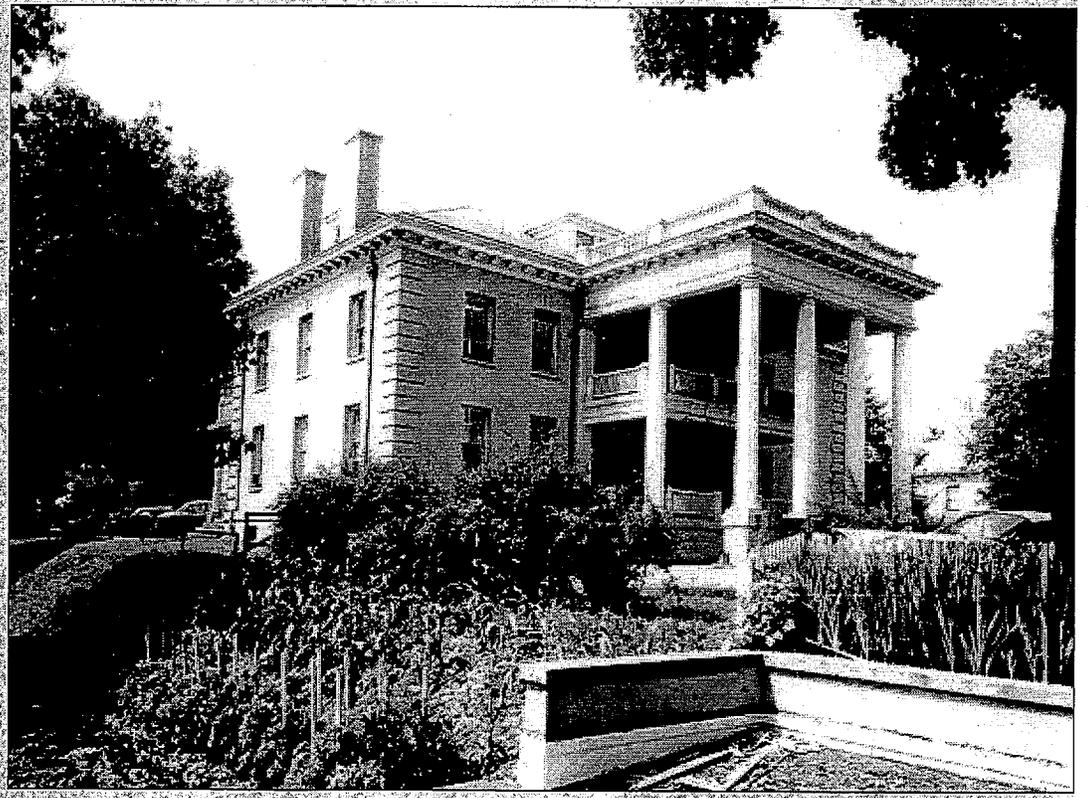
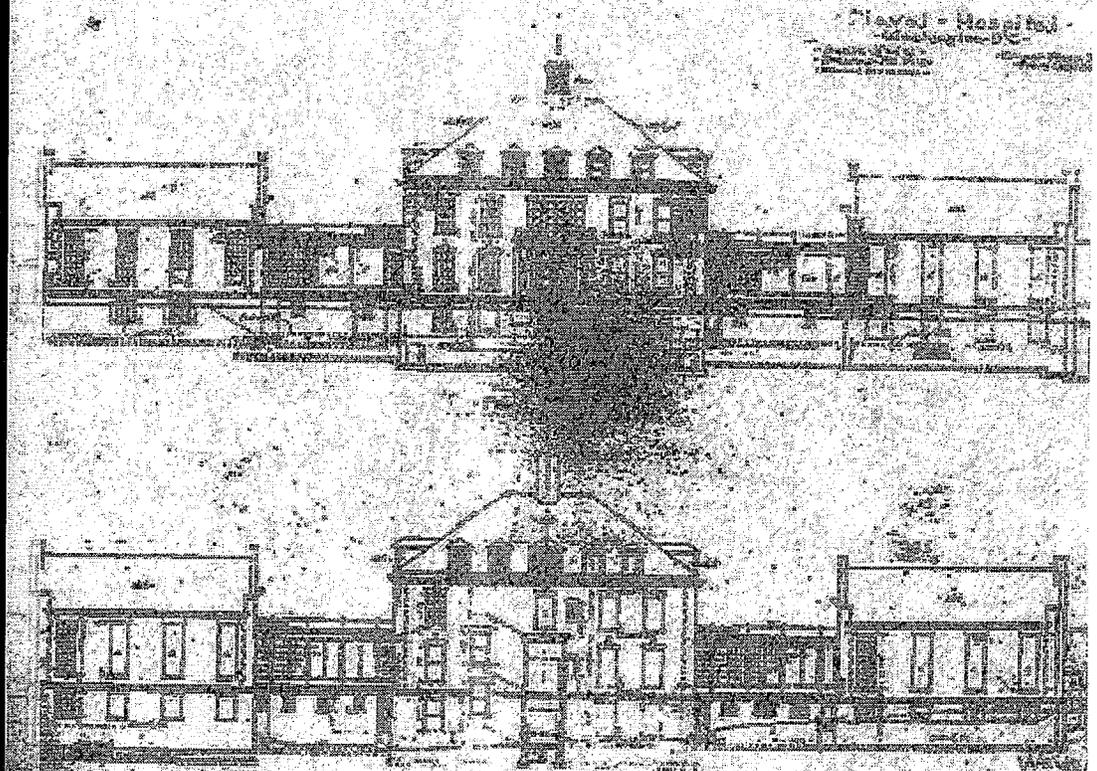


SWANKE HAYDEN CONNELL ARCHITECTS



Potomac Annex:  
Buildings 1 & 3-7

Historic Structures Report, Corrected Final Submission  
 General Services Administration Project Control Number: 44007  
 September 9, 1997  
 VOLUME 2 OF 2



## INTRODUCTION

A scientific paint analysis is based upon the removal of small samples of accumulated paint layers on original architectural elements of a building in order to determine the early colors of such elements, the sequence of finishes, and an appropriate color match for restoration. A second purpose of this paint analysis is to determine relative dates for alterations, using the historic paint sequences as a common point of reference. Paint analysis was requested for Potomac Annex Buildings 1, 3, 4, 5, 6 and 7 as part of a Historic Structures Report of the complex of historic buildings built as the Washington Naval Hospital. Building 2, the original Naval Observatory, is addressed in a separate Historic Structures Report.

The surviving historic architectural features on the exterior and interior of the building were sampled for paint stratigraphies which might yield clues about the original and subsequent finishes of the building. Areas to be sampled for paint analysis were specified by the GSA in the Scope of Work for the Historic Structures Report for the Potomac Annex Historic District. Since the date of construction, changes have been made to the structures, such as the replacement of the main doors on all buildings, or systematic stripping of accumulated paint layers in the course of repainting. These undocumented changes have obliterated the ability to study the historic finishes of some elements of the building. As many samples as possible were taken following the specifications during a site visit and on August 2 - 5, 1994. Substitutions or replacements have been made by the conservator in some instances, subject to GSA approval.

Small paint samples were removed, individually packaged and labeled, and brought to the laboratory of Acroterion, Historic Preservation Consultants, in Madison, New Jersey, for visual inspection during August 8 - 22, 1994. Janet W. Foster was responsible for sampling and laboratory analysis.

The relative dating of paint layers within the samples was greatly aided by the discovery of a circa 1940's painting of Building 2, the Old Naval Observatory. This large portrait of the building is said to have been painted by an officer based at the Naval Hospital during World War II. It hangs in Potomac Avenue Room 2126, original dining room of the observatory superintendent's home.

This painting shows Building 2 with light green trim. Since the light green paint color does appear on window and door trim consistently throughout buildings 1 through 7, the painting may be relied upon as an accurate document of the finishes of Potomac Annex in the 1940s. It also provides a relative date for the architectural elements which contain this paint layer, and allow definite conclusions to be drawn on which were the early finishes of the buildings, and which post-date the period of significance for the complex, which is the period after the Naval Hospital moved from the site in 1941.

### SUMMARY CONCLUSIONS

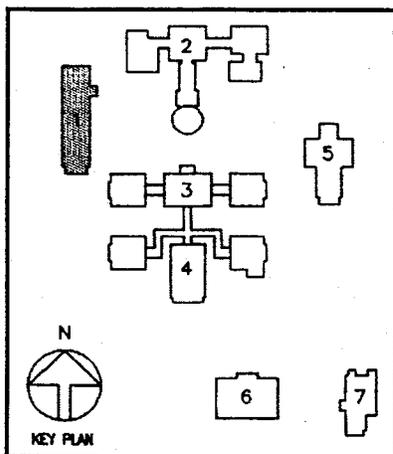
The period of significance for the Potomac Avenue complex covers the first third of the twentieth century, when the campus was fully built for the Washington Naval Hospital. Buildings 1,3,4,5,6, and 7 were constructed between 1902 and 1908. Their original paint colors are recommended for restoring the buildings to their historic appearance. This means retaining the unpainted yellow brick walls, accented with white cornices, porticoes, balustrades, and dormers. Where sun porches exist, they are also to be painted all white. A dark yellowish green color was originally used on the window sash and frames of all the buildings. Repainting the windows dark green will give a "historic" appearance to the buildings, as dark colored sash in particular was a very common paint treatment in the 19th and early 20th centuries, which has generally fallen out of fashion since World War I. Most of the doors in the Naval Hospital complex have been replaced. If the metal and glass replacements are removed, and wooden doors replicating the originals are reinstalled, the same dark green paint found on the windows should be used. An original varnish finish was identified on Building 7, and it is unknown if it is typical for the complex. Varnish should be returned to the wooden doors of Building 7, but on any wooden replacement doors on Buildings 1, 3, 4, 5, and 6, dark green paint should be used as is documented on a few service entries for these buildings, and has the advantage of being a more practical finish.

During World War II, all the buildings, including the old Observatory, were painted in the same way. The Observatory was painted a light yellow, to match the naturally yellow brick used on other buildings of Potomac Annex. All the buildings had light green window and doors in this era. The color scheme for the World War II era is well documented, both in the paint samples removed for study, and in the painting of Building 2 found in the original Superintendent's House of the old Observatory. However, the World War II period is not of the greatest historic and architectural significance for Potomac Annex, and so it should not be recreated with a finishes restoration.

Inside the Potomac Annex buildings, finishes reflected their utilitarian nature. For the most part, interiors were finished with cream-colored paint on the walls, and stained and varnished woodwork. The lobby of Building 3, which was the most public space in the complex during the early years of this century, retains its original, modest architectural features in its beamed ceiling and bracket cornice. The walls of this space were originally painted a warm reddish brown color, making it a literal "bright spot" in the Potomac complex. There is no evidence of complex finishes, such as glazing, or graining, or the use of wallpapers, in any of the areas sampled.

Restoration of the original finishes through the complex will enhance the buildings' exterior appearance. Interior finishes will be appropriate both to the historic character of the buildings as well as compatible to their modern use as office.

## BUILDING 1

**Building 1 - Procedure**

Eleven (11) exterior samples were removed from Potomac Annex Building 1 for microscopic investigation. Included in the study were fragments from the window frames and sash, doors and door frames, cornice, balustrade, and sun porch woodwork. Seventeen (17) samples were removed from the interior of the building, from the main hallway, an office, and the sun porch.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty

power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source, 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

**Building 1 - Inventory of Samples**

The following is a list of all paint samples removed for laboratory investigation. Where samples differ from those requested in the proposal, an explanation is given in italics.

Exterior

1. Door - north gable end  
*Original front door (east elevation) has been removed and replaced with an aluminum-frame and glass entry.*
2. Door frame - north gable end  
*Original front door (east elevation) has been removed and replaced with an aluminum-frame and glass entry.*
3. Window sash - east elevation

4. Window frame - east elevation
5. Dormer trim - east elevation
6. Balustrade, top railing - east elevation
7. Portico column
8. Portico cornice
9. Portico railing
10. Sun porch sash - east elevation
11. Sun porch frame - east elevation

### Interior

1. Public Spaces
  - a. Main entry hall and stair
    1. ceiling
    2. door
    3. door frame
    4. window sash
    5. window frame
    6. stair, stringer
2. Private Spaces
  - a. Office: Room 1119
    1. wall
    2. ceiling, coffer
    3. ceiling, coffer frame
    4. ceiling, ceiling beam dividing coffers
    5. baseboard
    6. door frame
    7. window sash
    8. window frame
  - b. Sun porch: Room 1122
    1. door frame
    2. window sash
    3. window frame

**Building 1 - Paint Seriation Charts**

The results of microscopic investigation of the paint samples are recorded in chart form on the following seven pages.

Potomac Annex, Building 1					
sample no.	1	2	3	4	5
Exterior	door		window		dormer
	door	frame	frame	sash	trim
substrate	wood	wood	wood	wood	wood
earliest layer			very dark yellowish green (NBS) primer and finish Munsell 2.5 G 2/4	very dark yellowish green (NBS) primer and finish Munsell 2.5 G 2/4	dark gray primer yellowish white finish
1940s			dark gray primer	dark gray primer	
			dark green finish	dark green finish	yellowish white finish
			dark gray primer	dark gray primer	
			dark green finish	dark green finish	yellowish white finish
	white primer light yellow green finish	white primer light yellow green finish	light yellow green finish	light yellow green finish	yellowish white finish
	light greenish gray finish	light greenish gray finish	light greenish gray finish	light greenish gray finish	yellowish white finish
	white primer	white primer	white primer	white primer	white primer
	white finish	white finish	white finish	white finish	white finish
newest layer	white primer	white primer	white primer	white primer	white primer
	white finish	white finish	white finish	white finish	white finish
comments					



Potomac Annex, Building 1					
sample no.	10	11			
Exterior	sun porch				
	sash	frame			
substrate	wood	wood			
earliest layer	white primer white finish	white primer white finish			
1940s	white finish	white finish			
	yellowish white finish	yellowish white finish			
	light yellow green finish				
	light greenish gray finish				
	white primer white finish	white finish			
	white finish	white finish			
newest layer		white finish			
comments					

Potomac Annex, Building 1					
sample no.	I1a1	I1a2	I1a3	I1a4	I1a5
Interior	Public Spaces				
	Main entry hall and stair				
	ceiling	door	door frame	window sash	window frame
substrate	plaster	wood	wood	wood	wood
earliest layer	creamy white finish	creamy white finish	creamy white finish (fracture)	creamy white finish (fracture)	white finish (fracture)
	creamy white finish	white finish	white finish	white finish	
	light green finish	light green finish	light green finish	light green finish	light green finish
		light brownish red finish	light brownish red finish	creamy white finish	
		gray blue finish	light blue finish	gray blue finish	
		yellow cream finish	yellowish cream finish	yellowish cream finish	
		light gray blue finish			
		light blue finish	light blue finish	light blue finish	
				light brownish red finish	light brownish red finish
				light blue finish	light blue finish
				light olive green finish	light olive green finish
			gray blue finish		gray blue finish
					yellowish cream finish
	tan finish				light green finish
	bright white finish	light green finish	light green finish	light green finish	
	dark tan finish	creamy white finish	creamy white finish	creamy white finish	white finish
	creamy white finish	white finish	white finish	white finish	creamy white finish
newest layer	white finish *	creamy white finish	creamy white finish	creamy white finish	
comments	* thick layer				

Potomac Annex, Building 1					
sample no.	I1a6	I2a1	I2a2	I2a3	I2a4
Interior	Public Spaces	Private Spaces			
	Main entry hall and stair	Office: Room 1119			
	stair, stringer	wall	ceiling, coffer	ceiling, coffer frame	ceiling, ceiling beam dividing coffers
substrate	wood	plaster	plaster	wood	wood
earliest layer	cream finish red finish tan finish light blue finish light green finish gray blue finish light blue finish light green blue finish yellowish cream finish creamy white finish white finish yellowish cream finish	moderate yellowish pink finish   light blue finish   creamy white finish varnish (wall repair) creamy white finish	white   light green finish creamy white finish creamy white finish creamy white finish white finish white finish white finish white finish	white cream finish   creamy yellow finish light green finish dark cream finish white finish creamy white finish white finish	light yellow finish (fracture)   creamy yellow finish   white finish creamy white finish white finish creamy white finish
newest layer		white finish	white finish	tan finish	white finish
comments					

Potomac Annex, Building 1					
sample no.	I2a5	I2a6	I2a7	I2a8	
Interior	Private Spaces				
	Office: Room 1119				
	baseboard	door frame	window sash	window frame	
substrate	wood	wood	wood	wood	
earliest layer	light yellowish white	light yellowish white finish	light yellowish white finish	light yellowish white finish	
	tan finish (fracture)	tan finish (fracture)	white finish		
	creamy white finish	creamy white finish	creamy white finish	light green finish	
	white finish	white finish	bright white finish	cream finish	
			white finish		
	cream finish	light green finish	light green finish	light green finish	
	light blue finish	light blue finish	light blue finish	light blue finish	
		light green finish	light green finish		
		blue finish	blue finish		
		light tan finish	light tan finish		
	tan finish	dark tan finish	tan finish	tan finish	
	white finish	creamy white finish		white finish	
	creamy white finish	yellowish tan finish		creamy white finish	
newest layer	tan finish	tan finish		tan finish	
comments					

Potomac Annex, Building 1					
sample no.	I2b1	I2b2	I2b3		
Interior	Private Spaces				
	Sun porch: Room 1122				
	door frame	window sash, casements	window frame		
substrate	wood	wood	wood		
earliest layer	light yellowish white finish	light yellowish white finish	light yellowish white finish		
	white finish	white finish	white finish		
	creamy white finish	white finish	white finish		
	white finish	bright white finish	white finish		
	light green finish	light green finish	light green finish		
		light yellow finish	light yellow finish		
	light blue finish	light blue finish	light blue finish		
		light green finish	light green finish		
	red brown finish	red brown finish	red brown finish		
	creamy white finish	creamy white finish	creamy white finish		
	white finish	white finish	white finish		
newest layer	tan finish	tan finish	tan finish		
comments					

### *Building 1 - Observations*

#### Exterior

The first microscopic observation of the Potomac Annex paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting paint layers, especially where many white paint layers have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences can reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation indicates "creamy white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints.

The most visible and accessible areas of the building - the portico and columns - have the highest number of paint layers accumulated on them. Although most building elements are of equal age, the more inaccessible the areas have less paint build-up. There are exceptions to this rule. Where accumulated paint has been stripped prior to repainting, the historic sequence is, of course, lost. There is no evidence of extensive removal of paint on this building, except at the baluster railing.

At Building 1, the door and door frame on the north gable end have only four finish layers of paint. This is not surprising given that a visual inspection suggests that they are mid-20th century replacements of the original doors. Their first finish coat is a light yellowish green, which may be dated to the World War II era.

Window sashes in Building 1, as in other buildings of the Potomac Annex complex, were originally painted dark green. They were repainted in the same color until the World War II era saw them change to light green. The window frame sample revealed that it was painted dark green as well, and only later, painted light green, gray, and finally white, as it is now. The sun porch sash were dark green. The sun porch frames were apparently always painted white, to "read" as a trim element of the building rather than part of the window.

The green windows and white trim of the original period of construction of the building are in keeping with early 20th century taste, and would have harmonized with the unpainted yellow brick walls of the structure.

### Interior

The public spaces sampled in Building 1, the stair hall and entrance hall, were originally painted a creamy white finish. No distinction was made between plaster walls and wooden doors or windows - the entire interior was painted monochromatically, as it is now. The sun porch (Room 1122) was similarly treated.

The large private office, Room 1119, which is architecturally the most interesting space in Building 1, was treated with different colors of paint to define and emphasize the architecture. Originally, the plaster walls of the room were light brown (NBS). The flat plaster ceiling was bright white. The decorative coffers on the ceiling, the wooden baseboard, doors, and window frames, were also bright white. The use of color on the walls and white as the trim is the opposite of the current treatment of the room, where walls are white and the trim is a tan colored paint.

### ***Building 1 - Recommendations***

#### Exterior

Building I of the Potomac Annex should be repainted to its original color scheme. The yellow brick building should remain unpainted. The wooden trim, including cornice, dormers, sun porch, portico, and railings should be repainted a **high-quality white paint**.

No Munsell match or commercial brand recommendation.

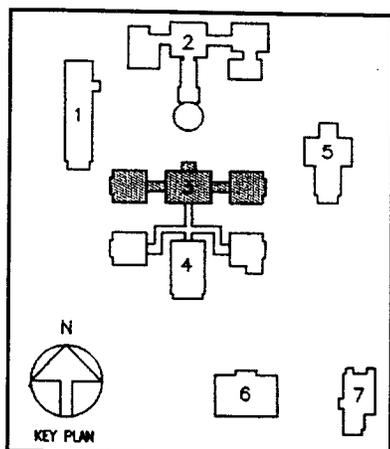
The window sash and frame should be painted a very **dark yellowish green (NBS) Plochere Color Notation: 1082, Munsell Color Notation: 2.5 G 2/4**. The wooden doors which remain, and any future wooden or metal doors should also be painted this dark green color. A good commercial match for this **dark green** is Benjamin Moore's "**High Gloss House Paint - Chrome Green**".

#### Interior

The hallway and stair hall are designated restoration zones for their floor plan and remaining doors and trim. The original finish was a creamy white, similar to the existing color. This may be continued in subsequent repainting, but the finishes of the halls are not of primary importance to the appearance and retention of the space. Any painted finish appropriate to the use of the building is acceptable in these areas.

Room 1119 should have its original color scheme restored, using light brown on the walls and white trim. The plaster ceiling should be painted a flat white paint. The coffers, doors, frames, sash, and other trim in the room should be painted a glossy white paint. **No commercial match is specified for these white paints**. The plaster walls should be painted a **light brown** to match Benjamin Moore # 1110, Plochere 181, and Munsell Color Notation: 10 YR 7/4.

## BUILDING 3

**Building 3 - Procedure**

Fourteen (14) exterior samples were removed from Potomac Annex Building 3 for microscopic investigation. Included in the study were fragments from the window frames and sash, doors and door frames, cornice, balustrade, and dormers. Twenty-two (22) Interior samples were taken from the main lobby, staircase, and a representative first floor room.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty

power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source of 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

**Building 3 - Inventory of Samples**

The following is a list of all paint samples removed for laboratory investigation. Where samples differ from those requested in the proposal, an explanation is given in italics.

Exterior

1. Door - basement level, north elevation  
*Original front door (north elevation, first floor) has been removed and replaced with an aluminum frame and glass entry.*
2. Door frame - basement level  
*Original front door (north elevation, first floor) has been removed and replaced with an aluminum frame and glass entry.*

3. First floor entry - north elevation - recessed panels flanking former door
4. Window sash - north elevation
5. Window frame - north elevation
6. Connecting link: window sash - east wing, north elevation
7. Connecting link: window frame - east wing, north elevation
8. Main building: cornice - west elevation
9. Connecting link - cornice - west wing, south elevation
10. Portico column
11. Portico cornice
12. Dormer frame - west elevation
13. Dormer cornice - west elevation
14. Wood wall connecting link - east wing, north elevation

### Interior

#### Public Spaces

##### a. Main Entry / Lobby

1. Wall
2. Ceiling, coved cornice
3. Ceiling, coffer beam, underside molding
4. Ceiling bracket
5. Flat ceiling surface
6. Door
7. Door frame
8. Elevator trim - pilaster shaft

##### b. Main Staircase

1. Wall
2. Ceiling
3. Staircase rise
4. Staircase tread
5. Staircase railing
6. Staircase handrail
7. Window sash

8. Window frame
  - c. Conference Room (Room # 3115)
    1. Wall above chair rail
    2. Chair rail
    3. Window sash
    4. Window frame
    5. Door
    6. Door frame

### ***Building 3 - Paint Seriation***

The results of microscopic investigation of the paint samples are recorded in charts on the following five pages.

Potomac Annex, Building 3						
sample no.	1	2	3	4	6	
Exterior	Basement		main building		connecting link	
	north elevation		north elevation, first floor	north elevation	east wing, north elevation	
	door	door frame	entry, recessed panel flanking former door	window sash	window sash	
substrate	wood	wood	wood	wood	wood	
earliest layer	yellowish white (NBS) primer and finish Munsell 2.5 Y 9/2					
	dark gray primer			white primer	white primer	
	very dark yellowish green (NBS) finish Munsell 2.5 G 2/4			very dark yellowish green (NBS) finish Munsell 2.5 G 2/4	very dark yellowish green (NBS) finish Munsell 2.5 G 2/4	
	dark gray primer			dark gray primer	dark gray primer	
	dark green finish			dark green finish	dark green finish	
				dark gray primer	dark gray primer	
				dark green finish	dark green finish	
			white primer	white primer	light yellow green (NBS) primer	light yellow green (NBS) primer
	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4
				light greenish gray (NBS) primer Munsell 5 GY 7/2	light greenish gray (NBS) primer Munsell 5 GY 7/2	
light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2		
white finish	white finish	white finish	white primer	white primer		
white finish	white finish	white finish	white finish	white finish		
newest layer	white finish	white finish	white finish	white finish	white finish	
comments						

Potomac Annex, Building 3					
sample no.	5	7	8	9	
Exterior	main building	connecting link	main building	connecting link	
	north elevation	east wing north elevation	cornice	west wing, south elevation	
	window frame	window frame		cornice	
substrate	wood	wood	wood		
earliest layer	white primer	white primer			
	yellowish gray-white (NBS) finish Munsell 2.5 Y 8.5/2	very dark yellowish green (NBS) finish Munsell 2.5 G 2/4	yellowish white (NBS) finish Munsell 2.5 Y 9/2	yellowish white (NBS) finish Munsell 2.5 Y 9/2	
	white primer	white primer			
	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	yellowish white finish	yellowish white finish	
	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	yellowish white finish	yellowish white finish	
			yellowish white finish	yellowish white finish	
			white finish	white finish	
			white finish	white finish	
			white finish	white finish	
	white finish	white finish	white finish	white finish	
			white finish*	white finish*	
			white finish	white finish	
			white finish	white finish	
		white finish	white finish		
		white finish*	white finish*		
		white finish*	white finish*		
newest layer	white finish*	white finish	white finish*	white finish*	
	white finish*	white finish			
comments	* All are lead-based except those marked *		* All are lead-based except those marked *		

Potomac Annex, Building 3						
sample no.	10	11	12	13	14	
Exterior	main building				connecting link	
	portico		west elevation	west elevation	east wing, north elevation	
	column	cornice	dormer frame	cornice	wood wall	
substrate	wood	wood	galvanized metal	galvanized metal	wood	
earliest layer			very oily, yellowish primer of white oil-based paint	very oily, yellowish primer of white oil-based paint		
			yellowish white (NBS) finish Munsell 2.5 Y 9/2	yellowish white (NBS) finish Munsell 2.5 Y 9/2		
			yellowish white (NBS) finish Munsell 2.5 Y 9/2	yellowish white (NBS) finish Munsell 2.5 Y 9/2		
			white finish	white finish		
			white finish	white finish		
			white finish	white finish		
			white finish	white finish		
			white finish	white finish		
			white finish	white finish		
			white finish	white finish	white primer	
		white primer	white primer	white finish	white finish	white finish
		white finish	white finish	white finish	white finish	white finish
		white finish	white finish	white finish	white finish	white finish
newest layer	white finish	white finish	white finish	white finish	white finish	
	white finish	white finish	white finish	white finish	white finish	
comments						

Potomac Annex, Building 3					
sample no.	11a1	11a2	11a3	11a4	11a5
Interior	Public Spaces				
	Main entry/Lobby				
	wall	ceiling, coved cornice	ceiling, coffer beam, underside molding	ceiling, bracket	flat ceiling, bottom of molded beams
substrate	plaster	plaster	plaster	plaster	plaster
earliest layer	moderate reddish brown (NBS) finish		white finish	white finish	white finish
	yellowish cream finish	yellowish cream finish	yellowish cream finish	yellowish cream finish	yellowish cream finish
	light tan brown finish	creamy white finish	creamy white finish	creamy-white finish	creamy white finish
	cream finish	cream finish	cream finish	cream finish	cream finish
			cream finish	yellowish cream finish	orange cream finish
	brown finish	tan finish	tan finish	tan finish	brown finish
	yellowish cream finish	yellowish cream finish	yellowish cream finish	yellowish cream finish	yellowish cream finish
		yellowish cream finish			
		cream finish			
		yellowish cream finish			
	green finish	green finish	green finish	green finish	green finish
	light green finish	cream finish			
	light tan finish	cream finish	cream finish	cream finish	cream finish
		cream finish			
	white finish	white finish	white finish	white finish	
	white finish	white finish	white finish	white finish	
newest layer	white finish				

Potomac Annex, Building 3					
sample no.	I1a6	I1a7	I1a8		
Interior	Public Spaces				
	Main entry/Lobby				
	door	door frame	elevator trim, pilaster shaft		
substrate	wood	wood	metal - iron		
earliest layer	varnish	varnish	black finish		
	light green finish		brick red primer light green finish		
	light blue finish		light blue finish		
	light yellow finish		light yellow finish		
	yellow finish				
	white finish				
	cream tan finish		creamy white finish		
newest layer	light tan finish		tan finish		
comments					

Potomac Annex, Building 3					
sample no.	I1b1	I1b2	I1b3	I1b4	I1b5
Interior	Public Spaces				
	Main staircase				
	wall	ceiling	staircase, riser	staircase, tread	staircase, railing
substrate	plaster	metal	metal	metal	metal
earliest layer	moderate reddish brown (NBS) finish	black primer			
	yellowish cream finish				
	light tan brown finish				
	cream finish				
	brown finish				
	yellowish cream finish				
	green finish	green finish			
	light green finish	yellowish cream finish		black finish	
newest layer	light tan finish	white finish	black finish	clear finish	black finish
comments					

Potomac Annex, Building 3					
sample no.	I1b6	I1b7	I1b8	I1c1	I1c2
Interior	Public Space				
	Main staircase			Conference Room, Room 3115	
	handrail	window sash	window frame	wall, above chair rail	chair rail
substrate	wood	wood	wood	plaster	wood
earliest layer	brown varnish	brown varnish (fracture) light green finish light blue finish creamy yellow finish	brown varnish (fracture) light green finish light blue finish light yellow finish light yellow finish	green finish    white finish	    white finish
newest layer	black finish	tan finish	tan finish	tan finish	tan finish
comments					

Potomac Annex, Building 3					
sample no.	11c3	11c4	11c5	11c6	
Interior	Public Spaces				
	Conference Room, Room 3115				
	window sash	window frame	door	door frame	
substrate	wood	wood	wood	wood	
earliest layer	<b>brown varnish</b>			<b>brown varnish</b>	
	green finish			-	
	light green finish	light green finish	light green finish	light green finish	
			green finish	green finish	
	light blue finish	light blue finish	light blue finish	light blue finish	
	tan finish	tan finish	tan finish	tan finish	
	cream finish	cream finish	cream finish	cream finish	
	white finish	white finish			
		orange yellow finish			
newest layer	tan finish	tan finish	tan finish	tan finish	
comments					

### *Building 3 - Observations*

The first microscopic observation of the Building 3 paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting paint layers, especially where many white paint layers have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences can reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation is described as "yellowish white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints between samples.

The most visible and accessible areas of the buildings, usually the portico and its railings, have many built-up paint layers. The relatively few layers of paint found at Building 3 suggests that the paint accumulation was so great that complete scraping and stripping of all earlier layers took place in the recent past to provide a better substrate for repainting. Where stripping allegedly took place before repainting, the historic sequence is, of course, lost. The more inaccessible cornices of the main building and the hyphen retain a significant build-up of paint, all examined layers are white with pronounced dirt layers between. The inaccessible areas are less likely to be "touched up" to cover surface dirt; the less frequent repainting lessens the need to strip a thick paint build-up.

At Building 3, the door frames at the first floor and basement levels exhibit only five finish layers of paint. A visual inspection suggests that the door frames are original features of the building, and that their earlier paint layers must have been removed. The main, first floor door does not survive; the basement door has two layers of dark green paint, preceding a lighter green finish coat. This suggests that the door has been in place since before World War II, when the light green paint layer was uniformly applied to wood building elements throughout Potomac Annex.

Window sashes in Building 3, as in other buildings of the Potomac Annex complex, were originally painted a dark green color. They were repainted in the same color until the World War II era, when the color was changed to light green. The window frame of the connector section of the building revealed that it was painted a dark green color as well, and only later, painted light green, gray, and finally white, as it is now. The window frame sample of the first floor window tested shows only early layers of white paint, matching the treatment of the other building trim. The frame was painted light green, then gray, in a color sequence found throughout the compound, and roughly dating to the 1940s.

The walls of the connector between the main block of Building 3 and its wings are tongue-and-groove pine with only three layers of paint on the examined sample. This suggests that these walls were stripped of accumulated paint in the recent past, a process that was on-going on other parts of the building complex when these samples were taken. The evidence from other buildings on the campus with the same sun-porch type appendages suggests that the woodwork would have originally been painted white to match other architectural trim on the building.

The dark green windows and white trim of the original period of construction of the building are congruent with early 20th century taste, and would have harmonized with the yellow brick walls of the structure.

The main entrance lobby of Building 3 served as one of the primary public spaces for the Potomac Annex in the years it served as a hospital. It has more architectural articulation than most spaces in the complex, and this articulation was apparently highlighted by paint. The walls in this space were originally painted a warm orange-red color. The coffered ceiling and bracketed cornice were painted white. The staircase at the back of the lobby is metal, and it was finished with glossy black paint. Woodwork in the lobby and staircase area was originally varnished, with a brown tint added to the varnish to darken and smooth out the color of the pine wood.

### ***Building 3 - Recommendations***

#### Exterior

Building 3 of the Potomac Annex should be repainted with its original color scheme. The yellow brick building should remain unpainted. The wooden trim, including cornice, dormers, sun porch, portico, and railings, should be repainted with a **high-quality, glossy white paint**.

**No Munsell match or commercial brand recommendation.**

The window sash and frame should be painted a very **dark yellowish green (NBS) Plochere Color Notation 1082, Munsell Color Notation 2.5 G 2/4**. The wooden door which remains, and any future wooden or metal doors should also be painted this dark green color. A good commercial match for this dark green is **Benjamin Moore's "High Gloss House Paint - Chrome Green"**.

#### Interior

The interior of the lobby and stair case in Building 3 should be repainted its original color. The walls should be painted a **reddish brown** paint, in a pearl finish; **Plochere Color Notation 362, Munsell Color Notation: 10 R 3/10**. A good commercial match for this color is **Benjamin Moore's # 1203**,

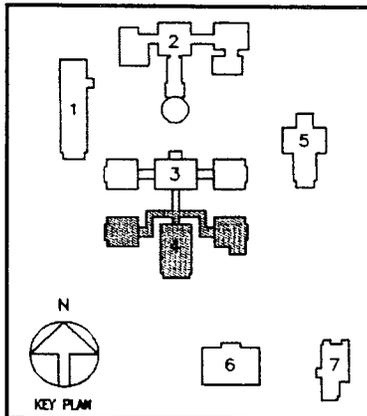
The flat ceiling surface of the lobby and stair case should be painted a flat-finish white paint. No specific commercial match is recommended.

The coffer beams, ceiling brackets, cove, and other decorative parts of the ceiling of the lobby should be repainted a true **white paint** in a pearl finish. **No specific commercial match is recommended.**

Repaint the staircase railing, tread, riser a **glossy, black paint**. **No specific commercial match is recommended.**

Refinish window sash, frames, doors, and door frames with a **brown-tinted varnish in a gloss finish**. Existing accumulated paint layers must be removed first.

## BUILDING 4

***Building 4 - Procedure***

Eight (8) exterior samples were removed from Potomac Annex Building 4 for microscopic investigation. Included in the study were fragments from the window frames and sash, cornice, balustrade, and the wooden-walled connecting link between the main portion of the building and its extensions. Eight (9) interior samples were removed from the glazed corridors and a stairway.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source of 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

***Building 4 - Inventory of Samples***

The following is a list of all paint samples removed for laboratory investigation. Where samples differ from those requested in the proposal, an explanation is given in italics.

Exterior

1. Window sash - south elevation
2. Window frame - south elevation
3. Window sash - east connecting link, south elevation
4. Window frame - east connecting link, south elevation

5. Main building - cornice, south elevation
6. Connecting link - cornice, south elevation
7. Balustrade over main portico, south elevation
8. Wood wall connecting link - east wing, south elevation

#### Interior

1. Public Spaces - First Floor
  - a. Glazed Corridor
    1. Brick wall
    2. Ceiling
    3. Window sash
    4. Window frame
    5. Baseboard
  - b. Stair Lobby
    1. Brick wall
    2. Staircase riser
    3. Baluster

#### ***Building 4 - Paint Seriation***

The results of microscopic investigation of the paint samples are recorded in charts on the following four pages.

Potomac Annex, Building 4					
sample no.	1	2	3	4	8
Exterior	main building south elevation		east connecting link, south elevation		connecting link, east wing south elevation
	window		window		
	sash	frame	sash	frame	wood wall
substrate	wood	wood	wood*	wood*	wood*
earliest layer	white primer	white primer			
	<b>very dark yellowish green (NBS) finish</b> Munsell 2.5 G 2/4	<b>yellowish white (NBS) finish</b> Munsell 2.5 Y 9/2			
		bright white finish			
	dark gray primer	light yellow green (NBS) primer			
	dark green finish	light yellow green (NBS) finish Munsell 7.5 GY 8/4			
	dark gray primer	light greenish gray (NBS) primer			
	dark green finish	light greenish gray (NBS) finish Munsell 5 GY 7/2			
	white primer	white primer	white primer	white primer	white primer
	white finish	white finish	white finish	white finish	white finish
	white finish	white finish			
newest layer	white finish	white finish			
comments			shows signs of scorching from flame used in paint removal of early white primer and finish	shows signs of scorching from flame used in paint removal of early white primer and finish	shows signs of scorching from flame used in paint removal of early white primer and finish

Potomac Annex, Building 4					
sample no.	5	7	6		
Exterior	main building	main building main portico	connecting link		
	south elevation	south elevation	south elevation		
	cornice	balustrade	cornice		
substrate	wood	wood	wood		
earliest layer			yellowish white (NBS) finish Munsell 2.5 Y 9/2  yellowish white finish  yellowish white finish  yellowish white finish  yellowish white finish  yellowish white finish  white primer white finish white finish white finish		
newest layer		white primer white finish white finish white finish	yellowish white finish  yellowish white finish  white finish white finish white finish		
comments					

Potomac Annex, Building 4					
sample no.	I1a1	I1a2	I1a3	I1a4	I1a5
Interior	Public Spaces				
	Glazed connecting corridor				
	wall	ceiling	window sash	window frame	baseboard
substrate	hard, cream colored brick	plaster patching compound	wood	wood	wood
earliest layer	light green finish		dark brown varnish	dark brown varnish	dark brown varnish
				brown varnish	cream finish
			light green finish	light green finish	light green primer glossy black finish
			light blue green finish	light blue green finish	light green primer glossy black finish
			light green finish	light green finish	light green primer glossy black finish
newest layer	white finish	white finish	creamy white finish	creamy white finish	white primer glossy black finish
					white primer glossy black finish
			tan finish	tan finish	white primer glossy black finish
comments		patching compound, bright white, no old plaster substrate exists			

Potomac Annex, Building 4					
sample no.	I1b1	I1b2	I1b3		
Interior	Public Spaces				
	Elevator / Stair Lobby				
	wall	staircase, riser	staircase, baluster		
substrate	hard, white brick	wood	wood - pine		
earliest layer	light green finish	reddish brown varnish (heavy dirt layer)	reddish brown varnish		
	creamy white finish	creamy white finish	dark brown varnish		
	light green finish	light green finish	light green finish		
	white finish	light blue green finish (heavy dirt layer)	yellow primer light green finish white primer light blue finish		
newest layer	creamy white finish	glossy black finish	white primer light tan finish		
comments					

#### *Building 4 - Observations and Conclusions*

The first microscopic observation of the Building 4 paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting paint layers, especially where many layers of white paint have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences may reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation indicates "yellowish white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints.

Most of the connecting wings of Building 4 have been stripped of accumulated paint prior to repainting, and thus the historic sequence is lost. This process was continuing at the time these samples were taken. The only area with a significant paint build-up was the cornice of the connecting link. The sample was obtained by climbing onto the scaffold the GSA painters were using as they burned off paint from the connecting link's walls, windows, and eventually, the cornice. The cornice sample reveals eleven layers of white paint, separated by clear dirt layers. The use of white as the original finish on the cornice and other woodwork is supported by the paint analyses from other buildings in the complex.

The cornice and balustrade on the south elevation of the building exhibit only three finish coats of white paint, suggesting that they were stripped of accumulated paint in the recent past. At Building 4, the window frame and sash from the main part of the building do retain a significant amount of paint. The frame does not have as many paint layers as the sash sampled. This may be a result of scraping prior to repainting in the past, or it may indicate a repair to the window frame.

