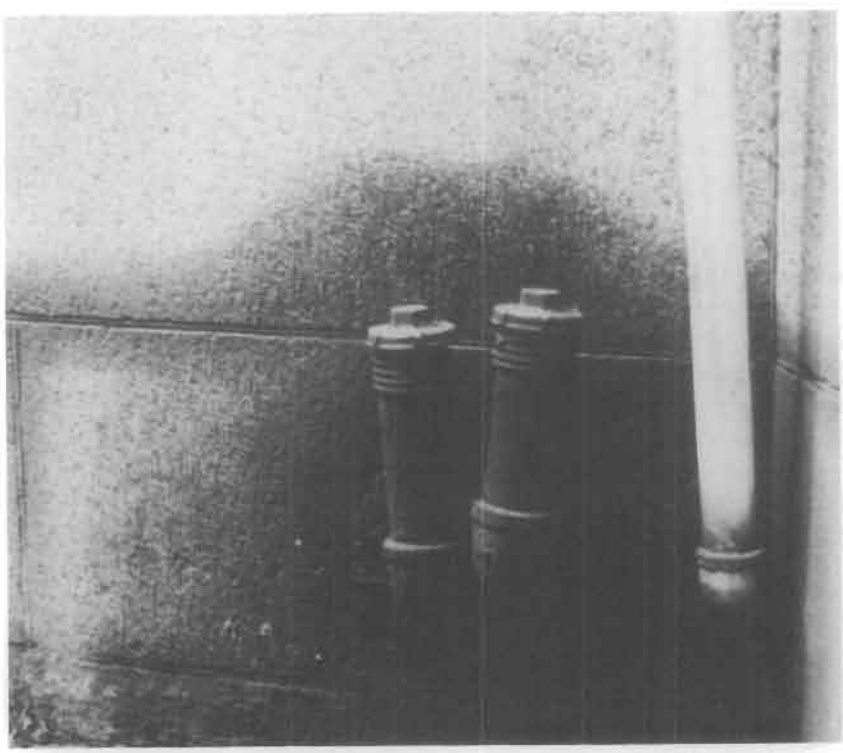


Figure 18. Removal of this oil stain which has penetrated deep into the granite will necessitate poulticing with an organic solvent.

Green stains are usually associated with the presence of a number of *copper* compounds. Copper roofing, brass ornaments and bronze hardware and sculpture are among the obvious scources of green staining. Copper and bronze stains are usually not difficult to eliminate successfully. Generally, they are soluble in an ammonia solution (aqueous ammonium hydroxide).

Industrial Stains

Industrial stains result from contact with such materials as *fuel oil, asphalt* and *tar*. Some superficial (or surface) industrial stains, like smoke and soot and oil, may be removed by gently scrubbing with a scouring powder containing bleach (but not household bleaches which are sodium-based) or water-based household detergents that are acid and alkali-free. However, scouring powders sometimes contain abrasives which may damage delicate masonry surfaces. Ammonia also dissolves some superficial oily stains; thus, a solution of ammonia and water applied in a poultice is useful for removing oil and grease stains from marble. But most procedures for the removal of these oily stains require the use of organic solvents. Because flooding the surface with solvents is both inefficient and costly, brushing with an emulsion of organic solvents such as mineral spirits may be more effective. A water rinse afterward is necessary.

Industrial stains that have penetrated more deeply into the masonry should not be rubbed in, but should always be removed with a poultice (figure 18). An appropriate solvent (or solvent mixture) must be selected. This will probably involve some testing to find a solvent best suited to the type of stain. Among the common organic solvents that may be effective in removing industrial stains are the following: naptha, mineral spirits, chlorinated hydrocarbons (such as methylene chloride and perchloroethylene), ethyl alcohol, acetone, ethyl acetate, amyl acetate, toluene, xylene, and trichlorethylene. (A slight variation of the poultice method consists of thoroughly soaking the stained area with the solvent, and immediately covering it with absorbent powder.)

It may not always be possible to remove all traces of asphaltic stains, but their visual impact will be substantially reduced

by using these methods. Additional washing and scrubbing with detergent or scouring powder following application of the poultice may further reduce staining.

Removal of larger chunks of asphalt or tar accumulations may be facilitated by applying dry ice or spraying with carbon dioxide. The asphalt or tar will be embrittled by the dry ice or carbon dioxide, and after tapping with a small hammer, can usually be removed from the masonry surface by prying it up with a putty knife, (figure 19). This same technique can be use for removing gum, adhesives or other sticky substances, Such techniques, however, should not be used on wet masonry, as they may freeze the moisture in the masonry, and cause cracking or spalling. Organic solvents or bleaches are also effective, sometimes in a poultice, on sticky substances.

Figure 19. Efficient removal of tar splatters from limestone and sandstone may be facilitated initially by applying dry ice or carbon dioxide, but complete removal will probably require poulticing with an inorganic solvent.

Biological Stains

Heavy growths of *lichens, algae, moss and fungi* should be removed from masonry surfaces. Lichens in particular, and mosses, tend to encourage stone or masonry deterioration, because they produce oxalic acid, and, because like other plant growth, they attract—or are attracted to—moisture, one of the major enemies of masonry. Thus, in most cases, it is best to eliminate all plant, lichen and algae growth on historic masonry.

Lichens and algae can usually be removed with water and a stiff natural bristle brush, after soaking, if necessary (figure 20). Stains caused by plant growth such as mildew (which is a fungus) can sometimes be removed with organic solvents, but are generally best treated with diluted ammonia or bleaches. Hydrogen peroxide can also be effective. Calcium hypochlorite solutions and pastes (the basic of swimming pool chlorine) and Chloramine-T may also be useful in many cases. Chemical removal of the growth itself may sometimes be accomplished with zinc or magnesium fluorosilicate, copper naphthenate, or with a variety of quartenary ammonium salts. Low-to-medium-pressure (100-400 psi) water rinsing can be used to eliminate much of the plant material prior to treatment and stain removal. However, these compounds should be used with caution, as some copper compounds may stain light-colored masonry, and the use of zinc or magnesium fluorosilicate may result in formation of a surface crust on some masonry.

Figure 20. Plant growth such as lichens growing on a protected side of this limestone and granite parapet wall, can be damaging even to a relatively hard stone like granite because lichens secrete oxalic acid. Lichens can usually be removed, after soaking with water by scrubbing with a stiff natural bristle brush.

Other growing vines such as ivy and Virginia Creeper should be cut at the roots, and allowed to dry before removal to prevent the disk-tipped tendrils

characteristic of these plants from dislodging parts of the masonry. Once the plants have dried up they can be carefully pulled off; the roots should be killed (ammonium sulfamate may be applied to the roots if necessary, taking care not to get it on the masonry). Any remaining dried plant material on the walls can be removed by scrubbing with a non-metallic brush, and then washed off (figure 21). Except in extreme cases, herbicides should not be used to remove algae, moss or lichens because of the danger of introducing addtional salts or acids into the masonry, as well as the potential for creating environmental problems.

Most of these forms of plant growth on masonry buildings—algae, moss, lichens and fungi—are a direct result of moisture in the masonry and lack of sunshine. Thus, unless the specific conditions change, i.e., the moisture problem is eliminated, or the masonry is given more exposure to the sun, they will recur continually (figure 22). A leaking downspout or gutter can be repaired, a tree or bush too close to the building can be trimmed or pruned to introduce more sunlight, and even lawn sprinklers can be redirected so they do not repeatedly deposit excessive amounts of water on the same area of a building surface (figure 23).

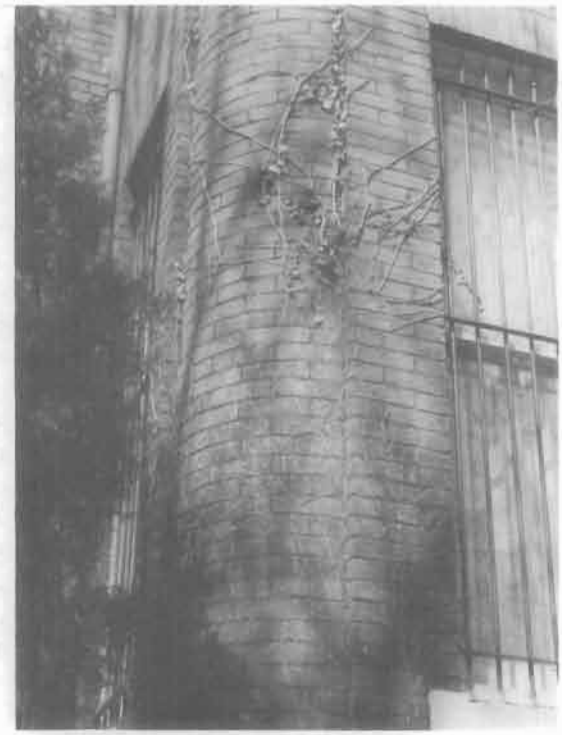


Figure 21. After the ivy was cut at the roots, it has been allowed to wither and die before being pulled off the wall. Most of the ivy has been removed, but a few tendrils still cling higher on the wall. After these have completely dried and have been pulled off, the remaining dried plant material can then be removed from the brick by scrubbing with water and a bristle brush.

Figure 22. The discoloration on this white marble is a green-colored algae growth on a shady side of the building and caused by water dripping from the air-conditioner above it.

Figure 23. The moss growing around the downspout and along the base of this stucco building clearly indicates the presence of excess moisture—here due to rising damp as well as a leaky downspout. Photograph: Lee H. Nelson, FAIA

Graffiti

As with other types of cleaning problems, it is always preferable to identify the substance used to create the graffiti before selecting what is likely to be the best remover. If there is any possibility of discovering how the graffiti was applied (such as discarded spray paint cans in the immediate area), it is worthwhile to investigate, since the manufacturer of a particular product may be able to provide specific information concerning the ingredients of the paint, and thereby simplify the task of removal. It is also important to be aware that it may be extremely difficult, if not impossible, to completely remove all traces of some types of graffiti. Successful and total removal of graffiti may depend on the type and surface texture of the masonry, as well as the particular substance applied. After its removal, which is essentially a spot cleaning operation, the masonry surface may appear spotty. If too unsightly, cleaning the entire surface or wall may be necessary. Sometimes it may be easier to "redirty" slightly the cleaned area to blend in with the uncleaned wall.

Like most other cleaning projects, successful graffiti removal will probably involve a "trial and error" approach, unless the material used to apply it can be readily identified before cleaning is begun. And, as with any type of cleaning of historic masonry, the gentlest method possible should always be tried first; otherwise, one may run the risk of permanently etching the graffiti into the masonry surface.

Painted graffiti applied from a spray can or by a felt-tipped marker or lipstick may generally be removed from masonry by a commercial paint remover—either a solvent type of remover such as lacquer thinner or acetone, or a methylene chloride-based remover (figure 24). In some instances, poulticing may not be necessary. If the graffiti has not permeated deeply into the masonry, it may be removed by the paint remover or a solution of trisodium phosphate brushed on with a non-metallic brush. After the paint has softened, as much as possible should be scraped off with a wooden scraper. Then the area should be washed again using a detergent and soapy water, and rinsed thoroughly with water.