The examined window sash samples retained a full sequence of paint colors, which is comparable to window sash samples from other buildings of the same era on the Potomac Annex campus. The sashes were originally painted a dark green color, two more coats of this paint color were eventually applied, followed by a light yellowish green (NBS), probably corresponding to the World War II era.

The interior walls of the corridor connecting Building 3 with Building 4 exhibit a hard, cream-colored brick base, and large, multi-paned windows above. Although now painted, the brick walls were not originally intended to be painted. The window sash and frames were originally varnished, with a dark brown tinted varnish to adjust the perceived color of the wood. Other woodwork sampled in the interior of Building 4, including baseboards, stair riser, and balustrade, was also finished with a brown-tinted varnish. The interior originally presented utilitarian, easy-to-clean surfaces, consistent with the building's use as a hospital.

### *Building 4 - Recommendations*

#### Exterior

Building 4 of the Potomac Annex should be repainted with its original color scheme. The yellow brick building should remain unpainted. The wood trim, including cornice, dormers, sun porch, portico, and railings should be repainted with a high-quality, **glossy-finish white paint**.

**No Munsell match or commercial brand recommendation.**

The window sash and frame should be painted a very **dark yellowish green (NBS), Plochere Color Notation 1082, Munsell Color Notation: 2.5 G 2/4**. A good commercial match for this dark green is **Benjamin Moore's "High Gloss House Paint - Chrome Green"**.

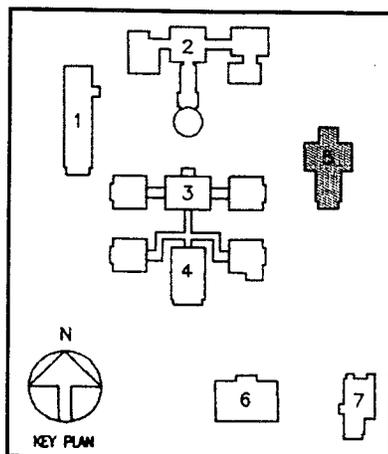
#### Interior

The paint should be removed from the brick walls extending the length of the glazed corridors. Unpainted brick was the original surface finish in these areas, and this finish, or lack of it, should be restored.

The wooden window frames, sash, baseboards, and stair case should be stripped of painted finishes, and restored to a clear finish. The original finish was a brown-tinted varnish over the wood surface. A **medium-brown-tinted varnish**, should be applied to the wood after paint has been stripped and the wood lightly sanded to prepare it to accept a new varnish finish.

**No Munsell match or commercial brand recommendation.**

## BUILDING 5

**Building 5 - Procedure**

Fifteen (15) exterior samples were removed from Potomac Annex Building 5 for microscopic investigation. Included in the study were fragments from the window frames and sash, cornice, sun porch, portico and balustrade. Nine (9) interior samples were taken for this study, from the main corridor and stair.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty

power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

**Building 5 - Inventory of Samples**

The following is a list of all paint samples removed for laboratory investigation. Where samples differ from those requested in the proposal, an explanation is given in italics.

Exterior

1. Door - to s.w. side porch
2. Door frame - to s.w. side porch
3. Window sash - north elevation, first floor
4. Window frame - north elevation, first floor
5. Dormer trim - north elevation
6. Cornice - dentil block, south elevation

7. Porte cochere column
8. Porte cochere railing
9. Porch baluster
10. Porch cornice molding
11. Porch column shaft
12. Porch column molded base
13. Porch railing
14. Sun porch sash - south elevation
15. Sun porch molding between first and second floors

### Interior

1. Public Spaces - First Floor
  - a. Main Corridor
    1. Wall
    2. Ceiling
    3. Door
    4. Door frame
    5. Rear entrance fanlight
  - b. Elevator / Stair Lobby
    1. Wall, decorative column at base of stairs
    2. Wall, stair landing
    3. Stair railing
    4. Stair handrail

### ***Building 5 - Paint Seriation***

The results of microscopic investigation of the paint samples are recorded in charts on the following five pages.

Potomac Annex, Building 5						
sample no.	1	2	3	4	5	
Exterior	main building					
	door to SW side porch		north elevation, first floor		north elevation	
	door	door frame	window sash	window frame	dormer trim	
substrate	wood*	wood*	wood	wood	wood	
earliest layer	very dark yellowish green (NBS) finish    light yellow green (NBS) finish Munsell 7.5 GY 8/4  light greenish gray (NBS) finish Munsell 5 GY 7/2  white primer  white finish  white finish	very dark yellowish green (NBS) finish    light yellow green (NBS) finish Munsell 7.5 GY 8/4  light greenish gray (NBS) finish Munsell 5 GY 7/2  white primer  white finish  white finish	gray primer	gray primer	<b>yellowish whites (NBS)</b> <b>Munsell 5 Y 9/2</b>	
				very dark yellowish green (NBS) primer	very dark yellowish green (NBS) primer	yellowish whites (NBS) Munsell 5 Y 9/2
				<b>very dark yellowish green (NBS) finish</b> <b>Munsell 2.5 G 2/4</b>	<b>very dark yellowish green (NBS) finish</b> <b>Munsell 2.5 G 2/4</b>	yellowish whites (NBS) Munsell 5 Y 9/2
				dark gray primer	dark gray primer	yellowish whites (NBS) Munsell 5 Y 9/2
				dark green finish	dark green finish	yellowish whites (NBS) Munsell 5 Y 9/2
				light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	yellowish whites (NBS) Munsell 5 Y 9/2
				light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	yellowish whites (NBS) Munsell 5 Y 9/2
				white primer	white primer	white primer
		white finish	white finish	white finish		
		white finish	white finish	white finish		
newest layer					white finish	
comments	* no visible primer	* no visible primer				

Potomac Annex, Building 5					
sample no.	6	8	9	10	7
Exterior	main building				
	south elevation	porte cochere	porch	porte cochere	
	cornice, dentil block	railing	baluster	cornice molding	column
substrate	wood	wood	wood	wood	wood
earliest layer	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2	shiny, metallic coating*			
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2	yellowish white finish			
	bright white finish				
	bright white finish	bright white finish	bright white finish	bright white finish	
	white finish				
	white finish	white finish	white finish	white finish	
newest layer	white finish				
comments					* possibly aluminum paint, further lab confirmation needed

Potomac Annex, Building 5					
sample no.	11	12	13	14	15
Exterior	main building				
	porch			sun porch	
	porch column shaft	porch column molded base	porch railing	sash	molding between first and second floors
substrate	wood	wood	wood	wood	wood
earliest layer	shiny, metallic coating		white finish	white primer	
	yellowish white (NBS) finish Munsell 5 Y 9/2		white finish	yellowish white (NBS) finish Munsell 5 Y 9/2	
	yellowish white finish		white finish		
	yellowish white finish		white finish		
	yellowish white finish		white finish		
	yellowish white finish		white finish		
	yellowish white finish		white finish		
	yellowish white finish		white finish		
	white finish		white finish		
	white finish		white finish		
	white finish	white finish	white finish		white finish
	white finish	white finish	white finish	light grayish- white primer	white finish
	white finish	white finish	white finish	white finish	white finish
		white finish	white finish	white primer	white finish
		white finish	white finish	white finish	white finish
newest layer		white finish	white finish		white finish
		white finish	white finish		white finish
comments	* possibly aluminum paint, further lab confirmation needed				

Potomac Annex, Building 5					
sample no.	I1a1	I1a2	I1a3	I1a4	I1a5
Interior	Public Spaces				
	Main corridor				
	wall	ceiling	door	door frame	rear entrance fan light
substrate	plaster	plaster	wood	wood	
earliest layer	light green finish	creamy white finish	creamy white finish		creamy white finish
	light green finish		white finish	white finish	white finish
	creamy white finish		creamy white finish		creamy white finish
	light green finish		white finish	white finish	white finish
	plaster patch	creamy white finish	creamy white finish	creamy white finish	creamy white finish
	creamy yellow finish		white finish		white finish
	creamy yellow finish		light green finish	light green finish	light green finish
	creamy yellow finish		white finish	white finish	white finish
	creamy yellow finish	creamy white finish	creamy white finish	creamy white finish	creamy white finish
	light green finish		light green finish	light green finish	light green finish
newest layer	creamy white finish	white finish	tan finish	tan finish	tan finish
comments					

Potomac Annex, Building 5					
sample no.	I1b1	I1b2	I1b3	I1b4	
Interior	Public Spaces				
	Elevator / Stair lobby				
	wall, decorative column	wall, stair landing	stair railing	stair handrail	
substrate	plaster	plaster	metal	wood - oak	
earliest layer	creamy white finish	creamy white finish		brown varnish	
	yellow creamy white finish	yellow creamy white finish			
	light green finish	light green finish			
	light green finish	light green finish			
	creamy white finish	creamy white finish			
		light blue green finish			
		off-white finish			
newest layer	off-white finish	off-white finish	bright orange primer glossy black finish	glossy black finish	
comments					

### *Building 5 - Observations*

#### Exterior

The first microscopic observation of the Potomac Annex paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting paint layers, especially where many white paint layers have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences can reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation may indicate "yellowish white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints.

The very visible and accessible areas of the building, like the porch railing and the balusters over the porte cochere have the most accumulated paint layers. They appear to have been re-coated with as many as nineteen paint layers. The new paint is invariably a single-coat application over the heavy dirt layer. The porch columns have relatively few layers, probably because they are far easier to scrape of accumulated layers before repainting than the tightly spaced porch railing members and balustrades. Where accumulated paint has been stripped prior to repainting, the historic sequence is no longer extant.

The columns of both the porte cochere and the porch have an unusual first finish. When the wood is scraped, the base looks blue-gray to the naked eye. Microscopic investigation reveals, however, that the first coat is a dull, metallic film. It appears to be aluminum paint, and it is not likely to be an original (1908) finish, as aluminum was very costly at that date, and reserved for interior decorative details where it could mimic silver, without tarnishing. It is probably part of a warning striping system applied to the columns. Later finishes on the columns are eleven layers of white paint, separated by distinct dirt layers.

At Building 5, the door and door frame on the southwest porch exhibit only six finish layers of paint. Their first finish is a dark green color, similar to the early dark green found on doors and window sash at buildings around the Potomac Annex complex. There is only one coat of dark green here, where examples from other building in the complex have multiple repaintings in dark green. This may indicate that the doors are later replacements of the originals, or simply that sheltered in the porch, the woodwork did not need repainting. The second finish is the light green which can be dated to World War II.

Window sashes and frames in Building 5, as in other buildings of the Potomac Annex complex, were originally painted dark green. The windows were repainted in the same color two more times until the World War II era, when they were painted a light green color. The sun porch sash have no trace of dark green paint on them, but a visual inspection suggests that these are replacements of the original windows. Their consistent white finishes correspond to the modern

(post World War II) treatment of window sash and frames throughout the Potomac Annex complex.

All other examined woodwork on Building 5 exhibits a chronology of white paint only. The varied number of layers may account for alterations to the structure, or reflect the fact that in light of the numerous times the woodwork was repainted, some scraping and removal of earlier layers was demanded in order to get a good adhesion of new paints. The paint scheme found on Building 5 is typical for that of the other buildings constructed during the early 20th century on the site.

### Interior

The interior of Building 5 was simply finished with creamy-white painted walls, and creamy-white painted woodwork. The functional interior has little architectural detail or decorative finishes. The private spaces were presumably treated as simply as the public areas.

### *Building 5 - Recommendations*

#### Exterior

Building 5 of the Potomac Annex should be repainted with its original color scheme. The yellow brick building should remain unpainted. The wooden trim, including cornice, dormers, sun porch, portico, and railings should be repainted a high-quality, gloss-finish white paint.

**No Munsell match or commercial brand recommendation.**

The window sash and frame should be painted a very **dark yellowish green (NBS), Plochere Color Notation 1082, Munsell Color Notation 2.5 G 2/4**. The wooden door which remains, and any wooden doors reinstalled in the future should be painted this dark green color. A good commercial match for this dark green is **Benjamin Moore's "High Gloss House Paint - Chrome Green"**.

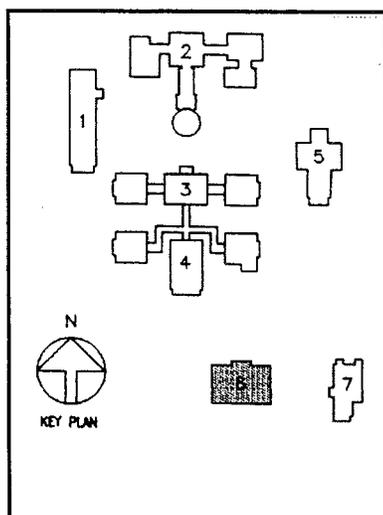
#### Interior

The hallway and stair hall are being designated as restoration zones for their floor plan and remaining doors and trim. The original finish was a creamy white, similar to the existing color. This may be continued in subsequent repaintings, but the finishes of the halls are not of primary importance to the appearance and retention of the space. **Any painted finish appropriate to the use of the building is acceptable in these areas.**

The wooden handrail on the staircase should be stripped of paint, and refinished to highlight its natural wood finish. It may be sealed with a tinted varnish to even out the color and protect the wood from staining. The color of the varnish roughly resembles a **Munsell 5 YR 3/4**, and a good commercial match is McCloskey Tung Seal in "Dark Oak". On interior applications, this varnish should be followed by a coat of a clear, gloss finish varnish. For exterior applications,

McCloskey's "Man-O-War" clear marine varnish in a gloss finish should be applied over the stain. A second choice would be **Benjamin Moore's "Benwood Interior penetrating Stains"**; matching the original color, however, involves two different colors of stain. To duplicate the original color, a coat of "Dark Walnut" should be applied. When dry, this layer should be lightly rubbed with a 0000 grade steel wool following with a coat of Benwood's "Red Mahogany". For interior applications, follow this second stain layer with Benjamin Moore's "One Hour Clear Finish" in high gloss finish. For exterior applications, the stain layers should be followed with a marine varnish, such as the McCloskey product, listed above.

## BUILDING 6

*Building 6 - Procedure*

Four (4) exterior samples were removed from Potomac Annex Building 6 for microscopic investigation. Included in the study were fragments from a window frame and sash, cornice, and column at the main entry. No interior samples were included in this study.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source of 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

*Building 6 - Inventory of Samples*

The following is a list of all paint samples removed for laboratory investigation.

Exterior

1. Window sash - basement level
2. Window frame - basement level
3. Cornice
4. Column at main entry

**Building 6 - Paint Seriation**

The results of microscopic investigation of the paint samples are recorded in the following chart.

Potomac Annex, Building 6					
sample no.	1	2	3	4	
	basement level		cornice	main entry	
	window sash	window frame	fascia	column	
substrate	wood	wood	wood	wood	
earliest layer	very dark yellowish green (NBS) primer	very dark yellowish green (NBS) primer			
	very dark yellowish green (NBS) finish Munsell 2.5 G 2/4	very dark yellowish green (NBS) finish Munsell 2.5 G 2/4	yellowish white (NBS) finish Munsell 2.5 Y 9/2		
	dark gray primer	dark gray primer dark green finish	yellowish white finish		
	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	yellowish white finish		
1940s	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	yellowish white (NBS) finish Munsell 5 Y 9/2	shiny, metallic coating* yellowish white (NBS) finish Munsell 5 Y 9/2**	
	bright white primer white finish		yellowish white (NBS) finish	yellowish white (NBS) finish	
			yellowish white (NBS) finish	yellowish white (NBS) finish	
			bright white primer white finish	yellowish white (NBS) finish	
			white finish		
			white finish		
			white finish	white finish	
			white finish	white finish	
			white finish**	white finish**	
		white finish**	white finish**	white finish**	
	white finish**	white finish**	white finish**	white finish**	
newest layer	white finish**	white finish^^		white finish**	
comments	** all layers lead-based except those marked **	** all layers lead-based except those marked **	* all layers lead-based except those marked **	* possibly aluminum paint, further lab confirmation needed ** all layers lead-based except those marked **	

### *Building 6 - Observations*

The first microscopic observation of the Potomac Annex paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting layers, especially where many white paint layers have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences can reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation may indicate "yellowish white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints.

Where accumulated paint has been stripped prior to repainting, the historic sequence is, of course, lost. The seventeen layers of white paint, separated by distinct dirt layers, which remain on the cornice attest to the diligent repainting of the building. It is unlikely that much scraping or stripping of early layers took place from the cornice, and it is assumed that these layers represent a complete chromo-chronology of the building's trim.

The portico column has an unusual first finish. When the wood is scraped, the base looks blue-gray to the naked eye. Microscopic investigation reveals, however, that the first coat is a dull, metallic film. It appears to be aluminum paint, although this has not yet been confirmed in the laboratory. If so, this is not likely to be an original (1908) finish, as aluminum was very costly at that date, and reserved for interior decorative details where it could mimic silver, without tarnishing. It may be part of a warning striping system applied to the columns. Testing from much higher up on the columns might reveal a difference in the stratigraphy which could confirm this hypothesis. Later finishes are nine layers of white paint, with clear dirt layers between each.

At Building 6, no historic doors remain on the building. Window sash and frames, as in other buildings of the Potomac Annex complex, were originally painted dark green. Paint analysis reveals that both sashes and frames were painted a light green color some time after the construction of the building. The appearance of light green on windows and doors is associated with the World War II era, based upon colors shown in a painting of the Old Observatory from the 1940s. White paint is the standard post-World War II treatment of window sash and frames throughout the Potomac Annex complex.

The paint scheme found on Building 6 is typical for that of the other Potomac Annex buildings constructed during the early 20th century.

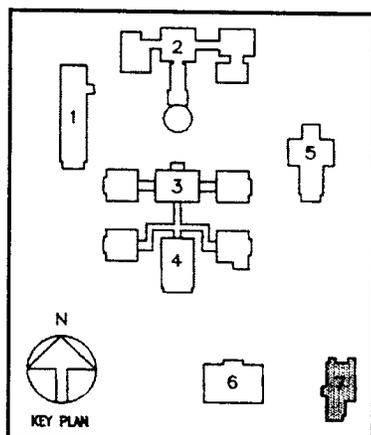
***Building 6 - Recommendations***

Building 6 of the Potomac Annex should be repainted with its original color scheme. The yellow brick building should remain unpainted. The wooden trim, including cornice, dormers, sun porch, portico, and railings should be repainted a high-quality, glossy white paint

**No Munsell match or commercial brand recommendation.**

The window sashes and frame should be painted a very **dark yellowish green (NBS), Plochere Color Notation 1082, Munsell Color Notation 2.5 G 2/4**. A good commercial match for this dark green is **Benjamin Moore's "High Gloss House Paint - Chrome Green"**.

## BUILDING 7

***Building 7 - Procedure***

Fourteen (14) exterior samples were removed from Potomac Annex Building 7 for microscopic investigation. Included in the study were fragments from the window frames and sash, doors and door frames, cornice, portico and balustrade. No interior samples were taken for this study.

The samples were removed with an X-acto knife, and contained portions of the substrate as well as surviving paint layers. Samples were taken to the laboratory and examined in cross-section using a stereo-binocular microscope at twenty to forty power magnification. Information derived from laboratory work includes:

- color chronology of each cross-section
- identification of paint composition
- color matching of appropriate finishes

Color matching was done under a fiber-optic halogen light source 3200 degrees Kelvin. The first significant color layer of each element was matched to the Munsell Book of Color (1976 edition). The Munsell color number follows the recommended color for restoration in the color chronology listings for each feature. Color chronologies begin with the earliest finish found in the sequence, and end with the color presently visible. The color name chart devised by the National Bureau of Standards has been used as a guide to color names for significant paint layers in this report. They are referenced by the initials NBS following the color name. All paint finishes are semi-gloss unless otherwise noted in color seriation charts; all finishes on the charts are paints unless otherwise noted.

***Building 7 - Inventory of Samples***

The following is a list of all paint samples removed for laboratory investigation. Where samples differ from those requested in the proposal, an explanation is given in italics.

Exterior

1. Door at basement level entry - west elevation
2. Door frame paneling below sidelight at main entry - west elevation
3. Window sash - north elevation
4. Window frame - north elevation
5. Cornice dentil block - north elevation
6. Dormer cornice - north elevation
7. Dormer window sash - north elevation

8. Portico column
9. Portico cornice
10. Portico railing
11. Balustrade over entry portico
12. French door from 2nd floor to portico balcony - north elevation
13. Door frame to French door from 2nd floor to portico balcony
14. Sun porch wall

### ***Building 7 - Paint Seriation Charts***

The results of microscopic investigation of the paint samples are recorded in the charts on the following three pages.

Potomac Annex, Building 7					
sample no.	1	2	10	11	14
	west elevation, basement level	west elevation, main level	porch		sun porch
	entry, door	main entry, door frame paneling below sidelight	railing	balustrade over entry porch	wall
substrate	wood	wood	wood	wood*	galvanized metal
earliest layer	moderate reddish brown (NBS) pigmented varnish Munsell 2.5 YR 3/4	moderate reddish brown (NBS) pigmented varnish Munsell 2.5 YR 3/4	yellowish white (NBS) finish Munsell 5 Y 9/2	white primer**  yellowish white (NBS) finish Munsell 5Y 9/2	
	light reddish brown (NBS) glossy finish Munsell 2.5 YR 5/4	very thick layer light olive gray (NBS) primer* creamy white finish	yellowish white (NBS) finish Munsell 5 Y 9/2	yellowish white (NBS) finish Munsell 5 Y 9/2	
	light yellow green (NBS) finish Munsell 7.5 GY 8/4	yellowish white (NBS) finish Munsell 5 Y 9/2  bright white primer	yellowish white (NBS) finish Munsell 5 Y 9/2		
1940s	light greenish gray (NBS) finish Munsell 10 GY 6/2	light greenish gray (NBS) finish Munsell 10 GY 6/2	yellowish white (NBS) finish Munsell 5 Y 9/2  yellowish white (NBS) finish Munsell 5 Y 9/2  yellowish white (NBS) finish Munsell 5 Y 9/2  yellowish white (NBS) finish Munsell 5 Y 9/2		light yellowish brown (NBS) finish Munsell 10 YR 7/4
	white finish	white finish*	bright white finish	bright white finish**	yellowish white finish
	white finish	white finish	bright white finish	bright white finish**	white primer yellowish white finish
	white finish	white finish*	bright white finish	bright white finish**	
		white finish*	bright white finish	bright white finish**	tan finish
			bright white finish		
			bright white finish		
			bright white finish		
newest layer			bright white finish		
comments		* not lead-based		* very weathered and dirty surface - exposed for some time between repainting ** not lead-based	

Potomac Annex, Building 7					
sample no.	3	4	7	12	13
	north elevation				
	window sash	window frame	dormer window sash	French door from second floor to portico balcony	door frame to French door from second floor to portico balcony
substrate	wood	wood	wood	wood	wood
earliest layer	dark grayish green (NBS) finish Munsell 5 G 2/2	dark gray primer dark grayish green (NBS) finish Munsell 5 G 2/2	dark grayish green (NBS) finish Munsell 5 G 2/2	dark grayish green (NBS) finish Munsell 5 G 2/2	dark grayish green (NBS) finish Munsell 5 G 2/2
	dark gray primer dark green finish	dark gray primer dark green finish	dark gray primer dark green finish	dark gray primer dark green finish	dark gray primer dark green finish
	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4	light yellow green (NBS) finish Munsell 7.5 GY 8/4
1940s	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2	light greenish gray (NBS) finish Munsell 5 GY 7/2
	white finish	white finish	white finish	white finish	white finish
newest layer	white finish	white finish	white finish	white finish	white finish
comments					

Potomac Annex, Building 7					
sample no.	5	6	8	9	
	north elevation		portico		
	cornice dentil block	dormer cornice	column	cornice	
substrate	wood	wood	wood	wood	
earliest layer	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
	yellowish white (NBS) finish Munsell 5 Y 9/2				
1940s	yellowish white (NBS) finish Munsell 5 Y 9/2				
	bright white finish	bright white finish	bright white finish	bright white finish	
	bright white finish	bright white finish	bright white finish	bright white finish	
	bright white finish	bright white finish	bright white finish	bright white finish	
newest layer	bright white finish	bright white finish	bright white finish	bright white finish	
comments					

### *Building 7 - Observations*

The first microscopic observation of the Potomac Annex paint samples reveals distinct dirt layers in nearly all the samples. The atmosphere was historically very dirty, and the remedy to clean the dirty surfaces has clearly been to apply a new layer of paint. The dirt layers are a helpful indicator in counting paint layers, especially where many white paint layers have accumulated. The whites are sometimes variable in tone - one layer might be grayer, another creamier, but these differences can reflect the response of individual areas of the building to sunlight, shadow, and weathering as easily as they can reflect subtle differences in tone of the paint when applied. When obvious, the color seriation indicates "yellowish white" or "bright white", although this is a term relative to surrounding layers, and no attempt has been made at this time to cross-match internal layers of the white paints.

The railing on the porch has the most accumulated paint layers. The railing appear to have been coated with as many as sixteen layers of paint. The new paint is invariably a single-coat application over the heavy dirt layer. The weathered substrate and relatively few existing paint layers on the balustrade above the represents the result of too many layers of overpainting. The many paint layers on an over painted object will begin to crack and fall off from its own weight, leaving the wood exposed and unfinished. In order to prevent that, good painting practice suggests that accumulated paint should be scraped off prior to repainting, a practice easily attended to on the broad, accessible surfaces of the cornices and columns. The difficulty of scraping tightly spaced balusters and railings suggests that the sixteen layers are a complete chronology of the building's painting. The other woodwork on the building - cornices, dormers, and columns, have only half that number of layers, probably due to scraping before repainting. All layers on all the architectural trim were white, as it is now.

At Building 7, the basement door and first floor door frame were first finished with a tinted varnish. This is the only instance of an exterior varnish finish found on the Potomac Annex buildings. It is also the only sample removed from a door which may be original to the construction of the complex, and nearly all the doors have been replaced through the years. Varnish found on the panel beneath the sidelights flanking the main level door further suggests that it was not just the door but the entire door and its surround which were originally varnished. Since the interior woodwork of many of the Naval Hospital buildings was finished with varnish, it is quite likely the exterior doors may have been so treated. The doors are sheltered beneath porticos, thus making varnish a more practical and longer-lived finish than it might otherwise be on an exterior application.

Window sashes and frames in Building 7, as in other buildings of the Potomac Annex complex, were originally painted dark green. The French door sash and its frame in the center of the west facade were originally painted dark green as well. The windows were repainted in the same color two more times until the World War II era, after which time they were painted a light green color. Their consistently white finishes correspond to the modern (post World War II) treatment of window sash and frames throughout the Potomac Annex complex.

The paint scheme found on Building 7 is typical for that of the other buildings constructed during the early 20th century on the site.

### ***Building 7 - Recommendations***

#### Exterior

Building 7 of the Potomac Annex should be repainted with its original color scheme. The yellow brick building should remain unpainted. All wooden trim, whether original or replacement elements, including cornice, dormers, door frames, sun porch, portico, and railings should be repainted a high-quality, **gloss- finish white paint**.

**No Munsell match or commercial brand recommendation.**

The window sash and frame should be painted a very **dark yellowish green (NBS), Plochere Color Notation: 1082, Munsell Color Notation 2.5 G 2/4**. Any replacement wooden doors recreated for the building should also be painted this color. A good commercial match for this dark green is **Benjamin Moore's "High Gloss House Paint - Chrome Green"**.

The basement level door and door frame should be stripped of accumulated paint and finished with a stain to match **Munsell 5YR 3/4**. A good commercial match is McCloskey Tung Seal in "Dark Oak". On interior applications, this varnish should be followed by a coat of a clear, gloss finish varnish. For exterior applications, **McCloskey's "Man-O-War"** clear marine varnish in a gloss finish should be applied over the stain.

A second choice would be **Benjamin Moore's "Benwood Interior penetrating Stains"**; matching the original color, however, involves two different colors of stain. To duplicate the original color, a coat of "Dark Walnut" should be applied. When dry, this layer should be lightly rubbed with a 0000 grade steel wool following with a coat of Benwood's "Red Mahogany". For interior applications, follow this second stain layer with **Benjamin Moore's "One Hour Clear Finish"** in high gloss finish. For exterior applications, the stain layers should be followed with a marine varnish, such as the McCloskey product, listed above.

RECOMMENDED PAINT COLORS

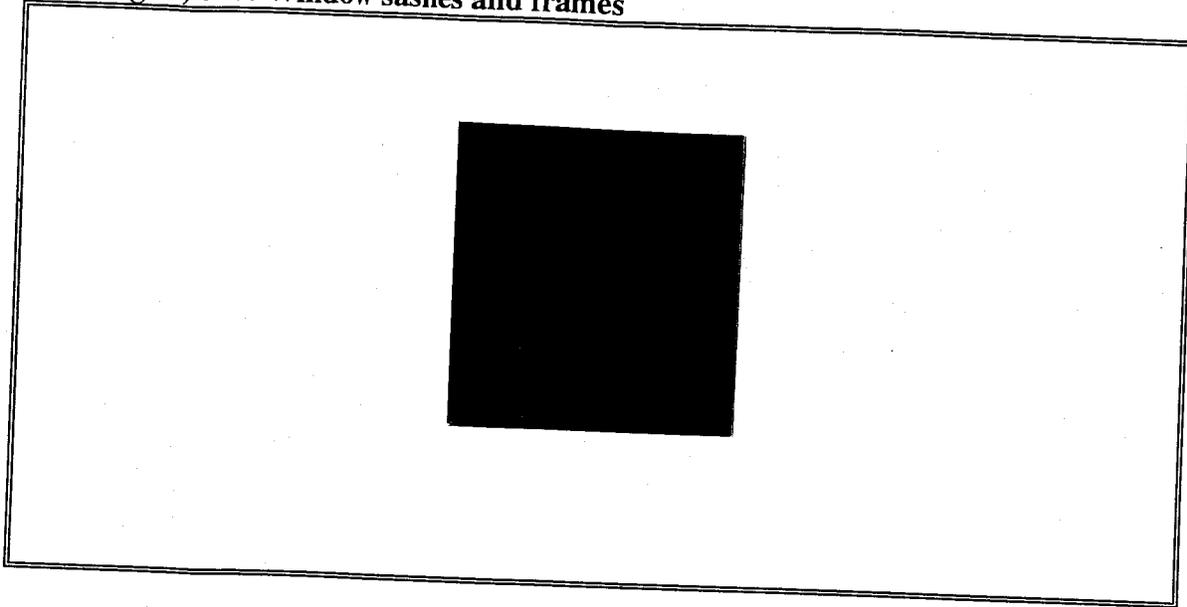
*Dark yellowish green (NBS)*

**Plochere 1082**

**Munsell Color Notation: 2.5 G 2/4**

**Benjamin Moore Match: High Gloss House Paint - Chrome Green**

**Buildings 1, 3-7: Window sashes and frames**



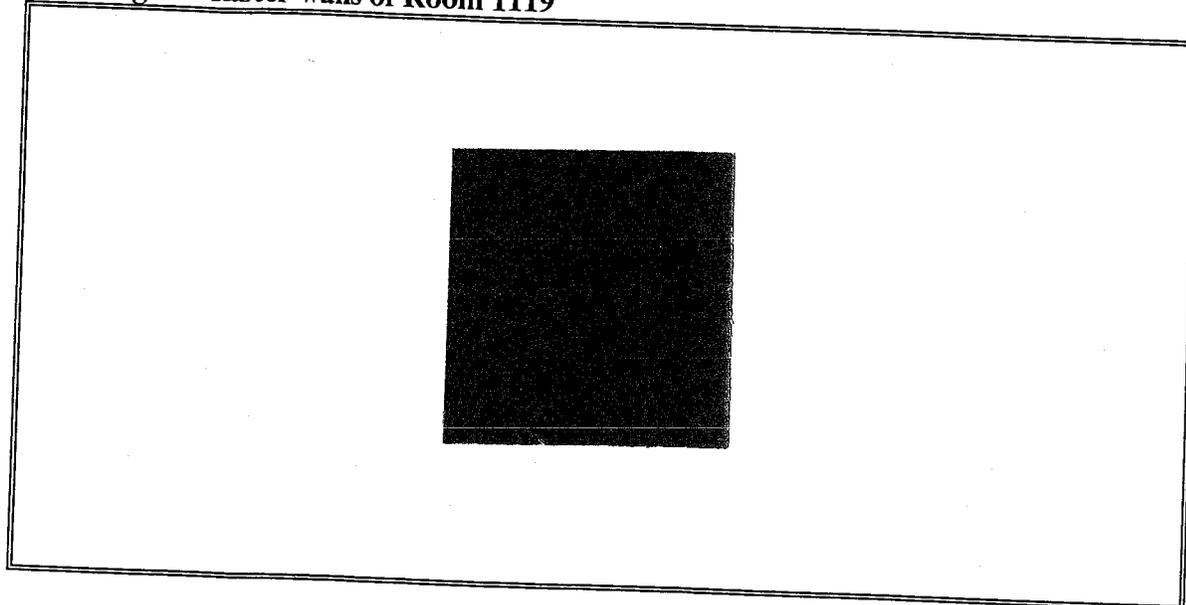
*Light Brown (NBS)*

**Plochere Color Notation: 181**

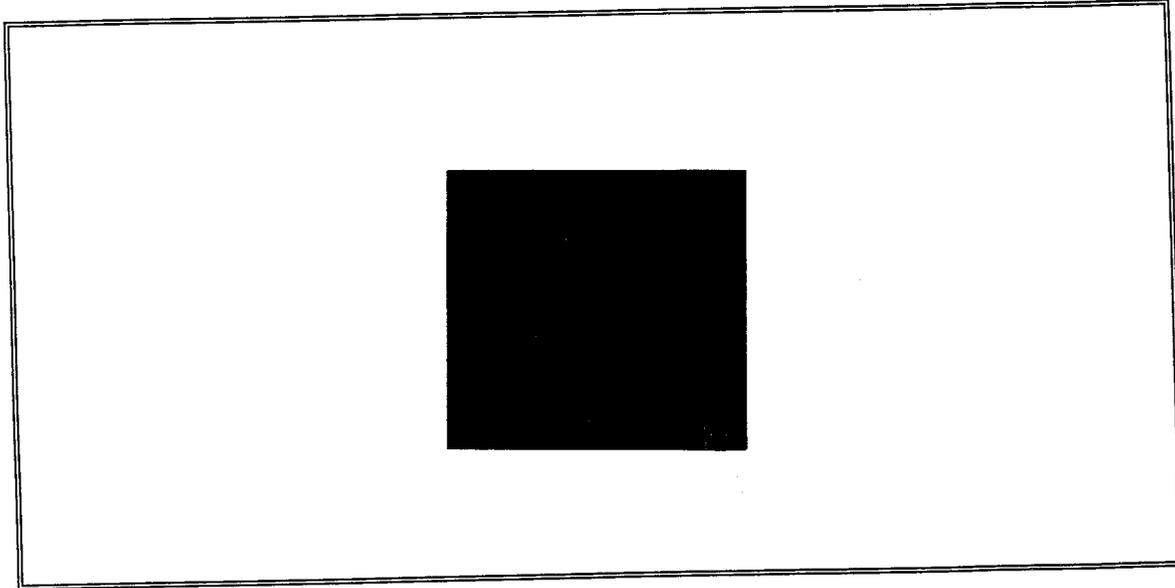
**Benjamin Moore Match: #1110**

**Munsell Color Notation: 10 YR 7/4**

**Building 1: Plaster walls of Room 1119**



*Moderate Reddish Brown (NBS)*  
**Plochere Color Notation: 362**  
*Munsell Color Notation: 10 R 3/10*  
**Benjamin Moore Match: 1203**

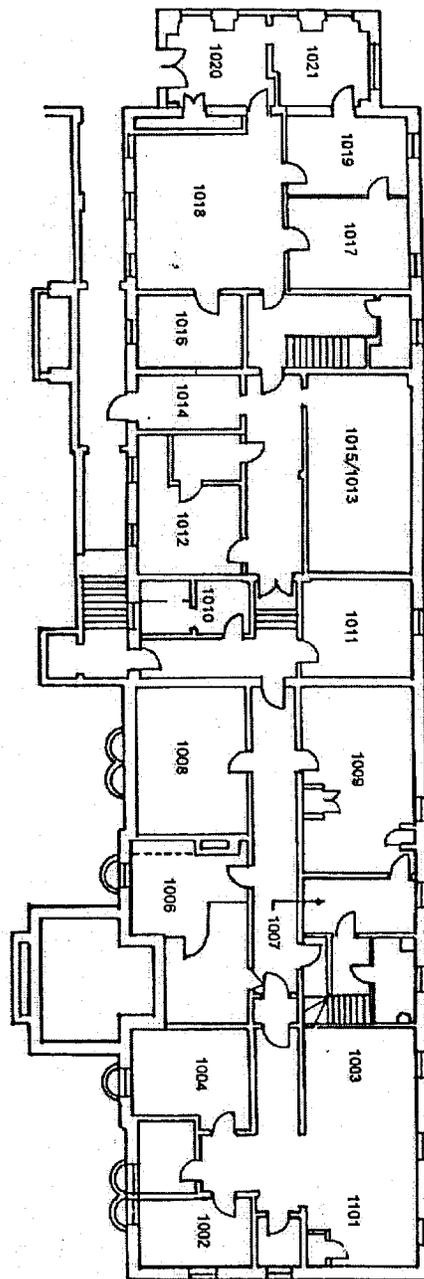


*Buildings 1, 3-7: Paint Sample Locator Plans and Elevations*

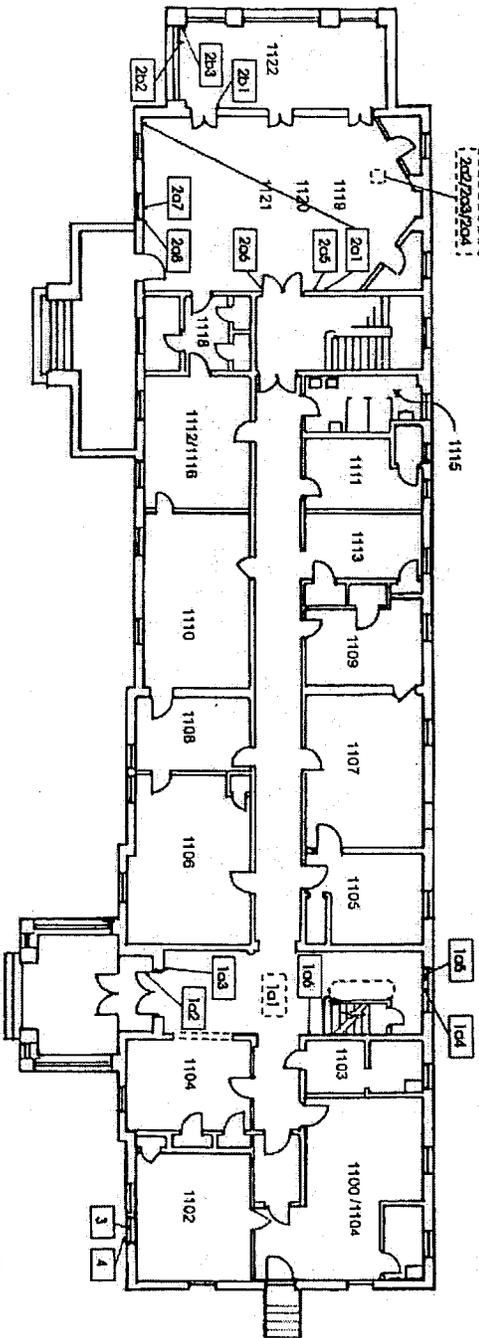


POTOMAC ANNEX BUILDINGS 1, 3-7

BUILDING 1 - PAINT SAMPLE LOCATIONS



Basement



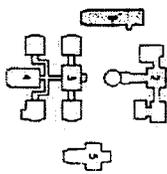
First Floor



CHAPTER 5. PAINT ANALYSIS

POTOMAC ANNEX 1, 3-7  
BUILDING 1

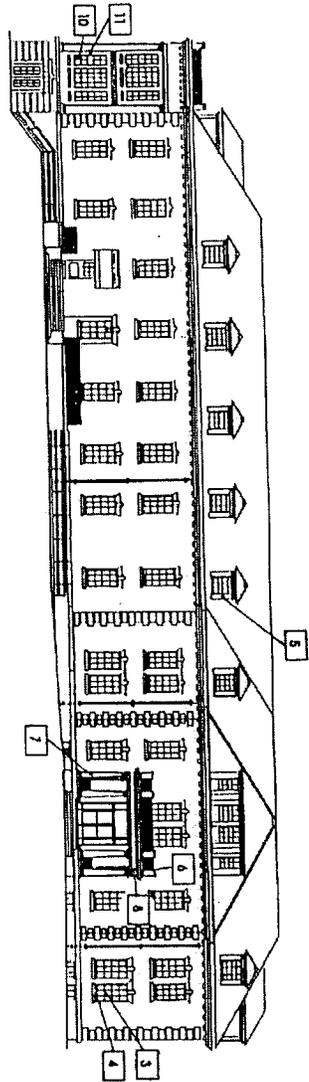
Painted by: [unclear] / J.Z.  
2/8/97  
FLOOR PLANS  
PAINT SAMPLE  
LOCATIONS



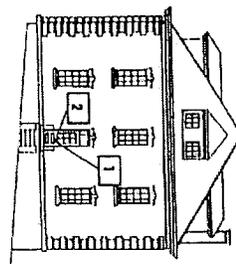
POTOMAC ANNEX BUILDINGS 1, 3-7

BUILDING 1 - PAINT SAMPLE LOCATIONS

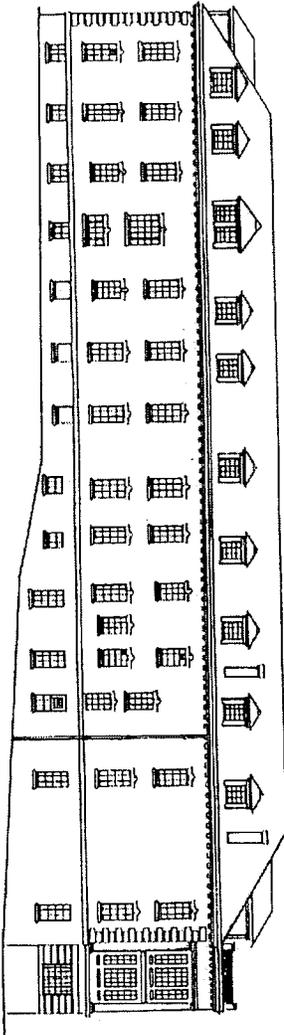
CHAPTER 5. PAINT ANALYSIS



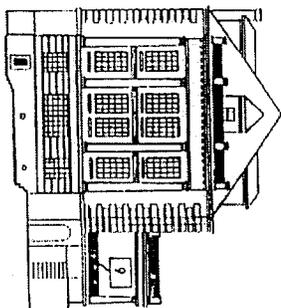
East Elevation



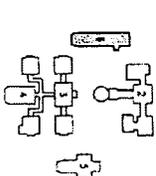
North Elevation



West Elevation



South Elevation

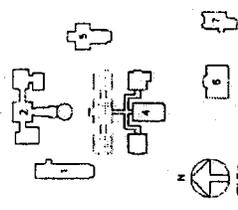
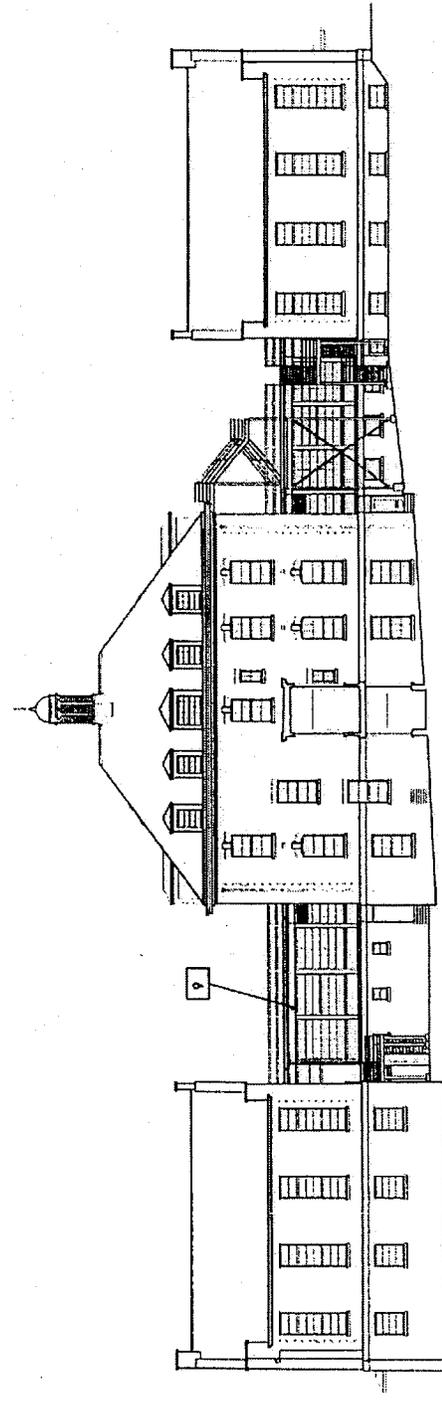
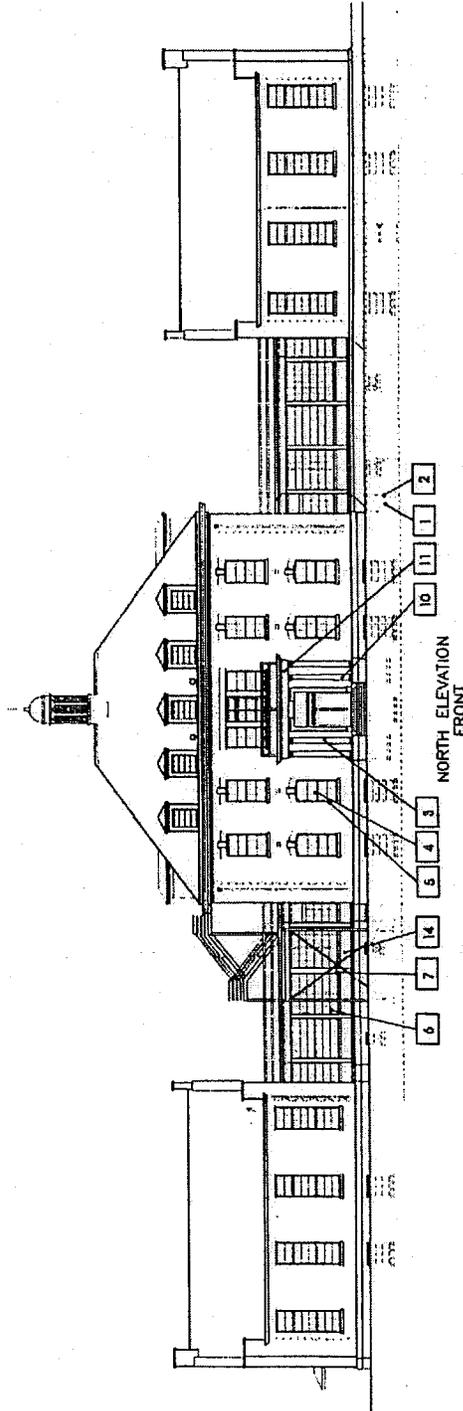


Project No. 10000  
 Date 10/1/97  
 POTOMAC ANNEX 1, 3-7  
 BUILDING 1

Prepared by: [Signature]  
 Checked by: [Signature]  
 Date: 10/1/97  
 ELEVATIONS  
 PAINT SAMPLE  
 LOCATIONS



BUILDING 3 - PAINT SAMPLE LOCATIONS



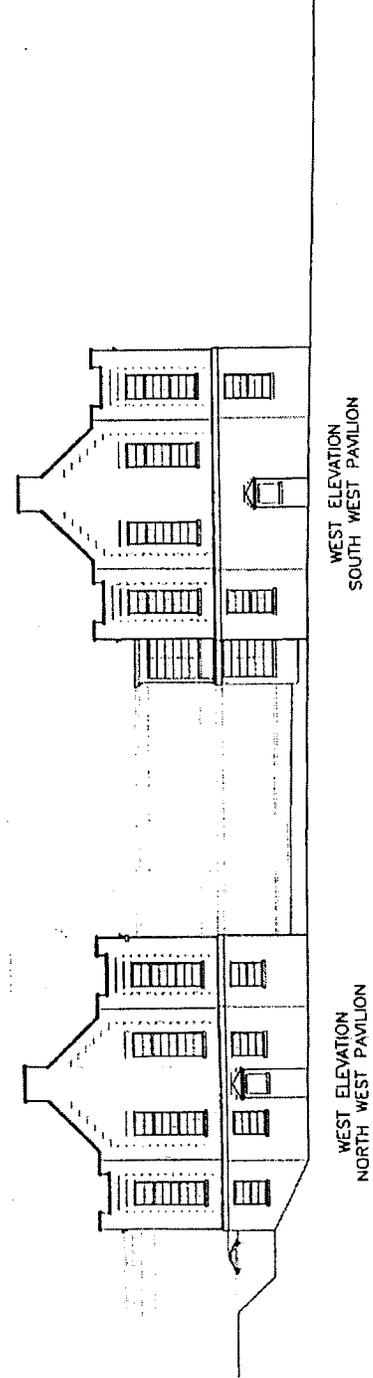
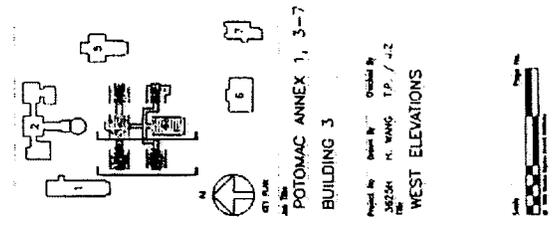
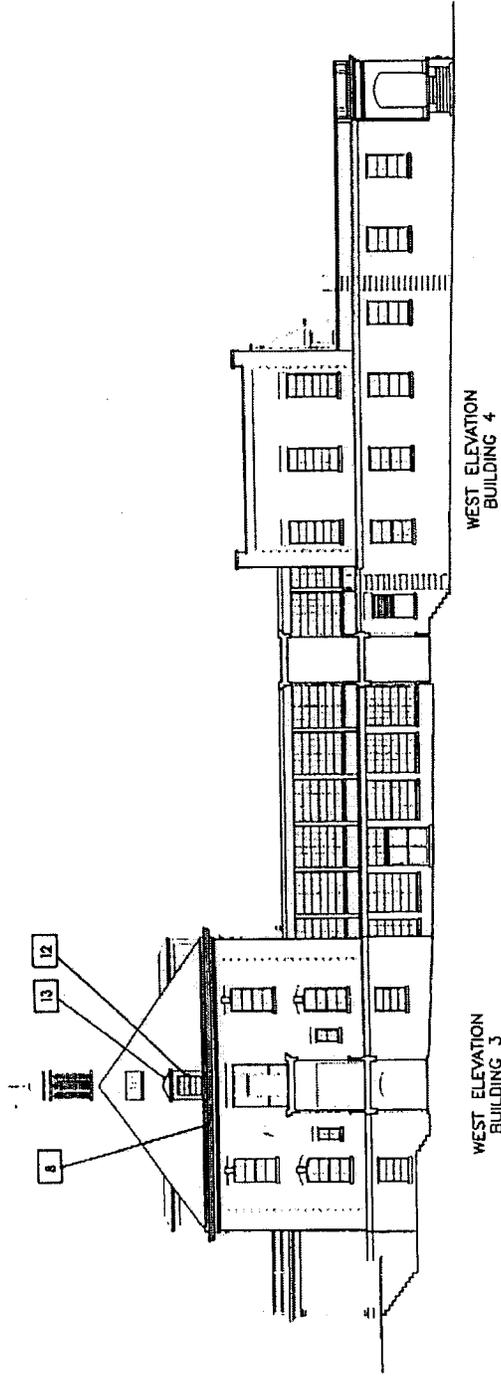
POTOMAC ANNEX 1, 3-7  
 BUILDING 3  
 Project No. Drawn By: Checked By:  
 JESSE H. WANG T.P. / J.C.  
 PAINT SAMPLE  
 LOCATIONS

SOUTH ELEVATION REAR

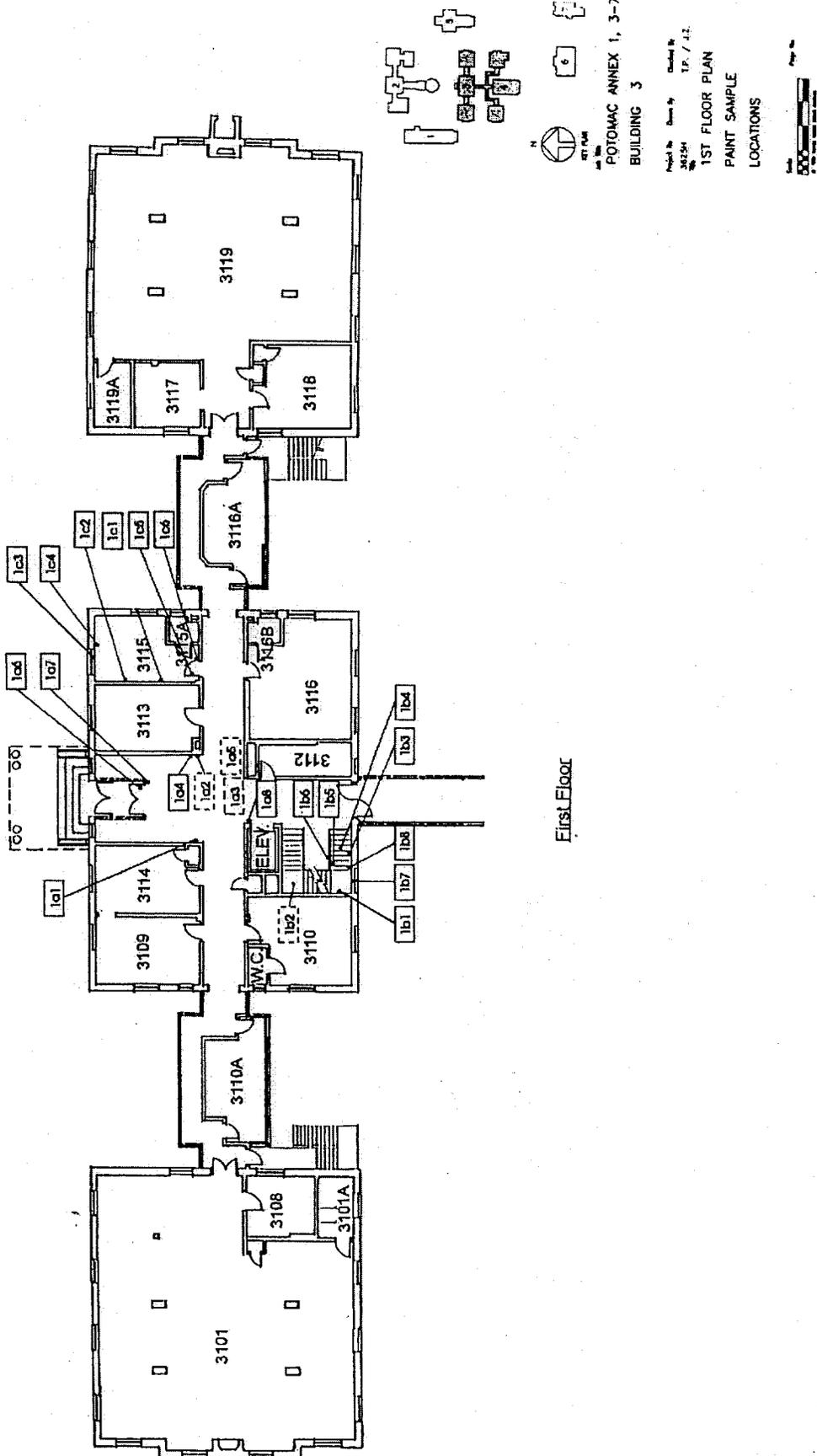
NORTH ELEVATION FRONT

POTOMAC ANNEX BUILDINGS 1, 3-7

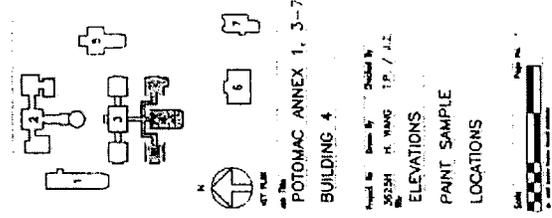
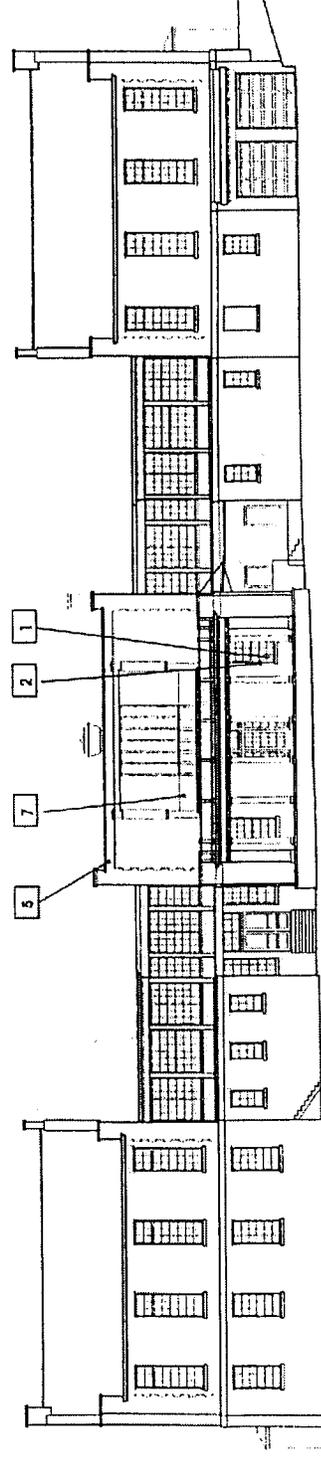
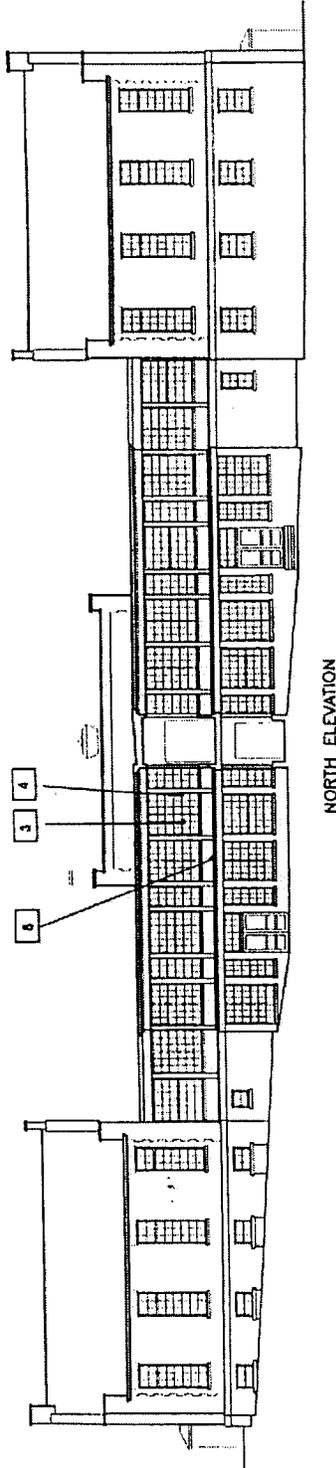
BUILDING 3 - PAINT SAMPLE LOCATIONS



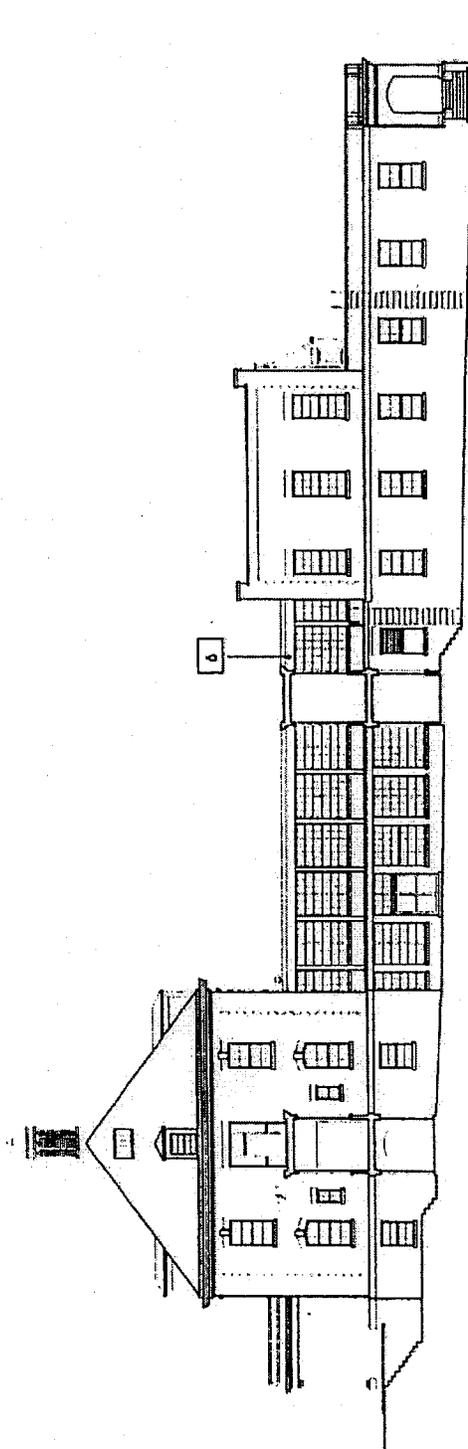
BUILDING 3 - PAINT SAMPLE LOCATIONS



BUILDING 4 - PAINT SAMPLE LOCATIONS

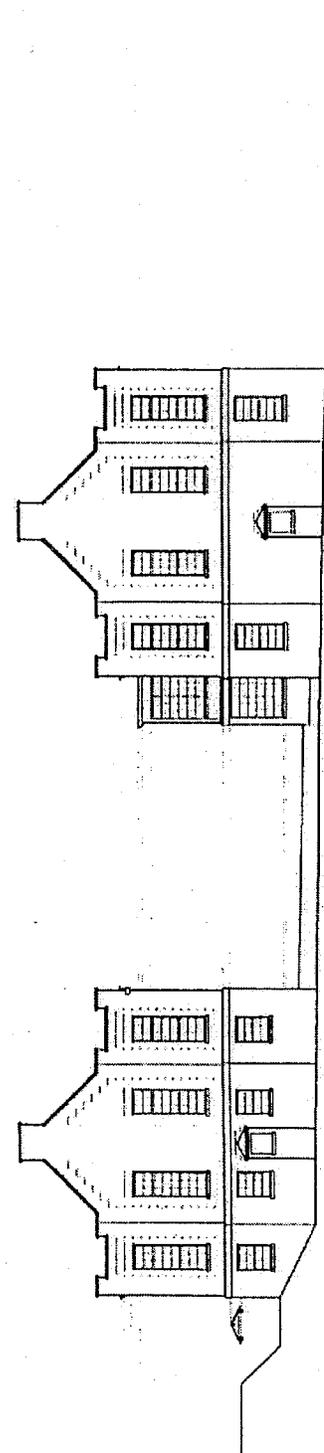
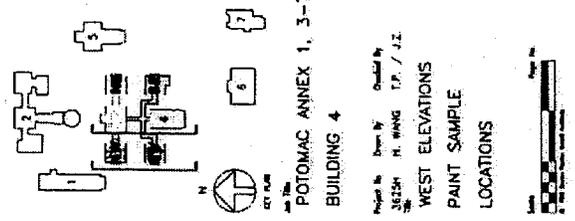


BUILDING 4 - PAINT SAMPLE LOCATIONS



WEST ELEVATION  
BUILDING 3

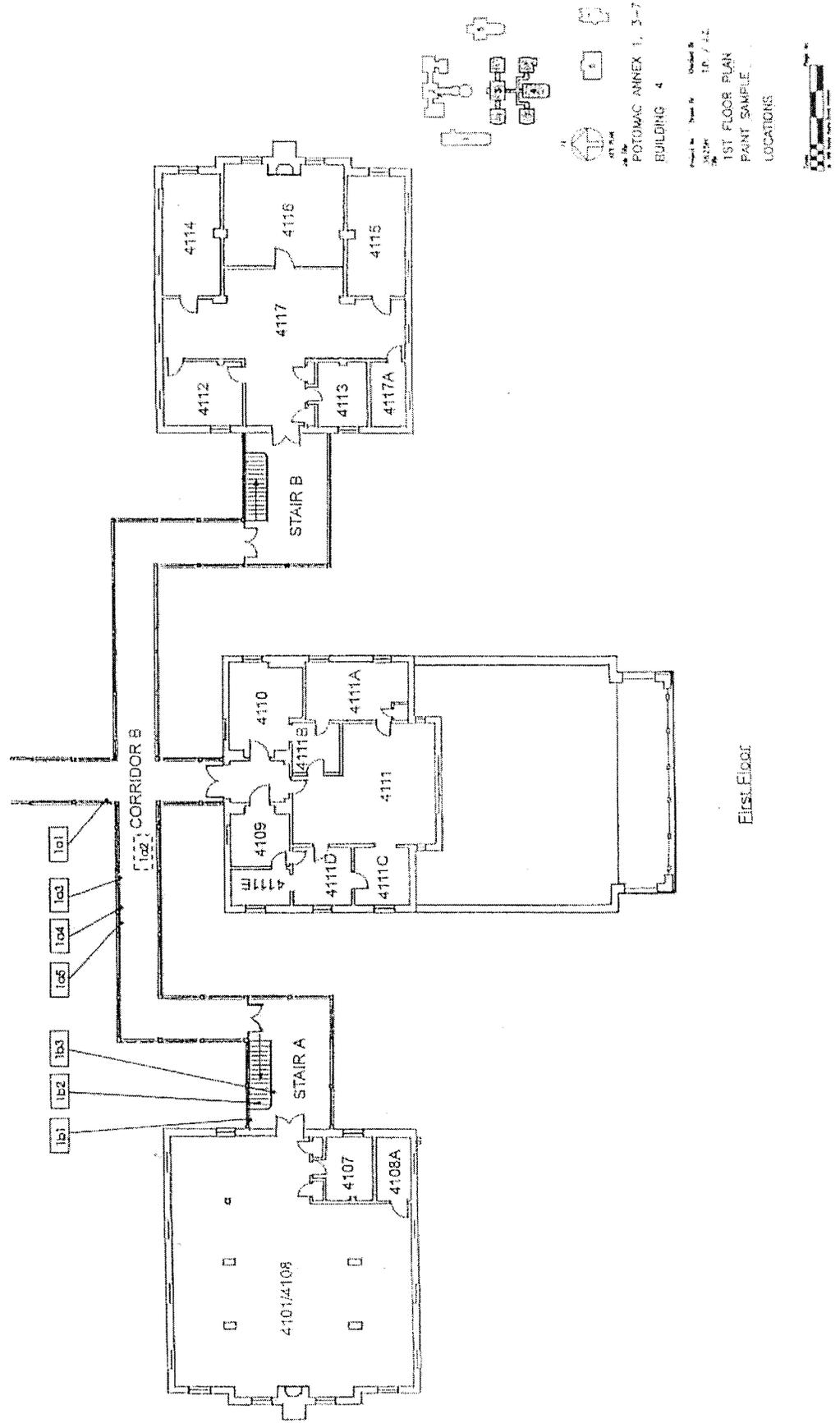
WEST ELEVATION  
BUILDING 4



WEST ELEVATION  
NORTH WEST PAVILION

WEST ELEVATION  
SOUTH WEST PAVILION

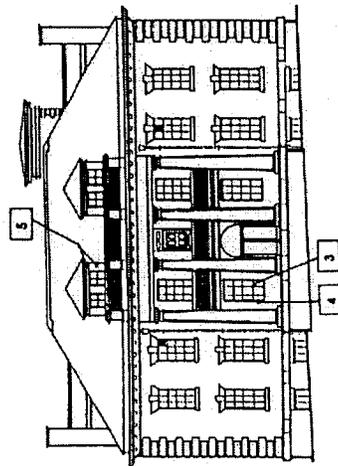
BUILDING 4 - PAINT SAMPLE LOCATIONS



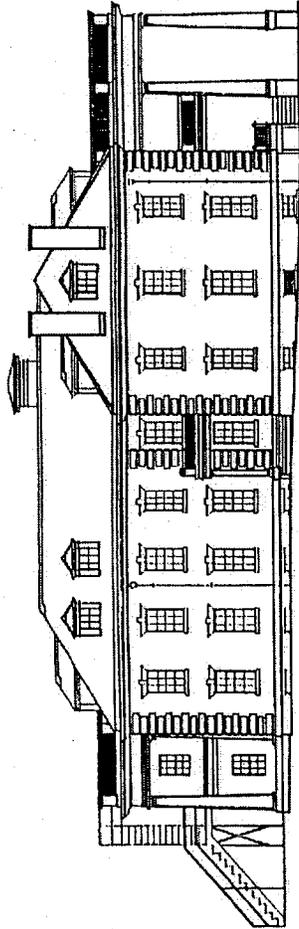
CHAPTER 5. PAINT ANALYSIS

POTOMAC ANNEX BUILDINGS 1, 3-7

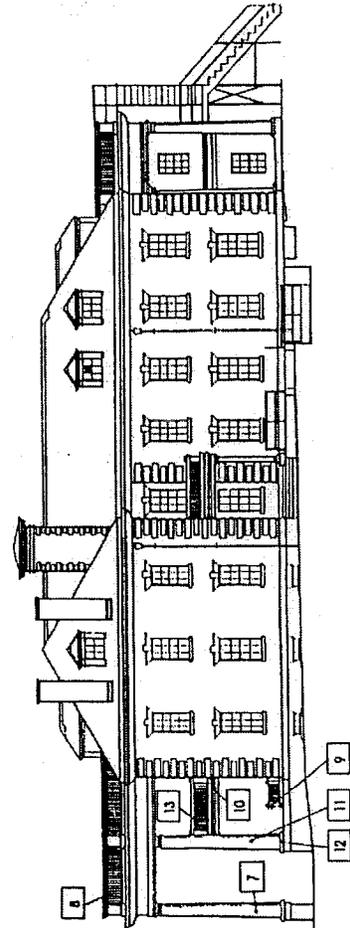
BUILDING 5 - PAINT SAMPLE LOCATIONS



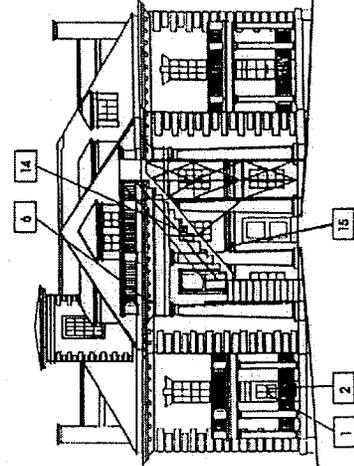
North Elevation



East Elevation



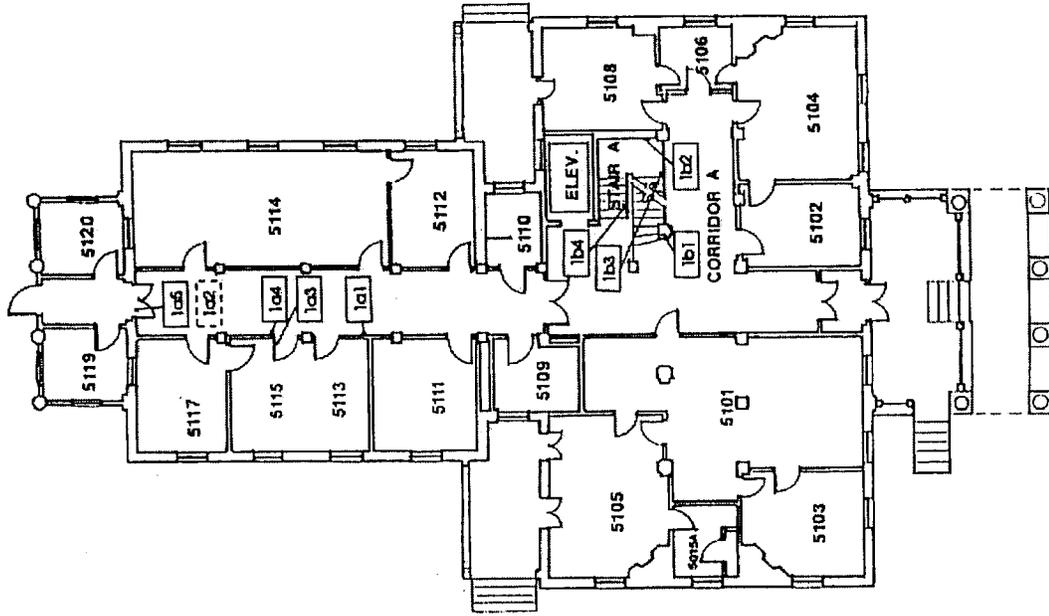
West Elevation



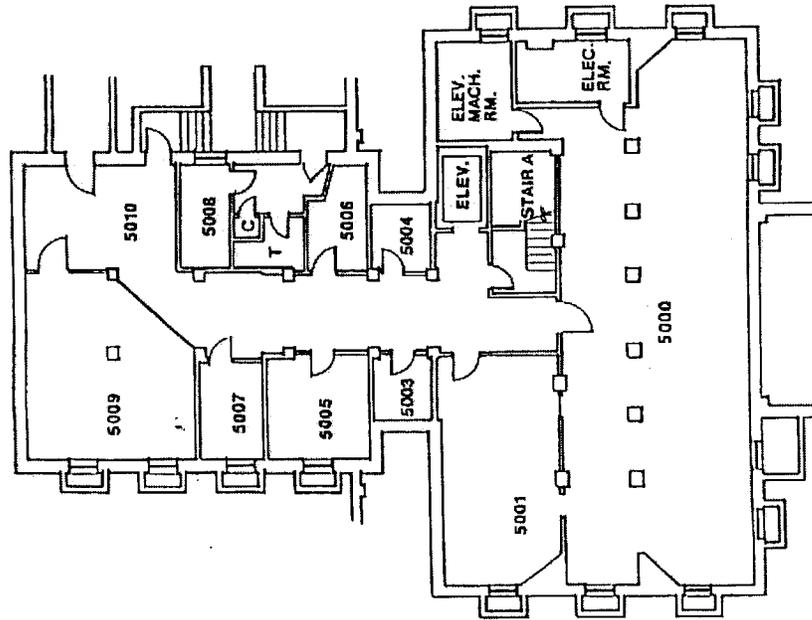
South Elevation

POTOMAC ANNEX 1, 3-7  
 BUILDING 5  
 Project No. 38234  
 Date 10 / 22  
 Drawn By T.P. / J.Z.  
 ELEVATIONS  
 PAINT SAMPLE  
 LOCATIONS

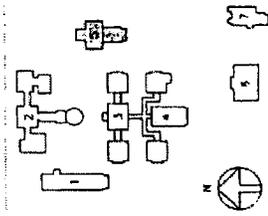
BUILDING 5 - PAINT SAMPLE LOCATIONS



First Floor



Basement



POTOMAC ANNEX 1, 3-7  
 BUILDING 5

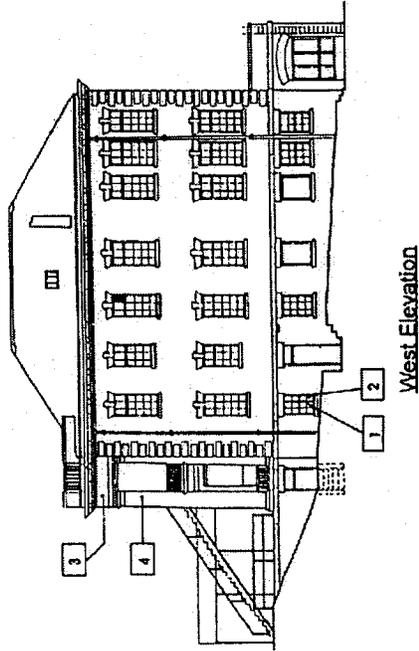
Project No. 38254  
 Drawn By T.P. / J.Z.  
 BASEMENT PLAN  
 1ST FLOOR PLAN  
 PAINT SAMPLE  
 LOCATIONS



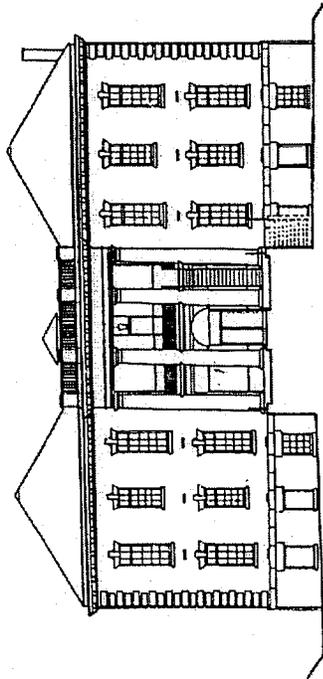
CHAPTER 5. PAINT ANALYSIS

POTOMAC ANNEX BUILDINGS 1, 3-7

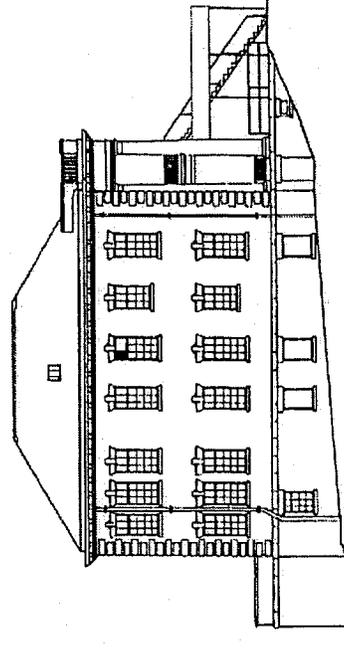
BUILDING 6 - PAINT SAMPLE LOCATIONS



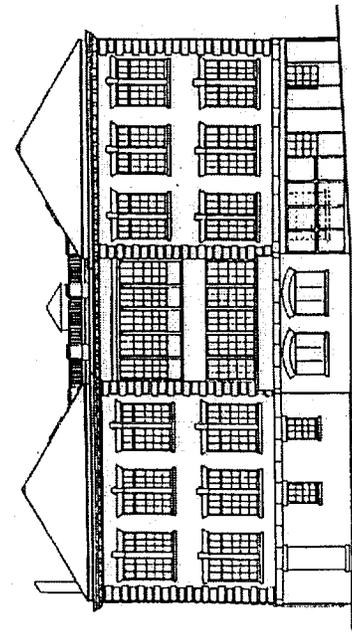
West Elevation



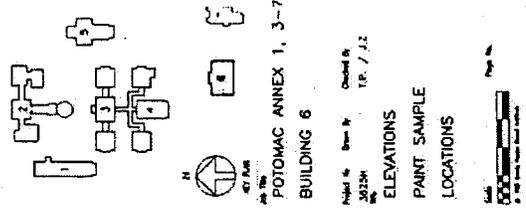
North Elevation



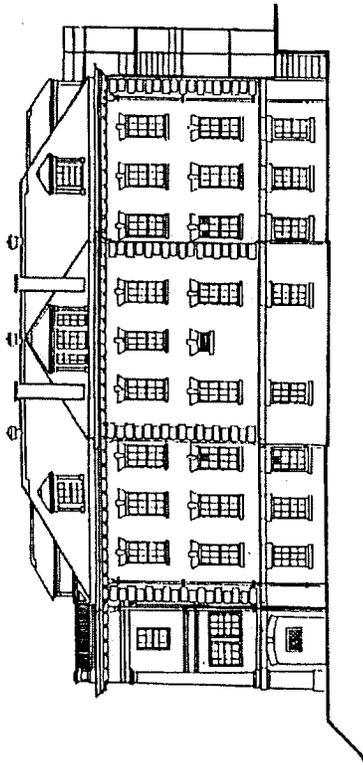
East Elevation



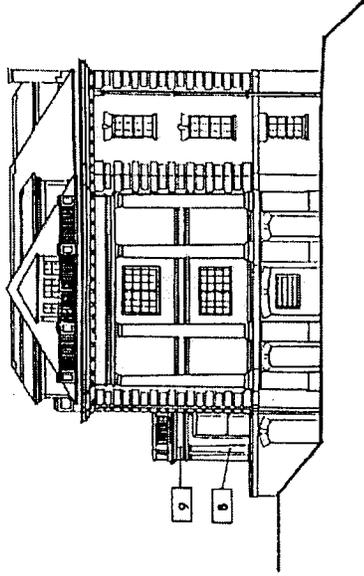
South Elevation



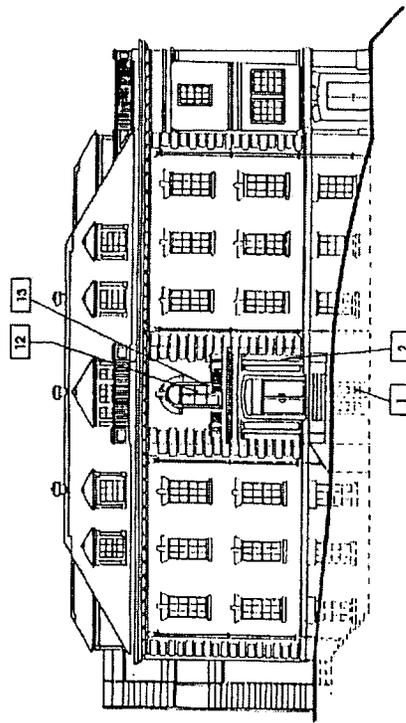
BUILDING 7 - PAINT SAMPLE LOCATIONS



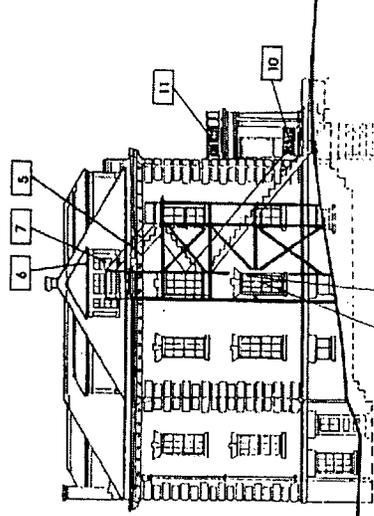
East Elevation



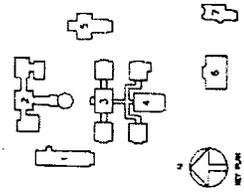
South Elevation



West Elevation



North Elevation



Project No. 26394  
 Drawn By: P.P. / J.J.  
 Date: 7/12  
 POTOMAC ANNEX 1, 3-7  
 BUILDING 7

ELEVATIONS  
 PAINT SAMPLE  
 LOCATIONS





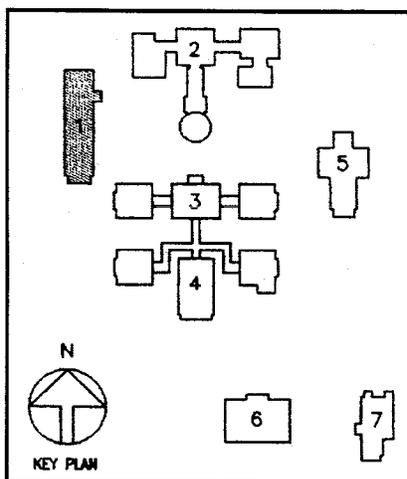
## INTRODUCTION

The purpose of a materials conservation analysis is to identify significant materials and techniques of construction and decoration, to describe the conditions of those materials, and, in the event of deficiencies in materials, to determine repair options and to recommend actions for restoration, conservation or preservation treatment.