A variety of commercial solvents are available on the market, which may contain aromatic non-chlorinated solvents such as xylol, toluene with methanol or ketone, or chlorinated hydrocarbon solvents such as methylene chloride. But before trying these solvents which, as noted, are effective but are also very toxic and dangerous to handle, it is always best to try something milder, such as a detergent solution and water combined with hand-scrubbing with a non-metallic brush.

Although many cleaning contractors may advise application of a coating to protect masonry surfaces that are particularly vulnerable to defacement by graffiti, a coating is generally not recommended. Historic masonry may be discolored or damaged more by such coatings, which may inhibit moisture evaporation, than by the graffiti. Furthermore, the coating itself is likely to be removed by subsequent graffiti removals.

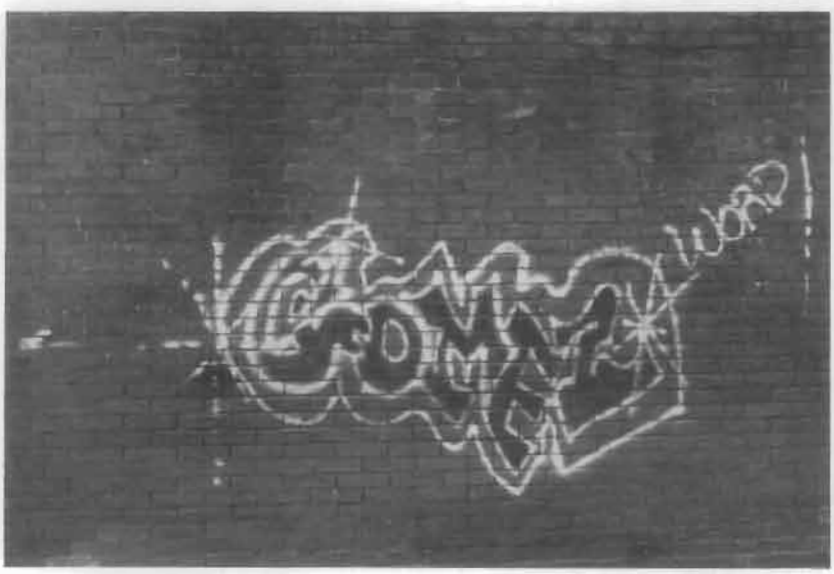


Figure 24. Spray-painted graffiti on this brick wall can be removed with paint remover, and in this case, probably will not require poulticing.

Salt/Efflorescence

Efflorescence is a whitish powder made up of excess salts that have crystalized on the masonry surface. Because efflorescence may have many causes, it is important to identify the source of the problem. For example, although efflorescence is usually a sign of excessive amounts of moisture in the masonry, it may also result from

chemical cleaning or repointing if the masonry is not thoroughly rinsed. It may also come from heavy use of de-icing salts, or rain penetrating masonry through deteriorated mortar joints may result in efflorescent patches on an entire facade. Finally, air pollution often results in the formation of thick sulfate (salt) crusts on the underside of moldings and eaves—areas not regularly washed by rainfall (figure 25).

Efflorescence can usually be brushed or washed off with water since it is formed of water soluble salts. Some efflorescence that results from cleaning may eventually disappear through normal rain washing; however, some chemical residue left from the cleaning process can form damaging insoluble salts. Efflorescence resulting from water penetration into the masonry structure will continue to reappear unless the source of the water entry is removed; thus, the first task is to identify the point of entry and stop the water penetration (figure 26).

Figure 25. Excess moisture leaching out through the walls has resulted in the formation of white efflorescent salts on the brick and blackish sulfate salts on the limestone water table.

Figure 26. Efflorescent salts appearing on many of the brick piers of this turn-of-the-century building may indicate the existence of clogged interior gutters that, because they no longer function have been supplemented by an exterior rain removal system. Photograph: National Park Service

Sulfate encrustations often may be removed with a heavy wooden scraper. But removal of particularly heavy salt buildup may also require a poultice of one of the following: diatomaceous earth, cotton, crushed dolomite, crushed limestone, or shredded polyester fiber soaked in distilled water. The area of the masonry that displays efflorescence should also be soaked in distilled water before applying the poultice to avoid redistributing the salts back into the masonry.

Cautions and Precautions. Several points need to be made regarding the use of chemicals in poultices. First, copper stains should never be removed from limestone with potassium cyanide or sodium cyanide as is sometimes recommended. Both of these cyanide compounds can be lethal to cleaning personnel. Second, most organic solvents are flammable. Their vapors, easily absorbed through the skin and the lungs, are carcinogenic, and some are irritating to the skin. Third, bleach should never be used in conjunction with ammonia in a poultice; this simple-sounding household combination produces toxic chlorine gas that may cause lung tissue damage or death. Finally, spraying liquid nitrogen or asphalt or tar will make it brittle and thus removable, but it is highly flammable and so dangerous to work with that a user must be specially licensed.

Other Methods of Stain Removal

While it is usually necessary to employ a poultice to remove most stains on masonry, other, sometimes simpler, procedures may also be effective. If a stain is superficial, it may often be eliminated by applying a chemical remover or solvent with brushes, or by "washing" the solvent over the surface using a low pressure (under 100 psi) spraying apparatus. It may also help to coat the surface with talc

or similar material to help absorb the stain in a sort of simplified poultice. To prevent outward migration of the staining agent, which would increase the size of the stained area, the masonry immediately adjacent to the stain on all sides should be thoroughly prewetted. Following application of the cleaning solution, the masonry must be rinsed off, and the entire procedure repeated, as necessary. Rinsing need not be done with pressure; in fact, it is normally sufficient to gently flood the treated surface for several minutes.

Cautions and Precautions. Mechanical or abrasive procedures such as sandblasting, grinding or chiseling to remove dirt, paint, stains or graffiti are not acceptable methods of cleaning historic masonry. Such abrasive methods may—with varying degrees of success—remove the offending substance from the masonry, but may also damage the masonry by removing or abrading the outer surface layer (figure 27). Very loose or flaking paint or a similar coating on smooth surfaces, such as brick, may sometimes be successsfully removed by careful hand-scraping in preparation for repainting, but the physical irregularities of most rough-cut or carved surfaces make this impractical. Furthermore, abrasive cleaning techniques may also be harmful to the applicator, passersby and public property.

Cleaning to Remove Bird Droppings

Removal of small amounts of bird droppings may be accomplished as part of a regular cleaning project with cold water washing, possibly supplemented with detergents and chelating agents such as EDTA (ethylene diamine tetra-acetic acid), or on non-acid sensitive masonry with acidic cleaners, where appropriate. Removal may also be facilitated by brushing with a non-metallic brush and scraping with a wood scraper (figure 28).

In some instances where particularly porous types of stone may have been stained by heavy accumulations of droppings that have permeated into the stone over the years, they can be removed by using a combination of the above materials.

Cautions and Precautions. Histoplasmosis and cryptococcosis, both potentially fatal

Figure 27. Heavily pitted by sandblasting, this window recess provides a vivid contrast to adjacent undamaged brick protected from abrasion by a metal signboard.

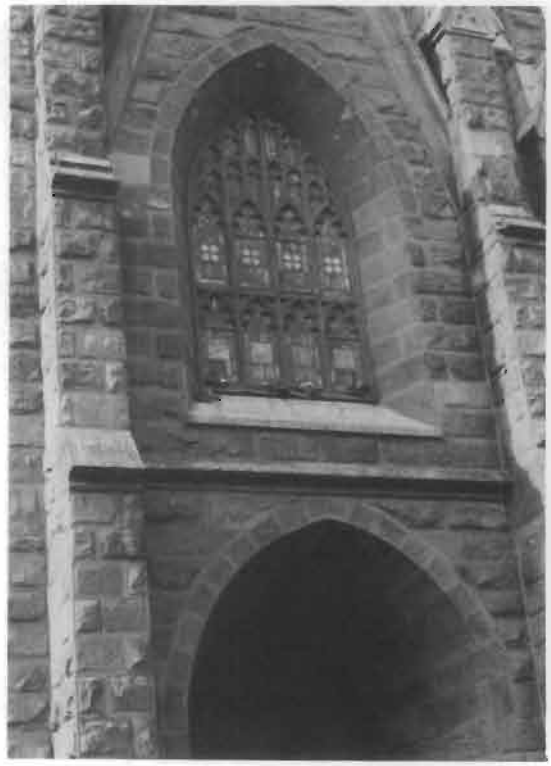


Figure 28. If water, or water and detergent wash, does not remove the pigeon droppings from this sandstone sill and stringcourse below, it may be necessary to use a dilute acidic cleaner containing hydrofluoric acid, providing the sandstone is not calcareous and thus, acid-sensitive.

diseases of the lungs and central nervous system, can result from exposure to accumulations of pigeon excrement. Because of this disease potential, it may be better to apply water pressure from a safe distance to remove excessive amounts of droppings and better not to attempt total removal, particularly if droppings are not highly visible or do not appear to be damaging the masonry. Bleach should not be used as a component of any removal process; bird droppings contain ammonia, which forms toxic gases when mixed with some bleaches. When removing bird droppings, cleaning personnel should guard against exposure to the attendant health hazards by wearing protective masks and clothing.

Part III
Summary of Guidance

The "Gentlest Means Possible"

Although masonry may be one of the most durable of historic building materials, it is nonetheless susceptible to damage by improper maintenance or repair techniques and by harsh and abrasive cleaning methods. Thus, cleaning historic masonry is recommended only when necessary to halt deterioration or to remove heavy soiling, and *only* after careful testing. Observing the "gentlest means possible" rule always means beginning with a low-pressure water wash, supplemented, if necessary, with non-ionic detergents and scrubbing with non-metallic brushes. If this very gentle method does not clean the masonry, or if paint or stains must be removed, the next step is to use a chemical cleaning process. Abrasive cleaning methods are damaging and are not suitable cleaning techniques for historic masonry buildings.