This Materials Conservation Analysis involved visual inspection of the building's exterior beginning in July 1994 and extending through October 1995. Inspection of the exterior was made from the ground level, through the windows at various floors on all elevations, and at the roof level. The exterior conditions, which encompass both missing and deteriorated building materials, are organized by material. For each material, there is a description of its deterioration, a list of treatment, options, and, a recommendation for treatment. This analysis is performed in order to determine the extent of materials deterioration and to contribute to a prioritized summary of repairs, included in *Chapter 9, Design Guidelines/ Rehabilitation Actions*.

An in depth analysis of the mortars can be found in *Chapter 7, Mortar Analysis*, while conditions related to soiling of materials are addressed in *Chapter 8, Materials Cleaning Analysis*. Specifications relating to the work described here can be found in *Chapter 10, Guideline Specifications*. The Restoration and Rehabilitation zones in which these materials exist are designated in *Chapter 9, Design Guidelines/ Rehabilitation Action*.

### BUILDING 1: EXTERIOR EXISTING CONDITIONS



#### *Introduction*

Conditions on Building 1 at the Potomac Annex are generally good. On Building 1 the yellow brickwork exhibits light and superficial soiling and requires little or no intervention. The granite on this building shows more moderate soiling. The use of window air conditioners has resulted in staining of some granite elements such as window sills and the water table or band course.

The pointing is generally in excellent condition with notable exception: 1) where granite building elements such as keystones, sills and band courses meet brickwork, the mortar joints are open; 2) the end joints of canted brick lintels are consistently open; 3) the butt joints on the granite band courses at ground level are open or have been badly repointed or caulked. From these open joints on the band course have emanated cracks and open joints which extend in almost all cases to the first floor granite window sills and in some cases up to second floor windows. Damage to brickwork other than stress cracks is minor.

The wood elements require only typical periodic maintenance consisting of scraping and painting except for the dormer windows which have been recently repainted.

Concrete has generally not fared well on Building 1. Sidewalks and associated walls exhibit deterioration which is at times severe; efflorescences, bulging, and network cracking are noted particularly in areaways. Steps and slabs which have been repaired and painted are not visually well integrated into the rest of the building.

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning.

### ***Brick***

#### General Conditions and Soiling

Yellow, unglazed brick is the primary construction material for Building 1. Overall the brick is in good condition, exhibiting only light, superficial soiling.

#### Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 1 in association with the vertical or head joints of the granite water table. The stresses associated with the open joints transfer up and through the brick above, following the mortar joint pattern. Frequently they continue up to the first floor granite window sills (Figure 1-1). In some cases these cracks extend up the wall to the second floor windows (Figure 1-2). These conditions are pervasive on all elevations of Building 1. Stress cracks and open joints are also associated with the two areaways on the front of Building 1 (Figures 1-3, 1-4, 1-5).

#### Other Open Joints

The heads of the windows in Building 1 consist of wedged shaped brick voussoirs with granite keystones. The joints between the keystones and brick are consistently open as are the joints between the brick voussoir at each end of the window head trim and the surrounding brickwork of the wall (Figure 1-6).

#### Movement

A small brick retaining wall at the south end of Building 1 is somewhat displaced and exhibits efflorescence of salt (Figure 1-7). Brick piers for the small stoop at the north end also show movement (Figure 1-8).

### Spalls and Damaged Brick

The northeast corner of Building 1 has damaged brick (Figure 1-9). There is a minor spall on the first floor window, second to the right from the main entrance (Figure 1-10).

### *Concrete*

Concrete can be found at the window wells, capstones, and the two porches on Building 1. The window wells exhibit movement away from the building. The resulting damage from this movement has been repaired with cement and caulk which are now both failing (Figures 1-11 and 1-12). There is some damage to the concrete in the window wells (Figure 1-13). Cement capstones have been dislodged by contact with automobiles and have cracked from the rusting of embedded metal railings (Figure 1-14). Some of the joints in these capstones have been caulked and overlaid with bitumen (Figure 1-15). The slabs of the portico which were presumably cracked or disfigured have been coated with a cementitious material which is a poor match for surrounding concrete (Figure 1-16). The supporting arches for the south areaway consists of badly deteriorated concrete (Figure 1-17). The exposed concrete foundation on the south and rear of the building shows some deterioration due to rebar corrosion (Figure 1-18).

### *Wood*

Windows, dormers, cornices, the portico and the sun porch consist of painted wood. While the wood itself is generally in good condition (windows in the dormers show more deterioration), most of these elements are in need of scraping, painting, and caulking. This is particularly true of the small dormers.

### *Copper*

Copper leaders and roof flashing are in good condition. However, leaders and gutters require cleaning. Evidence of blockage and associated damage to the painted woodwork nearby is noted (Figure 1-19).

### *Granite and Cast Stone*

Granite and cast stone form the water table which surrounds the building at the base of the first floor. These elements - like the granite keystones - are generally in good condition but are lightly to heavily soiled. However, the joints between juxtaposed stones are open or have been filled with caulk (Figure 1-20). The bed joints and the top horizontal joints for the granite water table are generally open. Run-off from window air conditioners has stained the granite (Figure 1-21).

### *Iron Railings*

Iron railings are found in the areaways and on the two main entrances to Building 1. These railings are generally in good condition, requiring periodic scraping and painting. Water entry at their bases has rusted some of the railings causing damage to the concrete (Figures 1-5 and 1-14).

**BUILDING 1: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS***Open Mortar Joints in Brick and Stone Elements*

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin, but also an expansion/contraction joint to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

## Open Joints - Treatment Options

No Treatment: Water will begin or continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

## Open Joints - Treatment Recommendation

Cut and Point: There is no viable alternative to this approach.

*Stress Cracks in Brickwork*

Building stresses can be transferred from one element to another. At Building 1 the stress cracking in the brick is related to the open head joints in the granite water table or corrosion of iron anchors. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer to the weakest elements, first the mortar and finally the brick will crack. This condition allows more water to enter which results in further, often more serious, deterioration of other building elements. This condition may also be caused by rusting iron anchors in window lintels and sills. Several bricks have also been damaged by impact.

## Stress Cracks, Cracked or Spalled brick - Treatment Options

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color, texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

#### Stress Cracks, Cracked or Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This option re-establishes the mechanical integrity of the wall and also provides an aesthetically superior solution.

#### ***Bulging Retaining Wall***

The pressure of juxtaposed earth combined with hydrostatic water pressure and salt crystallization are forces strong enough to cause retaining walls to bulge and shift.

#### Bulging Retaining Wall - Treatment Options

No Treatment: Shifting or bulging of the wall will continue and may ultimately lead to unsafe conditions.

Excavate, Waterproof, Cut and Point: Earth is excavated from next to the wall, the waterproofing skin renewed. The joints on the opposite side of the wall are cut and repointed. This will keep the wall in its current configuration.

Rebuild Wall: The existing wall is demolished. Earth is excavated and the wall is rebuilt with proper waterproofing. Brick must be selected to match existing brick on the building and pointing should match surrounding mortar in color, texture and profile.

#### Bulging Retaining Wall - Treatment Recommendation

Excavate, Waterproof, Cut and Point: The bulging of the wall is not significant enough to warrant demolition and reconstruction.

### *Coating on Concrete Slabs at Portico and South Entrance Stoop*

A cementitious coating has been applied to both concrete slabs at the principal entrances to Building 1. These coatings have undoubtedly been applied to provide a waterproof skin to deteriorating concrete and to give a uniform appearance to presumably cracked concrete. Unfortunately, the color and texture of the coating do not harmonize well with existing materials. In addition, the coating may be masking underlying problems in the concrete.

#### Coating on Concrete Slabs - Treatment Options

No Treatment: While the rate of deterioration of the concrete may be slowed by the coating, the current solution is clearly unsightly.

Remove Coating, Repair Concrete, Repaint: This option allows for an assessment of the condition of the concrete and permits any required repairs. (Repairs may have been executed at the time of the application of the current coating). A paint which is closer in color to the tan-grey of concrete would be applied. The gritty texture of the current coating should be avoided.

Demolish Slab and Pour New Concrete: Inherent problems of waterproofing and the suspect existing conditions of the concrete could be addressed and dealt with in this option.

#### Coating on Concrete Porches - Treatment Recommendation

Demolish Slab and Pour New Concrete: This option provides a more lasting solution to the current concrete problems on this building. (See other concrete problems addressed below.)

### *Separating and Damaged Concrete Window Wells*

Window wells are constructed to provide light into the basements of the buildings. These wells are often subject to severe stress and deterioration due to their location at or below grade and their original construction method. The window wells require more frequent periodic maintenance due to these conditions.

#### Separating and Damaged Concrete Window Wells - Treatment Options

No Treatment: While the conditions of these wells do not pose a significant hazard to the building, the conditions will worsen over time.

Repair with new Concrete Patching Techniques: All existing concrete and caulk repairs should be removed and new concrete infills or patches should be made in a matching concrete.

Demolish and Rebuild: This option would provide the opportunity to eliminate existing problems and to tie the wells into the building.

#### Separating and Damaged Concrete Window Wells - Treatment Recommendation

Demolish and Rebuild: The new wells can be pitched to better drain water. The use of granite (as in Buildings 5, 6 and 7) is an excellent solution.

#### *Cracked and Deteriorating Concrete Capstones*

The concrete capstones have both an aesthetic and mechanical function. Capstones are added to cap or cover the exposed joints in a brick or concrete block wall or to cap or finish the top of a concrete wall. Pre-cast concrete capstones can be shaped to shed water (by canting and the use of a drip edge), thereby protecting the mortar joints of a brick wall. In order to preserve the walls they protect, the capstones require proper maintenance by repointing all deteriorated joints and replacing all cracked stones to match existing. Where poorly maintained and corroding posts of metal railings have caused cracking of the concrete capstone, they should be patched to prevent further damage.

#### Cracked and Deteriorating Concrete Capstones - Treatment Options

No Treatment: Deterioration will continue and become more severe. Current damage to the capstones is unsightly.

Repointing of Joints and Repair Using Concrete Patching Techniques: While this option slows deterioration, concrete patches are difficult to execute and may not match the existing concrete. The bitumen surrounding certain cross joints can be mechanically removed and the joints repointed with mortar.

Demolish and Rebuild (See related work for areaway walls): This allows for the setting of a sleeve within the new capstone to receive the metal posts of the railings and re-setting of the capstones.

#### Cracked and Deteriorating Concrete Capstones - Treatment Recommendation

Demolish and Rebuild: This is the correct repair.

### *Areaway Concrete Walls and Arches*

Areaways are designed to provide access to basement entrances to the building. Because the concrete walls associated with these areaways are at or below grade they are often in poor condition as is the case on this east elevation of Building 1.

#### Areaway Concrete Walls and Arches - Treatment Options

No Treatment: The concrete will continue to deteriorate at increasing rates with possible de-stabilization of the overlying porch.

Repair Using Concrete Patching Techniques: Deteriorated areas of concrete should be removed, the rebar corrosion should be removed and primed and concrete patches installed. Additionally, waterproofing of concrete walls should also be carried out as described above. This solution will be unsightly unless a paint is applied to all areas of the concrete to blend the patching material with the existing remaining concrete. The coating will require maintenance every 5 - 10 years.

Demolish and Rebuild: This option is the most expensive but the arches are already seriously deteriorated. The capstones, the south entrance's concrete slab and the rusted iron railings could all be addressed at the same time.

#### Areaway Concrete Walls and Arches - Treatment Recommendation

Demolish and Rebuild: New concrete can be better isolated from the surrounding soil which appears to be one of the sources of the deterioration of the concrete. The overlying concrete slab could also be rebuilt at this time.

### *Cracks in Exposed Concrete Foundation Wall*

The foundation wall supports the entire structure. Deterioration of this concrete is minor, but it should be dealt with at an early stage. To neglect it's maintenance will only cause major problems of water entrance resulting in further deterioration at a later date.

#### Cracks in Exposed Concrete Foundation - Treatment Options

No Treatment: Deterioration will continue to worsen.

Cut and Repair using Concrete Patching Techniques: Damage is minor, and aesthetics are not a significant issue here. Rebars should be cleaned and painted and a cement patch installed. It is not necessary to paint the concrete wall.

### Cracks in Exposed Concrete Foundation - Treatment Recommendation

Cut and Repair using Concrete Patching Techniques: This is the only viable option.

### *Peeling and Failing Paint on Wood*

(Note: some dormer windows may need to be replaced.)

Paint not only protects wood from excessive moisture and ultra-violet light damage, but also decorates particular elements, establishing the tonal pattern on building elevation. Periodically, paint should be renewed to re-establish both of these purposes from time to time.

### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate, and more paint will fail, compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

### *Blocked Copper Gutters and Leaders*

Gutters and leaders conduct water off and away from the buildings. When they are not properly maintained, water will collect. During cold weather it will freeze, causing more extensive damage to the storm drainage system as well as other parts of the building.

### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This should be part of a yearly maintenance program.

### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: This is no other viable choice.

### ***Rust Stains on Granite Band Course***

Aesthetically, the granite band course provides a light colored building element which gives visual "lift" to the building. Stains on this element compromise the aesthetic effect.

#### Rust Stains on Granite Band Course - Treatment Options

No Treatment: While the stains pose no physical threat to the granite, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultrice: Treatment with clay poultrices of ammonium thioglycolate will remove these stains. (See also *Chapter 8. Materials Cleaning Analysis*)

#### Rust Stains on Granite Band Course - Treatment Recommendation

Remove Stains with Iron Chelating Poultrice: This is the least damaging method to remove the rust staining.

### ***Rusting Iron Railings***

(Note: See related deficiency, *Cracked and Deteriorating Concrete Capstones*, above.)

Railings are provided primarily as a safety measure. If these railings fail at their bases, safety is not assured.

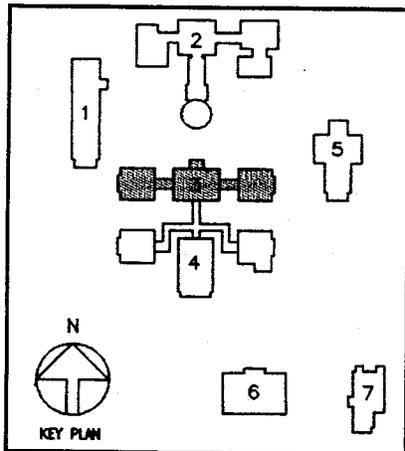
#### Rusting Iron Railings - Treatment Options

No Treatment: Corrosion will continue at ever-increasing rates.

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: This approach deals with the current level of corrosion and any future corrosion. This process should be part of a periodic maintenance program on 2-3 year cycles.

#### Rusting Iron Railings - Treatment Recommendation

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: Demolition of the areaway concrete will obviate this approach at that location; otherwise it is the standard treatment.

**BUILDING 3: EXTERIOR EXISTING CONDITIONS****Introduction**

Conditions on Buildings 3 at the Potomac Annex are generally fair-to-good. Buff colored brick is moderately and selectively soiled. This soiling appears to be embedded in a cracked and crazed surface glaze which is not entirely intact. White glazed brick is lightly soiled and is damaged in some areas.

Pointing on Building 3 is in good condition with notable exception: 1) Where limestone building elements such as lintels, sills and band courses meet brickwork, the mortar joints are open; 2) Vertical butt joints on the limestone water table are open; 3) From these open joints on the water table step cracks have emanated to window sills; 4) Bluestone window wells have open joints.

Some limestone elements are damaged and stained; however, the wood elements require only typical periodic maintenance consisting of scraping and painting.

Concrete has generally not fared well on Building 3. Concrete sidewalks and associated walls and steps exhibit deterioration which is at times severe; efflorescences, bulging, and network cracking are noted particularly in areaways (which are also constructed partly of brick).

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning. Some leaders have been purposely blocked. Paint on metal roofs is in poor condition and requires a more intense and more frequent maintenance program.

**Brick**General Conditions and Soiling

The buff brick is soiled moderately and selectively giving it a mottled appearance (Figure 3-1). This brick exhibits a crazed and cracked outer skin which entraps much of the soiling (Figure 3-2). Minor graffiti and bitumen deposits are found on this brick (Figure 3-3). The removal of window grates at the basement level damaged some of the brick (Figure 3-4).

The white glazed brick, like the buff brick, is selectively damaged but to a much lesser extent (Figure 3-5). The areas of loss comprise about twenty percent of the total surface area of this brick.

Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 3 in association with the vertical or head joints of the limestone water table (Figure 3-6). Stress cracks and open joints have been caulked

at the basement level (Figure 3-7). Caulk repairs are also seen at grade for open joints between brick and concrete sidewalks (Figure 3-8).

### *Limestone*

Limestone is used for capstones on the raked cornices, parapet walls, keystones and some window lintels, sills and belt courses (or water tables) on Building 3. All of these limestone elements shows signs of loss but do not suffer from active granular disintegration or stress cracking. The light build up of gypsum and flyash appears to be confined to the window lintels and keystones and sills (Figure 3-9). The head joints in the water table and the joints of most of the limestone elements are open or have been repointed with visually or physically incompatible materials (Figure 3-10).

Metal brackets supporting the power lines have rusted and stained the limestone water table (Figure 3-11). In addition, the window air conditioning units have stained this water table as well as some of the limestone window sills (Figure 3-12). During the most recent campaign of repainting of the woodwork, paint has been splattered on the limestone elements. Limestone elements near parking areas or areas of vehicular exhibit percussive damage (Figure 3-13).

### *Bluestone*

Window wells for Building 3 are constructed of sandstone (Bluestone is classified as a sandstone). Many of the stones are displaced and the interstitial joints are open.

### *Wood*

All wood elements on the exterior require scraping, painting and caulking.

### *Concrete and Brick Areaway and Retaining Wall, Capstones and Steps*

The concrete has not fared well on Building 3. The curved brick retaining wall on the north elevation of Building 3 is bulging significantly and exhibits extensive efflorescence (Figure 3-14). Capstones are crumbling (Figure 3-15) and previous repairs are failing (Figure 3-16). (It should be noted that during the examination of the facades, bluestone was found on the north stairway, indicating that it, not concrete, was probably the original material for the steps.) The underside of the concrete slab that forms the floor of the entrance portico to Building 3 is very badly damaged (associated with corroding rebar) with losses are as large as several inches in depth (Figure 3-17). These losses are associated with dampness, efflorescence and extensive corrosion of the rebar.

### *Copper*

Copper leaders are generally in good condition, but some blockages are noted with associated damage to brickwork.

### *Iron Railings*

Iron railings on porticos and stairways are rusting due to lack of maintenance. The rust has stained some of the concrete and limestone elements.

### *Tin Roofs*

Tin roofs which have been painted show extensive loss and lack of adhesion of paint (Figure 3-18).

## BUILDING 3: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS

### *Open Mortar Joints in Brick and Stone Elements*

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin but also expansion/contraction joints to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

#### Open Joints - Treatment Options

No Treatment: Water will begin or continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

#### Open Joints - Treatment Recommendation

Cut and Point: There is no viable alternative to this approach.

### *Stress Cracks in Brickwork*

Building stresses can be transferred from one element to another. At Building 3 the stress cracking in the brick is related to the open head joints in the limestone water table. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer to the weakest elements, first the mortar and finally the brick will crack. This allows more water to enter resulting in further, often more serious, deterioration of other building

elements. This condition may also be caused by rusting iron anchors in window lintels and sills.

#### Stress Cracks, Cracked or Spalled brick - Treatment Options

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color, texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

#### Stress Cracks, Cracked, Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This options returns the mechanical integrity of the wall and also provides an aesthetically superior solution.

### *Damaged Limestone*

These limestone elements provide aesthetic contrast to the brick.

#### Damaged Limestone - Treatment Options

No Treatment - allows for further deterioration of limestone; damage is visually disruptive

Repair with Patching Mortar - a good match in color and texture can be achieved

Dutchman Repair - A good match can be achieved, but at a higher cost.

#### Damaged Limestone - Treatment Recommendation

Repair with Patching Mortar - Damage is not extensive enough to warrant dutchmen. Where limestone has been damaged by impact, install safeguards such as guard rails or stanchions.

### ***Bulging Retaining Wall***

The pressure of juxtaposed earth combined with hydrostatic water pressure and salt crystallization are forces strong enough to cause retaining walls to bulge and shift.

#### **Bulging Retaining Wall - Treatment Options**

No Treatment: Shifting or bulging of the wall will continue and may ultimately lead to unsafe conditions.

Excavate, Waterproof, Cut and Point: Earth is excavated from next to the wall, the waterproofing skin renewed. The opposite side of the wall is cut and repointed. This will keep the wall in its current configuration.

Rebuild Wall: The existing wall is demolished. Earth is excavated and the wall is rebuilt with proper waterproofing. Brick must be selected to match existing brick on the building and pointing should match surrounding mortar in color, texture and profile.

#### **Bulging Retaining Wall - Treatment Recommendation**

Excavate, Waterproof, Cut and Point: The bulging of the wall is not significant enough to warrant demolition and reconstruction.

### ***Cracked and Deteriorating Concrete Capstones***

The concrete capstones have both an aesthetic and mechanical function. Capstones cap or cover the exposed joints in a brick or concrete block wall or to cap or finish the top of a concrete wall. Pre-cast concrete capstones can be shaped to shed water (by canting and the use of a drip edge), thereby protecting the mortar joints of a brick wall. In order to preserve the wall which they protect, the capstones require proper maintenance by repointing all deteriorated joints and replacing all cracked stones to match existing. Where poorly maintained posts of metal railings have caused cracking of the concrete capstone, they should be patched to prevent further damage.

#### **Cracked and Deteriorating Concrete Capstones - Treatment Options**

No Treatment: Deterioration will continue and become more severe. Current damage to the capstones is unsightly.

Repointing of Joints and Repair Using Concrete Patching Techniques: While this option slows deterioration, concrete patches are difficult to execute and may not match the existing concrete. The bitumen surrounding certain cross joints can be mechanically removed and the joints repointed with mortar.

Demolish and Rebuild (See related work for areaway walls.): This allows for the setting of a sleeve within the new capstone to receive the metal posts of the railings and re-setting of the capstones.

#### Cracked and Deteriorating Concrete Capstones - Treatment Recommendation

Demolish and Rebuild: This is the correct repair.

#### *Areaway Concrete Walls and Steps*

Areaways are designed to provide access to basement entrances to the building. Because the concrete walls associated with these areaways are at or below grade they are often in poor condition.

#### Areaway Concrete Walls and Steps - Treatment Options

No Treatment: The concrete will continue to deteriorate at increasing rates with possible de-stabilization of the overlying porch.

Repair Using Concrete Patching Techniques: Deteriorated areas of concrete should be removed, the rebar corrosion removed and primed and concrete patches installed. In addition waterproofing of concrete walls should also be carried out as described above. This solution will be unsightly unless a paint is applied to all areas of the concrete to blend the patching material with the existing remaining concrete. The coating will require maintenance every 5 - 10 years.

Demolish and Rebuild: This option is the most expensive but the arches are already seriously deteriorated. The capstones, the south entrance's concrete slab and the damage from the rusted iron railings could all be addressed at the same time.

#### Areaway Concrete Walls and Steps - Treatment Recommendation

Demolish and Rebuild: New concrete can be better isolated from the surrounding soil which appears to be one of the sources of the deterioration of the concrete. The overlying concrete slab could also be rebuilt at this time.

#### *Peeling and Failing Paint on Wood*

Paint not only protects wood from excessive moisture and ultra-violet light damage, but it also decorates particular elements, establishing the tonal pattern on the building elevation. Periodically, the paint should be renewed to re-establish both of these purposes.

### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate. More paint will fail therefore compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

### ***Blocked Copper Gutters and Leaders***

Gutters and leaders are provided to conduct water off of and away from the building. When not properly maintained, water will collect and expand, especially during cold weather, causing more extensive damage to the storm drainage system as well as other parts of the building.

### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This activity should be part of a yearly maintenance program.

### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: There is no other viable choice.

### ***Rust Stains on Limestone***

Aesthetically, the limestone provides a light colored building element which gives visual "lift" to the building. Stains on this element compromises this aesthetic effect.

### Rust Stains on Limestone - Treatment Options

No Treatment: While the stains pose no physical threat to the limestone, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultice: Treatment with clay poultices of ammonium thioglycolate will remove these stains

### Rust Stains on Limestone - Treatment Recommendation

Remove Stains with Iron Chelating or Iron Reducing Poultice: This is the least damaging method to remove the rust staining.

### ***Rusting Iron Railings***

Railings are provided primarily as a safety measure. If these railings fail at their bases, safety is not assured.

#### Rusting Iron Railings - Treatment Options

No Treatment: Corrosion will continue at ever-increasing rates.

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: This approach deals with the current level of corrosion and any future corrosion. This process should be part of a periodic maintenance program on 2-3 year cycles.

#### Rusting Iron Railings - Treatment Recommendation

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: Demolition of the areaway concrete will obviate this approach at that location. Otherwise it is the standard treatment.

### ***Failing Paint on Tin Roofs***

Paint is applied to metal surfaces to provide protection and give color balance.

#### Failing Paint on Tin Roofs - Treatment Options

No Treatment: Corrosion and paint loss will eventually diminish a roof's integrity.

Scrape, Prime, and Paint: This approach deals with the current level of corrosion and any future corrosion as well as re-established the color balance on the elevation. This process should be part of a periodic maintenance program on 5-year cycles.

#### Failing Paint on Tin Roofs - Treatment Recommendation

Scrape, Prime, and Paint: This approach deals with the current level of corrosion and any future corrosion; it also re-establishes the color balance on the elevation. This process should be part of a periodic maintenance program on 5-year cycles.

### *Holes and Metal Inserts in Brickwork (from Installation of Window Grates)*

The holes and metal inserts appear to have been supports for signage. If allowed to remain within the brickwork, they will continue to deteriorate and expand. The corrosion product will cause the brick to crack and spall. The holes offer entry ports for water causing subsequent freeze/thaw damage.

#### Holes and Metal Inserts in Brickwork - Treatment Options

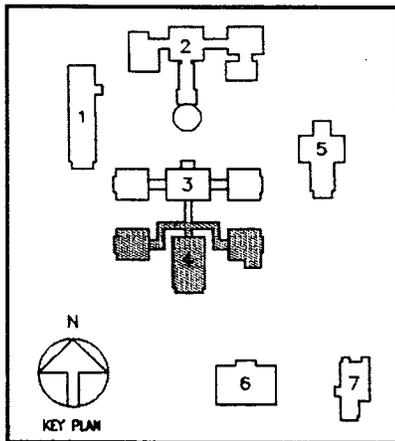
No Treatment: The holes will continue to allow water to enter the wall, and the existing metal inserts will continue to rust. Both actions have the potential to cause unsightly damage to the brick.

Remove Inserts and Fill All holes: A sympathetic mortar mix with fine sand, cement, lime and pigment can be used to fill these holes.

Remove and Replace Brick: Brick can be cut out and replaced with matching brick and mortar.

#### Holes and Metal Inserts in Brickwork - Treatment Recommendations

Remove Inserts and Fill All holes: The holes are small enough such that a mortar replacement will be both aesthetically successful and long lasting.

**BUILDING 4: EXTERIOR EXISTING CONDITIONS****Introduction**

Conditions on Building 4 at the Potomac Annex are generally fair-to-good. Buff colored brick is moderately and selectively soiled. This soiling appears to be embedded in a cracked and crazed surface glaze which itself is not entirely intact. White glazed brick is lightly soiled and is damaged in some areas.

Pointing on Building 4 is in good condition with notable exception: 1) Where limestone building elements such as lintels, sills and band courses meet brickwork, the mortar joints are open; 2) Vertical butt joints on the limestone water table are open; 3) From these open joints on the water table step cracks have emanated to window sills; 4) Blue stone window wells have open joints.

Some limestone elements are damaged and stained, but the wood elements require only typical periodic maintenance consisting of scraping and painting.

Some limestone elements are damaged and stained, but the wood elements require only typical periodic maintenance consisting of scraping and painting.

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning. Paint on metal roofs is in poor condition and requires a more intense and more frequent maintenance program.

**Brick**General Conditions and Soiling

The buff brick is soiled moderately and selectively giving it a mottled appearance (Figure 4-1). This brick exhibits a crazed and cracked outer skin which entraps much of the soiling. Bitumen deposits are found on this brick (Figures 4-2 and 4-3).

The white glazed brick, like the buff brick, is selectively damaged but to a much lesser extent (Figure 4-4). The areas of loss comprise about twenty percent of the total surface area of this brick.

Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 4 in association with the vertical or head joints of the limestone water table in the same way as on Building 3 (Figure 4-5).

Damaged Brick

Brick has been dislodged and broken by impact at entryways (Figure 4-6).

### *Limestone*

Limestone is used for capstones on the raked cornices, parapet walls, keystone and some window lintels, sills and belt courses (or water tables) on Building 4. All of these limestone elements shows signs of loss, but do not suffer from active granular disintegration or stress cracking. The light build up of gypsum and flyash appears to be confined to the window lintels and keystone and sills (Figure 4-7). The head joints in the water table and the joints of most of the limestone elements are open or have been repointed with visually or physically incompatible materials. Limestone elements are often soiled with biological growth (Figure 4-8).

Damage has occurred to limestone elements both by impact from vehicles and by corrosion of iron anchors (Figures 4-9, 4-10, 4-11, 4-12). (Vehicular impact has also displaced granite capstones and corrosion has also cracked some nearby bricks.) Some previous repairs to limestone are unsightly (Figure 4-13).

### *Wood*

All wood elements on the exterior require scraping, painting and caulking.

### *Copper*

Copper leaders are generally in good condition, but there are some blockages associated with damaged brickwork (Figures 4-14 and 4-15).

### *Iron Railings*

Iron railings on porticos and stairways are rusting due to lack of maintenance. The rust has stained some of the concrete and limestone elements.

### *Tin Roofs*

Tin roofs which have been painted show extensive loss and lack of adhesion of paint.

## **BUILDING 4: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS**

### *Open Mortar Joints in Brick and Stone Elements*

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin, but also expansion/contraction joints to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

### Open Joints - Treatment Options

No Treatment: Water will begin or continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

### Open Joints - Treatment Recommendation

Cut and Point: There is no viable alternative to this approach.

### *Stress Cracks in Brickwork*

Building stresses can be transferred from one element to another. At Building 4 the stress cracking in the brick is related to the open head joints in the limestone water table. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer to the weakest elements, then the mortar and finally the brick will crack. This allows more water to enter resulting in further, often more serious, deterioration of other building elements. This condition may also be caused by rusting iron anchors in window lintels and sills. Some of the bricks have been damaged from impact.

### Stress Cracks, Cracked or Spalled brick - Treatment Options

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color, texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

### Stress Cracks, Cracked, Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This options returns the mechanical integrity of the wall and also provides an aesthetically superior solution.

### *Damaged Limestone on Window Sills*

These limestone elements provide aesthetic contrast to the brick

#### Damaged Limestone - Treatment Options

No Treatment - This option allows for further deterioration of limestone; damage is visually disruptive.

Repair with Patching Mortar - A good match in color and texture can be achieved.

Dutchman Repair - A good match can be achieved, but at a higher cost.

#### Damaged Limestone - Treatment Recommendation

Repair with Patching Mortar - Damage is not extensive enough to warrant dutchmen.

### *Damaged Limestone on Portico*

These limestone elements provide aesthetic contrast to the brick

#### Damaged Limestone - Treatment Options

No Treatment - This option allows for further deterioration of limestone; damage is visually disruptive.

Repair with Patching Mortar - A good match in color and texture can be achieved.

Dutchman Repair - A good match can be achieved but at a higher cost.

#### Damaged Limestone - Treatment Recommendation

Dutchman Repair - damage is extensive and confined to specific elements of defined geometric shapes which are well repaired by dutchmen. Corroded iron anchors should be replaced with stainless steel.

### *Displaced Granite Capstones*

Capstones have both an aesthetic and mechanical function. Capstones are added to cap or cover the exposed joints in a brick or concrete block wall or to cap or finish the top of a concrete or brick wall. Capstones can be shaped to shed water (by canting and the use of a drip edge), thereby protecting the mortar joints of a brick wall.

#### Displaced Granite Capstones - Treatment Options

No Treatment: Deterioration will continue and become more severe. Current damage to the capstones is unsightly.

Reset and Re-Anchor: This will protect the brick below and visually integrate the steps.

#### Displaced Granite Capstones - Treatment Recommendation

Reset and Re-Anchor: This is the only viable repair option; use only non-ferric anchors.

### *Peeling and Failing Paint on Wood*

Paint not only protects wood from excessive moisture and ultra-violet light damage, but also decorates particular elements, establishing the tonal pattern on the building elevation. Periodically, paint should be renewed to re-establish both of these purposes.

#### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate. More paint will fail therefore compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

#### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

### *Blocked Copper Gutters and Leaders*

Gutters and leaders are provided to conduct water off of the building. When they are not properly maintained, water will collect. It will freeze during cold weather, causing more extensive damage to the storm drainage system as well as other parts of the building.

### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This should be part of a yearly maintenance program.

### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: This is no other viable choice.

### *Rust Stains on Limestone*

Aesthetically, the limestone provides a light colored building element which gives visual "lift" to the building. Stains on this element compromises this aesthetic effect.

### Rust Stains on Limestone - Treatment Options

No Treatment: While the stains pose no physical threat to the limestone, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultice: Treatment with clay poultices of ammonium thioglycolate will remove these stains

### Rust Stains on Limestone - Treatment Recommendation

Remove Stains with Iron Chelating or Iron Reducing Poultice: This is the least damaging method which will remove the rust staining.

### *Rusting Iron Railings*

Railings are provided primarily as a safety measure. If these railings fail at their bases, safety is not assured.

### Rusting Iron Railings - Treatment Options

No Treatment: Corrosion will continue at ever-increasing rates.

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: This approach deals with the current level of corrosion and prevents any future corrosion. This process should be part of a periodic maintenance program on 2-3 year cycles.

### Rusting Iron Railings - Treatment Recommendation

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: Demolition of the areaway concrete will obviate this approach at that location. Otherwise it is the standard treatment.

### *Failing Paint on Tin Roofs*

Paint is applied to metal surfaces to provide protection and give color balance.

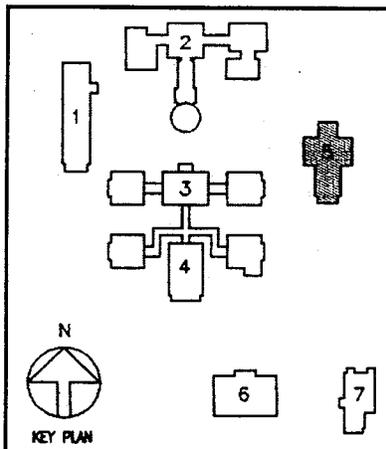
### Failing Paint on Tin Roofs - Treatment Options

No Treatment: Corrosion and paint loss will occur.

Scrape, Prime, and Paint: This approach deals with the current level of corrosion and any future corrosion as well as re-establishes the color balance on the elevation. This process should be part of a periodic maintenance program on 5-year cycles.

### Failing Paint on Tin Roofs - Treatment Recommendation

Scrape, Prime, and Paint: This approach deals with the current level of corrosion and any future corrosion; it will also re-establish the color balance on the elevation. This process should be part of a periodic maintenance program on 5-year cycles.

**BUILDING 5: EXISTING EXTERIOR CONDITIONS****Introduction**

Conditions on Building 5 at the Potomac Annex are generally good. On Building 5 the yellow brickwork exhibits light and superficial soiling requiring little or no intervention. The granite on this building shows more moderate soiling. The use of window air conditioners has resulted in staining of some granite elements such as window sills and the water table or band course.

The pointing on this building is generally in excellent condition, with notable exception. On Building 5 where granite building elements such as keystones, sills and band courses meet brickwork, the mortar joints are open. In addition the end joints of canted brick lintels are consistently open. Further, the butt joints on the granite band courses at ground level are open or have been badly repointed or caulked. From these open joints on the band course, cracks have emanated and open joints extend to the first floor granite window sills and, in some cases, to second floor windows. Damage to brickwork other than stress cracks is minor.

With the exception of the columns on Building 5, wooden elements require only typical periodic maintenance consisting of scraping and painting.

Concrete has generally not fared well in this building. Sidewalks and associated walls exhibit deterioration which is at times severe.

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning.

**Brick**General Conditions and Soiling

Yellow, unglazed brick is the primary construction material for Building 5. Overall the brick is in good condition while exhibiting light, superficial soiling.

Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 5 in association with the vertical and head joints of the granite water table. The stresses associated with the open joints transfer up and through the bricks above, following the mortar joint pattern. Frequently, they continue up to the first floor granite window sills (Figure 5-1). Articulated brick corners have consistently open joints where the corners meet the plane of the brick walls (Figure 5-2). These conditions are

pervasive on all elevations of Building 5. Stress cracks and open joints are also associated with the loading area on the north elevation of Building 5 (Figure 5-3).

### Other Open Joints

The head of the windows in Building 5 consist of wedged shaped brick voussoirs with granite keystones. The joints between the keystones and brick are consistently open as are the joints between the brick voussoir at each end of the window head trim and the surrounding brickwork of the wall.

### Damaged Brick

The northwest corner of Building 5 has damaged brick. (Figure 5-4).

### *Concrete*

Concrete is used at the portico (north) and two side porches (east and west elevations) on Building 5. The steps of the west porches are damaged (Figure 5-5) and rusted railings have damaged the concrete capstones (Figure 5-6).

### *Wood*

Windows, dormers, cornices, and porches consist of painted wood. While the wood itself is in generally in good condition (windows in the dormers show more deterioration), most of these elements are in need of scraping, painting, and caulking. The main exception are the columns for the front porch, some of which show serious deterioration (Figure 5-7).

### *Copper*

Copper leaders and roof flashing are in good condition. However, the leaders and gutters require cleaning.

### *Cast Iron*

One wooden column on the front porch has been replaced with cast iron. The paint is peeling causing the iron to rust and stain the granite supports. (Figure 5-8).

### *Granite*

Granite forms the water table which surrounds the building at the base of the first floor. These elements - like the granite keystones - are generally in good condition but are lightly to heavily soiled (Figure 5-9). The joints between juxtaposed stones are open or have been filled with caulk or poorly repointed (Figure 5-10). The bed joints and top joints for the granite water table are generally open. Run-off from window air conditioners has stained the granite. Granite window

wells have open joints (Figure 5-11). Bitumen has been accidentally spattered on some granite window wells (Figure 5-12).

### ***Iron Railings***

Iron railings are generally in good condition, requiring only periodic scraping and painting. However, water entry at their bases has rusted some of the railings, causing damage to the concrete (Figure 5-6).

## **BUILDING 5: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS**

### ***Open Mortar Joints in Brick and Stone Elements***

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin, but also expansion/contraction joints to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

#### **Open Joints - Treatment Options**

No Treatment: Water will continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

#### **Open Joints - Treatment Recommendation**

Cut and Point: There is no viable alternative to this approach.