Summary of Cleaning Techniques*

Substance to be Removed	Acid-Sensitive Masonry **Limestone, Marble, Calcareous Sandstone, Glazed Brick, Architectural Terra Cotta, Polished Granite**	Non-Acid-Sensitive Masonry **Sandstone, Slate, Granite, Unglazed Brick, and Unglazed Terra Cotta, Concrete**
Dirt and/or Pollutant Crusts	Water wash Water + non-ionic detergent Alkaline cleaner (ammonia or potassium hydroxide)	Water wash Water + non-ionic detergent Acidic cleaner (hydrofluoric acid)
Paint (oil, latex, acrylic coating, vinyl, epoxy, urethane-type coatings)	Alkaline paint remover (ammonia or potassium hydroxide or trisodium phosphate) Organic solvent paint remover (methylene chloride)	Alkaline paint remover (ammonia or potassium hydroxide or trisodium phosphate) Organic solvent paint remover (methylene chloride)
Whitewash and Cementitious Paints	Acetic acid *or* very weak solution of hydrochloric acid	Acetic acid Hydrochloric acid
Stains - Iron (Rust)	*Poultice with:* Sodium citrate in water + glycerine *or* Ammonium oxalate	*Poultice with:* Oxalic acid or orthophosphoric acid + sodium salt of EDTA in water *or* Dilute hydrofluoric acid
Stains - Copper	*Poultice with:* Ammonium chloride *or* Aluminum hydroxide + ammonia	*Poultice with:* Ammonia (+ EDTA) *or* Dilute hydrofluoric acid
Stains - Industrial (smoke, soot, grease, oil, tar, asphalt, waxes)	Scouring powder with bleach Water-based household detergent Ammonia Mineral spirits Alkaline cleaner *Poultice with one of the following:* Sodium bicarbonate (baking soda) Naptha Mineral spirits Methylene chloride Perchloroethylene Ethyl alcohol Acetone Ethyl acetate Amyl acetate Toluene Xylene Trichloroethylene Dry ice/carbon dioxide (Tar, Asphalt, Gum)	Scouring powder with bleach Water-based household detergent Ammonia Mineral spirits Alkaline cleaner *Poultice with one of the following:* Sodium bicarbonate (baking soda) Naptha Mineral spirits Methylene chloride Perchloroethylene Ethyl alcohol Acetone Ethyl acetate Amyl acetate Toluene Xylene Trichloroethylene Dry ice/carbon dioxide (Tar, Asphalt, Gum)
Stains - Plant and Fungal (lichens, algae, moss, fungi)	Dilute ammonia Bleaches Hydrogen peroxide Sodium hypochlorite Chloramine-T	Dilute ammonia Bleaches Hydrogen peroxide Sodium hypochlorite Chloramine-T
Stains - Graffiti (paint, spray-paint, felt-tipped marker)	Organic solvent or alkaline paint remover Lacquer thinner or acetone Organic solvent (methylene chloride) See also **Paint,** above	Organic solvent paint remover Lacquer thinner or acetone Organic solvent (methylene chloride) See also **Paint,** above
Salt/Efflorescence	Water wash Water (poultice)	Water wash Water (poultice)
Bird Droppings	Water wash Water + detergent + chelating agent such as EDTA	Water wash Water + detergent + chelating agent such as EDTA Acidic cleaners (hydrofluoric acid)

*Cleaning techniques are listed in order starting with the "gentlest means possible."

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Preservation by Prevention: Paint and Historic Brick

Published December 16, 2009 in **Preservation by Prevention** 0

Paint flakes and fails when trapped water cannot escape naturally from historically-unpainted brick.

Paint flakes and fails when trapped water cannot escape naturally from historically-unpainted brick.

Winter has arrived! Though this season brings opportunities to celebrate and make merry indoors, it also brings sleet, snow, and ice outdoors. For an owner of a historic brick house, this freeze-thaw cycle can be a cause for concern – particularly if the house's exterior is painted when it should not have been.

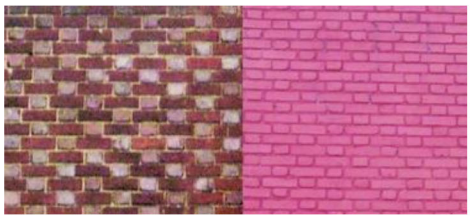
Modern waterproof sealants, coatings, and paints significantly decrease the brick's natural breathability. Water saturation and decreased breathability trap water in the material, and as the water freezes in the material it expands causing stress cracks and eventually spalling, and ultimately, failure. In unpainted or appropriately-painted brick houses, the porous brick absorbs water from sleet, snow, and ice, and with the material's proper, natural breathability, the water evaporates, leaving the brick intact despite years of exposure to this cycle.

Some brick houses were supposed to be painted. That said, not all historic brick houses that are currently painted were meant to be painted, let alone covered in some of the waterproof coatings available today. So then, how does one determine which houses were supposed to be painted and which ones were not?

Generally speaking, in the United States, historic brick houses that needed paint were built prior to the 1870s, when the use of strong, machine-made brick became a more widespread practice. Bricks in the U.S. were first made by hand, with clay, sand, and water pressed into molds, then dried and fired. Eventually, brickmaking technology advanced from hand-power to animal-power to water-power to steam-power, and eventually, to the uniform machine-made. The mineral content of the clay and sand determined the color, while application of glazes affected the bricks' finish.

Houses made from the weaker, softer, and more porous handmade brick of the early periods often required the use of a protective coating for an added layer to combat natural elements, such as the sleet, snow, and ice in the winter months.

By the mid-nineteenth century, advances in brickmaking offered stronger brick options that did not require paint for protection. They featured harder "dress" faces that served as both the construction material and the decoration, never meant to be painted.



Painting Flemish-bond with glazed headers (l) obscures the intended decorative patterning (r).

Glazes were used more widely and creatively, forming decorative patterns in the walls. A prevalent example of glazes in brick patterns is with the Flemish-bond. Though the bond type itself dates back to the Colonial period in the U.S., its use with specially glazed bricks became a popular ornamental device in the late-nineteenth century.

Brick houses that were meant to be painted also do not usually feature the non-glazed decorative patterning that many late-nineteenth and twentieth century brick homes have, such as corbelling (stepped pattern below a projected element) and dogtoothing (bricks laid at an angle, so they project diagonally, resembling teeth). If a historic brick house features these types of brick detail, they were most likely not meant to be painted in the first place.

The Secretary of the Interior's Standards for Rehabilitation expressly do not recommend the painting of historically unpainted brick. Historically unpainted brick was not coated because the materials had sufficient strength without paint and had decorative applications. Because of the damaging effects of water saturation and freeze-thaw cycles, painting historically unpainted brick can eventually destroy the brick. Additionally it requires long-term maintenance, a huge expense best avoided.

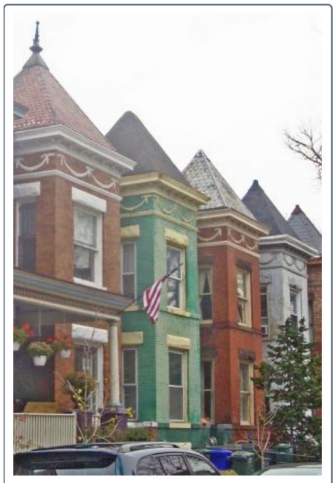
For a brick house that should not have been painted, there are a few methods of removal for returning the brick to its historically appropriate state:

- Let the paint deteriorate naturally. The paint will flake and chip because of the water trying to escape, so make sure you remove paint chips from the ground below. The house may appear unattractive for a period of time, but eventually, the brick will reappear with renewed breathability.
- Very gently scrape the chipping paint by hand. If the paint does not come off with gentle hand-scraping, do not increase pressure or speed – you want to avoid chipping or removing any of the bricks' hard outer surface.
- Sometimes, gel or paste paint removers are appropriate. As with any paint removal method, the guidance of a technical preservation specialist and spot testing are necessary.

Dogtoothing (l) and corbelling (r) with unpainted tan and yellow brick.

If you have a painted brick house that would have been painted historically (i.e., one with weak bricks built before mid-nineteenth century and devoid of brick decorative detail), do not remove the paint. Appropriately-painted historic brick houses require the paint for protection, and there are options for responsible maintenance. While it is usually recommended to paint the painted brick with the same kind of paint it already has, even if it is modern, it is best to avoid fully waterproof coatings. The brick needs protection, but it also needs to breathe.

Historically painted brick would have been painted with wholly natural paints, such as lime-based whitewash and milk paint. Historical-recipe, natural paints are breathable and environmentally safe. If the appropriately-painted brick house is already painted with historical paints or if the house is unpainted but should be painted, then historical paints are the most responsible option.



In this row of late-nineteenth century brick rowhouses, the painted brick shows signs of efflorescence (second from left) and flaking (r).

Though sometimes charming and lovely, paint on historic brick houses is only appropriate when the house required paint for exterior wall protection in its initial, non-machine-made brick construction. Painting historically unpainted brick – particularly with the modern waterproof paints – involves intensive long-term maintenance and the destruction of historical materials. With historically unpainted brick, let the decorative brick details and fancy glaze be the charm and the beauty – and leave the modern waterproof paint on the shelf.

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Historic Brick, **Paint**

‹ Reduce, Reuse, Rehab: New Insulation Options for a Greener Historic Home

Architectural Ambler: Brattle Street ›

BLOG PUBLICATIONS

REPORT

Sec. 21-2-129. - New Center Area Historic District.

(a) An historic district to be known as the New Center Area Historic District is hereby established in accordance with the provisions of this article.

(b) This historic district designation is hereby certified as being consistent with the Detroit Master Plan of Policies.

(c) The boundaries of the New Center Area Historic District, as shown on the map on file in the Office of the City Clerk, are as follows:

Beginning at the intersection of the center lines of Lothrop and Second Avenue and proceeding northerly along the center line of Second Avenue to its intersection with the center line of Bethune; thence westerly along the center line of Bethune to its intersection with the center line of Bethune Court to its intersection with the center line of Delaware; thence easterly along the center line of Delaware to its intersection with the center line of Second; thence southerly along said center line of Second Avenue to its intersection with the center line of the east-west alley between Delaware and Pallister; thence easterly along said east-west alley to its intersection with the center line of the north-south alley between Woodward Avenue and Second; thence northerly along the center line of said north-south alley to its intersection with the southerly boundary of Lot 92 of Peerless Addition No. 1 of part of quarter section 56 of the 10,000-acre tract (L18/P38) extended westward; thence easterly along the southern boundary of said Lot 92, extended eastward, to its intersection with the center line of Woodward Avenue; thence northerly along the center line of Woodward Avenue to its intersection with the center line of the east-west alley between Virginia Park and Euclid, extended eastward, this being the same as the northern boundary of Lot 1 the aforementioned Peerless Addition No. 1, extended eastward; thence westerly along the center line of said east-west alley to its intersection with the center line of the east service drive of the John C. Lodge Freeway; thence southerly along the center line of said east service drive to its intersection with the center line of the east-west alley between Seward and Virginia Park; thence easterly along the center line of the said east-west alley between Seward and Virginia Park to its intersection with the center line of Third Avenue; thence southerly along said center line of Third Avenue to its intersection with the center line of Seward; thence west along said center line of Seward to its intersection with a line drawn parallel to and 13 feet west of the western boundary of Lot 14, Block 7, of Beck's Subdivision of part of quarter sections 55 and 56, 10,000-acre tract (L4/P59); thence southerly along said line to its intersection with the center line of the east-west alley lying between Seward and Delaware; thence westerly along the center line of said alley to its intersection with western boundary of Lot 38 (extended northward) of Block 4 of Henry Weber's Subdivision of part of quarter sections 55 and 56, 10,000-acre tract (L2/P40); thence southerly along said western boundary of Lot 38 extended southward to its intersection with the center line of Delaware; thence easterly along the center line of Delaware to its intersection with the center line of Third Avenue; thence southerly along the center line of Third Avenue to its intersection with the center line of Lothrop; thence easterly along the center line of Lothrop to the point of the beginning. (These boundaries include: Peerless Addition No. 1 of part of quarter section 56, TTAT (L18/P38), Lots 1-14 and 79-92; Peerless Addition No. 2 of part of quarter section 56, TTAT (L18/P39), Lots 15-30 and 63-78; Peerless Addition No 3 of part of quarter section 56, TTAT (L18/P40), Lots 31-41 and 52-62; Leggett's Sub of part of Henry Weber's Sub of part of sections 55 and 56, TTAT (L21/P53), Lots 22-32 and part of Lot 21 and Lots 65-75 and west 30 feet of Lot 76; Stone, Todd and Company's Sub of Lots 1, 2, and 3 of center part of quarter sections 55 and 56, TTAT, and Lots 41, 42, 43 and 44 of Henry Weber's Sub of quarter sections 55 and 56, TTAT (L18/P99), Lots 5-18 and Lots 25-70; Lothrop and Duffield's Sub of part of quarter sections 55 and 56, TTAT (L17/P22), Lots 70-85, 110-125, and 28-37 and west 45 feet of 27; Beck's Sub of part of quarter sections 55 and 56, TTAT (L4/P59), Block 2, Lots 5-10 and vacated Beck Street; Block 3, Lots 4-9 and vacated Beck Street, Block 4, Lots 1-6 and vacated Otto inclusive, Block 5, Lots 1-6 and vacated Otto inclusive, Block 6, Lots 1-7 and east 16.5 feet of Lot 8; and Block 7, Lots 14-24 and east 13 feet of Lot 13; Henry Weber's Sub of Lots 5-7 and 9, part of Leggett and Miller's Sub of part of sections 55 and 56, TTAT, (L2/P40), Lots 5, 6 and east 40 feet of Lot 7 and Lots 38, 39, and the west 30 feet of Lot 40; and Schmidt's Sub of part of quarter sections 55 and 56, TTAT (L19/P66), Lots 1-16).