### ***Stress Cracks in Brickwork***

Building stresses can be transferred from one element to another. At Building 5 the stress cracking in the brick is related to the open head joints in the granite water table. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer to the weakest elements, then the mortar and finally the brick will crack. This allows more water to enter resulting in further, often more serious, deterioration of other building elements. This condition may also be caused by rusting iron anchors in window lintels and sills.

### Stress Cracks, Cracked or Spalled brick - Treatment Options

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color, texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

### Stress Cracks, Cracked, Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This options returns the mechanical integrity of the wall and also provides an aesthetically superior solution.

### *Cracked and Deteriorating Concrete Capstones on West Porch*

The concrete capstones have both an aesthetic and mechanical function. Capstones are added to cap or cover the exposed joints in a brick or concrete block wall or to cap or finish the top of a concrete wall. Pre-cast concrete capstones can be shaped to shed water (by canting and the use of a drip edge), thereby protecting the wall. In order to preserve the wall which they protect, the capstones require proper maintenance by repointing all deteriorated joints and replacing all cracked stones to match existing. Where poorly maintained posts of metal railings have caused cracking of the concrete capstone, they should be patched to prevent further damage.

### Cracked and Deteriorating Concrete Capstones - Treatment Options

No Treatment: Deterioration will continue and become more severe. Current damage to the capstones is unsightly.

Repointing of Joints and Repair Using Concrete Patching Techniques: While this option slows deterioration, concrete patches are difficult to execute and may not match the existing concrete. The bitumen surrounding certain cross joints can be mechanically removed and the joints repointed with mortar.

Demolish and Rebuild: This allows for the setting of a sleeve within the new capstone to receive the metal posts of the railings and re-setting of the capstones.

#### Cracked and Deteriorating Concrete Capstones - Treatment Recommendations

Demolish and Rebuild: This is the preferred repair. It eliminates a great deal of maintenance.

#### *Deteriorating Concrete Steps on North, East and West Porches*

Steps are needed to provide safe and easy access to buildings with different levels, deteriorating steps are a safety hazard.

#### Deteriorating Concrete Steps - Treatment Options

No Treatment: The concrete will continue to deteriorate at increasing rates and continue to pose a safety hazard.

Repair in Concrete: Deteriorated areas would be removed, rebar corrosion removed and then painted and patched with a sympathetic concrete material. This solution will be temporary and unsightly.

Demolish and Rebuild: This option is the most expensive, but the steps are badly damaged, and capstones and railing should be dealt with at the same time.

#### Deteriorating Concrete Steps - Treatment Recommendation

Demolish and Rebuild: This is the best option both visually and for safety; the rebuilt steps should be constructed with granite to match existing.

#### *Peeling and Failing Paint on Wood*

(Note: some dormer windows may need to be replaced.)

Paint not only protects wood from excessive moisture and ultra-violet light damage, but also decorates particular elements, establishing the tonal pattern on the building elevation. Periodically, the paint should be renewed to re-establish both of these purposes.

#### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate. More paint will fail, therefore, compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

#### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

#### *Damaged Wood on North Porch Columns*

The columns provide support for the portico roof. The paint on the columns is severely checked and peeling, indicating moisture within the columns.

#### Damaged Wood on North Porch Columns - Treatment Options

No Treatment: Wood will continue to rot and deteriorate.

Remove Rotted Wood; Replace with New Wood Elements: New pine or poplar wood bases will re-establish the structural integrity of the columns. Wood dutchmen can be used to replace small areas of rot. Other voids can be filled with epoxy wood filler. A method to increase the air circulation within the hollow column should be devised.

#### Damaged Wood on North Porch Columns - Treatment Recommendation

Remove Rotted Wood; Replace with New Wood Elements: This is the only viable option.

#### *Blocked Copper Gutters and Leaders*

Gutters and leaders are provided to conduct water off of the building. When they are not properly maintained, water will collect and expand, especially during cold weather, causing more extensive damage to the storm drainage system as well as other parts of the building.

#### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This should be part of a yearly maintenance program.

#### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: There is no other acceptable option.

### ***Rust Stains on Granite Band Course***

Aesthetically, the granite band course not only provides a light colored building element which gives visual "lift" to the building, but it also helps shed water off of the wall. Stains on this element compromise the aesthetic effect.

#### **Rust Stains on Granite Band Course - Treatment Options**

No Treatment: While the stains pose no physical threat to the granite, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultice: Treatment with clay poultices of ammonium thioglycolate will remove these stains. (See also Chapter 8. *Materials Cleaning Analysis*)

#### **Rust Stains on Granite Band Course - Treatment Recommendation**

Remove Stains with Iron Chelating Poultice: This is the least damaging method to remove the rust staining.

### ***Rusting Iron Railings***

(Note: See related deficiency, *Cracked and Deteriorating Concrete Capstones*, above.)

Railings are provided primarily as a safety measure. If these railings fail at their bases, safety is not assured.

#### **Rusting Iron Railings - Treatment Options**

No Treatment: Corrosion will continue at ever-increasing rates.

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: This approach deals with the current level of corrosion and prevents future corrosion. This process should be part of a periodic maintenance program on 2-3 year cycles.

#### **Rusting Iron Railings - Treatment Recommendation**

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: Demolition of the areaway concrete will obviate this approach at that location. Otherwise it is the standard treatment.

### *Rusting Iron Replacement Column Plinth on North Portico*

Maintenance of this plinth is essential to the structural integrity of the entrance portico.

#### Rusting Iron Replacement Column Plinth on North Portico - Treatment Options

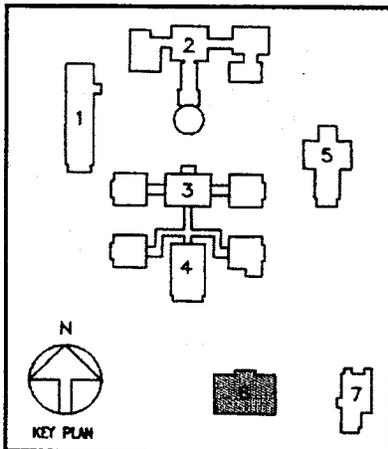
No Treatment: Corrosion will continue and eventually threaten the structure of the portico.

Scrape, Prime and Paint: Scraping will remove the existing corrosion. Priming with a carefully selected metal primer will prevent further rusting. Fresh paint will unite the column paint with the existing paint scheme and protect the primer. This repair will not prevent rust from continuing to form on the interior surface.

Replacement: Replace the existing metal plinth with a wooden plinth to match adjacent wooden plinths in material and profile. Coordinate this work with the work proscribed in Damaged wood on North Porch Columns section above.

#### Rusting Iron Replacement Column on North Portico - Treatment Recommendation

Replacement: Replace the existing metal plinth with a wooden plinth to match adjacent wooden plinths in material and profile. Coordinate this work with the work proscribed in the Damaged wood on North Porch Columns section above.

**BUILDING 6: EXISTING EXTERIOR CONDITIONS****Introduction**

Conditions on Building 6 at the Potomac Annex are generally good. On Building 6 the yellow brickwork exhibits light and superficial soiling requiring little or no intervention. The granite on this building shows more moderate soiling. The use of window air conditioners has resulted in staining of some granite elements such as window sills and the water table or band course.

The pointing on this building is generally in excellent condition, with notable exception. On Building 6 where granite building elements such as keystones, sills and band courses meet brickwork, the mortar joints are open. In addition the end joints of canted brick lintels are consistently open. Further, the butt joints on the granite band courses at ground level are either open, badly repointed, or caulked. From these open joints on the band course cracks have emanated and open joints extend to the first floor granite window sills and, in some cases, up to second floor windows. Damage to brickwork other than stress cracks is minor.

On Building 6, wooden elements require only typical periodic maintenance consisting of scraping and painting. Concrete has generally not fared well in this building. Sidewalks and associated walls exhibit deterioration which is at times severe.

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning.

**Brick**General Conditions and Soiling

Yellow, unglazed brick is the primary construction material for Building 6. Overall the brick is in good condition while exhibiting light, superficial soiling.

Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 6 in association with the vertical or head joints of the granite water table. The stresses associated with the open joints transfer up and through the brick above, following the mortar joint pattern. Frequently they continue up to the first floor granite window sills (Figure 6-1). In some cases these cracks extend below the water table to the granite basement window lintels (Figures 6-2 and 6-3). Articulated brick corners have consistently open joints where the corners meet the plane of the brick walls. These conditions are pervasive on all elevations. Brick work below grade on the west side of the front entrance shows efflorescence and open joints (Figure 6-4).

### Other Open Joints

The head of the windows in Building 6 consist of wedged shaped brick voussoirs with granite keystones. The joints between the keystones and brick are consistently open as are the joints between the brick voussoir at each end of the window head trim and the surrounding brickwork of the wall.

### Damaged Brick

Embedded metal anchors (purpose unknown) remain in place or have been removed, leaving holes in the masonry (Figure 6-5). The holes are unsightly while the metal anchors are sites of future damage by freezing water.

### *Concrete*

Concrete steps and sidewalks leading to the basement on the west side of the entrance portico show signs of deterioration by expanding (rusting) iron railings (Figure 6-6) and otherwise general failure (Figures 6-7 and 6-8).

### *Wood*

Windows, dormers, cornices, the portico and porches consist of painted wood. While the wood itself is generally in good condition, most of these elements are in need of scraping, painting and caulking.

### *Copper*

Copper leaders and roof flashing are in good condition; however, leaders and gutters require cleaning.

### *Granite*

Granite forms the water table which surrounds the building at the base of the first floor. These elements - like the granite keystones and basement window lintels and sills - are generally in good condition but are lightly to heavily soiled. The joints between juxtaposed stones are open or have been filled with caulk or too strong of a pointing mortar. The bed joints and the top horizontal joints for the granite water table are generally open. Run-off from window air conditioners has stained some of the granite.

### *Iron Railings*

Iron railings are generally in good condition. They require periodic scraping and painting. Water entry at their bases has rusted some of the railings, causing damage to the concrete. (Figure 6-6).

**BUILDING 6: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS*****Open Mortar Joints in Brick and Stone Elements***

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin, but also expansion/contraction joints to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

**Open Joints - Treatment Options**

No Treatment: Water will begin or continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

**Open Joints - Treatment Recommendation**

Cut and Point: There is no viable alternative to this approach.

***Stress Cracks in Brickwork***

Building stresses can be transferred from one element to another. At Building 6 the stress cracking in the brick is related to the open head joints in the granite water table. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer from weakest elements to the mortar and then the brick will crack. This allows more water to enter resulting in further, often more serious, deterioration of other building elements. This condition may also be caused by rusting iron anchors in window lintels and sills.

**Stress Cracks, Cracked or Spalled brick - Treatment Options**

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color, texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

#### Stress Cracks, Cracked, Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This options returns the mechanical integrity of the wall and also provides an aesthetically superior solution.

#### *Holes and Metal Inserts in Brickwork*

The holes and metal inserts appear to have been supports for signage. If allowed to remain within the brickwork, they will continue to deteriorate and expand, causing the brick to crack and spall. The holes offer entry ports for water causing subsequent freeze/thaw damage.

#### Holes and Metal Inserts in Brickwork - Treatment Options

No Treatment: The holes will continue to allow water to enter the wall, and the existing metal inserts will continue to rust. Both actions have the potential to cause unsightly damage to the brick.

Remove Inserts and Fill All holes: A sympathetic mortar mix with fine sand, cement, lime and pigment can be used to fill these holes.

Remove and Replace Brick: Brick can be cut out and replaced with matching brick and mortar.

#### Holes and Metal Inserts in Brickwork - Treatment Recommendations

Remove Inserts and Fill All holes: The holes are small enough such that a mortar replacement will not be unsightly, and it will be permanent.

#### *Cracked and Deteriorating Concrete Steps and Sidewalks*

(Note: See also *Rusting Iron Railings* below.)

Steps and sidewalks are needed to provide safe and easy access to buildings with different levels. Deteriorating steps are a safety hazard.

### Cracked and Deteriorating Concrete Steps and Sidewalks - Treatment Options

No Treatment: The concrete deterioration will continue and become more severe. Current damage is unsafe and unsightly.

Repair with Concrete Patching Techniques: Deteriorated areas would be removed, rebar corrosion removed and then painted and patching with a sympathetic concrete material executed. While this solution will slow down the deterioration, it is difficult to execute well and could be unsightly.

Demolish and Rebuild: This option allows for complete repair of the rusting railings as well as re-establishing safe access.

### Cracked and Deteriorating Concrete Steps and Sidewalks - Treatment Recommendation

Demolish and Rebuild: This is the best option for both visual and safety reasons.

### *Peeling and Failing Paint on Wood*

Paint not only protects wood from excessive moisture and ultra-violet light damage, but also decorates particular elements, establishing the tonal pattern on the building elevation. Paint should be renewed to re-establish both of these purposes from time to time.

### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate, and more paint will fail, therefore compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

### *Blocked Copper Gutters and Leaders*

Gutters and leaders are provided to conduct water off of the building. When not properly maintained, water will collect and freeze during cold weather, causing more extensive damage to the storm drainage system as well as other parts of the building.

### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This should be part of a yearly maintenance program.

#### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: This is no other choice.

#### *Rust Stains on Granite Band Course*

Aesthetically, the granite band course provides a light colored building element which gives visual "lift" to the building. Stains on this element compromise the aesthetic effect.

#### Rust Stains on Granite Band Course - Treatment Options

No Treatment: While the stains pose no physical threat to the granite, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultice: Treatment with clay poultices of ammonium thioglycolate will remove these stains. (See also Chapter 8 *Materials Cleaning Analysis*)

#### Rust Stains on Granite Band Course - Treatment Recommendation

Remove Stains with Iron Chelating Poultice: This is the least damaging method to remove the rust staining.

#### *Rusting Iron Railings*

(Note: See related deficiency, *Cracked and Deteriorating Concrete Steps and Sidewalks*, above.)

Railings are provided primarily as a safety measure. If these railings fail at their bases, safety is not assured.

#### Rusting Iron Railings - Treatment Options

No Treatment: Corrosion will continue at ever-increasing rates.

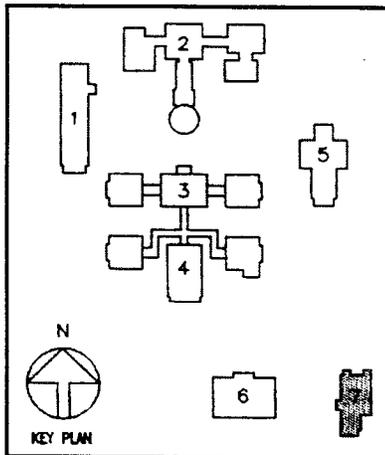
Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: This approach deals with the current level of corrosion and any future corrosion. This process should be part of a periodic maintenance program on 2-3 year cycles.

#### Rusting Iron Railings - Treatment Recommendation

(Note: The recommended treatment below is valid only as long as concrete steps and walks continue to be patched. If the existing concrete is replaced, then the correct construction detail for installing metal posts in concrete should be used.)

Excavate, Scrape, Prime, Paint, Fill with Concrete, Caulk: It is the standard repair for this deficiency.

## BUILDING 7: EXTERIOR EXISTING CONDITIONS

*Introduction*

Conditions on Building 7 at the Potomac Annex are generally good. On Building 7 the yellow brickwork exhibits light and superficial soiling requiring little or no intervention. The granite on this building shows more moderate soiling. The use of window air conditioners has resulted in staining of some granite elements such as window sills and the water table or band course.

The pointing on this building is generally in excellent condition, with notable exception. On Building 7 where granite building elements such as keystones, sills and band courses meet

brickwork, the mortar joints are open. In addition the end joints of canted brick lintels are consistently open. Further, the butt joints on the granite band courses at ground level are open or have been badly repointed or caulked. From these open joints on the band course, cracks have emanated and open joints extend to the first floor granite window sills and, in some cases, up to second floor windows. Damage to brickwork other than stress cracks is minor.

On Building 7, wooden elements require only typical periodic maintenance consisting of scraping and painting. Concrete has generally not fared well in this building. Sidewalks and associated walls exhibit deterioration which is at times severe.

Metal railings are in good condition with some rust evident where they are anchored into the concrete. Copper gutters and leaders - some recently replaced - are in good condition but require periodic cleaning.

*Brick*General Conditions and Soiling

Yellow, unglazed brick is the primary construction material for Building 7. Overall the brick is in good condition while exhibiting light, superficial soiling. Bitumen has been spattered on the brickwork when waterproofing repairs were executed (Figure 7-1).

Stress Cracks and Open Joints

Stress cracks and open joints are found on Building 7 in association with the vertical or head joints of the granite water table. The stresses associated with the open joints transfer up and through the brick above, following the mortar joint pattern. Frequently they continue up to the first floor granite window sills. Articulated brick corners have consistently open joints where the corners meet the plane of the brick walls. These conditions are pervasive on all elevations. Semi-round brick arches also have open mortar joints (Figure 7-2). Brickwork near a concrete retaining wall contains open joints due to shifting of the concrete wall (Figure 7-3).

### Other Open Joints

The head of the windows in Building 7 consist of wedged shaped brick voussoirs with granite keystones. The joints between the keystones and brick are consistently open as are the joints between the brick voussoir at each end of the window head trim and the surrounding brickwork of the wall (Figure 7-4).

### *Concrete*

Concrete is used for the walkways and nearby walls as well as a retaining wall on Building 7. The tops of the walls associated with walkways have been repaired in the past, and these repairs are failing (Figure 7-5). Some concrete stucco is also failing where it has been directly applied to brickwork (Figure 7-6). A concrete retaining wall on the west elevation near the main entrance portico shows efflorescence and some bulging (Figure 7-7). Concrete bases for the piers under the entrance portico are damaged (Figure 7-8). Other sidewalk walls have damaged capstones (Figure 7-9).

### *Wood*

Windows, dormers, cornices, the portico and the sun porch consist of painted wood. While the wood itself is generally in good condition, most of these elements (especially small dormers) are in need of scraping, painting, and caulking.

### *Copper*

Copper leaders and roof flashing are in good condition. However, leaders and gutters require cleaning.

### *Granite*

Granite forms the water table which surrounds the building at the base of the first floor. These elements - like the granite keystones - are generally in good condition but are soiled in a range from light to heavy. However, the joints between juxtaposed stones are open or have been filled with caulk. The bed joints and the top horizontal joints for the granite water table are generally open. Run-off from window air conditioners has stained some of the granite. Granite steps exhibit failing pointing and caulking (Figure 7-10).

### *Iron Railings*

Iron railings are generally in good condition, requiring periodic scraping and painting.

**BUILDING 7: EXTERIOR TREATMENT OPTIONS AND RECOMMENDATIONS*****Open Mortar Joints in Brick and Stone Elements***

Brick and stone construction elements are pointed with mortar to provide not only a watertight skin, but also expansion/contraction joints to buildings. Pointing requires periodic maintenance. Where the mortar is cracked or missing, water can enter the wall causing deterioration of metal construction elements or interior decorative materials such as plaster or wood.

**Open Joints - Treatment Options**

No Treatment: Water will begin or continue to deteriorate the wall with increasing intensity.

Cut and Point: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

**Open Joints - Treatment Recommendation**

Cut and Point: There is no viable alternative to this approach.

***Stress Cracks in Brickwork***

Building stresses can be transferred from one element to another. At Building 7 the stress cracking in the brick is related to the open head joints in the granite water table. Moisture entering the wall through open joints has caused expansion/contraction stresses within the wall. Due to the nature of masonry construction, these stresses easily transfer from the weakest elements, to the mortar and finally the brick will crack. This allows more water to enter which results in further, often more serious, deterioration of other building elements.

**Stress Cracks, Cracked or Spalled brick - Treatment Options**

(Note: Treatments discussed here are for cracked brick. Open mortar joints associated with the stress cracks should be cut out and repointed as above.)

No Treatment: Water will continue to cause further deterioration of building elements.

Epoxy Repair: Structural epoxies can mend broken bricks, but this technique is often difficult to execute and unsightly when completed.

Remove and Replace Brickwork: Bricks are cut out and replacements that match existing in texture, color and size are reset in mortar to match surrounding pointing in color,

texture, and profile. Retain as much of the original materials as possible; replacement material should match, as closely as possible, the original material. If rusting metal sills or lintels are found, remove them and install stainless steel replacements. Where bricks have been damaged by impact, install protective devices such as guard rails and stanchions.

#### Stress Cracks, Cracked, Spalled Brickwork - Treatment Recommendation

Remove and Replace Brickwork: This option returns the mechanical integrity of the wall and also provides an aesthetically superior solution.

#### *Cracked and Deteriorating Concrete Walkways and Wall Capstones*

Walkways and wall capstones are needed to provide safe and easy access to buildings as well as aesthetic purposes.

#### Cracked and Deteriorating Concrete Walkways and Wall Capstones - Treatment Options

No Treatment: The concrete deterioration will continue and become more severe. Currently, the damaged walkways are unsafe and unsightly.

Repair with Concrete Patching Techniques: Deteriorated areas would be removed, rebar corrosion removed and then painted and patched with a sympathetic concrete material executed. While this solution will slow down the deterioration, it is difficult to execute well and could be unsightly.

Demolish and Rebuild: This option allows for complete repair as well as re-establishing safe access.

#### Cracked and Deteriorating Concrete Walkways and Wall Capstones - Treatment Recommendation

Demolish and Rebuild: This is the best option both visually and for safety.

#### *Bulging Concrete Retaining Wall*

The pressure of juxtaposed earth combined with hydrostatic water pressure and salt crystallization are strong enough forces to shift and cause retaining walls to bulge.

#### Bulging Concrete Retaining Wall - Treatment Options

No Treatment: Shifting or bulging of the wall will continue and may ultimately lead to unsafe conditions.

Excavate, Waterproof, Cut and Point: Earth is excavated from next to the wall, the waterproofing skin renewed. This will keep the wall in its current configuration.

Rebuild Wall: The existing wall is demolished. Earth is excavated and the wall is rebuilt with proper waterproofing.

#### Bulging Concrete Retaining Wall - Treatment Recommendation

Rebuild Wall: Continued movement of this wall could jeopardize the support for the entrance.

#### *Failed Concrete Stucco*

Stucco has been applied for decorative purposes. When it was installed, the proper surface preparation was omitted.

#### Failed Concrete Stucco - Treatment Options

No Treatment: The stucco presents no real hazard but will continue to fall off in a random manner.

Remove Stucco on Decorative Brick Only: Remove the existing stucco with hand tools from the yellow semi-glazed brick.

#### Failed Concrete Stucco - Treatment Recommendations

Remove Stucco on Decorative Brick Only: This requires little intervention with little risk of damage to the brick.

#### *Deteriorating Concrete Bases for Brick Piers*

The concrete bases provide support for entrance piers. If they become compromised structurally, the piers will fail, causing extensive damage to the entrance portico above.

#### Deteriorating Concrete Bases for Brick Piers - Treatment Options

No Treatment: Further deterioration of the concrete will ultimately jeopardize the piers.

Repair with Concrete Patching Techniques and Waterproof: Excavation of the earth near the bases can be followed by patching with new concrete. After the concrete cures, it should be waterproofed before the earth is pushed back into place. This will slow or stop the current deterioration.

### Deteriorating Concrete Bases for Brick Piers - Treatment Options

Repair with Concrete Patching Techniques and Waterproof: Complete demolition is not necessary since little of these bases is visible. This repair will adequately extend the lifetime of the bases.

### *Peeling and Failing Paint on Wood*

Paint not only protects wood from excessive moisture and ultra-violet light damage, but also decorates particular elements, establishing the tonal pattern on the building elevation. Paint should be renewed to re-establish both of these purposes from time to time.

### Peeling and Failing Paint - Treatment Options

No Treatment: Wood elements will continue to deteriorate. More paint will fail therefore compromising the aesthetics of the building.

Scrape, Prime, Paint and Caulk: This should be part of the normal maintenance program every 5 to 7 years.

### Peeling and Failing Paint - Treatment Recommendation

Scrape, Prime, Paint and Caulk: There is no other viable choice.

### *Blocked Copper Gutters and Leaders*

Gutters and leaders are provided to conduct water off of the building. When they are not properly maintained, water will collect and expand, especially during cold weather, causing more extensive damage to the storm drainage system as well as other parts of the building.

### Blocked Copper Gutters and Leaders - Treatment Options

No Treatment: Continued deterioration of paint and wood in areas where water builds up above the blockage.

Clear Gutters and Leaders: This should be part of a yearly maintenance program.

### Blocked Copper Gutters and Leaders - Treatment Recommendation

Clear Gutters and Leaders: There is no other acceptable option.

### *Rust Stains on Granite Band Course*

Aesthetically, the granite band course provides a light colored building element which gives visual "lift" to the building. Stains on this element compromise the aesthetic effect.

#### Rust Stains on Granite Band Course - Treatment Options

No Treatment: While the stains pose no physical threat to the granite, the aesthetic problems are obvious.

Remove Stains with Iron Chelating Poultice: Treatment with clay poultices of ammonium thioglycolate will remove these stains. (See also Chapter 8 *Materials Cleaning Analysis*.)

#### Rust Stains on Granite Band Course - Treatment Recommendation

Remove Stains with Iron Chelating Poultice: This is the least damaging method to remove the rust stains.



Figure 1-1

Location: North Elevation of Building 1 at West End

Problem: Stress crack (and open joints) from granite water table joint to first floor window

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.



Figure 1-2

Location: East Elevation of Building 1 at North End

Problem: Stress crack (and open mortar joints) between first and second floor windows

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.



Figure 1-3

Location: East Elevation of Building 1 in South Areaway

Problem: Open mortar joints

Cause of Problem: Freezing water in open joints of granite water table.

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.



Figure 1-4

Location: East Elevation of Building 1 in Central Areaway

Problem: Open mortar joints and stress cracks in brickwork

Cause of Problem: Freezing water in open joints.

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile. Crack brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.



Figure 1-5

Location: East Elevation of Building 1 in South Areaway

Problem: Open and badly repointed joints associated with iron railings

Cause of Problem: Freezing water in open joints, rusting iron railings

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.



Figure 1-6

Location: East Elevation of Building 1 at North End

Problem: Open joints between granite keystones and brick voussoirs

Cause of Problem: Freezing water in open joints

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

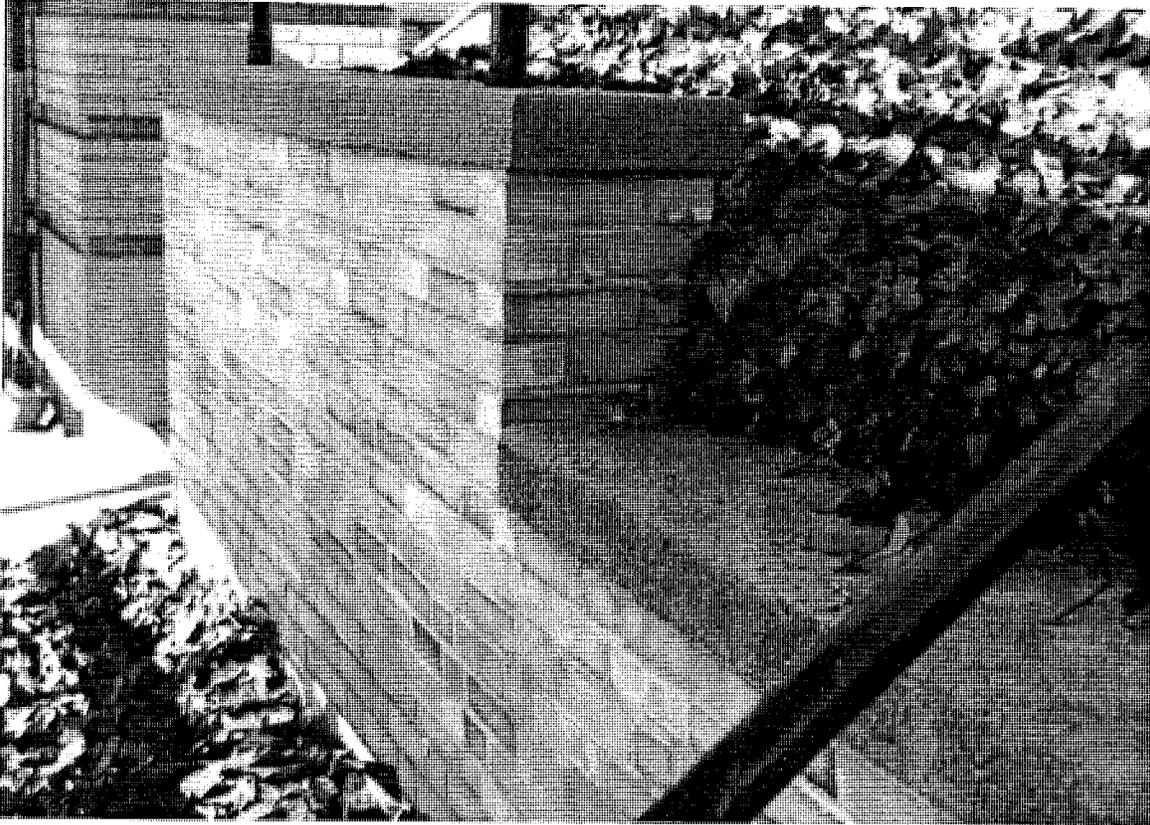


Figure 1-7

Location: South Elevation of Building 1 near South Areaway

Problem: Bulging and efflorescing brick retaining wall

Cause of Problem: Movement and freezing of water in the wall

Suggested Remedy: Earth should be excavated from next to the wall, the waterproofing skin renewed. The opposite side of the wall is cut and repointed.

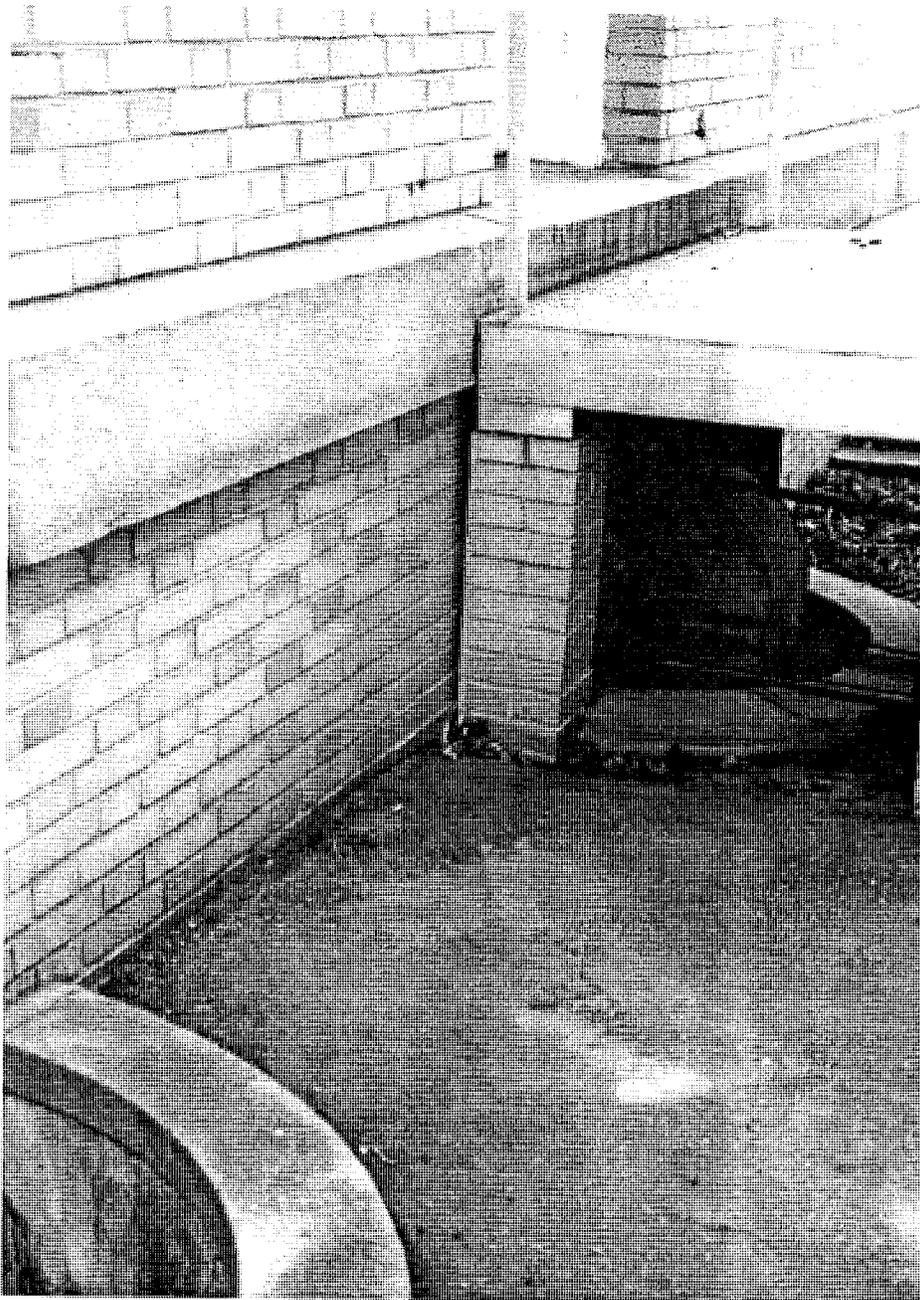


Figure 1-8

Location: North Elevation of Building 1 at Central Steps

Problem: Shifting of brick piers for steps

Cause of Problem: Rear piers not anchored to walls

Suggested Remedy: Rebuild piers anchoring rear ones to the wall

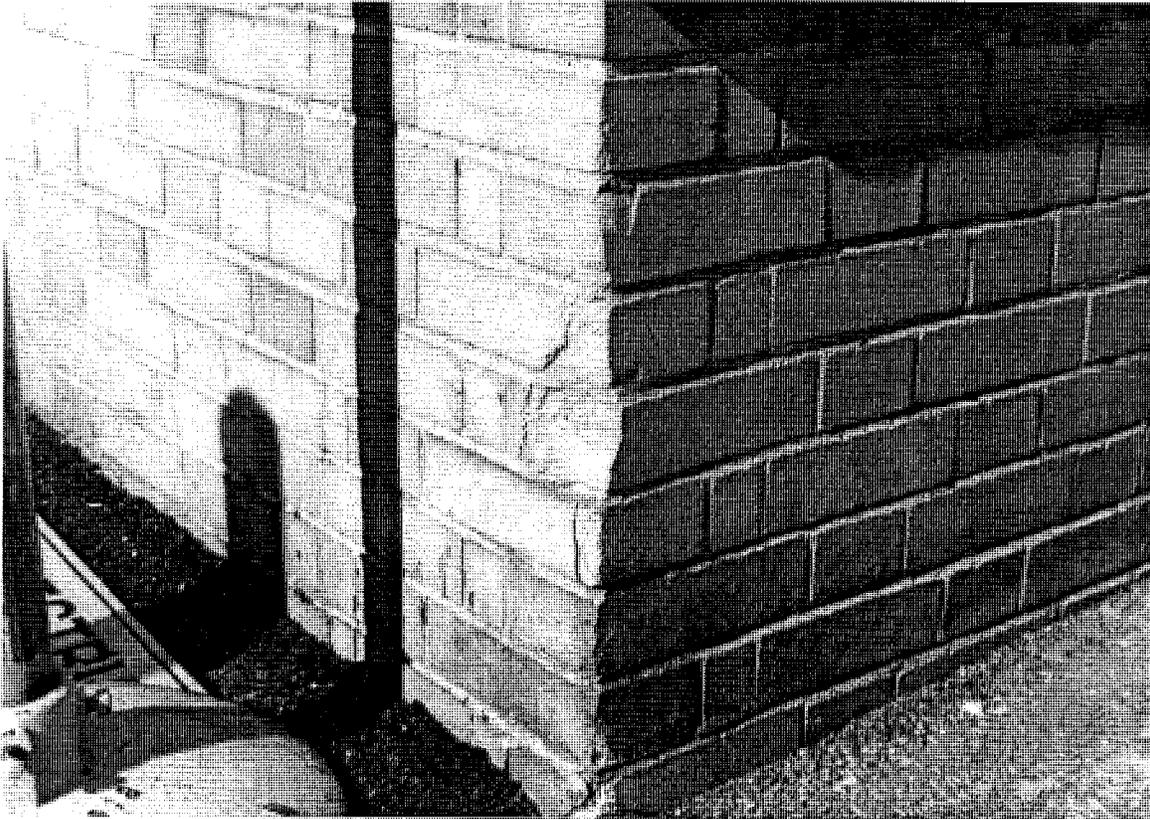


Figure 1-9

Location: Northeast Corner of Building 1

Problem: Damaged brick

Cause of Problem: Impact from vehicles

Suggested Remedy: Brick should be removed and replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.



Figure 1-10

Location: East Elevation of Building 1 in Central Area

Problem: Spalled brick

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.



Figure 1-11

Location: East Elevation of Building 1 at North End

Problem: Movement of concrete window wells

Cause of Problem: Freezing water in joints between brick wall and window well

Suggested Remedy: Demolish and rebuild



Figure 1-12

Location: East Elevation of Building 1 in Central Area

Problem: Failure of joint between brick walls and concrete window wells

Cause of Problem: Freezing water in joints between brick wall and window well

Suggested Remedy: Demolish and rebuild



Figure 1-13

Location: East Elevation of Building 1 at North End

Problem: Damaged tops of concrete window wells

Cause of Problem: Freezing water and movement of window wells

Suggested Remedy: Demolish and rebuild

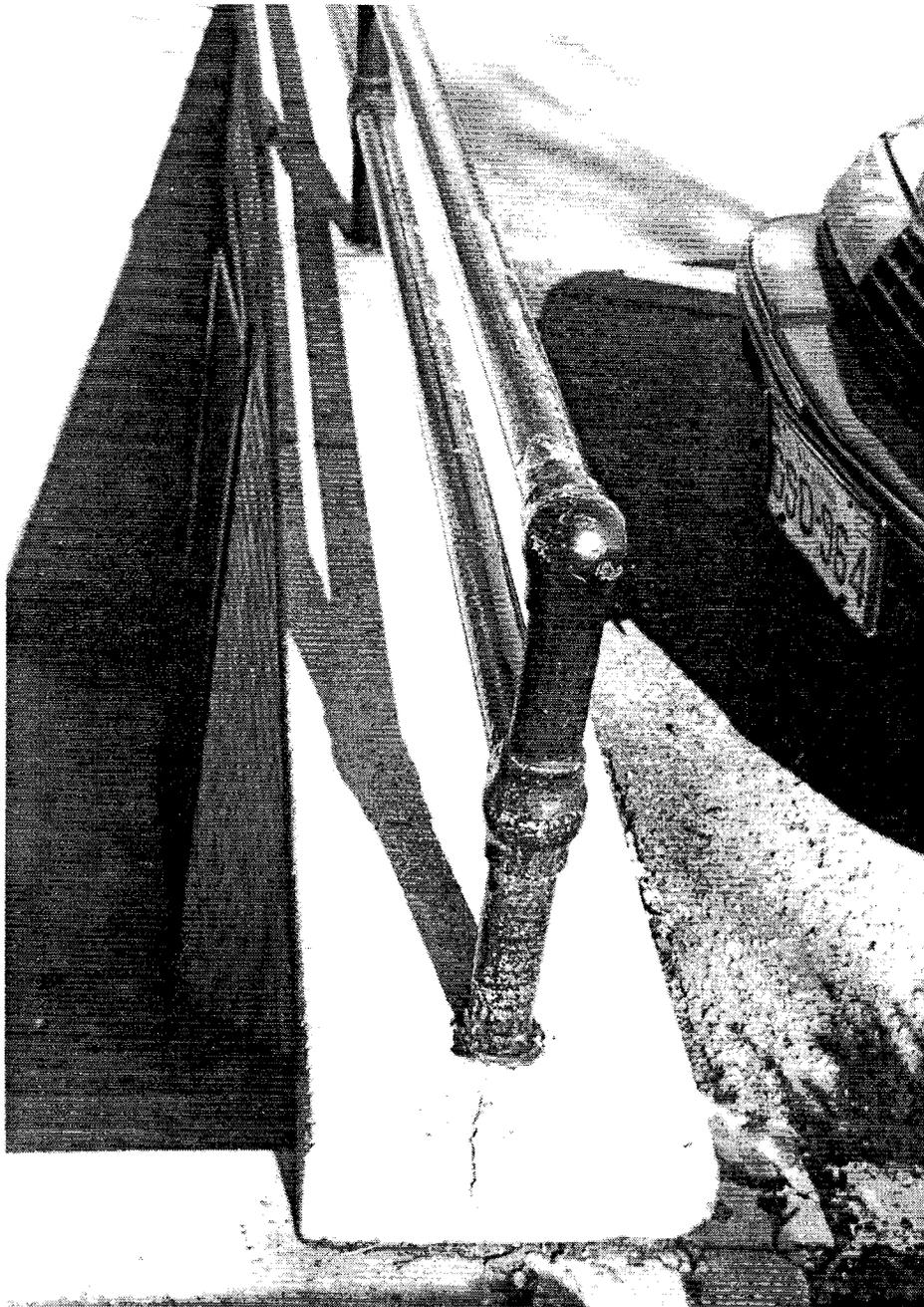


Figure 1-14

Location: East Elevation of Building 1 in Central Aeway

Problem: Damaged concrete capstones

Cause of Problem: Rusting iron railings

Suggested Remedy: Demolish and rebuild in concrete

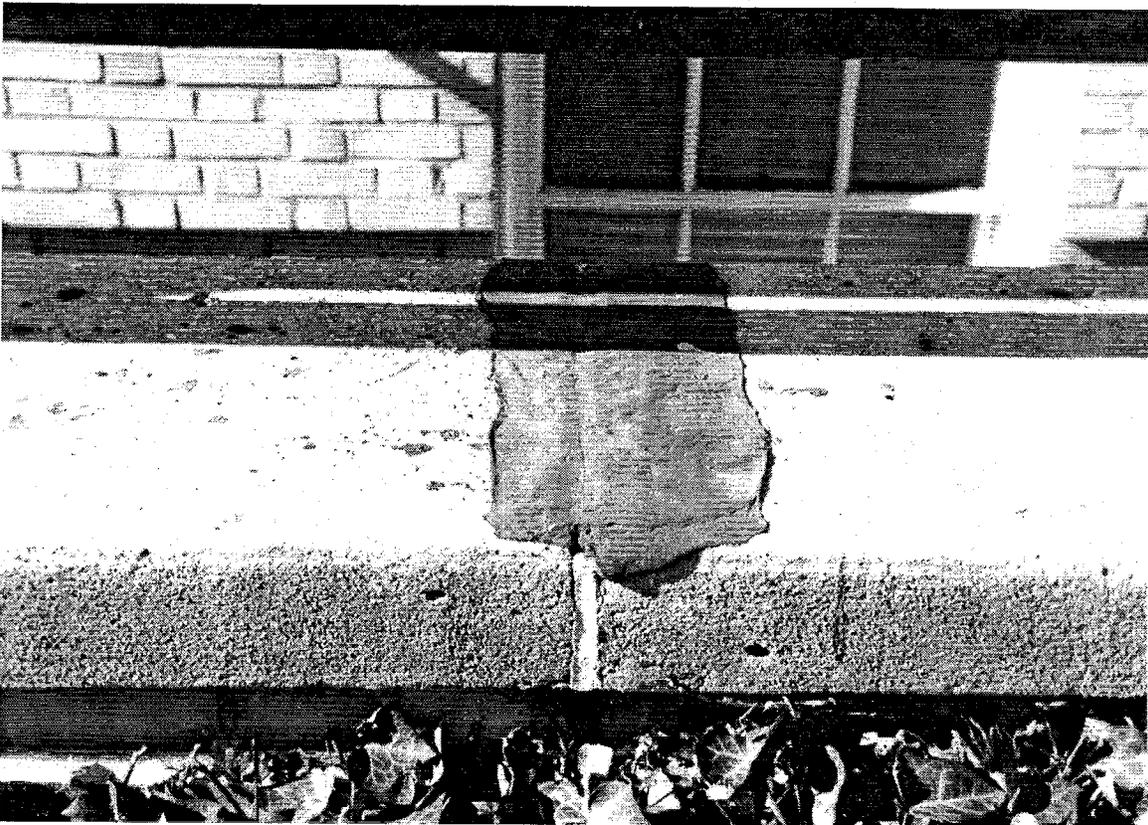


Figure 1-15

Location: East Elevation of Building 1 in South Areaway

Problem: Bitumen repairs to concrete capstone joints

Cause of Problem: Improper maintenance procedures

Suggested Remedy: Remove bitumen; cut and repoint joint (if capstones are replaced this remedy is unnecessary)

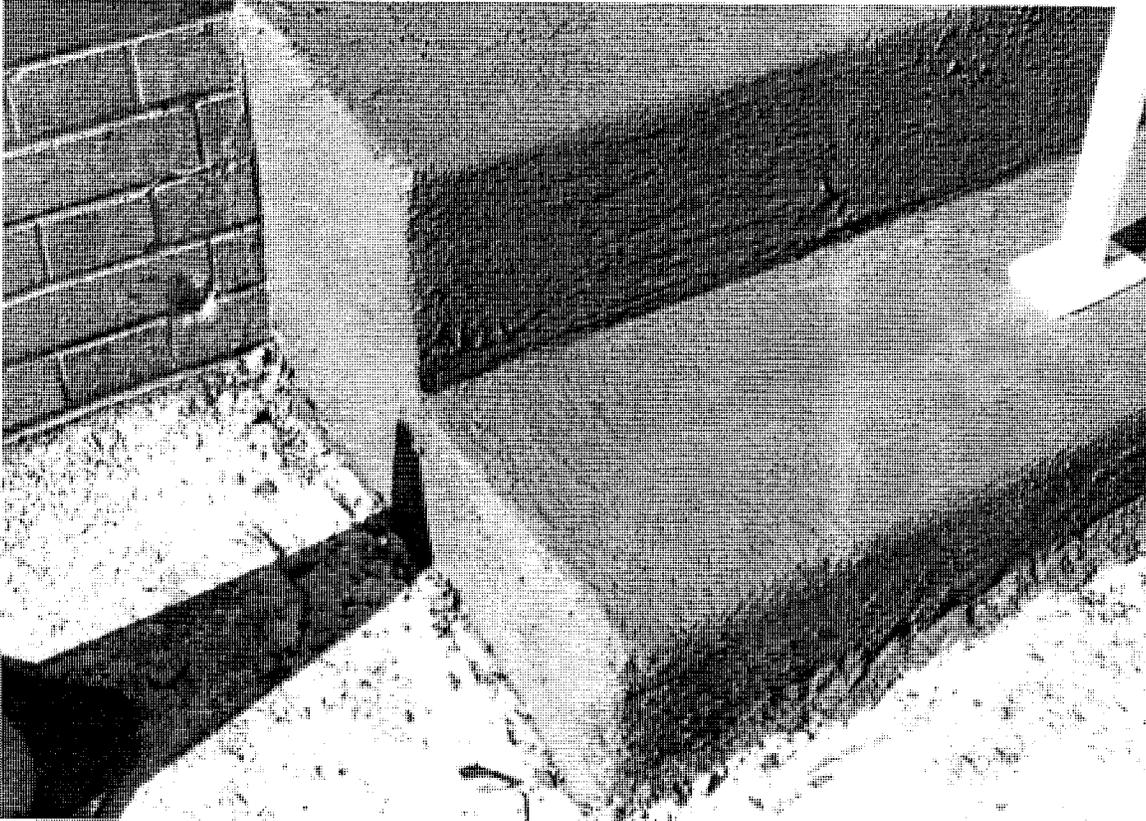


Figure 1-16

Location: East Elevation of Building 1 at South Entryway

Problem: Cementitious coating on concrete steps

Cause of Problem: Improper maintenance procedures

Suggested Remedy: Demolish and repour concrete slab



Figure 1-17

Location: South Elevation of Building 1 at South Areaway

Problem: Cracked concrete arches

Cause of Problem: Water penetration due to damaged concrete slab

Suggested Remedy: Demolish and repour concrete slab and arches



Figure 1-18

Location: South Elevation of Building 1 near Southwest Corner

Problem: Cracked concrete window "lintel"

Cause of Problem: Water penetration and rusting rebar

Suggested Remedy: Rebar should be cleaned and painted and a cement patch installed



Figure 1-19

Location: East Elevation of Building 1 at North End

Problem: Damage woodwork and paint

Cause of Problem: Water penetration due to blocked gutter and leader

Suggested Remedy: Clear and maintain gutters and leaders.

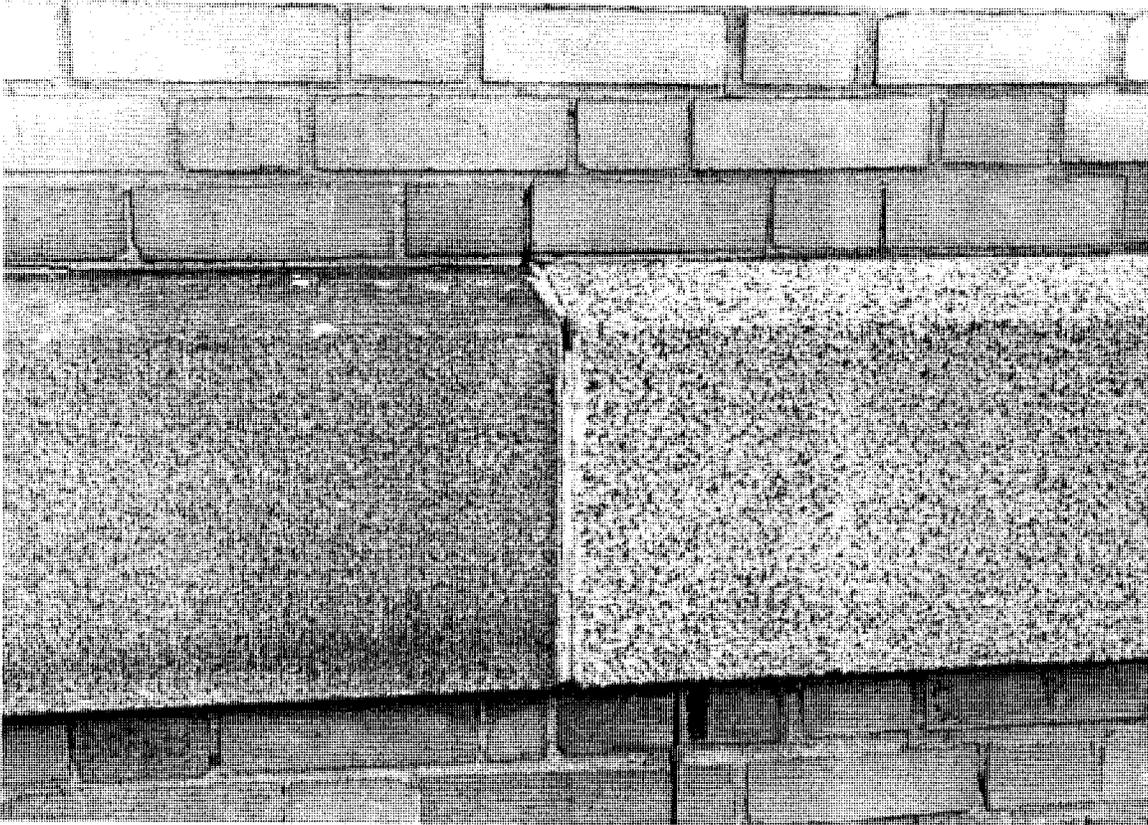


Figure 1-20

Location: North Elevation of Building 1 at near East End

Problem: Open mortar joints

Cause of Problem: Susceptibility of vertical joints to water run-off

Suggested Remedy: Cut and point (see Chapter VIII. Mortar Analysis for mortar suggestions)

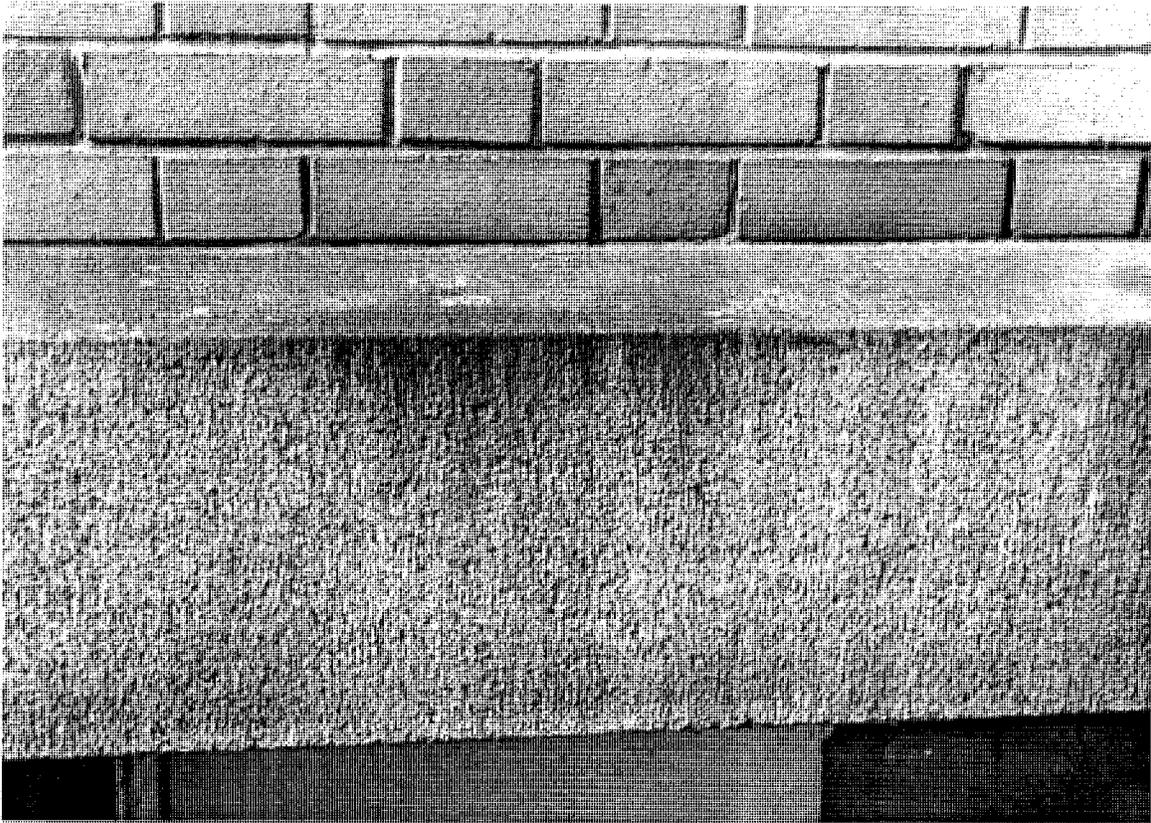


Figure 1-21

Location: East Elevation of Building 1 at near North Entrance

Problem: Rust stains on granite water table

Cause of Problem: Run-off from window air conditioners

Suggested Remedy: Poultice with iron-chelating agent



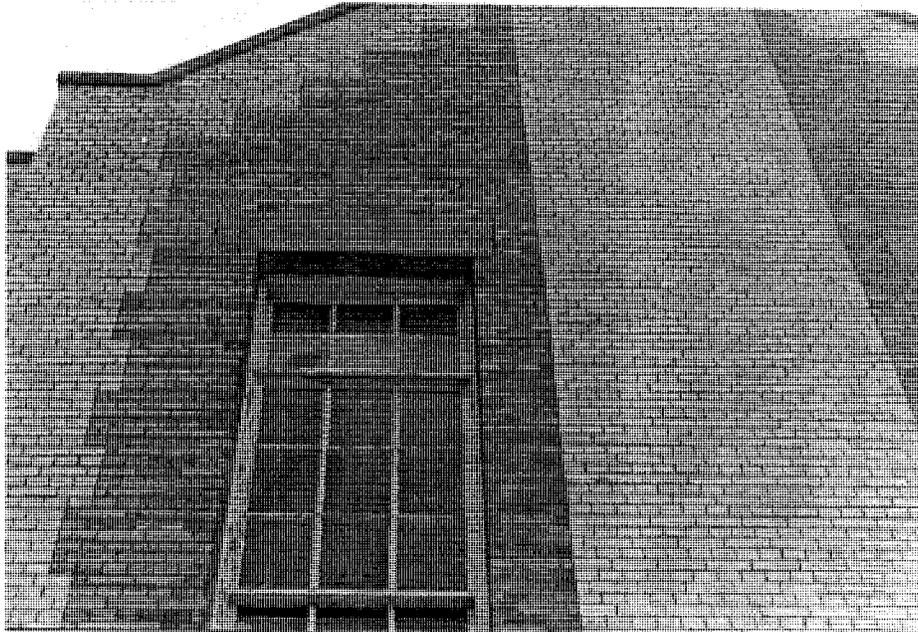


Figure 3-1

Location: West Elevation of Building 3 on West Pavilion

Problem: Mottled soiling of buff brick and light soiling of white brick

Cause of Problem: Atmospheric pollution

Suggested Remedy: The buff brick will not clean by conventional or unconventional methods (see also Chapter VIII. *Materials Cleaning Analysis*)

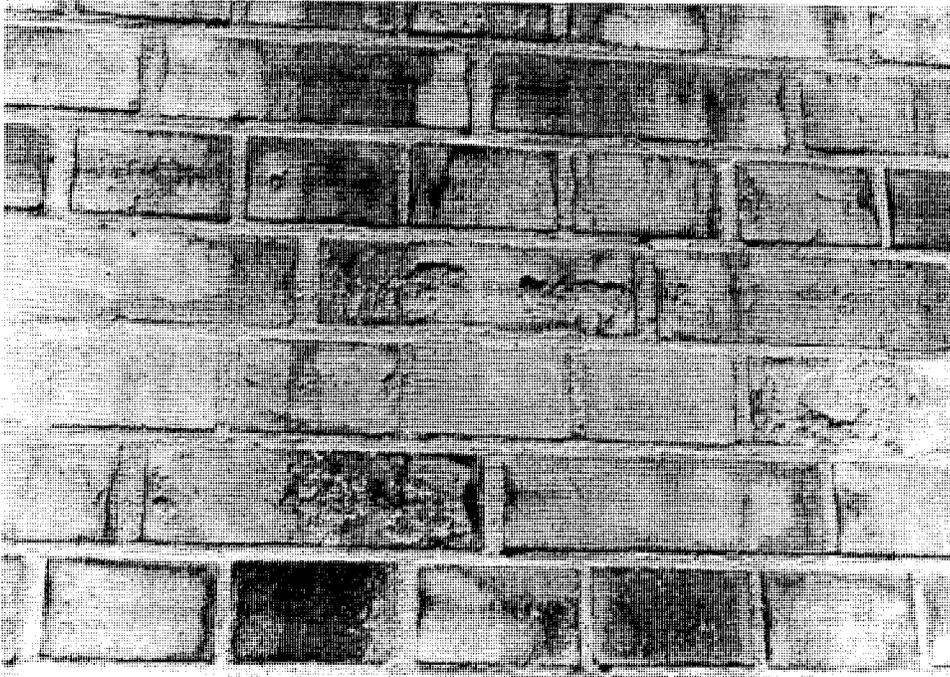


Figure 3-2

Location: North Elevation of Building 3 near West Pavilion

Problem: Damage brick

Cause of Problem: Unknown but may be poorly fabricated brick

Suggested Remedy: There is no remedy other than replacement of all buff brick

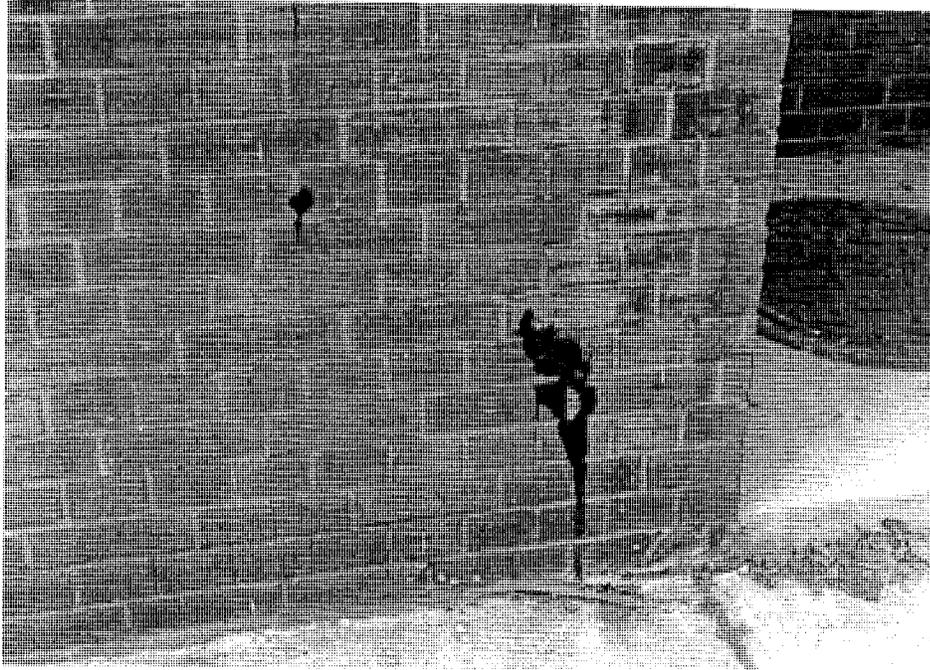


Figure 3-3

Location: North Elevation of Building 3 near West Pavilion

Problem: Bitumen deposits on brick

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII. *Materials Cleaning Analysis*)

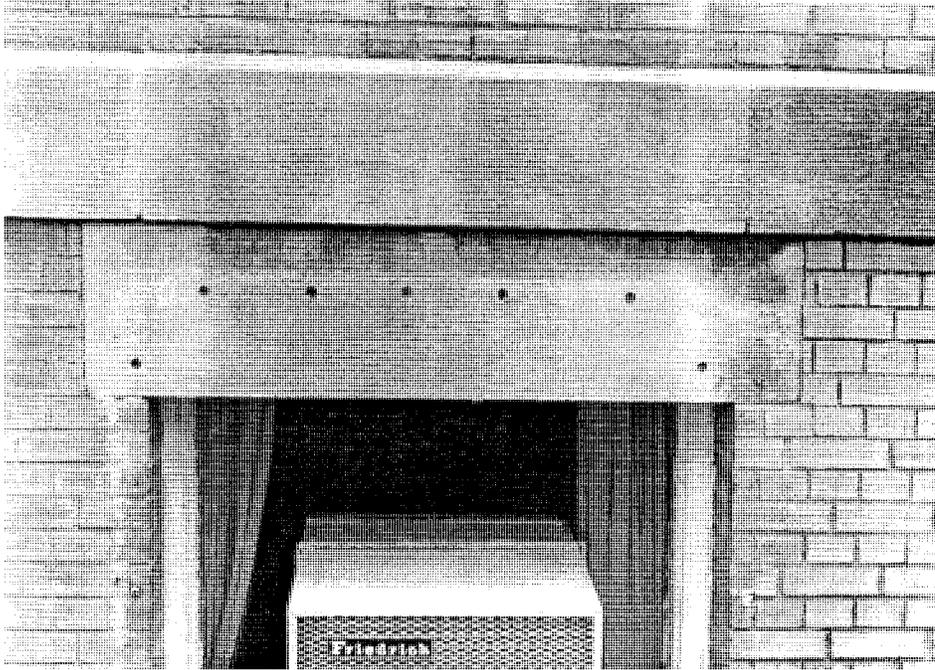


Figure 3-4

Location: South Elevation of Building 3 on East Pavilion

Problem: Damaged brick

Cause of Problem: Installation of window grates

Suggested Remedy: Remove inserts and fill all holes

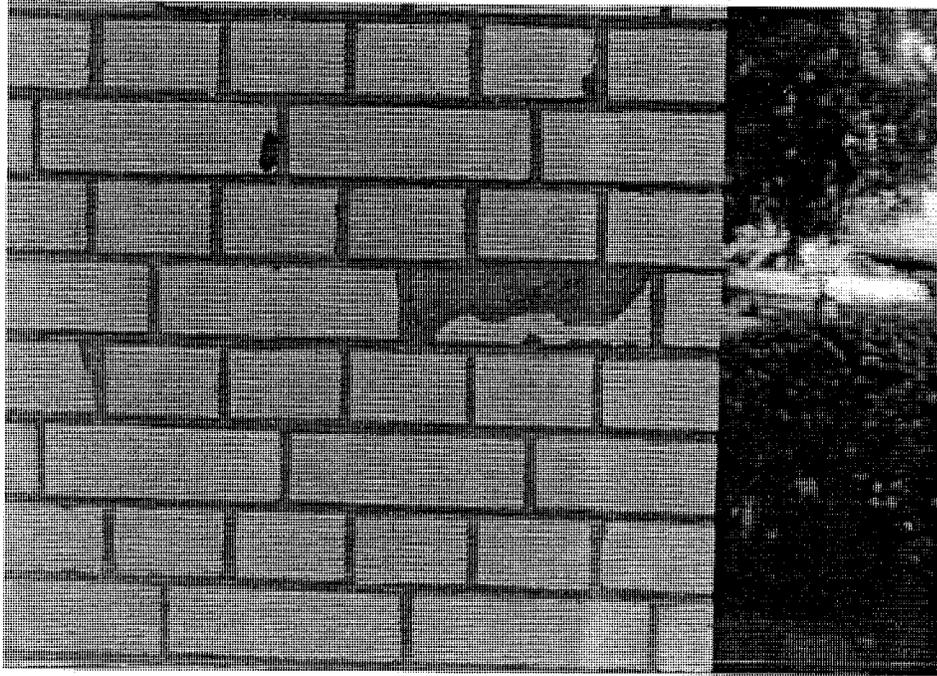


Figure 3-5

Location: East Elevation of Building 3 on West Pavilion

Problem: Damaged brick

Cause of Problem: Unknown but may be freezing water or impact damage

Suggested Remedy: Replace with matching brick and mortar

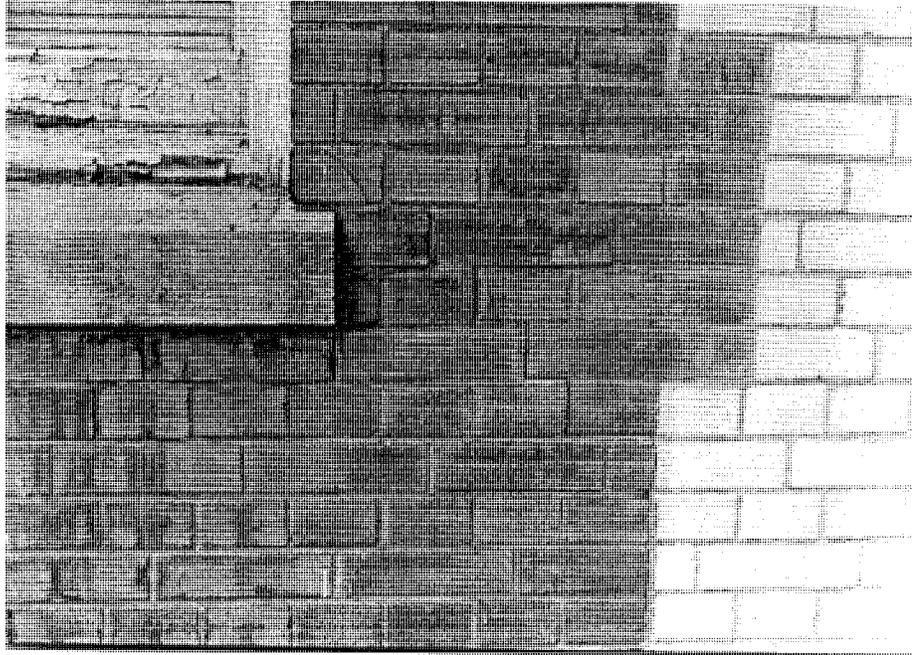


Figure 3-6

Location: East Elevation of Building 3 on East Pavilion

Problem: Open joints and stress cracks

Cause of Problem: Freezing water in open joints and/or rusting of iron anchors

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

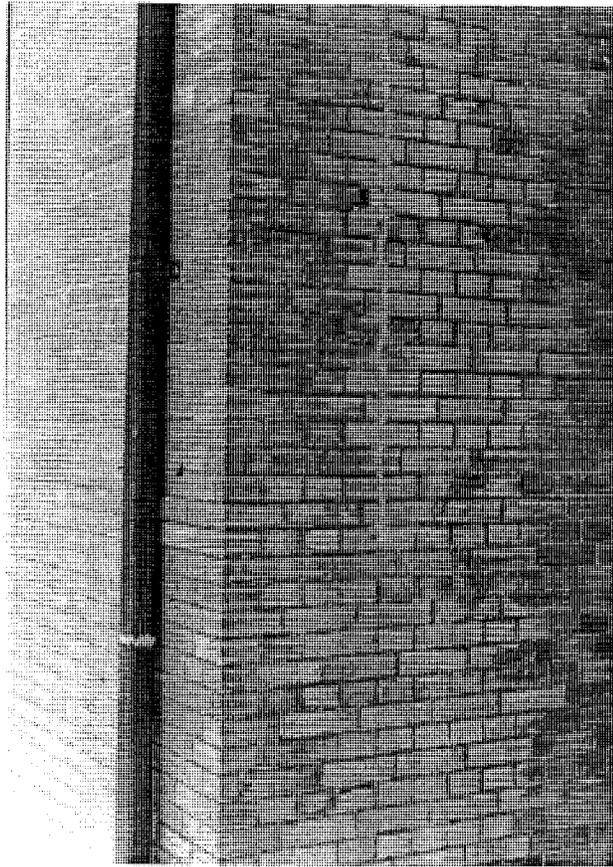


Figure 3-7

Location: South Elevation of Building 3 at West Corner

Problem: Stress crack in brick (caulked)

Cause of Problem: Unknown but possibly differential heat stress

Suggested Remedy: Remove brickwork and replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

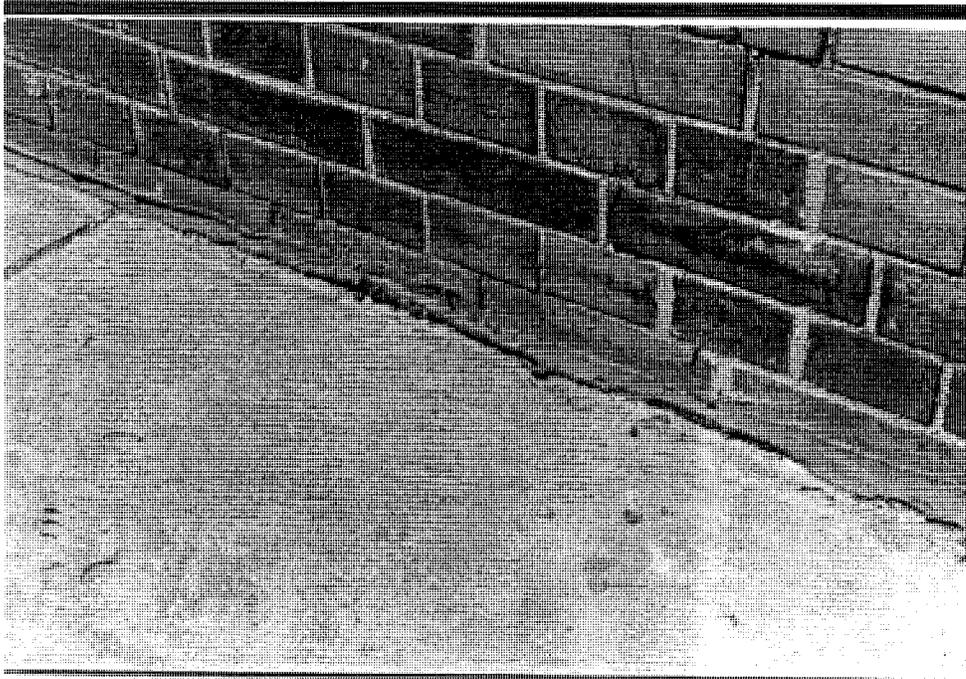


Figure 3-8

Location: East Elevation West Pavilion on North Side of Building 3

Problem: Caulked open joints

Cause of Problem: Improper maintenance

Suggested Remedy: Remove caulk and repoint with mortar

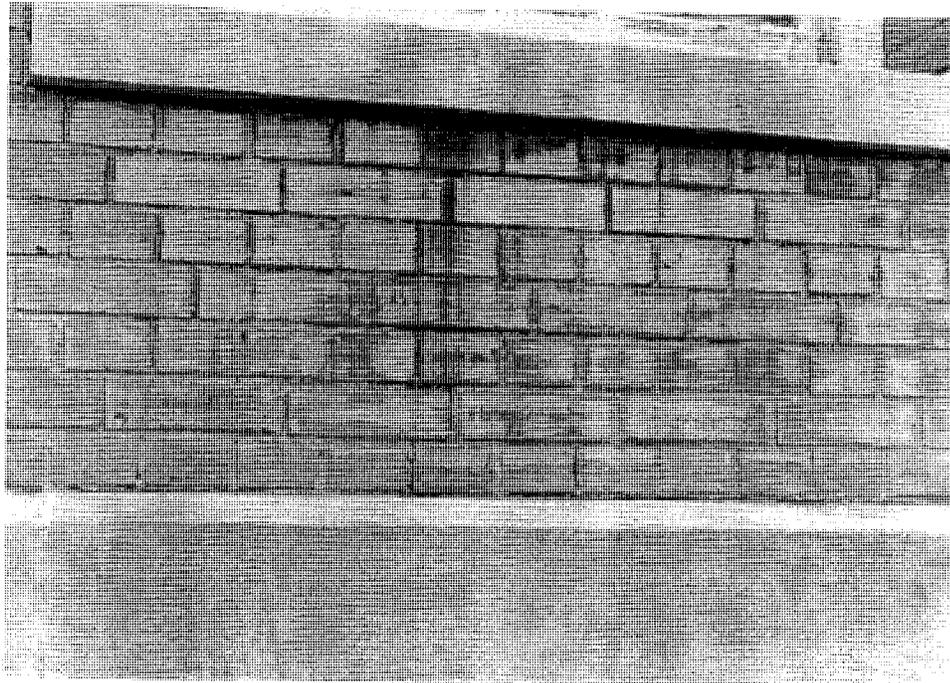


Figure 3-9

Location: South Elevation of Building on East Pavilion

Problem: Gypsum and flyash under limestone sills

Cause of Problem: Atmospheric pollution

Suggested Remedy: Water misting cleaning (for details see Chapter VIII. *Materials Cleaning Analysis*)

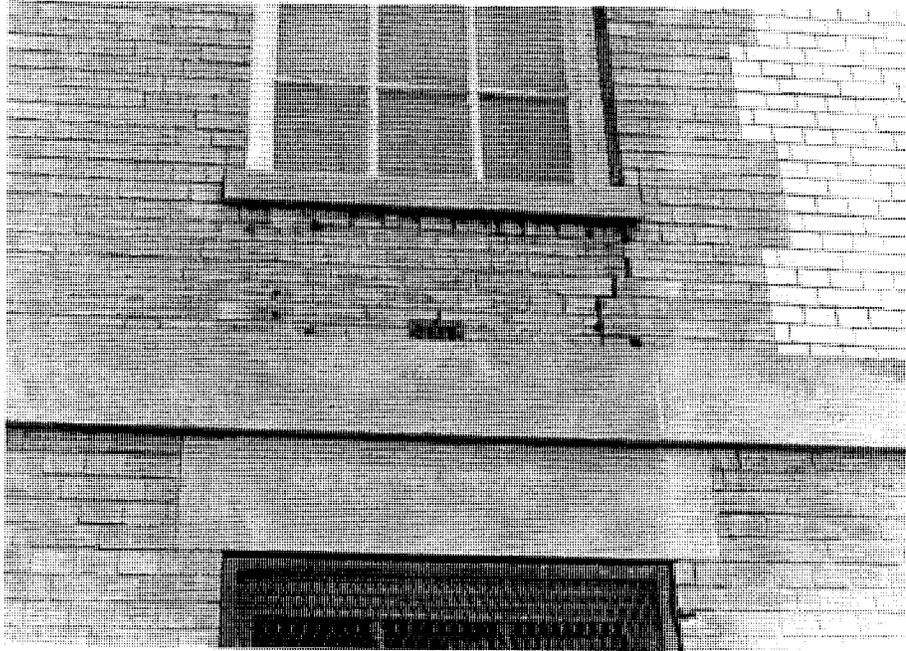


Figure 3-10

Location: South Elevation of Building 3 on West Pavilion

Problem: Open mortar joints

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

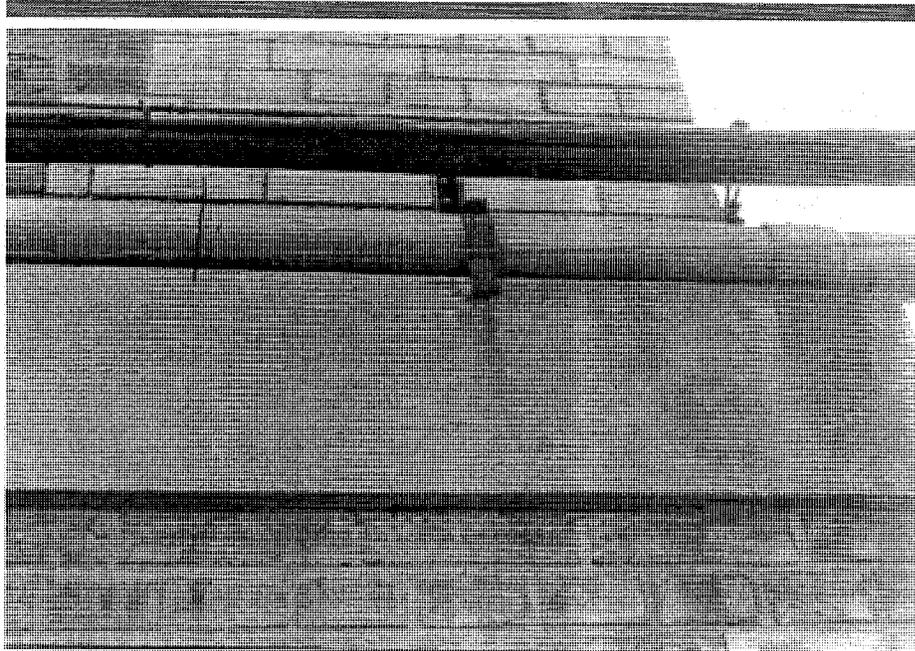


Figure 3-11

Location: North Elevation of Building 3 on West Pavilion

Problem: Stains on limestone

Cause of Problem: Rusting iron attachments

Suggested Remedy: Remove stain with iron poultice (scrape and paint iron elements)