(d) The elements of design, as defined in Section 21-2-2 of this Code, shall be as follows:

(1) *Height.* All houses that were originally single- or two-family have two full stories plus an attic or finished third floor within the roof; these are generally called "two-and-a half-story" houses. The few terraces in the district are two or 2½ stories tall. Apartment buildings range in height from three to ten stories; the majority are four stories tall. Additions to existing buildings shall be related to the existing structure; new building in New Center Commons (Delaware, Pallister and Bethune) and on Virginia Park shall meet the following standards:

a. The six adjoining structures on the same face, excluding churches and commercial structures, shall be used to determine an average height. If six structures are not available on the same block face, then one or more structures as close as possible to being directly across the street from the proposed structure may be used. The height of the two adjoining houses shall be added into the total twice, with a divisor of eight used to determine the average. Any new building must have a height of the main roof of at least 80 percent of the resulting average; in no case shall a new building be taller than the tallest roof height included in the computation. In determining the height of existing structures and proposed structures, the highest point of the main roof shall be used, even where towers, or other minor elements may be higher.

b. The level of the eaves of a proposed new structure having as much or more significance for compatibility as the roof height, an average eave or cornice height shall be determined by the same process as that described in Subsection (e)(1)a of this section. The proposed new structure shall have a height at the eaves, or cornice, of not less than 90 percent of the average determined from existing structures, and in no case shall eaves or cornice of the proposed structure be lower than the lowest eave or cornice height used in the computation, or higher than the highest.

(2) *Proportion of buildings' front façades.* Proportion varies in the district, depending on use, style, and size of buildings. While single-family dwellings may appear taller than wide or wider than tall, the overall appearance is neutral. Terraces or rowhouse buildings are wider than tall; apartment buildings appear taller than wide although some are wider than tall due to projecting and receding wall surfaces that emphasize the vertical.

(3) *Proportion of openings within the façades.* Areas of voids generally constitute between 15 percent and 35 percent of the front façade, excluding the roof. Most window openings are taller than wide, but are frequently grouped into combinations wider than tall. Where there are transom windows above doors, they are wider than tall; a few round windows exist on upper stories or attics. A great variety of sizes, shapes, and groupings of openings exist in the district.

(4) *Rhythm of solids to voids in front façades.* Queen Anne and Arts-and-Crafts style buildings display freedom in the arrangement of openings within the façades, but usually result in a balanced composition. In buildings derived from classical precedents, voids are usually arranged in a symmetrical and evenly spaced manner within the façade.

(5) *Rhythm of spacing of buildings on streets.* The spacing of buildings has generally been determined by the setback from the side lot lines. The spacing of buildings tends to be consistent, except where vacant lots occur. On Virginia Park, where lots are approximately 50 feet wide, some buildings are placed closer to one side lot line, creating room for a side driveway. On smaller lots in the district, the buildings occupy most of the width of their lots, while complying with the side lot setback restrictions.

(6) *Rhythm of entrance and/or porch projections.* Steps and porches exist on all of the single-unit and

multiple-unit 2½-story dwellings in the district; the progression of porches lends to the consistency of the streetscape. Entrances and porches are either placed centrally on the façade, as is usually the case with Classically-inspired buildings, or are placed to one side of the front façade, and the porch sometimes wraps around to the side. Rear porches are common on single-family residences; few side porches exist due to narrow lot sizes. On Virginia Park, there is an occasional porte cochere.

(7) *Relationship of materials.* The district exhibits a wide variety of building materials characteristic of single- and multiple-unit residential buildings dating from the last decade of the 19th Century and first quarter of the 20th Century. The majority of buildings are faced with brick; a brick veneer first story and a stucco, clapboard, or wood shingle second story is not unusual. All-stone, all-stucco, and all-wood buildings exist but are few in number. Later replacement siding is uncommon in the district; when it does exist, much of side changes the original visual relationship of the siding to the building. Stone sills and wood trim are common. Roofing includes slate, tile, and asphalt shingles. It is common for apartment buildings to have limestone or concrete high basements or first stories and stone ornamental detail and trim.

(8) *Relationship of textures.* The most common relationship of textures in the district is that of the low-relief pattern of mortar joints in brick contrasted to the smooth surface of wood trim and masonry sills. The brick is sometimes textured. Also common is the contrast in textures created by the juxtaposition of different materials used for the first and second stories; frequently, a brick first story is contrasted with a stucco or wood-sheathed second story. Half-timbering adds textural interest to the stucco where it exists on Neo-Tudor houses. In apartment buildings, stone, either rough cut or smooth and/or cut to appear like rustification at the basement and/or first-story level, contrasts with the main material, brick. Slate and tile roofs contribute to the textural interest, whereas asphalt shingles generally do not.

(9) *Relationship of colors.* Paint colors generally relate to style. Natural brick colors (red, brown, yellow, orange, buff) predominate in wall surfaces. Natural stone colors also exist. Stucco and concrete are usually left in their natural state or are painted in a shade of cream; half-timbering is frequently stained or painted brown or brownish-red. Classically inspired buildings, particularly Neo-Georgian and Colonial Revival, frequently have wood trim painted white, cream, or in a range of these colors. Where shutters exist, they are either dark green, black, or another appropriate dark color. Colors known to have been in use on buildings of this type in the 18th Century or 19th Century on similar buildings may be considered for suitability. Buildings of Medieval and/or Arts-and-Crafts inspiration generally have painted wood trim of dark brown; black and red is also present. Queen Anne and Late Victorian style houses may have several colors painted on the same façade. Storm windows are sometimes a different color from the window frames and sashes; window sashes are most often the same color as the window frames, with a few exceptions. Colors used on trim of apartment buildings are frequently brown, gray, black or green. The original color scheme of any building, as determined by professional analysis, is always acceptable for the building, and may provide suggestions for similar buildings. Roofs are in natural colors; slate is predominantly gray, gray-green and black; tile is green or red. Asphalt shingles display a variety of colors, most derived from colors of natural materials (tile, slate and wood colors).

(10) *Relationship of architectural details.* Architectural details generally relate to style. Porches, window frames, cornices, dormers and gables are frequently treated. Neo-Georgian and Colonial Revival buildings display classic details in wood; buildings influenced by the Arts-and-Crafts movement have wood details, such as half-timbering, heavy vergeboards, and other wood elements. The vernacular "four-square" buildings usually show restraint in detail. In general, the houses on Virginia Park are more ornate than those in the rest of the district. Some of the apartment buildings display carved stone ornament set in panels, string courses, spandrels and cornices.

(11) *Relationship of roof shapes.* A multiplicity of roof types exist, and frequently within the same building. Pred are hip and gabled, frequently punctured with dormers. A few buildings have engaged towers or bays with Other buildings have less complex roofs, appropriate to their architectural style.

(12) *Walls of continuity.* The major wall of continuity is created by the building façades when their setbacks are uniform within each block face. Where lighting poles and trees exist in sufficient numbers, they contribute to a minor wall of continuity along the tree lawns.

(13) *Relationship of significant landscape features and surface treatments.* The typical treatment of individual properties is a flat or slightly graded front lawn area in grass turf subdivided by a concrete or brick walk leading to the front entrance; a side walk sometimes leads to the rear. On sufficiently graded lots, steps lead up the earthwork terraces to the front steps. Some straight side driveways, primarily in concrete but a few in brick, leading from the street to the rear garages exist on Virginia Park, Bethune, and Lothrop. Where front lawns are uninterrupted by driveways, a unity to the succession of front lawns is achieved. Foundation plantings of an evergreen and deciduous character are present on individual lawns. Hedges between properties along the side lot lines are common; properties on corner lots frequently have hedges along the north-south street. Trees are evenly spaced on the tree lawn; on Pallister where the tree lawn has been widened, trees are planted close to the public sidewalk and upright lighting standards are evenly spaced near the brick paving of the street. Public sidewalks throughout the district are concrete; brownstone and some bluestone curbs remain on Delaware between Woodward Avenue and Second, Virginia Park and Seward. Virginia Park is paved in brick; traffic off Woodward Avenue enters and exits through a horseshoe with wrought iron gates and brick piers with stone cresting and foundations. A grassy turf, hedges, and young trees are planted inside the court created by the horseshoe. Newer gates at the entrances of other blocks are of the same materials. Side and rear yard wooden fences, either painted brown or left in a natural state, exist throughout New Center Commons. Side yard fences generally do not extend beyond the face line of the front porch, except where they fence in side lots or corner properties. Fencing, in public view through the district, is of a fluted design to compliment the style, design, material, and date of the residence. Pallister between Second and Third streets is a pedestrian street; it is paved in brick with concrete around its perimeter. Street furniture and upright iron light standards are placed at regular intervals. Ornamental poles (O.P. type, Public Lighting Department) are located on Delaware between Woodward Avenue and Second, Virginia Park and Seward. On Second Boulevard and Third Avenue, where they run throughout the district, are fluted steel lighting standards with craneneck pendants (Union Manufacturing Company No. 4700). Alleys are paved in either asphalt or concrete, the exception being the alley north of Delaware east of Second, which is brick. Parking areas off the alleys next to the alley-facing garages in New Center Commons are also either asphalt or concrete. Alleys are entered and exited on Bethune Court; they do not have outlets on Third Avenue. Bethune Court, Bethune Street, and the alleys have tall, modern light standards. Ornamental light posts on Pallister Commons are Union Metal manufacturing No. SP874-Y1.