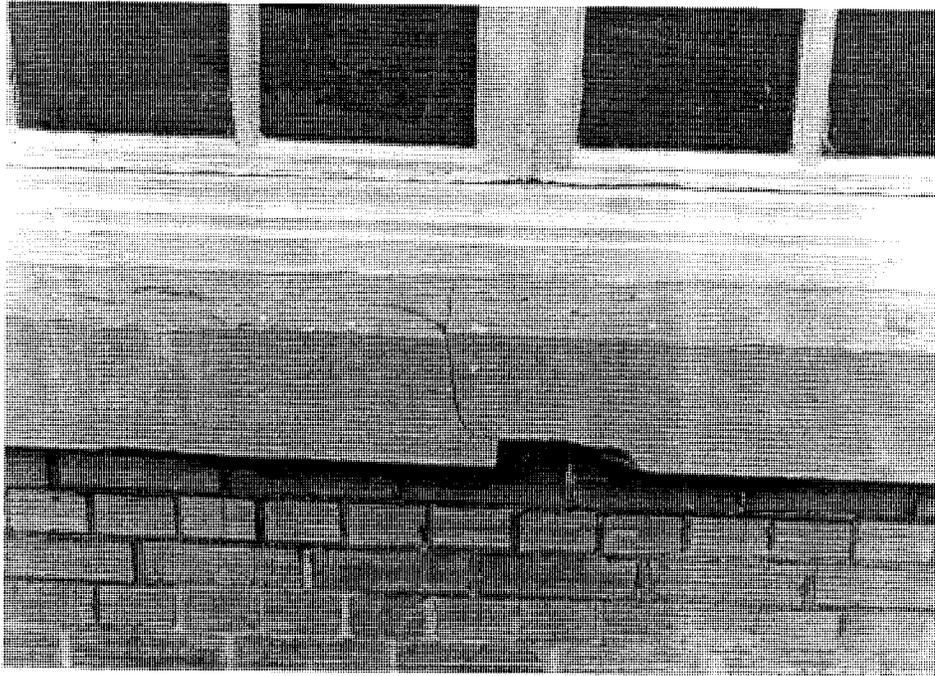


Figure 3-12

Location: West Elevation of Breezeway between Buildings 3 & 4

Problem: Damaged limestone

Cause of Problem: Impact from vehicles

Suggested Remedy: Repair with patching mortar

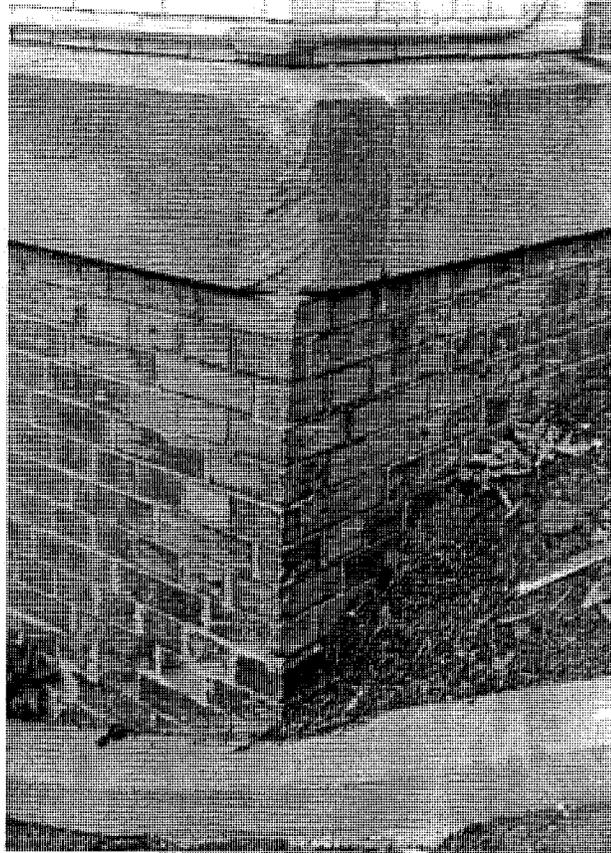


Figure 3-13

Location: East Elevation of Building 3 on South Corner of East Pavilion

Problem: Damaged limestone

Cause of Problem: Impact from vehicles

Suggested Remedy: Repair with patching mortar

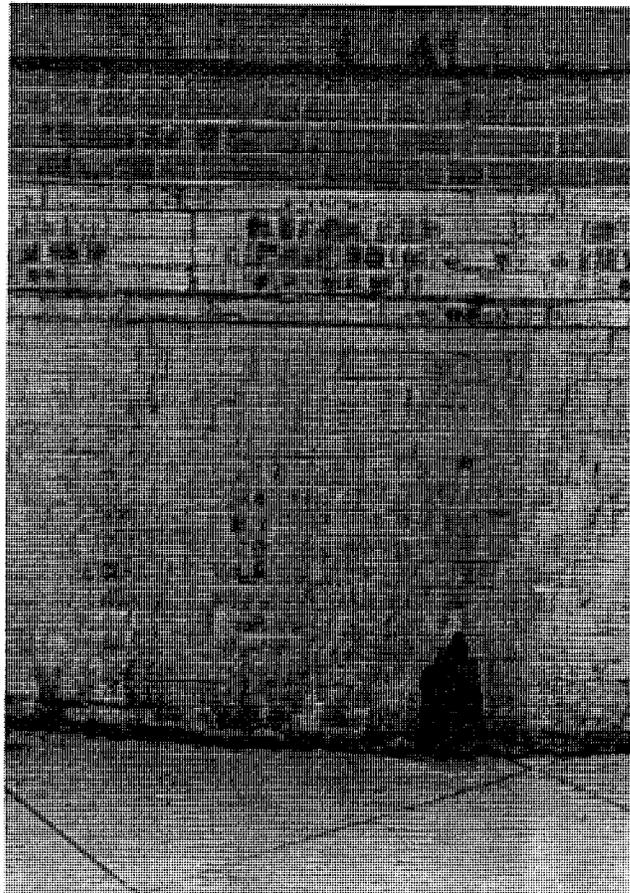


Figure 3-14

Location: North Elevation of Building 3 in Central Areaway

Problem: Bulging, cracked, efflorescing retaining wall

Cause of Problem: Water infiltration

Suggested Remedy: Excavate, waterproof, cut and point

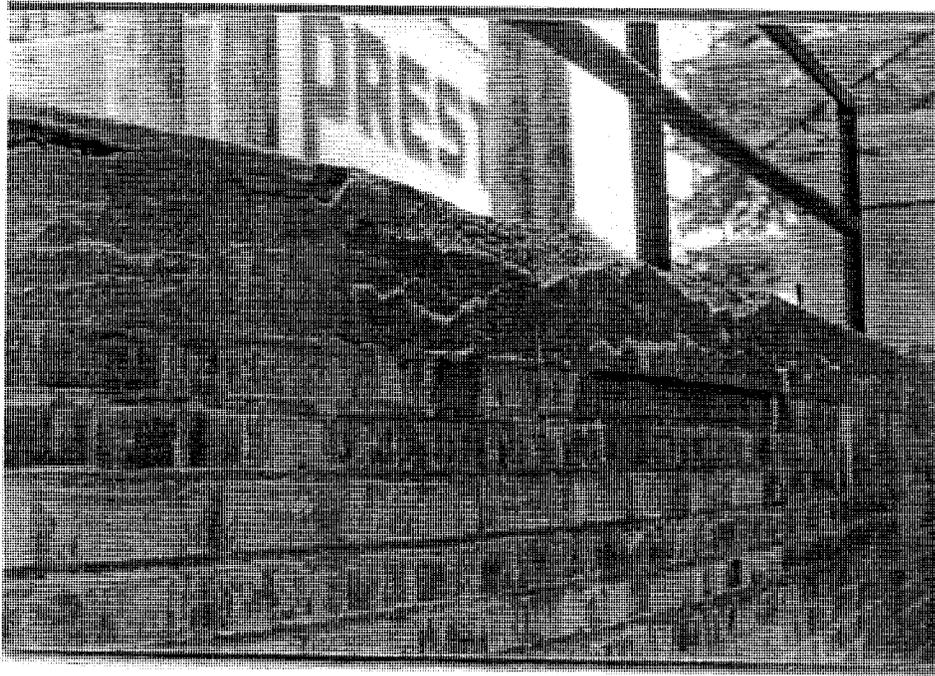


Figure 3-15

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete capstones

Cause of Problem: Water infiltration and corroding iron railings

Suggested Remedy: Remove and replace with new concrete

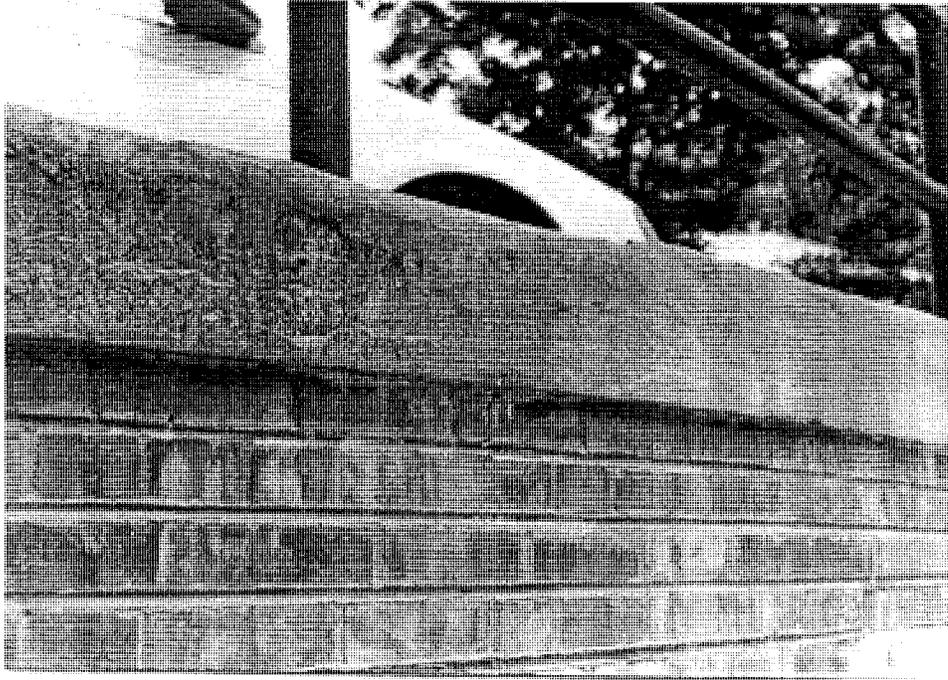


Figure 3-16

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete capstones with repairs

Cause of Problem: Improper and unsightly maintenance procedures

Suggested Remedy: Remove and replace with new concrete

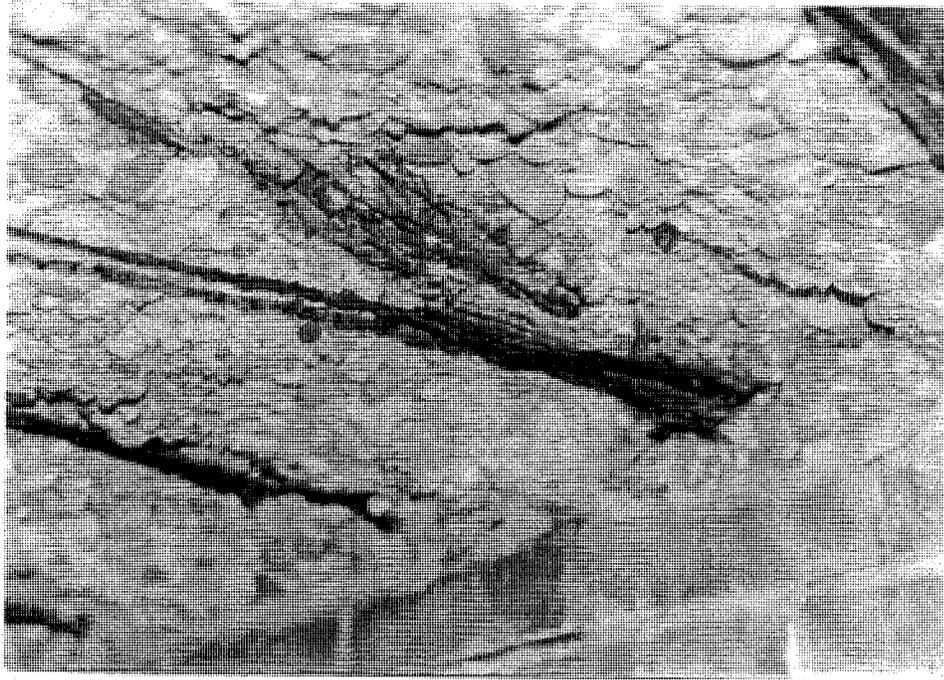


Figure 3-17

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete and corroding rebar

Cause of Problem: Water infiltration

Suggested Remedy: Demolish and rebuild

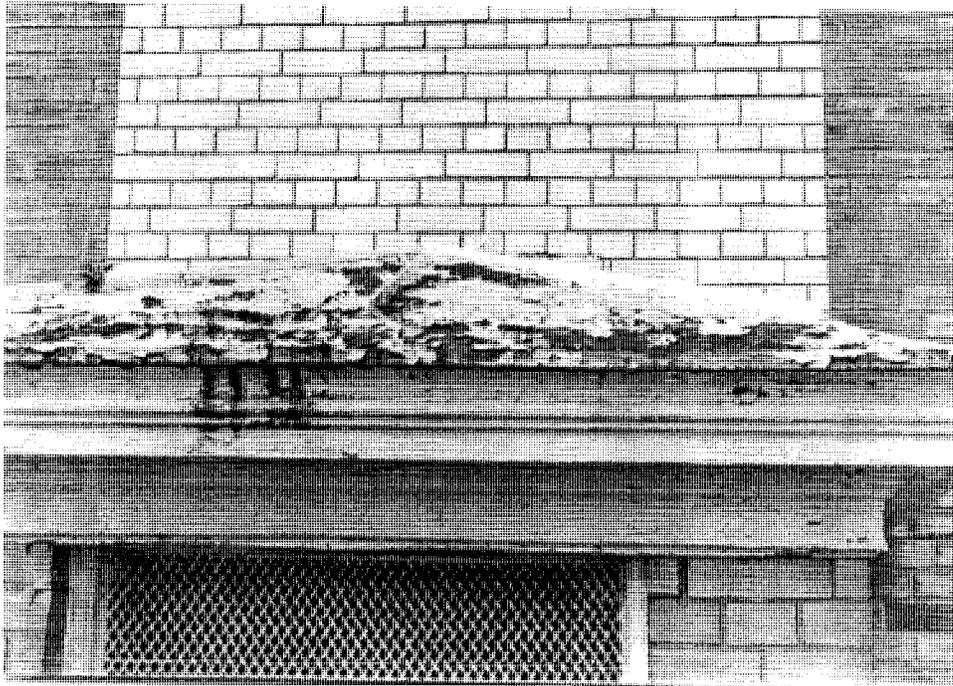


Figure 3-18

Location: East Elevation of Building 3 on East Pavilion

Problem: Failing paint

Cause of Problem: Inadequate maintenance

Suggested Remedy: Scrape, prime and paint

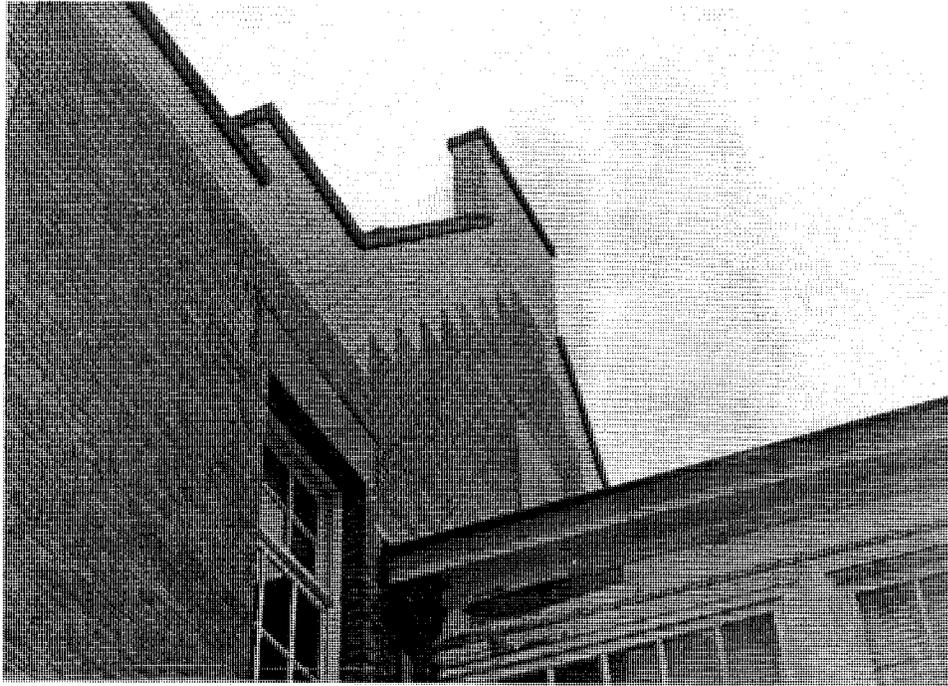


Figure 4-1

Location: East Elevation of East Pavilion on Building 4

Problem: Mottled soiling of buff brick and light soiling of white brick

Cause of Problem: Atmospheric pollution

Suggested Remedy: The buff brick will not clean by conventional or unconventional methods (see also Chapter VIII).

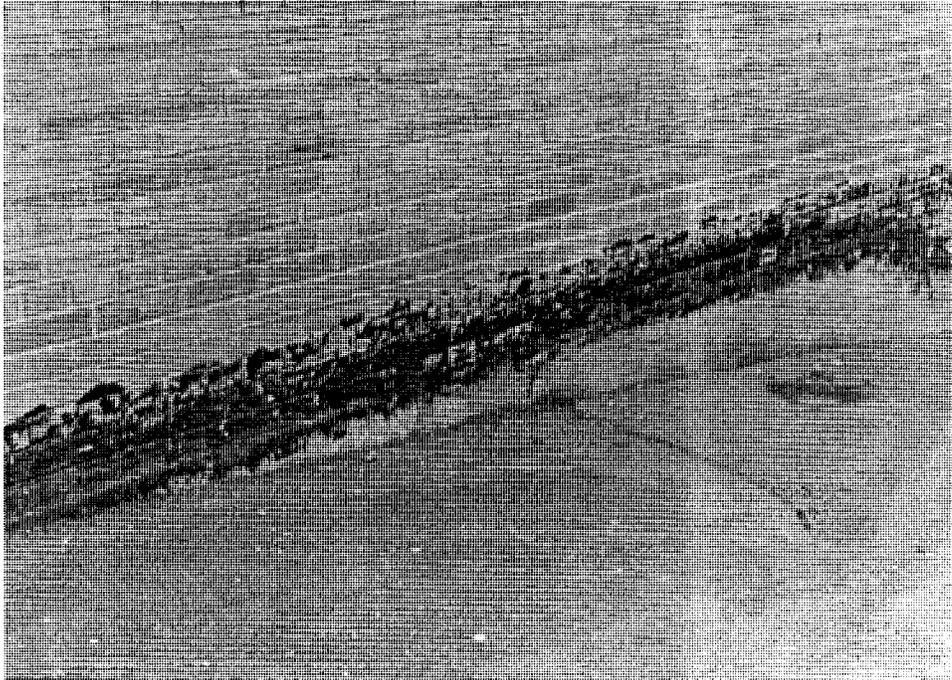


Figure 4-2

Location: North Elevation of Building 4 on West Pavilion

Problem: Bitumen deposits on brick

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII. *Materials Cleaning Analysis*)

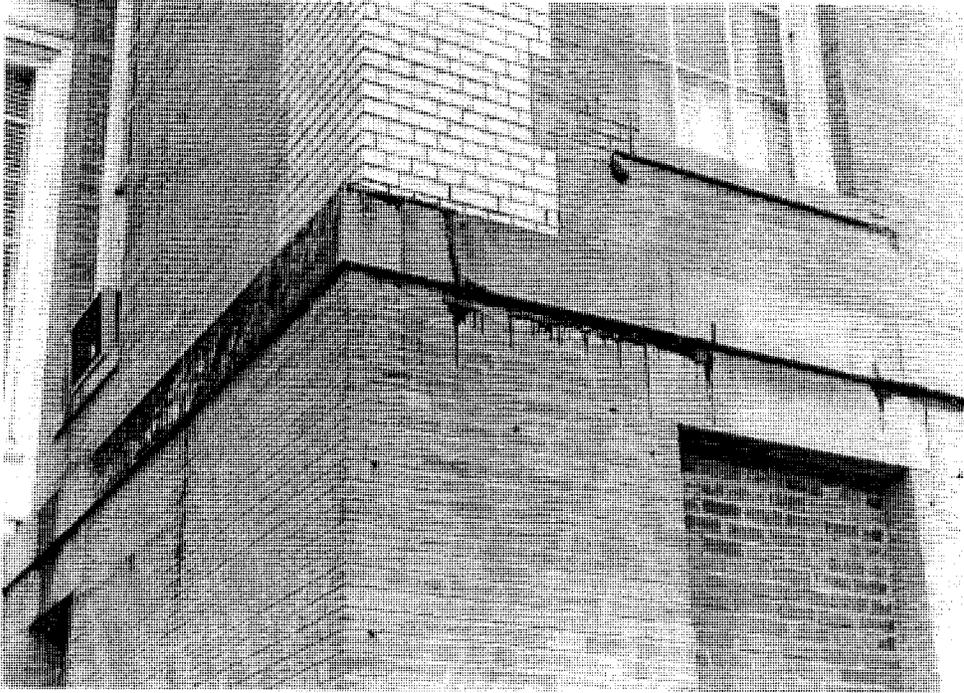


Figure 4-3

Location: South Elevation of Building 4 on East Pavilion

Problem: Bitumen deposits on brick and limestone

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII, *Materials Cleaning Analysis*)

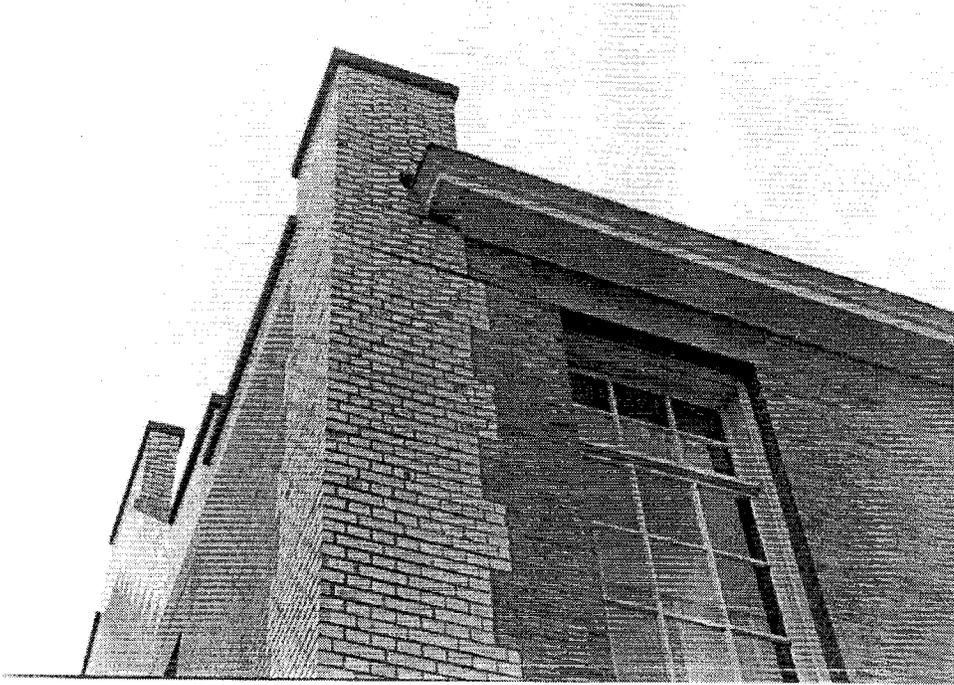


Figure 4-4

Location: North Elevation of Building 4 on West Pavilion

Problem: Damaged brick

Cause of Problem: Unknown but possibly freezing water or impact damage

Suggested Remedy: Replace with matching brick and mortar

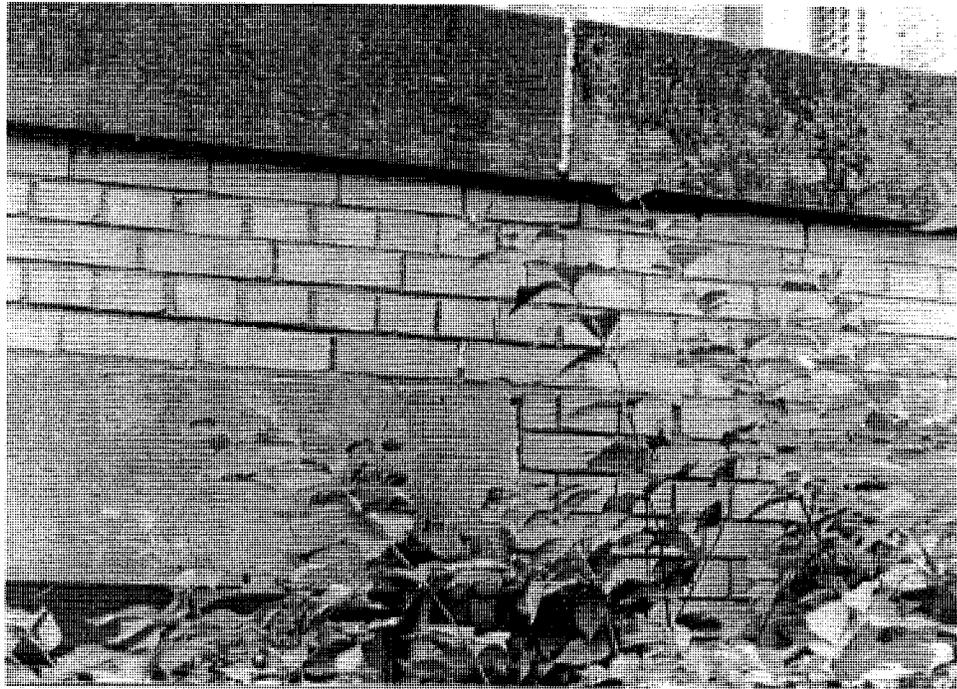


Figure 4-5

Location: East Elevation of East Pavilion on Building 4

Problem: Open joints and stress cracks

Cause of Problem: Freezing water in open joints and/or rusting of iron anchors

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

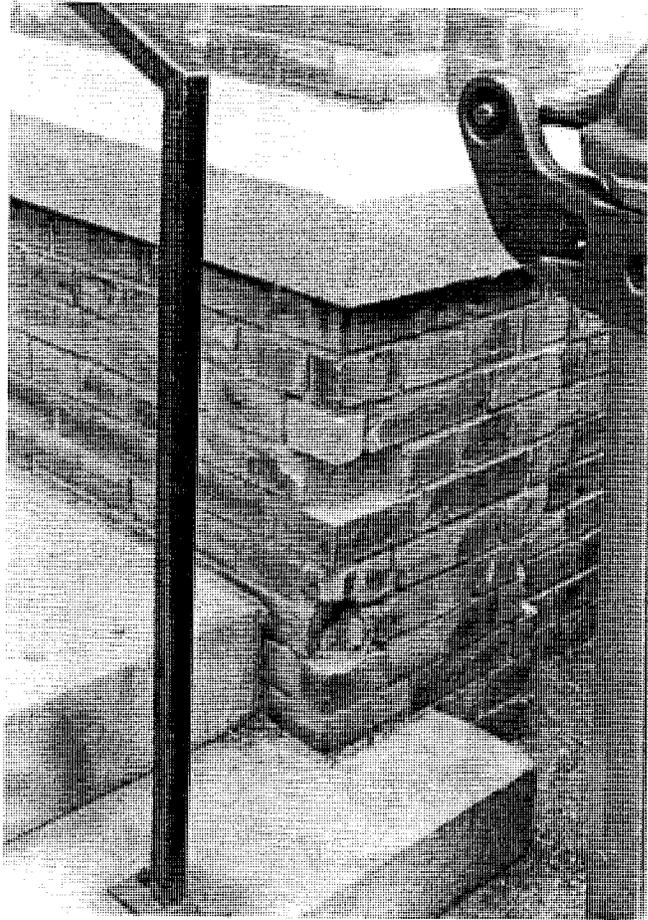


Figure 4-6

Location: East Elevation of Building 3 on East Pavilion

Problem: Open joints and damaged and missing brick

Cause of Problem: Vehicular impact

Suggested Remedy: Remove damaged; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

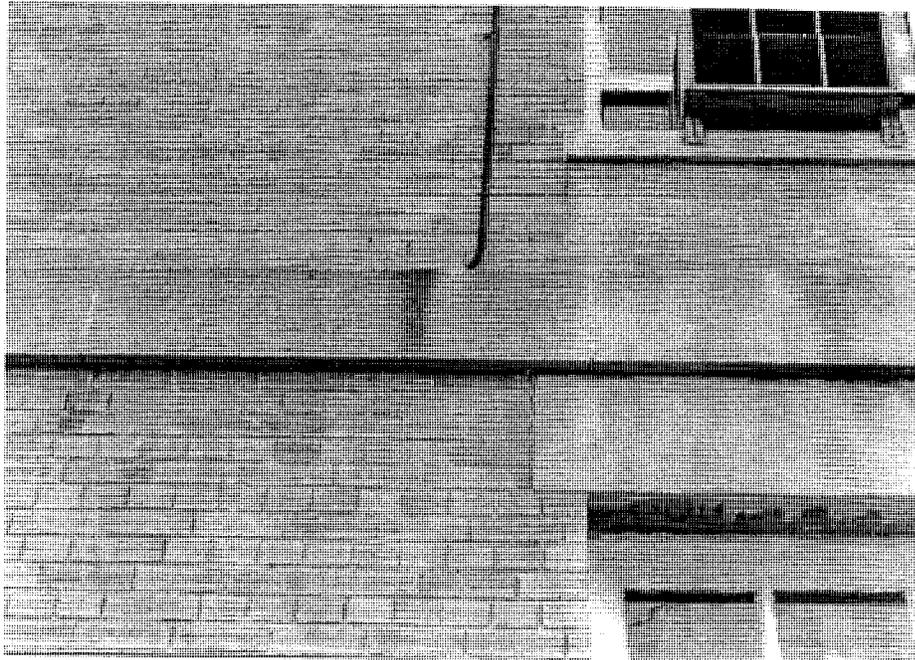


Figure 4-7

Location: North Elevation of Building 4 on West Pavilion

Problem: Gypsum and flyash under limestone sills

Cause of Problem: Atmospheric pollution

Suggested Remedy: Water misting cleaning (for details see Chapter VIII. *Materials Cleaning Analysis*)

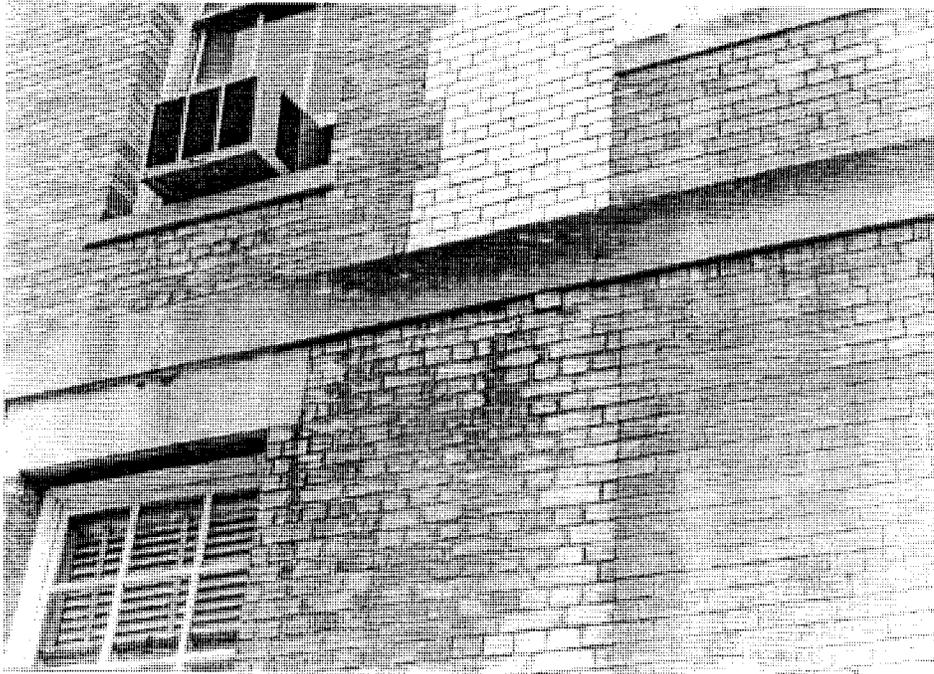


Figure 4-8

Location: West Elevation of Building 4

Problem: Biological soiling

Cause of Problem: Slow drying and overhanging trees

Suggested Remedy: Clean with power wash and detergent (for details see Chapter VIII. *Materials Cleaning Analysis*)

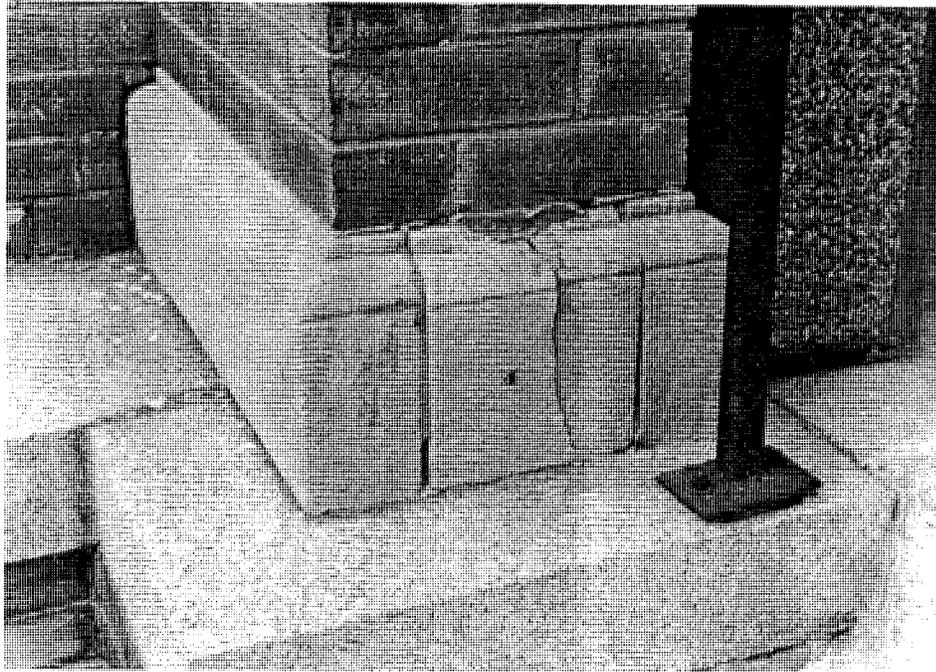


Figure 4-9

Location: West Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Impact damage or corrosion of iron anchors

Suggested Remedy: Remove damaged limestone and assess anchors; replace with stainless steel if corroded and replace limestone with dutchman

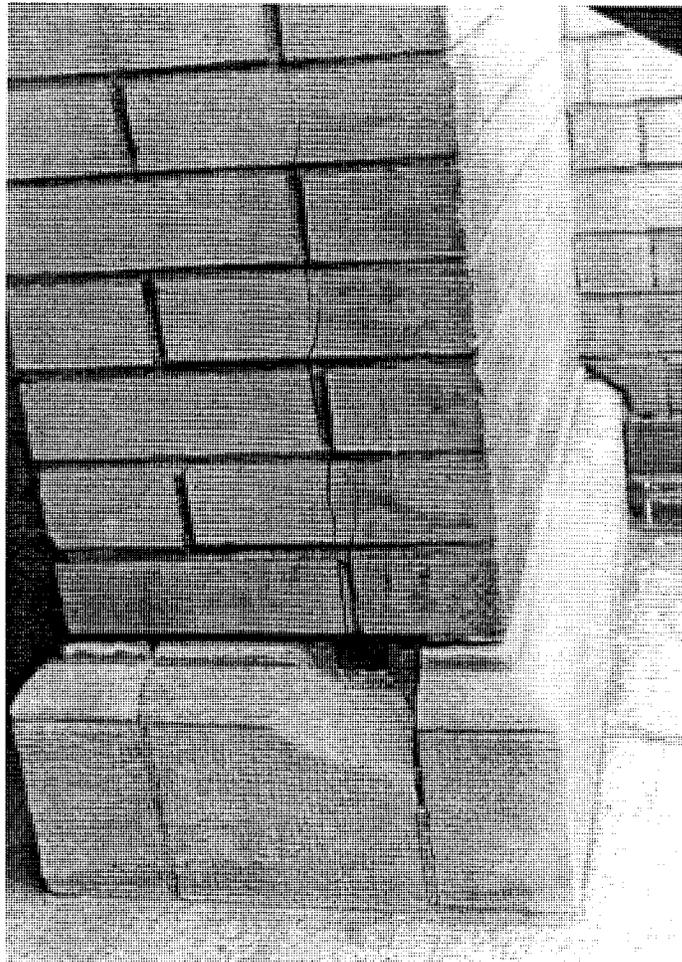


Figure 4-10

Location: South Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Corrosion of iron anchors

Suggested Remedy: Replace anchors with stainless steel and replace limestone with dutchman

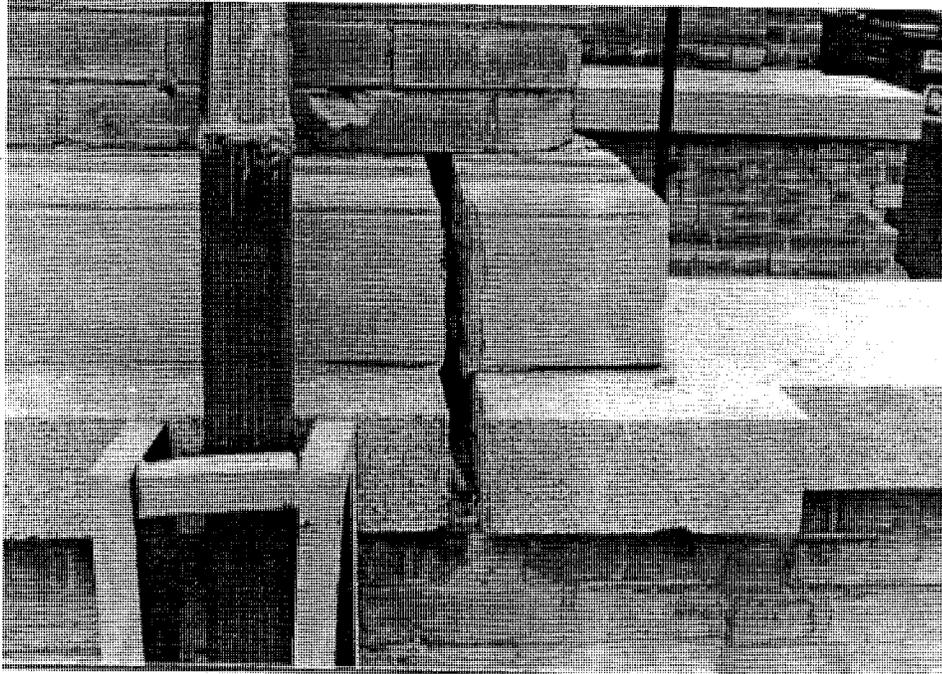


Figure 4-11

Location: South Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Vehicular impact