(14) *Relationship of open space to structures.* Vacant land in the New Center Historic District is located immediately west of Bethune Court, where it provides a small buffer from the street at the corners of Bethune Court and Pallister. Open space on Pallister is provided by the brick-paved pedestrian mall and widened tree lawns. There is also ample vacant land adjacent to the Virginia Park gates at the corners of Woodward Avenue and Virginia Park. Where buildings have been demolished, vacant land exists, usually in the form of parking lots. This condition prevails primarily in the block of Virginia Park between the Lodge Freeway Service Drive and Third Avenue, and on Lothrop. Backyards as well as front yards exist on

all single- and double-family residential properties; backyards to houses on Bethune, Pallister and Delaware tend to be relatively small due to the placement of 1½- or 2½-car garages and adjoining paved parking area off the alley.

(15) *Scale of façades and façade elements.* There is a variety in scale from street to street and style to style; most houses have a small to moderate appearance and apartment buildings have a moderate appearance. The size and complexity of façade elements and details either accentuate or subdue the scale of the façades. Houses on Virginia Park are large in scale compared with the rest of the district. The elements within the façades of Queen Anne and some Colonial Revival buildings emphasize their size by dividing the façades into large segments, such as towers, projecting gables, and bays. Neo-Georgian façades have restrained, small-scale detail within. Buildings influenced by the Arts-and-Crafts movement contain heavy elements, such as vergeboards and large brackets. Apartment buildings usually contain small-scaled elements within moderate to large-scale façades. Buildings generally are within normal limits of scale for moderate single- and multiple-family residences of the late 19th Century and early 20th Century.

(16) *Directional expression of front elevations.* Although some houses appear wider than tall and some appear taller than wide, the overall directional expression is neutral. Apartment buildings are expressed vertically; terraces (rowhouses) are horizontal. The Church of Christ, Scientist, is expressed horizontally.

(17) *Rhythm of building setbacks.* Setbacks vary from area to area within the district, though they are usually consistent within each block or streetface in compliance with deed restrictions. The varying designs of the houses, occasionally with slight setbacks in the façades, cause the houses to relate to the front setback line.

(18) *Relationship of lot coverage.* Lot coverage of single-family dwellings ranges from approximately 20 percent to 45 percent, most being in the 25 percent to 35 percent range of lot coverage. Lot coverage of multi-unit apartment buildings range from 50 percent to 90 percent of their lots, most being in the upper end of this range.

(19) *Degree of complexity within the façade.* The degree of complexity has been determined by what is appropriate for a given style. The Late Victorian buildings exhibit complex massing and multiplicity of forms, colors, and textures. Other styles in the district are less complex. The Classically-inspired buildings usually have simple, rectangular façades with varying amounts of ornamentation.

(20) *Orientation, vistas, overviews.* Single-family houses and apartment buildings are generally oriented towards the east-west streets. The majority of terrace buildings are oriented toward Third Avenue. The majority of the garages are oriented towards the alleys; where driveways exist, garages are frequently oriented towards both the street and the alley. All garages are detached and at the rear of the lot. A dramatic view of the General Motors Building and Fisher Building can be seen just south of the district.

(21) *Symmetric or asymmetric appearance.* Neo-Georgian and other classically inspired buildings are generally symmetrical. Other styles, including Queen Anne and Arts-and-Crafts inspired, are generally asymmetrical but result in balanced compositions. Front façades of apartment buildings are symmetrical in appearance.

(22) *General environmental character.* The character of the New Center Historic District is that of late 19th Century and early 20th Century residences on straight east-west streets. A cohesiveness is attained by entrance gates, uniform setbacks, spacing on lots, buried utilities, and, on Pallister, spacious tree lawns,

street furniture, and brick paving. Overall, the district has an urban, low to moderate density, revitalized residential character with small-scale commercial usage on its southern periphery and on Second from Virginia Park to Delaware.

(Code 1964, § 28A-1-41; Code 1984, § 25-2-89; Ord. No. 530-H, § 1(28A-1-41), eff. 11-22-1982)

REPORT

City of Detroit

CITY COUNCIL

Historic Designation Advisory Board

PROPOSED NEW CENTER AREA HISTORIC DISTRICT

Final Report

The proposed New Center Area Historic District consists of both sides of Virginia Park between Woodward and the Lodge Service Drive, and, in general, the first two blocks west off Woodward of Seward and Delaware, excluding the Woodward frontage, Pallister and Bethune between Bethune Court and Third, and the north side of Lothrop between Second and Third. The proposed district is located approximately three miles from the heart of downtown Detroit. To its north are more residential streets; to its south is a mixed use area with major commercial development, the New Center I Building, Fisher Building and General Motors Building, and some industrial development; to its east is a commercial strip along Woodward Avenue, Detroit's principal thoroughfare; and to its west are the Lodge Freeway and Henry Ford Hospital.

The residences in the proposed district date from about 1895 to 1930. A portion of the district, primarily on Bethune, Pallister, and Delaware, is being revitalized by housing rehabilitation, street rerouting, and other improvements and is called New Center Commons. Apartment buildings are primarily located on Seward, and Virginia Park is soon to be listed on the National Register of Historic Places.

BOUNDARIES: The boundaries of the proposed district are outlined in black on the attached map and are as follows:

Beginning at the intersection of the centerlines of Lothrop and Second Avenue and proceeding northerly along the centerline of Second Avenue to its intersection with the centerline of Bethune; thence westerly along the centerline of Bethune to its intersection with the centerline of Bethune Court; thence northerly along the centerline of Bethune Court to its intersection with the centerline of Delaware; thence easterly along the centerline of Delaware to its intersection with the centerline of Second; thence southerly along said centerline of Second to its intersection with the centerline of the east-west alley between Delaware and Pallister; thence easterly along said east-west alley to its intersection with the centerline of the north-south alley between Woodward and Second; thence northerly along the centerline of said north-south alley to its intersection with the southern boundary of Lot 92 of Peerless Addition No. 1 of part of ¼ section 56 of the 10,000 Acre Tract (L18/P33), extended westward; thence easterly along the southern boundary of said Lot 92, extended eastward, to its intersection with the centerline of Woodward Avenue; thence northerly along the centerline of Woodward Avenue

to its intersection with the centerline of the east-west alley between Virginia Park and Euclid, extended eastward, this being the same as the northern boundary of Lot 1 of the aforementioned Peerless Addition No. 1, extended eastward; thence westerly along the centerline of said east-west alley to its intersection with the centerline of the east service drive of the John C. Lodge Freeway; thence southerly along the centerline of said east service drive to its intersection with the centerline of the east-west alley between Seward and Virginia Park; thence easterly along the centerline of the said east-west alley between Seward and Virginia Park to its intersection with the centerline of Third Avenue; thence southerly along said centerline of Third Avenue to its intersection with the centerline of Seward; thence west along said centerline of Seward to its intersection with a line drawn parallel to and 13' west of the western boundary of Lot 14, Block 7, of Beck's Subdivision of part of ¼ sections 55 and 56, 10,000 Acre Tract (L4/P59); thence southerly along said line to its intersection with the centerline of the east-west alley lying between Seward and Delaware; thence westerly along the centerline of said alley to its intersection with the western boundary of Lot 38 (extended northward) of Block 4 of Henry Weber's Subdivision of part of ¼ sections 55 and 56, 10,000 Acre Tract (L2/P40); thence southerly along said line to its intersection with the centerline of Delaware; thence easterly along the centerline of Delaware to its intersection with the centerline of Third Avenue; thence southerly along the centerline of Third Avenue to its intersection with the centerline of Lothrop; thence easterly along the centerline of Lothrop to the point of the beginning.

HISTORY: The proposed New Center Area Historic District is comprised of several subdivisions of Sections 55 and 56 of the 10,000 acre tract, a tract of land entrusted to the Governor and Judges by an Act of Congress in 1806. The 10,000 acre tracts were a donation from the General Governors of the Territory of Michigan to defray the expenses of public buildings. This tract was not platted until 1816, about the time that Augustus B. Woodward received the tract from the Governors and Judges. This land lies north of the Boulevard and south of the Detroit Terminal right-of-way, and was bounded on the west by Greenfield Township and on the east by Conant Avenue.

In 1849, Gottlieb Beck purchased the south one-half acre of the north 106 2/3 acres of quarter sections 55 and 56 of the 10,000 acre tract, extending from Woodward to 12th Street, for a sum of $1,490. Beck came from Germany in 1837 and engaged in the tannery business on East Fort Street. He built a brick two-story farmhouse on Woodward at the corner of what later became Seward in 1851 and a tannery on Pallister Avenue just west of Woodward. Mrs. Beck moved back downtown with her children after Beck's death in 1855, when it must have been quite a burden to live so far out of town. Lewis, the Beck's eldest son, ran the tannery on Pallister until it burned down during the Civil War years. Traugott Schmidt, who operated his own tannery on Croghan (now Lafayette) and employed Lewis Beck as foreman, married the oldest of the Beck daughters, Mina, who later became the mother of a police commissioner, Carl E. Schmidt.

The old Beck Farm was sold in several parcels that were later subdivided. Beck's Sub, including both sides of Seward, was platted in 1876 by Caroline M. Wenzell (Beck), Lewis H. Beck, Carl E. Schmidt and Ida Schmidt (the latter two were the children of Mina and Traugott Schmidt), et.al. Schmidt's Sub, which included most of Seward between Woodward and Second Avenues, was platted in 1894 by Carl E. Schmidt, tanner at Traugott Schmidt, and his wife Alice.

By the end of the century, "...palatial residences now line the avenues that have been laid out through the farm, including Pallister, Parkman [later vacated], Delaware, and Seward Avenues." (Scrapbook: Palmer, Vol. 29; P. 157) These grand houses on Seward, occupied by such well-known Detroit personalities as Charles T. Fisher (Fisher Body Company), Frank W. Osborne (Assistant Treasurer, Buhl Sons Co.) and Charles Kotting (architectural firm of Chittendon & Kotting), were demolished for the construction of attractive medium-height apartment buildings erected between 1914 and the early 1940s.

Henry Weber, furniture manufacturer and dealer, his wife Caroline, Bernhard Stroh, brewer and father of Strohs Brewery, and his wife Clotilde, owners of the land consisting of both sides of Delaware and Pallister, filed a plat of Henry Weber's Sub with the Wayne County Register of Deeds in 1873. Later, the Weber Sub was sold and resubdivided in the 1890s into Stone and Todd Company's Sub (1893, Delaware between Woodward and Third), Leggett's Sub (1899, Pallister), Irving Place Sub (west of Hamilton) and Leggett and Miller's Sub (1912, Delaware between Hamilton and Third). However, a small part of Henry Weber's Sub, centered around Delaware and Third, was not resubdivided.

Another major subdivision in the New Center Commons area was Lothrop and Duffield's Sub, platted in 1892. It includes Bethune, parts of Lothrop and part of the north side of Grand Boulevard. Divie Bethune Duffield (1821-1891) formed a law partnership with George Van Ness Lothrop, called Lothrop and Duffield, soon after they both passed the Detroit bar exam in 1843. In 1857 they acquired the Taylor Farm, part of the 10,000 acre tract, in what was then in Greenfield Township, bounded by Woodward, 12th, on the north by a line 225' south of Pallister and on the south by Grand Boulevard. In addition to comprising one of the best regarded law partnerships in the city, both Duffield and Lothrop achieved prominence in their own rights.

Mr. Lothrop (1817-1895), a graduate of Brown and attendee of Harvard Law School, became city attorney general in 1847 and remained in that capacity for almost 30 years. He was also general solicitor for Michigan Central Railroad Company. In 1885 President Cleveland appointed him Minister to the Russian Court. When Lothrop died, he had about $900,000 in real estate holdings in Detroit.

Mr. Duffield was on the Detroit Library Commission and was an active member of the school board; a branch of the Detroit Public Library was named after him in 1912 and Duffield School was named in his honor. He was also a staunch temperance advocate and a poet.

After the death of D. Bethune Duffield in 1891, his wife Mary and George V. N. Lothrop and his wife Alvina subdivided their tract. Mary died in 1898, after which the partnership, known as Lothrop and Duffield Land Co. Ltd., was formed. The partnership included the sons of D. Bethune and Mary Duffield, George Lothrop (a physician) and Bethune Lothrop (a lawyer); Lothrop heirs; and, principally, Henry B. Lothrop, who became agent of the company. Individual lots were then free to be sold.

Streets, with the exception of Virginia Park, were named in the New Center area after either the landowner, subdivider or a famous person. Seward was named in 1860 after William H. Seward, the noted statesman; Pallister Road in 1860 after Thomas Pallister, landowner; Lothrop in 1883 after George V. N. Lothrop; and Bethune in 1881 after the maiden name of Mrs. George Duffield.

They were originally laid out in a straightforward, gridiron fashion and were paved with cedar, with the exception of Virginia Park, which was paved in brick. Building restrictions were attached to the deeds on all of the parcels in the various subdivisions and they usually varied from block to block. Houses in the first block west of Woodward were to be more expensive than those in the second or third blocks; a minimum construction cost was amongst the restrictions. Setbacks from the street or front lot line were also restricted. As a result, a uniformity from block to block was achieved.

Virginia Park, the northernmost street in the proposed district, encompasses an area which was laid out in 1893 by John W. Leggett and his wife, Grace; Frank E. Snow and his wife, Frances; and Joseph C.

Hough and his wife, Nellie. John W. Leggett was partner in the real estate firm of Hunt and Leggett. Frank E. Snow was a real estate developer and president of the Riverside Cartage Company which was located in the Hammond Building. The third developer, Joseph Hough was a newspaper advertising agent.

Virginia Park, originally named Virginia Avenue, is composed of three plats, each one a linear strip one block long and one lot deep. The Peerless Addition Number One runs between Woodward Avenue and Second Boulevard; Peerless Addition Number Two runs between Second Boulevard and Third Avenue, and Peerless Addition Number Three runs between Third and the John Lodge Service Drive, originally Crawford Street. Building lots were 50' wide by 163' deep. Two lots, on either side of Virginia Park, faced Woodward. These four lots, Lot 1, 2, 91 and 92, were approximately 87' in width and 200' deep. Public alleys of 20' in width ran perpendicular to Virginia Park west of the lots which faced Woodward. Each lot was referred to by name in the original plat, such as Tanglewood, Thistledown, Sorrento, Mayview, Shamrock, etc.

Building restrictions filed with the deeds required that property on Virginia Park be used for residential purposes only, that the buildings should be set back 25' from the street; that no building not of stone or brick be constructed; that no dwelling cost less than $5,000; that no double houses be erected; and that no more than one house on each 50' lot be erected.

Additional restrictions were placed on the four lots which faced Woodward Avenue. These required that the owners pave Woodward Avenue along their property with asphalt pavement and install sewers, lay gas pipes, install stone sidewalks, and plant shade trees.

Concern was raised as early as 1910 about the rapidly increasing commercialization of Woodward Avenue. Homeowners became concerned about the diminishing residential character of Detroit's most prominant thoroughfare and the negative impact this commercialization would have on adjoining property values. In response to this a group of property owners on Virginia Avenue formed the Virginia Avenue Improvement Association with the goal of re-landscaping the entrances to the sub-division. In keeping with the park-like nature of the new plan, the name was changed from Virginia Avenue to Virginia Park. Property owners donated between $500 to $2,500 to finance the plan. Under the headline, "Property Owners on Virginia Avenue Teach A Lesson In Civic Patriotism In Plan To Preserve Exclusive Residence Setting," the Detroit Free Press of March 26, 1911 announced:

> "Unique beyond anything yet devised in this city and strikingly original in the method of development is the plan by which property owners along Virginia Avenue propose to increase the natural beauty of their street and perpetuate it as a park-like thoroughfare, exclusively devoted to fine residences."

Property was acquired by the association on either side of Virginia Park at Woodward Avenue and on Hamilton Boulevard. On the east and similarly on the west, the property has a frontage of 163'; it extends 220' south on Woodward Avenue and 200' north of Virginia Park. George V. Pottle, a local architect and resident of Virginia Park, designed the semi-circular entranceway and gates. The Detroit Free Press of March 26, 1911 described the project thus:

> "Across the end of Virginia Avenue it is planned to erect an ornamented brick wall of Virginia Colonial design. The middle and main section of this wall will be 80 feet long at either end of the middle section, space will be left for an ornamental driveway 20 feet wide which will curve into Virginia Avenue like the segment of a circle. Beyond the driveway will be an ornamental pillar, then space for a footwalk and a short extension of the wall. For 50 feet inside the wall, the ground will be converted into a park, planted with trees, plants and shrubbery, through which will pass the driveways and walks.."

These improvements were constructed with private money and dedicated to the city. The majority of Lots 1, 2, 90 and 91, the lots on Woodward Avenue, were given to the city in 1911. The public alleys which ran between Lots 1 and 2 and Lots 90 and 91 have been vacated. The entranceway on Woodward Avenue has survived intact. The western entranceway, however, as well as 240' of Virginia Park frontage is now part of the John C. Lodge Freeway.

Gates were erected and small parks were planned in other prominant residential subdivisions along the Woodward Corridor at about the same time. These included the Arden Park-East Boston Historic District and the Boston-Edison Historic District.

The growth of the city of Detroit was aided by the electric railway (early 1890s) and that development of rapid transit out Woodward Avenue marked the beginning of the movement toward the boulevard on the north. The idea of creating a boulevard around the city first came up in 1870; it was envisioned as a gravel road where gentlemen with fast horses could let out the reins. Throughout the 1880s money was appropriated for the boulevard, but because of the controversial nature of the project, the street was not begun until 1891, when the plough was put into the fields at Woodward Avenue. West Grand Boulevard would become the base line for the New Center commercial development by General Motors and the Fisher Brothers of the 1920s.

Over the years the New Center area carried with it both prestige and decline. A retail strip developed on both sides of Woodward Avenue, the eastern boundary of New Center; major department stores located in New Center. Professional people resided in the ample houses even after the more affluent gradually moved to more prestigious neighborhoods such as Boston-Edison, Palmer Woods, or Grosse Pointe. But as the shift to the suburbs continued and the nation and city experienced less prosperous times and racial strife, the New Center area began to decline in popularity as a place to shop or live. The large single-family homes were converted to boarding houses or subdivided into rental units. Some later became Wayne State University Cooperative living houses or half-way houses.

General Motors Corporation announced in late 1978 that it was renovating what it called "New Center Commons." A massive revitalization project has been undertaken that involves rerouting streets, creating pedestrian malls on Pallister, Delaware, and Bethune with alley access to houses, rehabilitating buildings, and installing street furniture. Revitalization of New Center Commons by G. M. and the construction of the New Center One Building are anticipated to bring the people and prestige back to New Center.

ARCHITECTURAL DESCRIPTION:

Within the New Center Historic District are representative samples of residential architecture spanning the years 1895 through 1930. Residential works of Detroit's leading architects of the early twentieth century are represented in New Center Commons, including George V. Pottle, designer of the Virginia Park entranceway; Richard Marr, Joseph Mills, and A. C. Varney. Architectural firms represented are Pollmar & Ropes; Smith, Hinchman & Grylls; Rogers and MacFarlane; Baxter, O'Dell & Halpin; Chittenden & Kotting; and Malcomson and Higginbotham. Many residences were designed and constructed by building and contracting firms such as William J. Newton Company; Spitzley and Sons; W. E. Briggs Company, and many more.

All of the homes built as single dwellings in New Center Commons were constructed between 1895 and 1920. Homes dating from the last decade of the nineteenth century are usually located in the first block between Woodward Avenue and Second Boulevard. The homes are two and one-half stories tall and their diversity of architectural styles include Neo-Georgian, Arts and Crafts (Craftsman), Bungalow and Neo-Tudor.

Moderately tall apartment buildings erected approximately between 1915 and 1940 replaced single-family dwellings predominately on Seward. Most were built in the second and third decades of the twentieth century; these are adorned with rich historical detail.

1. 120 Virginia Park, The Charles Warren Pickell House, 1895, Colonial Revival, Tuller and Van Husan, contractors

Charles Warren Pickell was one of the prominent and widely known insurance men in the Midwest. Born in New York, Pickell moved to Michigan at an early age. Pickell graduated from Michigan State Normal College at Ypsilanti in 1879. From then until 1881 he was successively principal of the Public Schools at Middleville and Bronson, Michigan.

In 1884 Pickell became superintendent of Schools at Ludington, Michigan, a post he held for four years. From 1888 to 1891 he was district manager of the Penn Mutual Life Insurance Company at Grand Rapids. He came to Detroit in 1891 as associate manager of the Massachusetts Mutual Life Insurance Company, and a few months later became general manager.

Pickell had personally written more than $15,000,000 worth of insurance. He was the author of several volumnes including "Plain Hints" which was called the "insurance men's bible." Pickell was also responsible for writing a number of essays on insurance salesmanship.

The Pickell House is one of the earliest on Virginia Park. It is one of three built by Tuller and Van Husan on the first block of Virginia Avenue with permit #819 at an estimated cost of $18,000. The central feature of this symmetrical facade of orange brick is the large Colonial Revival three-quarter circular porch with Ionic columns. The wooden portico has a modillioned cornice, leaded glass sidelights surrounded by thin fluted pilasters, and a transom window above the door surround the entranceway.

Every fourth course of brick on the first story is recessed, creating a rusticated appearance. The two sash windows per bay share a common stone sill. Quoins of brick and a central Palladian window arrangement accentuate the upper story. A gable with a port-hole-type window intersects with the flat topped hipped roof over each of the end bays. A denticulated cornice caps the facade, and a dormer with Adamesque detailing and a swan's neck pediment projects over the central bay.

2. 660 Virginia Park, The Albert H. Finn House, 1897, Colonial Revival style, Rogers & MacFarlane, architects

Albert H. Finn, a prominent Detroit publisher, was the first resident at 660 Virginia Park. Finn was the son of Rev. Silas W. Finn, an energetic Baptist minister of Royal Oak. In 1879, as a boy of 17, Finn began publication of The Midget, known as Royal Oak's second newspaper which, however, only survived 15 weeks.

Finn became advertising manager and assistant general manager of the Detroit Journal, publisher of the Michigan Christian Herald, and founder of the Franklin Press, under whose imprint early issues of the American Boy, Motor News and other magazines were published. He also organized the first of the nationally famous Ad Craft Club advertising courses. In 1916 Finn turned to real estate. Specializing in Woodward Avenue frontage, Finn sold $800,000 worth to Hugh C. Chalmers within the first month of his new career. Finn also served as president of the Bungalohill Land Company, secretary of the Van Alstine Land Company, and maintained large holdings in Detroit, Toledo, and Chicago.

For many years Finn was closely associated with the Burton Historical Collection at the Detroit Public Library and was instrumental in enlarging its collection of Baptist manuscripts, letters, photographs, periodicals, and other valuable historical materials.

A life deacon in the First Baptist Church of Detroit, Finn helped organize the Young People's Union in 1891 and was one of the founders of the Children's Home at Thirteen Mile and Greenfield Road.

The Finn House is a large, Colonial Revival home with a symmetrical facade; an open portico with graceful Ionic columns supports a simple denticulated entablature. The importance of the central pavillion is further emphasized by the arched, paired windows above the portico and the paired gables with broken pediments at the attic level. A simple denticulated cornice divides the main body of the house from the steep hipped roof. The architectural partnership of Rogers and MacFarlane were very comfortable designing in the Colonial Revival style; examples of their residential architecture can be seen in West Village and Indian Village also.

3. 700 Virginia Park, The Charles B. Van Dusen House, 1908, Neo-Tudor/Arts and Crafts style

The first residents of 700 Virginia Park were Charles B. Van Dusen and his wife Minnie. Van Dusen served as president of the S.S. Kresge Company for 13 years. Van Dusen began in the retailing business in 1885 as a clerk for Allen Sheldon & Company, and in 1891 he joined the wholesale and dry goods firm of Edson, Moore and Company. Van Dusen joined the firm of Kresge and Wildon in the operation of a number of five-and-dime stores in 1904. By 1912, the S.S. Kresge Company was organized; Van Dusen was elected to the board of directors and made secretary-treasurer. He became vice president and general manager in 1915 and ten years later Van Dusen became president of the S.S. Kresge Company.

The most prominent feature of this asymmetrical orange brick house is the east bay; its gable intersects with the gabled roof of the building, and has a heavy vergeboard. The stuccoed second and attic story of this bay are articulated with false half-timbering and painted framing motifs; windows are grouped in threes. The second story of this bay projects, forming an oriel window. A stuccoed shed dormer projects from the west bay side of the roof. The front porch is supported by squared-off wood posts in an Arts and Crafts manner.

4. 750 Virginia Park, The Douglas House, 1910, Arts and Crafts style, George V. Pottle, architect

George V. Pottle, the architect of 750 Virginia Park, lived on Virginia Park and designed the gates at the ends of the three block long street in 1911. The Douglas House was built for H. A. Douglas, treasurer and assistant secretary of the Michigan Sugar Company and Minnosota Sugar Company, at an estimated cost of $6,500.

Mr. Pottle combined the Arts and Crafts propensity towards expressing materials and their joinery with the Prairie School's continuity of horizontal lines and large overhanging eaves. The first two stories are brownish orange brick; a porch with a slightly sloped roof spans the west half of the first floor. This porch is composed of brick piers; each of its faces is cut back to appear clustered. The wooden corniceline of the porch continues over the east one-half of the first story directly above three windows which rest on a continuous concrete sill. On the second story, the upper sash of the two groups of paired windows are subdivided by lead into small squares; each pair shares a sill.

The attic story is the most unusual feature of this house. It begins directly above the second story windows and culminates with the peak of the gable roof. It is sheathed in wood horizontal siding above a frieze of decorative wood work. Substantially overhanging eaves of the roof are supported by large wooden brackets with lower arms that extend the length of the attic's one-half story. Attention to detail in the attic is apparent; wooden pegs are plainly visible in the cornice, as are simulated tool marks on the brackets.

5. 120 Seward, Gramont Manor Apts., 1923, Second Renaissance Revival, Hugh T. Miller, architect

Like Pallister, Delaware and Bethune, Seward Avenue was populated with professionals and businessmen who lived in the substantial, well-built, moderately priced dwellings by 1900. But by 1915, the first of the moderately scaled apartment buildings had replaced all but a few single-family houses on the first two blocks of Seward west of Woodward.

Gramont Manor Apartments, designed by Hugh T. Miller and built and owned by Sam Satovsky, contractor and builder, in 1923, had 49 units and was constructed at an estimated cost of $136,000. It is four stories tall and is of reinforced concrete and yellow brick. The masonry foundations give the appearance of rustification; the sills and the watertable are also masonry.

The front facade has four projecting sections. The entrance bay between the two inner projections is deeply recessed, creating an almost processional entry. Upright cast iron lamps lead to the smooth masonry entrance vestibule; the segmentally arched doorway is flanked by Corinthian columns supporting an entablature bearing the name of the building. A medallion with cornucopia occupies the center of the balustraded attic section of the entrance. Decorative panels bearing garlands, patera, and anthemian ornaments are found in panels on the facade of the building. Decorative curved pediments top the cornices of the projecting and receding facade of this substantial apartment building.

The sides of the building are orange common brick. Light courts create projections and recessions in the plan of the building.

6. 620 Seward, Third Church of Christ, Scientist, 1922-23, Classical Revival, George D. Mason, architect

Mary Baker Eddy, spiritualist, naturalist and poet, founded her own brand of theism utilizing Christian concepts and naturalism and called it "Christian Science." She was a prolific writer and had a tremendous following. There are presently ten Churches of Christ, Scientist in Detroit; each has its affiliated reading room.

The Christian Science Monitor, the church's weekly newspaper, is one of the most widely circulated and read newspapers in the country.

The Third Church of Christ, Scientist was designed in 1922 by George D. Mason, outstanding Detroit architect whose career spanned the years 1875 to the 1940s and included the designs of churches, residences, commercial buildings, public buildings, and institutional buildings in a variety of styles. He travelled widely in Europe in 1884 and 1911 and became familiar with the gamut of historical styles. In 1920 he established the firm of George D. Mason & Company, architects.

The center of the reinforced concrete and yellow glazed brick building bows outward, forming a convex curve. Pilasters rising the two stories are at the corner of the building and where the bow begins. There are six engaged Tuscan two story columns around the curve with decorative panels at their bases. Wreaths are situated above the pilasters on the entablature. In between each column is alternatingly either a wooden double door or a double window.

Above the double windows of the second story is a continuous Greek fret pattern, and above the denticulated cornice in the attic panel is the name of the church.

7. 89 Delaware, The John S. Fee House, 1902, Queen Anne/Classical Revival, S. A. Palmer, builder (?)

The design of the Fee House, whose first owner was John S. Fee, manager of the Weaver Coal Company, reflects the transitional phase from Queen Anne to Colonial Revival around the turn of the century. The facade of the Fee house is stone; the sides and rear are orange common brick. The courses of rough-cut stone are thinner towards the top of the building, creating a lighter appearance at the top. The three story corner tower with a conical roof is indicative of the late nineteenth century Queen Anne massing. The open porch, however, is decisively Colonial Revival, with its Ionic order. The centrally placed door is surrounded by sidelights and topped with a transom window.

Above the entrance on the second story is a bowed window. All windows on the main body of the house have transoms containing leaded or stained glass. In the hipped roof are two dormers with hipped roofs and triple windows.

8. 116 Delaware, The George E. Lane House, 1902, Queen Anne/Colonial Revival

R. A. Bailey, possibly of the R. Arthur Bailey Company, manufacturers of plaster reproductions, received the permit for construction of this two and one-half story brick building with stone trim on February 17, 1897. When completed, it was estimated to have cost $5,000.

George E. Lane, the first owner of the house, was the secretary/treasurer of Morgan and Whately Company, ladies skirt and wrap manufacturers. He did not stay at this address long; in 1904 Charlemayne Clark, president of the Phoenix Wire Works, resided here. In the early 1920s it became the home of Newman's Miss School, a girl's finishing school. The addition to the west of the house was built in 1923 by the school. In the 1960s the buildings functioned as a print plant.

Architecturally, this house shares several features with the Perry McAdow House, locally designated with the First Unitarian-Universalist Church Historic District. Its porch is recessed on the west side of the facade; an arched opening leads to the porch and entrance. Above the entrance on the second story is a bowed oriel window. An oriel window is also on the west elevation. On the east corner of the facade is a two-story tower with a steep conical roof.

The first and second stories are divided by a band of brick headers cut on the diagonal. Beneath the cornice is a frieze of decorative brickwork. The main roof of the house is a steep hip with a flat top; it has one centrally located dormer projecting from it.

9. 715 Delaware, Neumann House, 1905, Colonial Revival, R. R. Stuart

William Neumann was general manager of William F. V. Neumann and Company, representing the Welsh Motor Car Company, Wayne Automobile Company, Soules Motor Car Company, Waverly Electric Company, and White Steamer Company. This orange brick two and one-half story house, built for Mr. Neumann, was constructed at an estimated cost of $4,000.

The porch is most characteristic of this simple Colonial Revival style. It occupies the eastern and central bay of the first story of the front facade; simple wooden Doric columns hold up the entablature and modillioned cornice of its almost flat roof. The western bay is composed of a two-story bay window with some leaded glass transoms. In the center-front of the

10. 8032-8050 Third, Terraces, 1915, Baxter, O'Dell & Halpin, architect

Mrs. Roy Haberkorn (Mary) commissioned Baxter, O'Dell, and Halpin to design these five rental units on property she and her deceased husband, a contractor, owned.

This row, between Seward and Delaware, cost approximately $10,500 to construct. It is two stories tall and built of red-orange pressed brick. In appearance and arrangement, they are typical of comparable size terraces elsewhere in Detroit from the first quarter of the twentieth century. Bays flank the brick porches with side-facing stairs, creating an undulating effect on the facade. Pairs of brackets support the projecting cornice.

11. 701 Bethune, The Langdon House, 1907, Neo-Tudor, Pollmar & Ropes, architects

Mrs. Emma Langdon was the original owner of this house designed by the well-regarded Detroit architectural firm of Pollmar and Ropes. Its estimated cost was $4,500. The front facade is articulated with two bays that project slightly forward; the first story is brick; the rest is stucco with decorative half-timbering painted red, although the stuccoed cream surface is carried down to the first story in the projecting west bay. The open porch has a gabled roof supported on brick piers. Its frontal gable has a cream-colored stucco finish and half-timbering painted red. Transom windows over first story windows contain leaded glass.

The main hipped roof of this house is intersected by a large gabled roof facing the street. It has wide vergeboards and contains one paired window in the center.

The Langdon House is representative of the well-designed modestly scaled houses in New Center Commons.

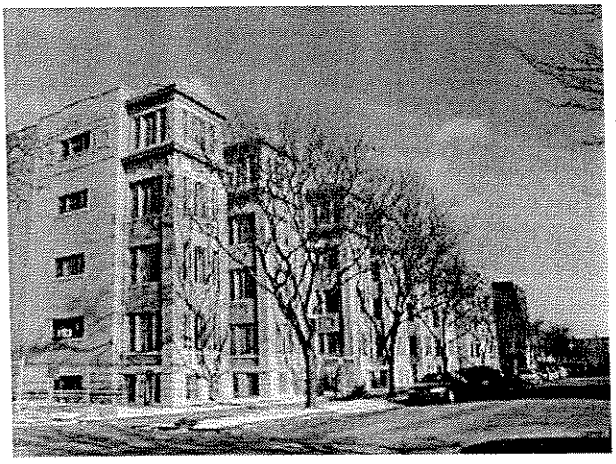
RECOMMENDATION: The Historic Designation Advisory Board recommends that the City Council establish the New Center Historic District with the design treatment level of rehabilitation. A draft ordinance for the establishment of the district is attached for consideration by the City Council.

REPORT

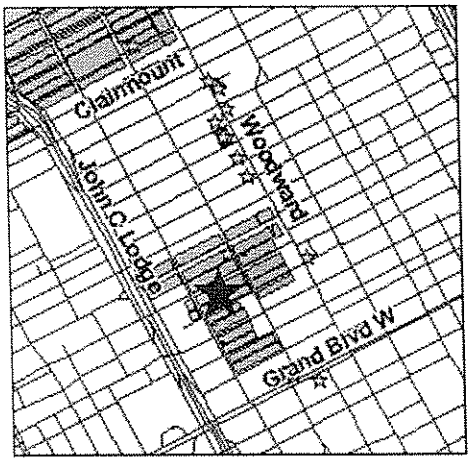
New Center Historic District

General boundaries: Virginia Park, Woodward, Lothrop, John C. Lodge Expressway.

Local	v	11/22/82
State		
State Marker		
National	v	2/28/83



Granmont & Birchmont Apts. 112-120 Seward

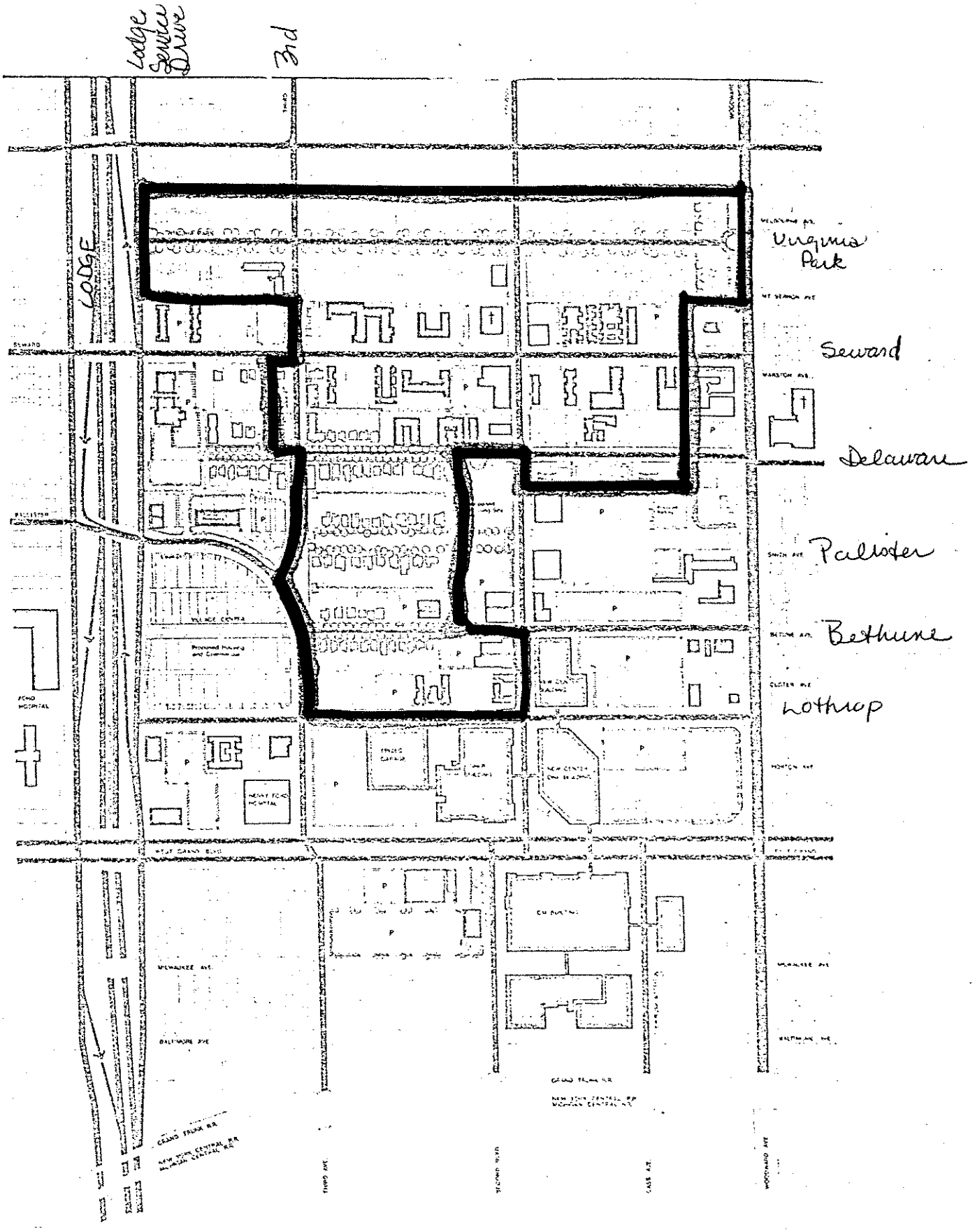


Historic overview:

Many streets in the New Center area were named after a landowner, subdivider or a famous person. Seward was named in 1860 after William H. Seward, the noted statesman; Pallister was for Thomas Pallister, landowner; and Lothrop after George V. N. Lothrop, City Attorney General, Minister to the Russian Court and real estate entrepreneur. The streets were originally laid out in a straightforward gridiron fashion and were paved with cedar, with the exception of Virginia Park (originally Virginia Avenue), which was paved in brick. Building restrictions were attached to parcels, ensuring that homes on the block closest to Woodward were more expensive than the second and third blocks, and minimum costs were enforced.

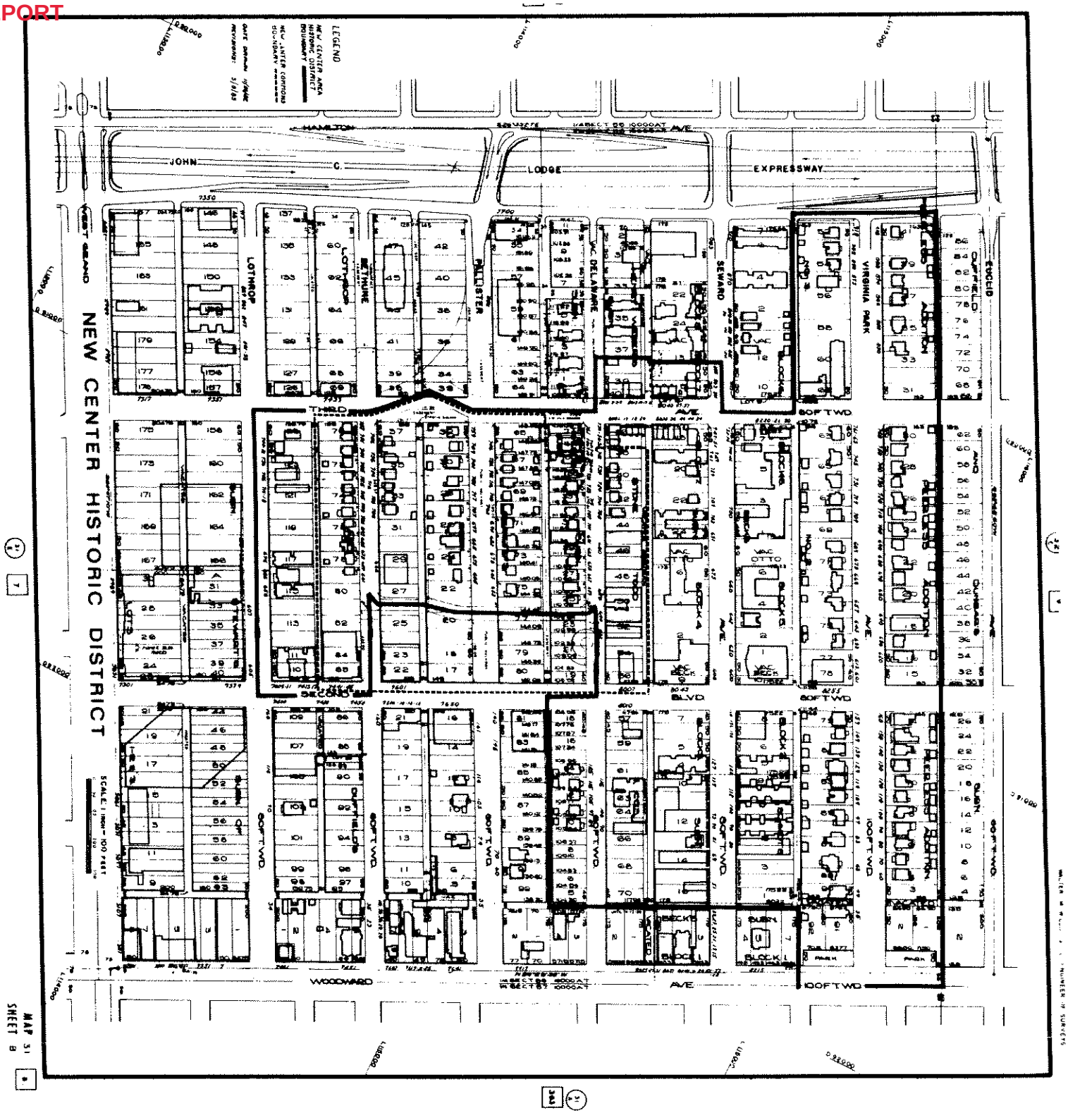
West Grand Boulevard became the base line for the New Center commercial development by General Motors and the Fisher Brothers of the 1920s. A retail strip developed on both sides of Woodward Avenue, the eastern boundary of New Center, and prestigious and high-end department stores located within the district. However, the nation and city experienced less prosperous times and racial strife during the late 1960s, and the shift to the suburbs was underway. New Center retained some professional people as residents even after the affluent gradually moved to more prestigious neighborhoods. Yet New Center's popularity declined, and many homes were converted to boarding houses or rental units, convenient for Wayne State University students.

In 1978 General Motors Corporation announced that it was renovating what it called "New Center Commons". A massive revitalization project rerouted streets, constructed pedestrian malls, and rehabilitated buildings. The project created a more upscale neighborhood, and today New Center Commons thrives as a residential area.



PROPOSED NEW CENTER HISTORIC DISTRICT
(Boundaries outlined in heavy black)

REPORT


NEW CENTER HISTORIC DISTRICT
LEGEND
JOHN C. LODGE EXPRESSWAY
WEST GRAND BLVD
LOTHROP
BETHUNE
PALLISTER
ST. ANTOINE
SEWARD
VIRGINIA PARK
EUCLID
THIRD AVE.
SECOND AVE.
WOODWARD AVE.
BLVD
80FT WD
100FT WD
SCALE: 1 INCH = 100 FEET
MAP 51
SHEET B