Suggested Remedy: Replace limestone with dutchman

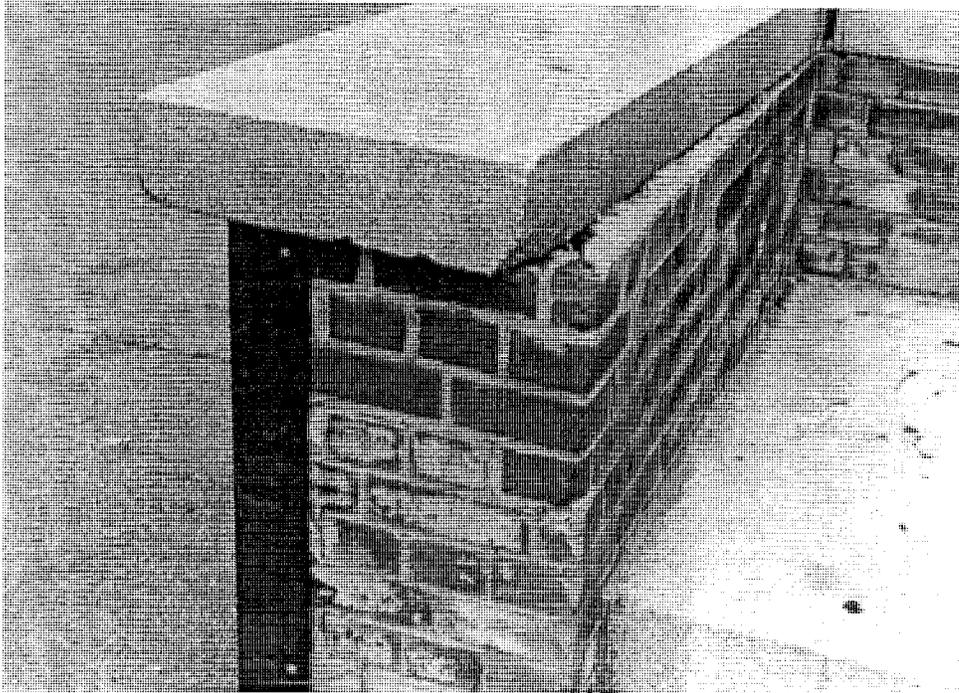


Figure 4-12

Location: South Elevation of Building 4 on South Portico

Problem: Displaced granite

Cause of Problem: Vehicular impact

Suggested Remedy: Reset and re-anchor granite

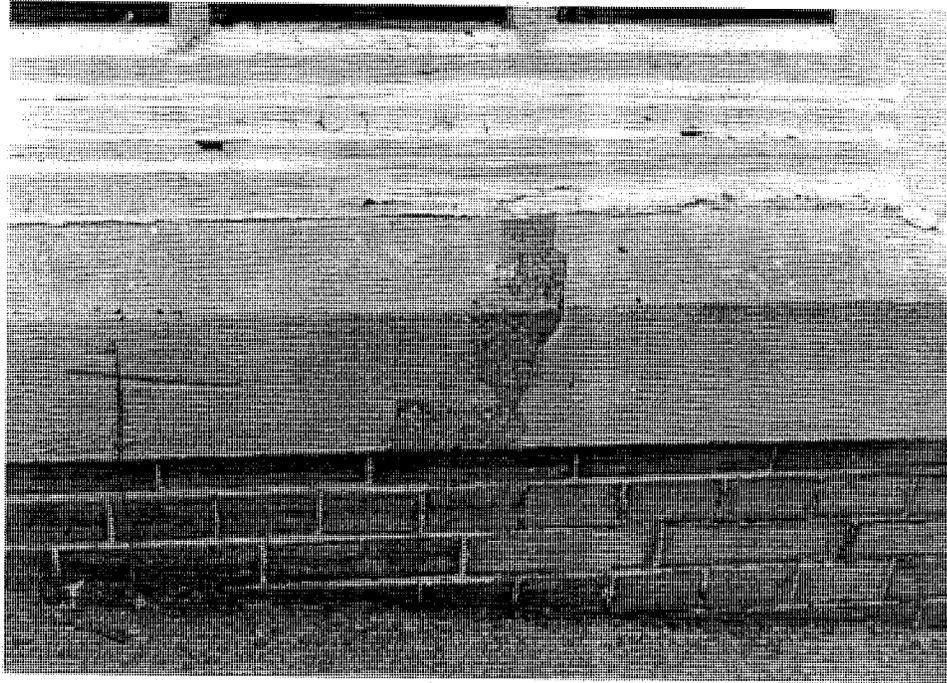


Figure 4-13

Location: West Elevation of Breezeway between Buildings 3 and 4

Problem: Damaged and repaired limestone

Cause of Problem: Improper choice of materials

Suggested Remedy: Remove and replace with better matching patching mortar



Figure 4-14

Location: South Elevation of Building 4 on Garage of East Pavilion

Problem: Open joints and displaced brick

Cause of Problem: Water infiltration from poorly functioning gutter and leader

Suggested Remedy: Clear gutters and leaders; reset brick with proper mortar

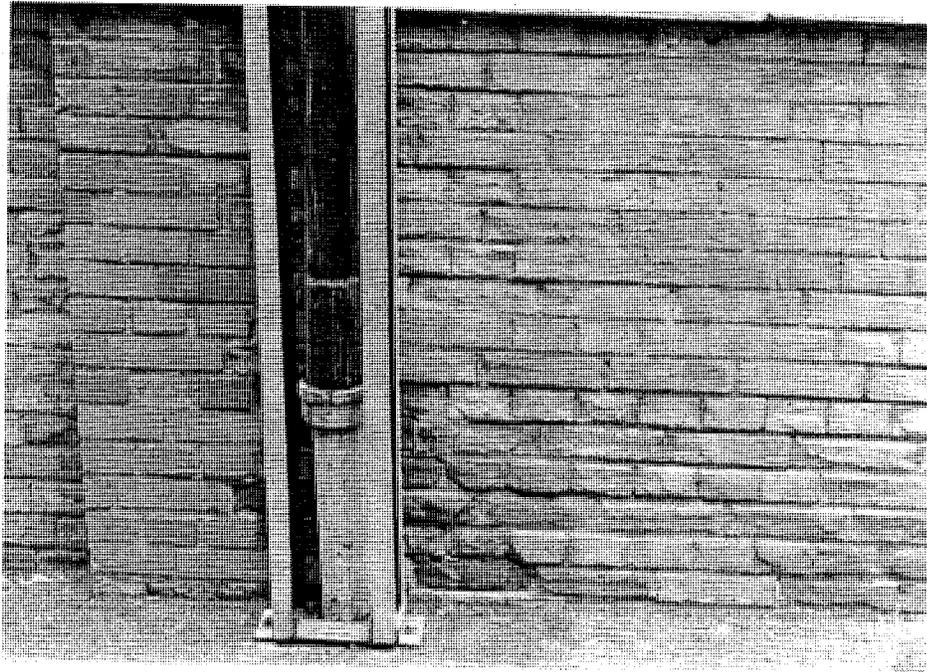


Figure 4-15

Location: South Elevation of Building 4 on South Portico

Problem: Damaged brick

Cause of Problem: Water infiltration from poorly functioning leader

Suggested Remedy: Clear leader



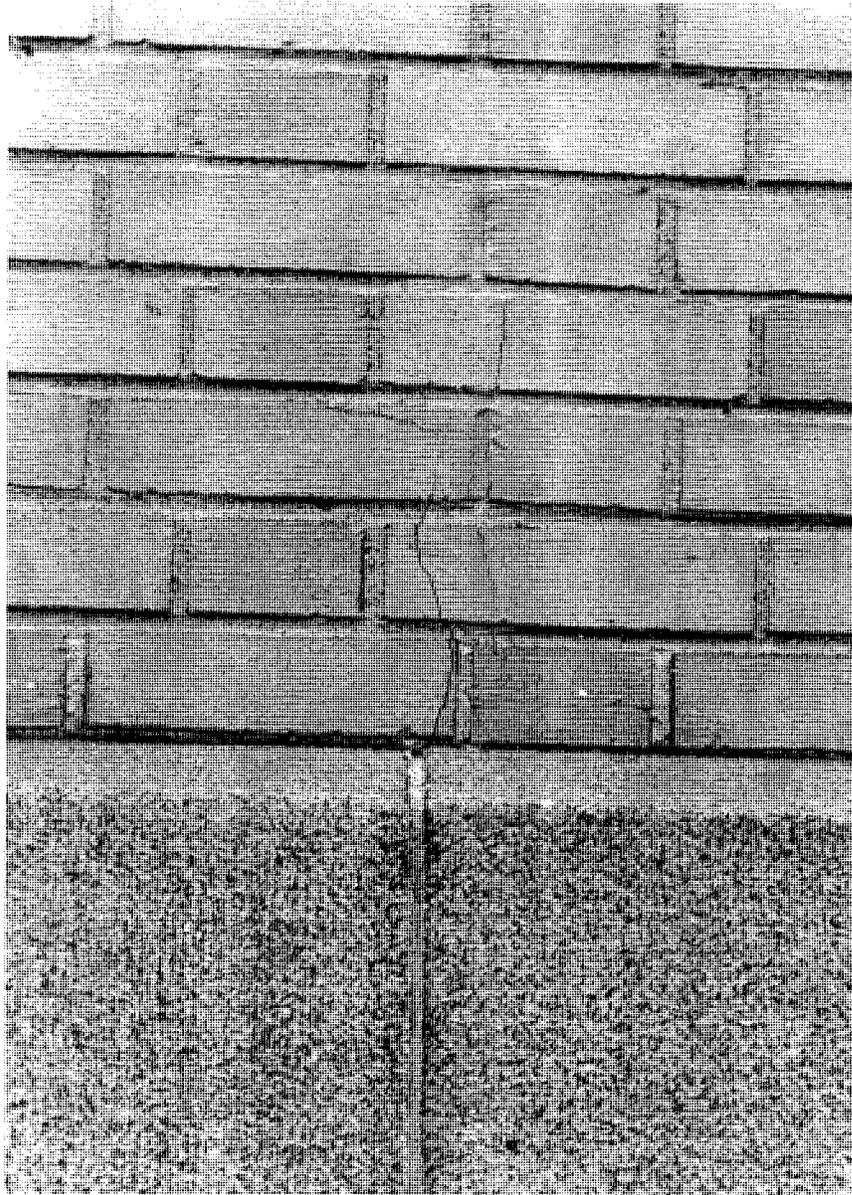


Figure 5-1

Location: North Elevation of Building 5 near West End

Problem: Stress cracks in brick and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

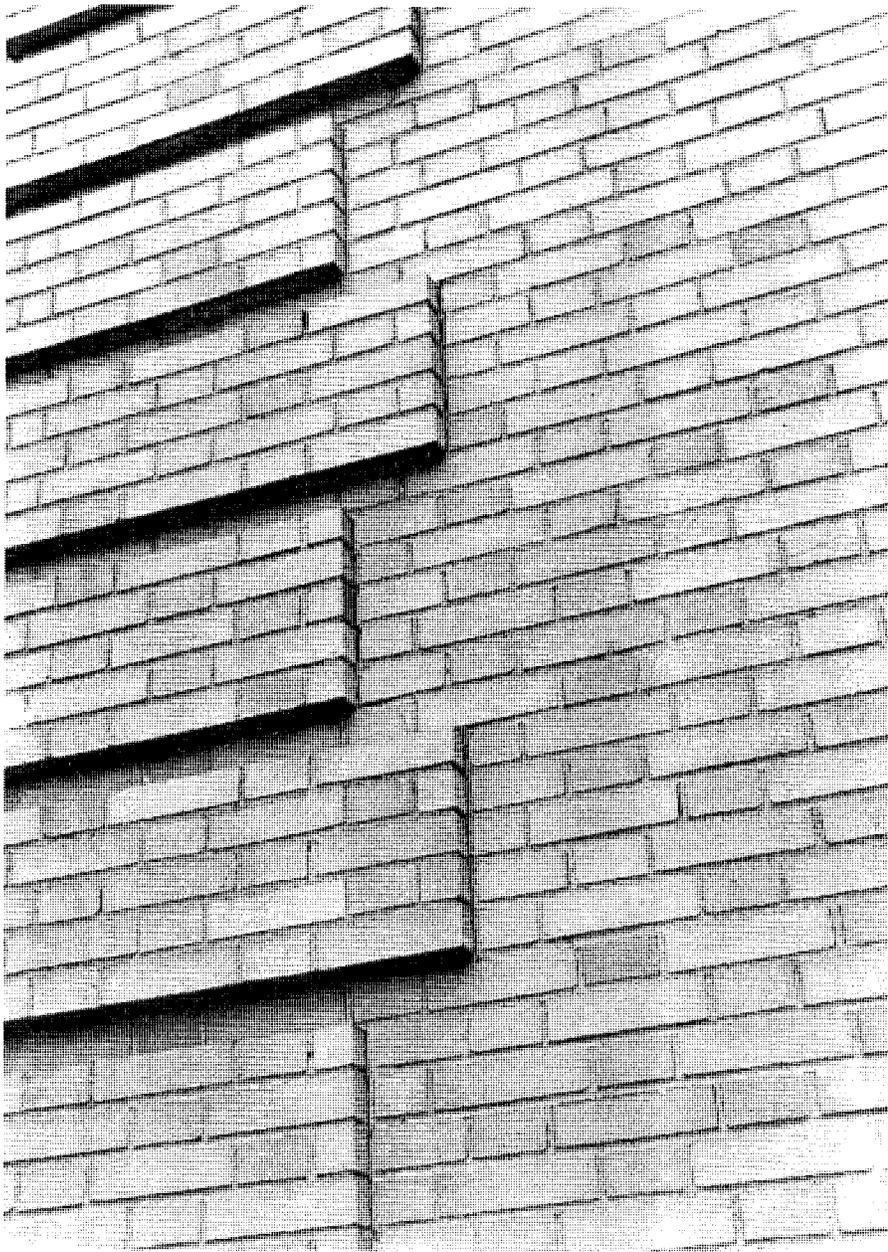


Figure 5-2

Location: East Elevation of Building 5 near South End

Problem: Open mortar joints at articulate brick

Cause of Problem: Freezing water in joints

Suggested Remedy: cut and point joints

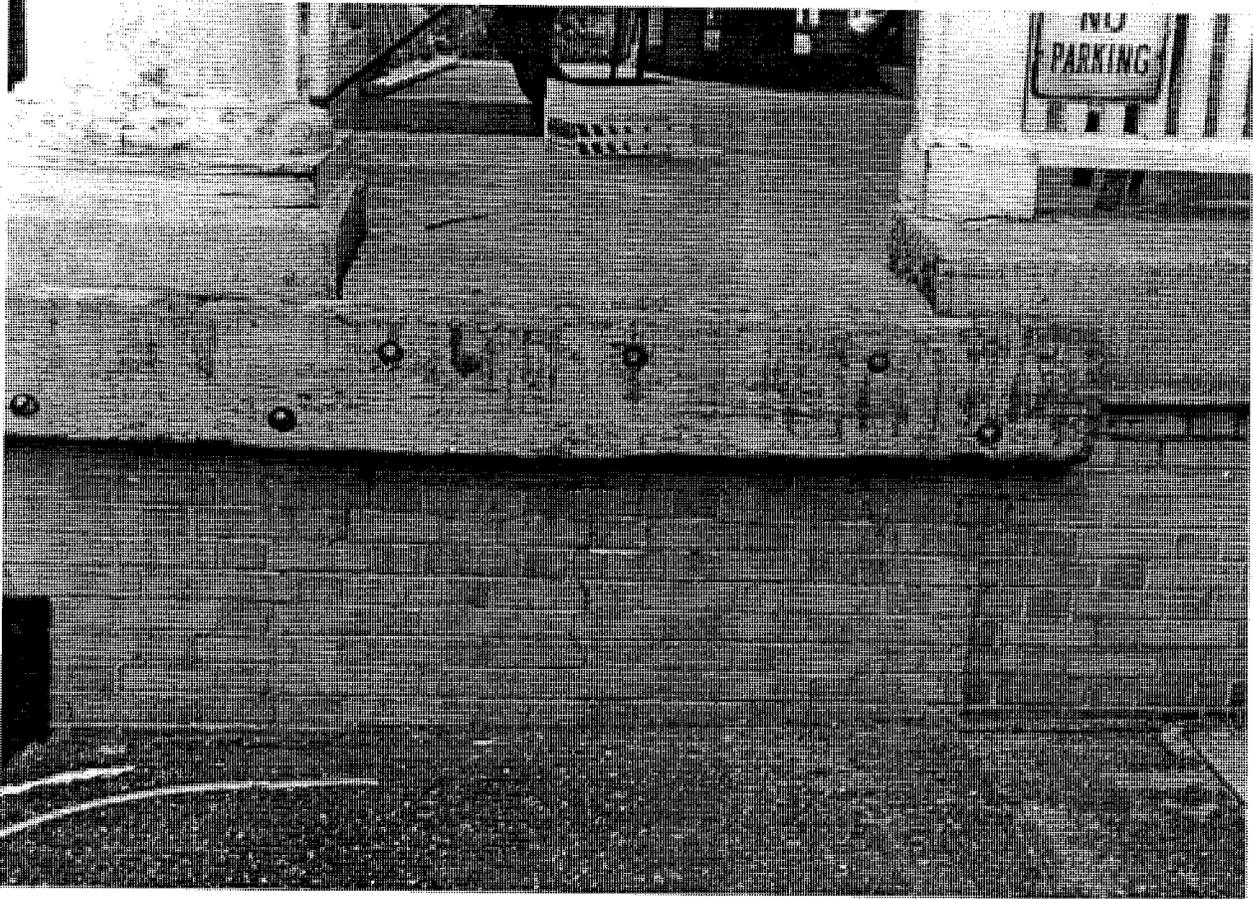


Figure 5-3

Location: North Elevation of Building 5 at West End of Porch

Problem: Open mortar joints and stress cracks in brick

Cause of Problem: Freezing water in joints; impact damage

Suggested Remedy: Brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

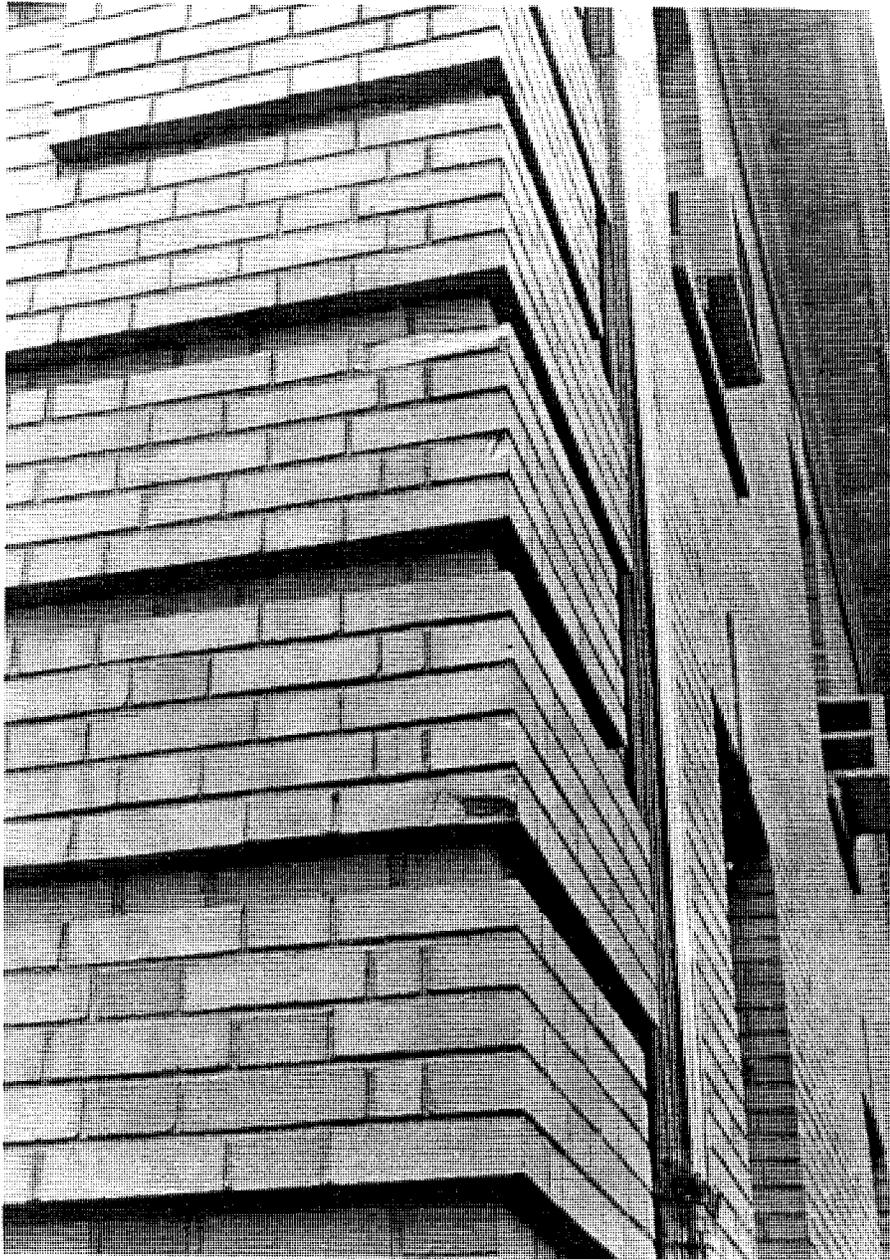


Figure 5-4

Location: Northwest Corner of Building 5

Problem: Damage brick

Cause of Problem: Unknown but perhaps impact damage

Suggested Remedy: Brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile



Figure 5-5

Location: West Elevation of Building 5 at Central Entryway

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild

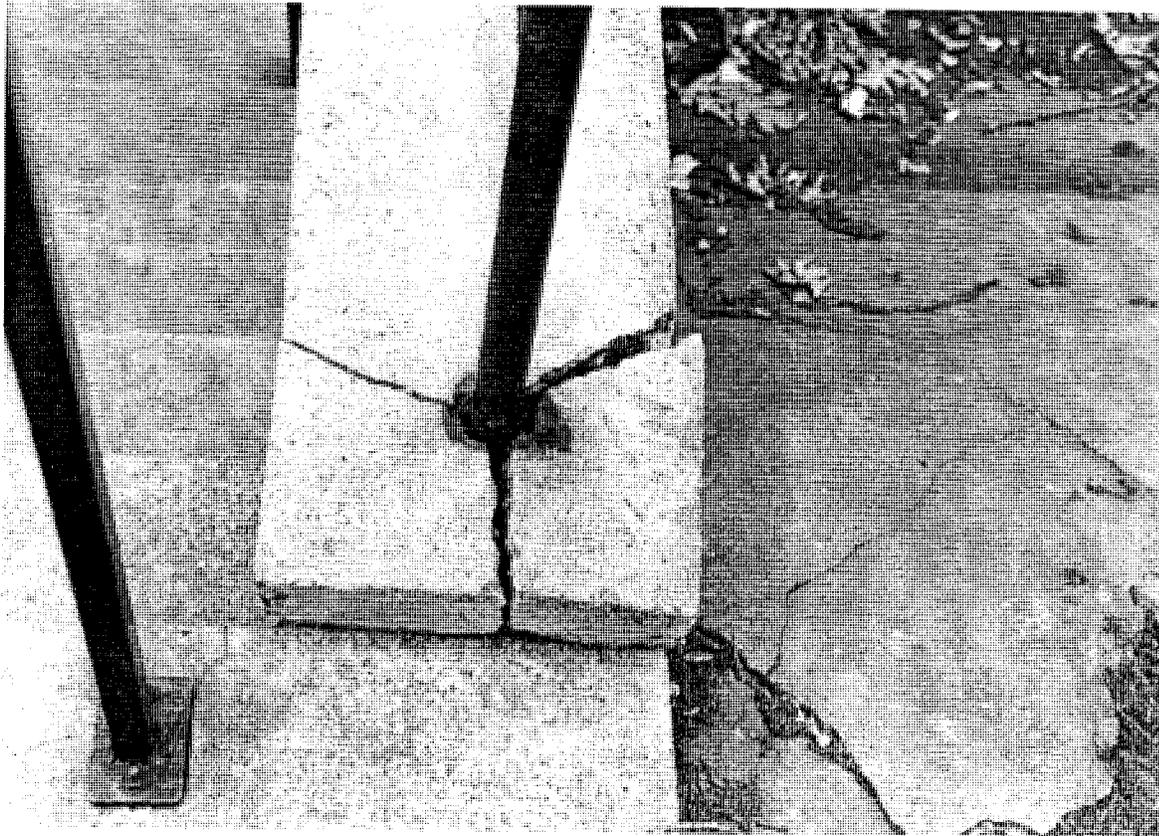


Figure 5-6

Location: West Elevation of Building 5 at Steps to Areaway

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing; rusting of iron railings

Suggested Remedy: Demolish and rebuild

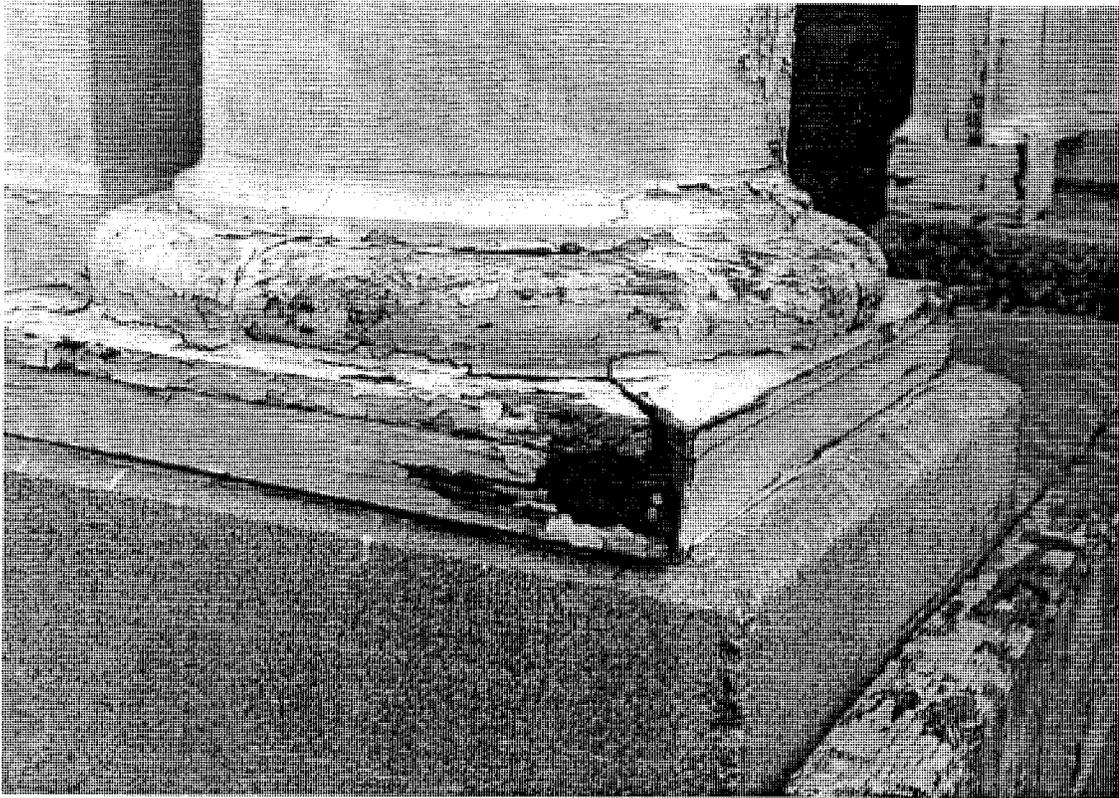


Figure 5-7

Location: North Elevation of Building 5 at Westernmost Column of Portico

Problem: Damaged wooden base

Cause of Problem: Water penetration and poor maintenance

Suggested Remedy: Remove rotted wood and replace with new elements

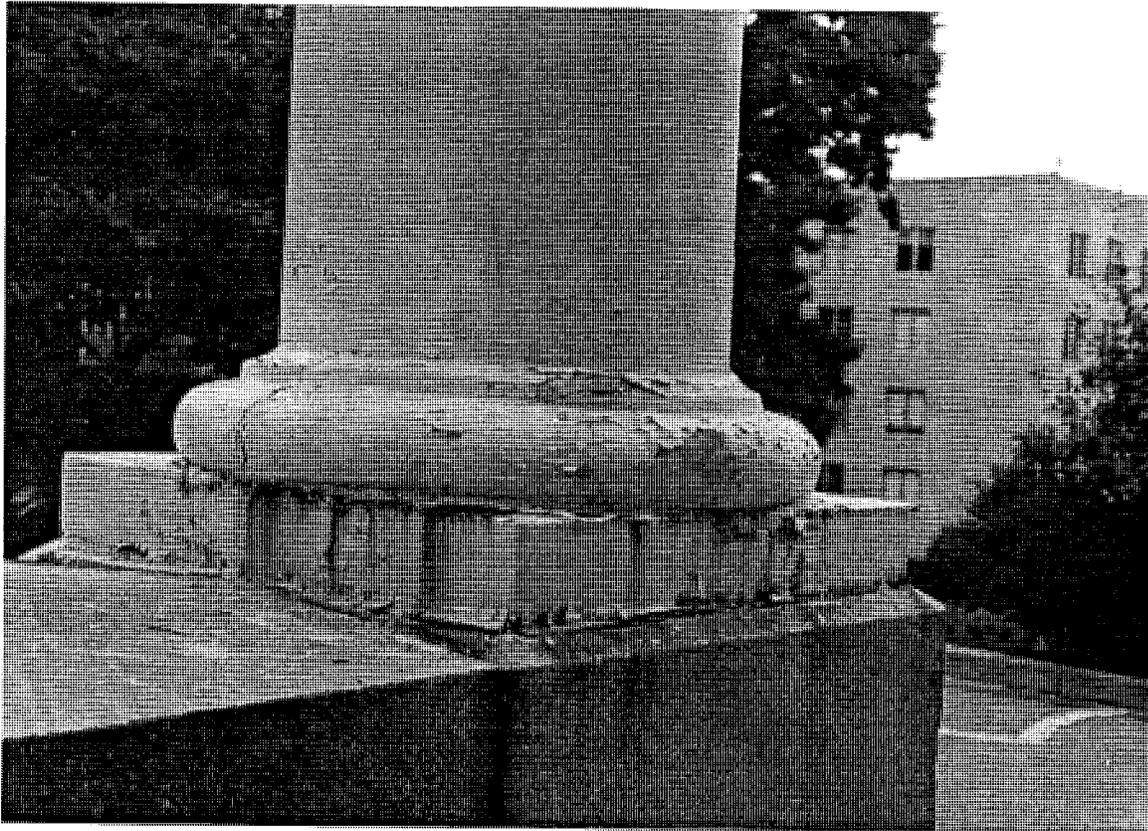


Figure 5-8

Location: North Elevation of Building 5 at Easternmost Column of Portico

Problem: Rusting of column leading to staining of granite

Cause of Problem: Water penetration of paint film and poor maintenance of paint

Suggested Remedy: Scrape and repaint column; poultice iron stain with chelating agent

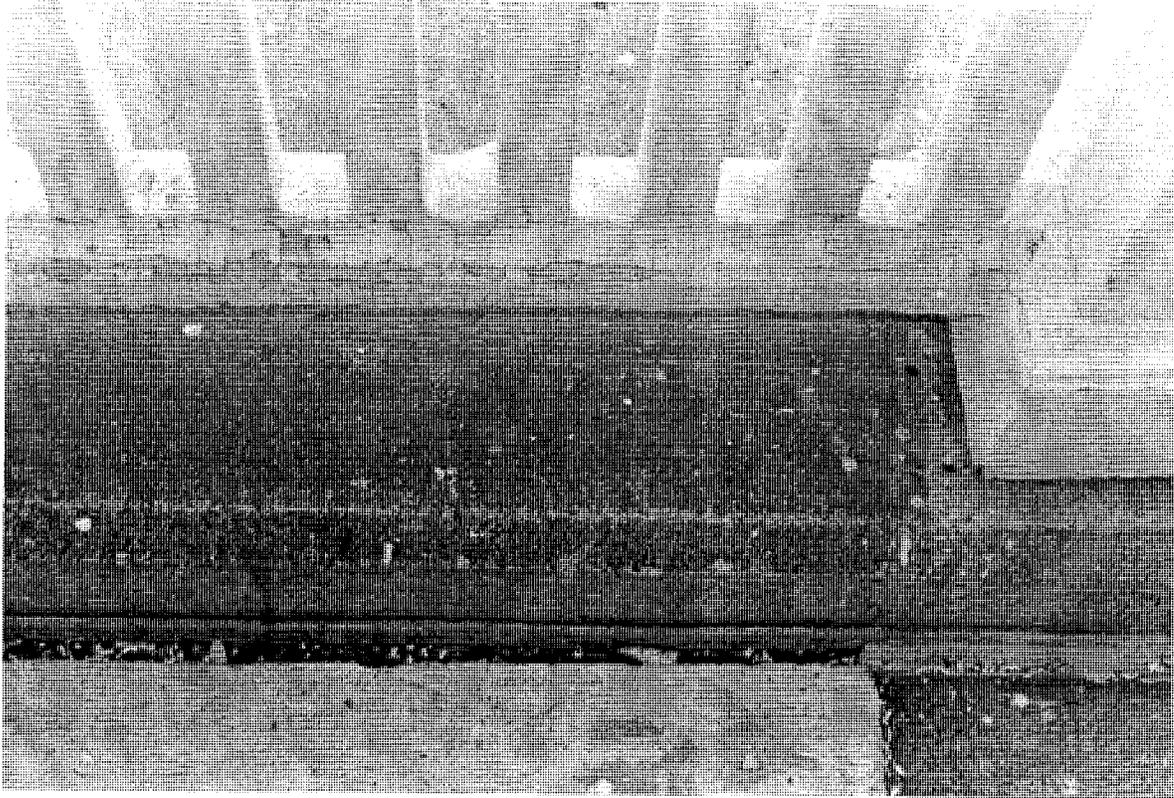


Figure 5-9

Location: North Elevation of Building 5 at Portico Balustrade

Problem: Soiling of granite

Cause of Problem: Atmospheric pollution

Suggested Remedy: Chemical cleaning (see Chapter VIII. Materials Cleaning Analysis for details)

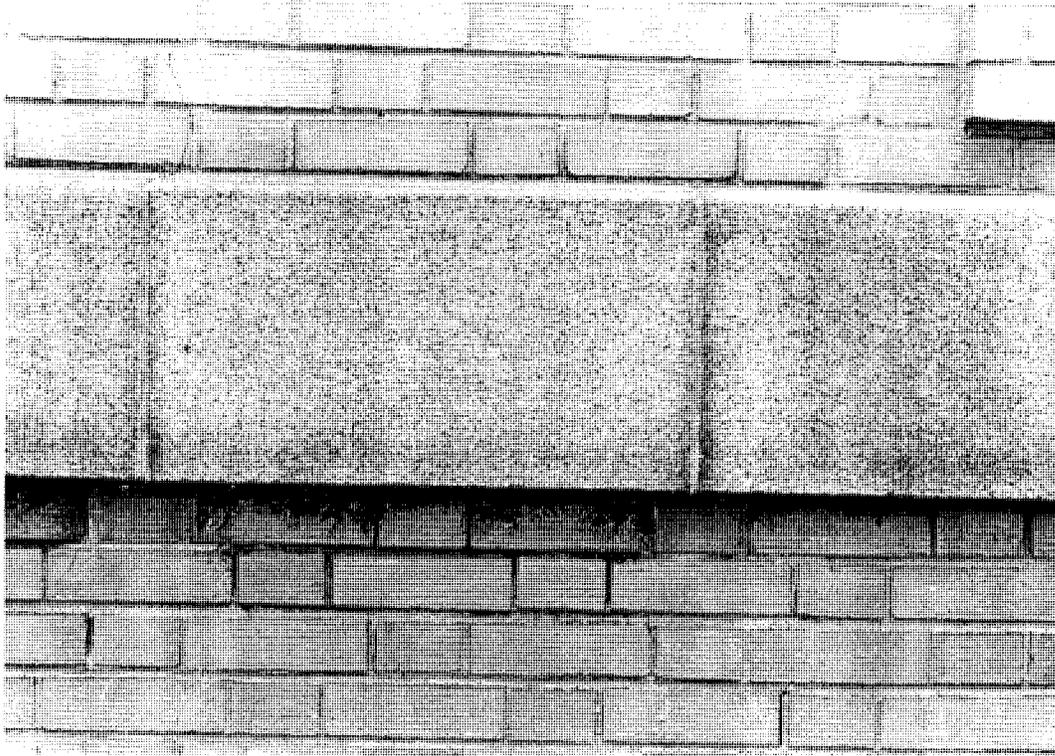


Figure 5-10

Location: North Elevation of Building 5 at West End

Problem: Open or caulked joints in granite water table

Cause of Problem: Susceptibility of vertical joints to water run-off; improper maintenance procedures

Suggested Remedy: Cut and point (see Chapter VII. Mortar Analysis for a discussion of replacement mortar)

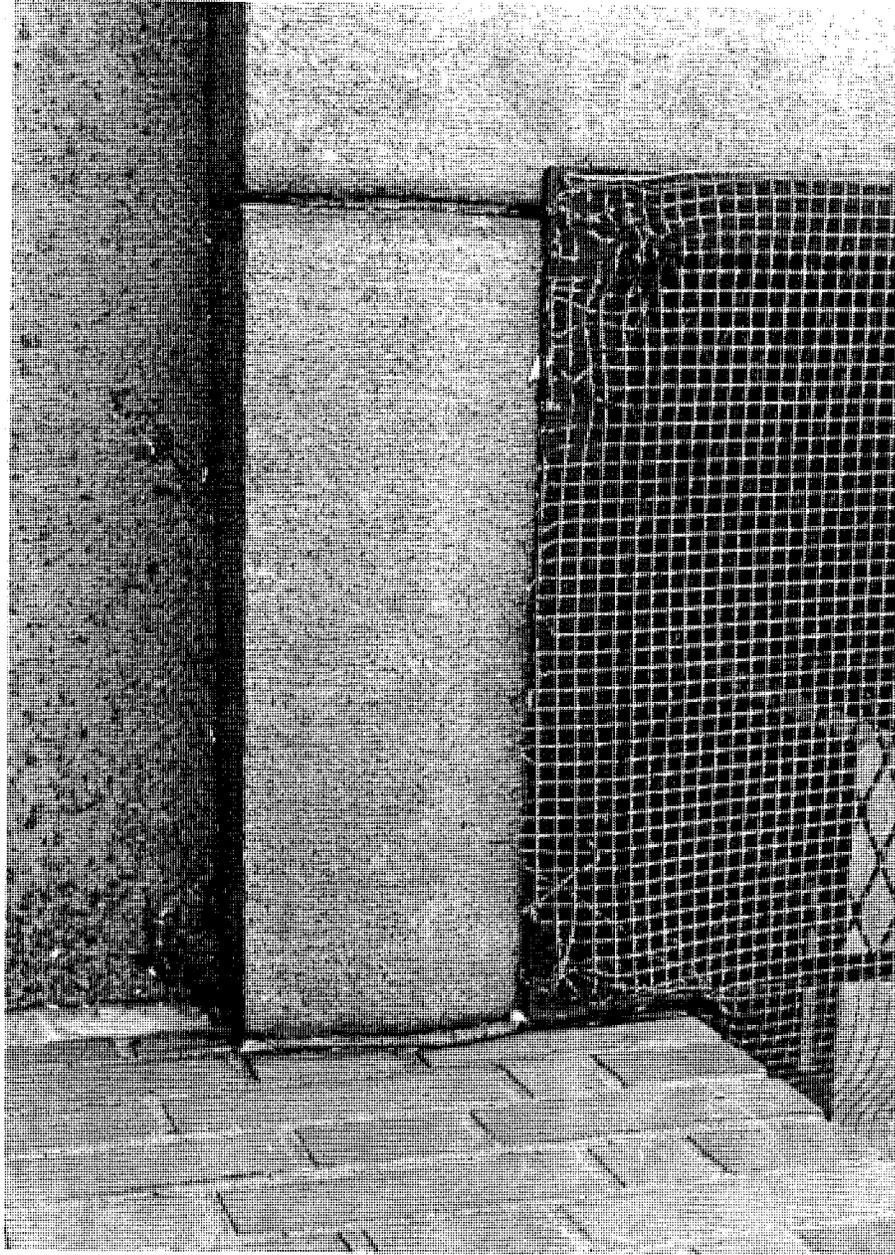


Figure 5-11

Location: West Elevation of Building 5 at North End

Problem: Open joints in granite window well

Cause of Problem: Susceptibility of vertical joints to water run-off; improper maintenance procedures

Suggested Remedy: Cut and point (see Chapter VII. Mortar Analysis for a discussion of replacement mortar)



Figure 5-12

Location: West Elevation of Building 5 at North End

Problem: Bitumen on granite

Cause of Problem: Sloppy application of waterproofing material for drain

Suggested Remedy: Poultice cleaning with solvent (see Chapter VIII. Materials Cleaning Analysis for details of treatment)



Figure 6-1

Location: North Elevation of Building 6 at West End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile



Figure 6-2

Location: North Elevation of Building 6 at West End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

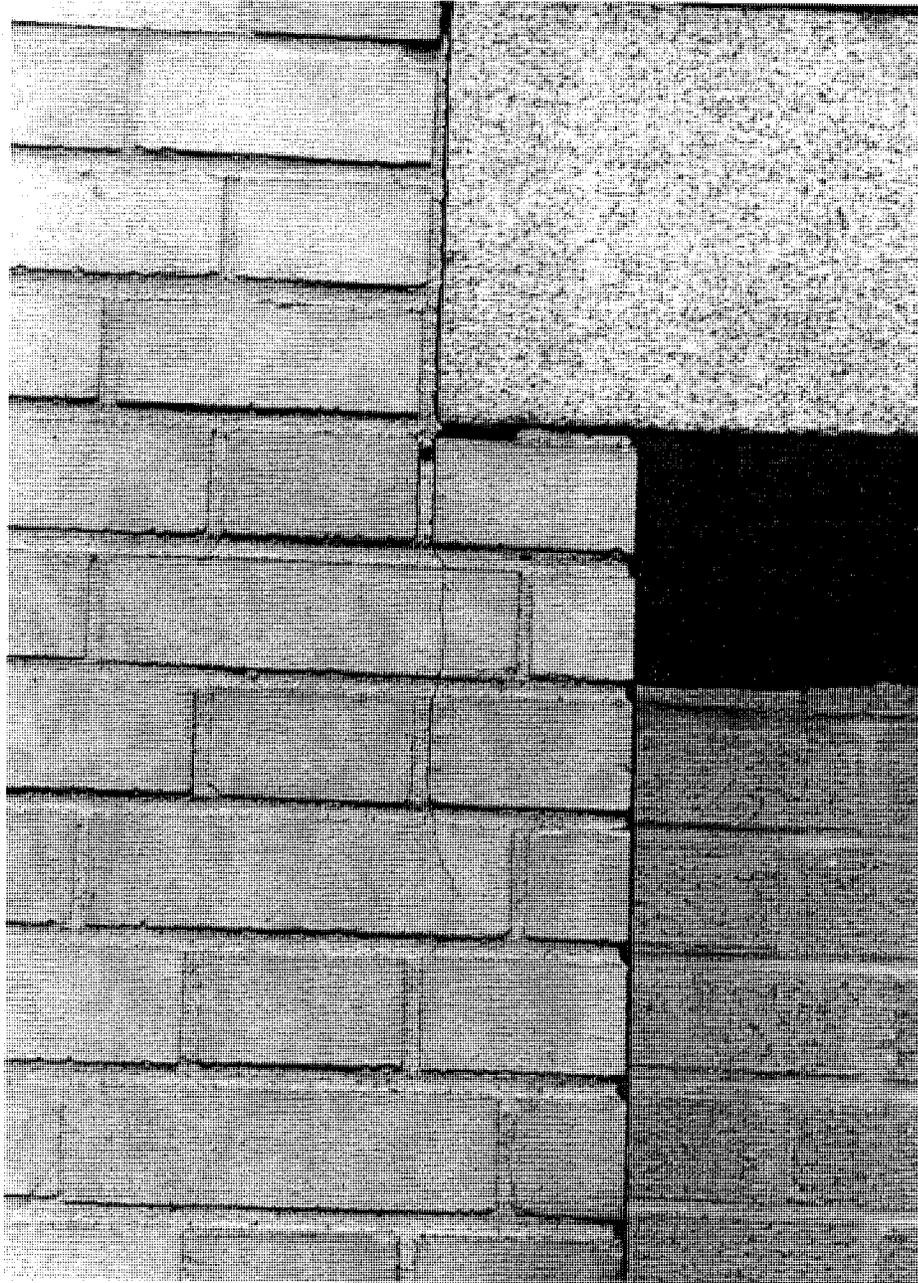


Figure 6-3

Location: East Elevation of Building 6 at North End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

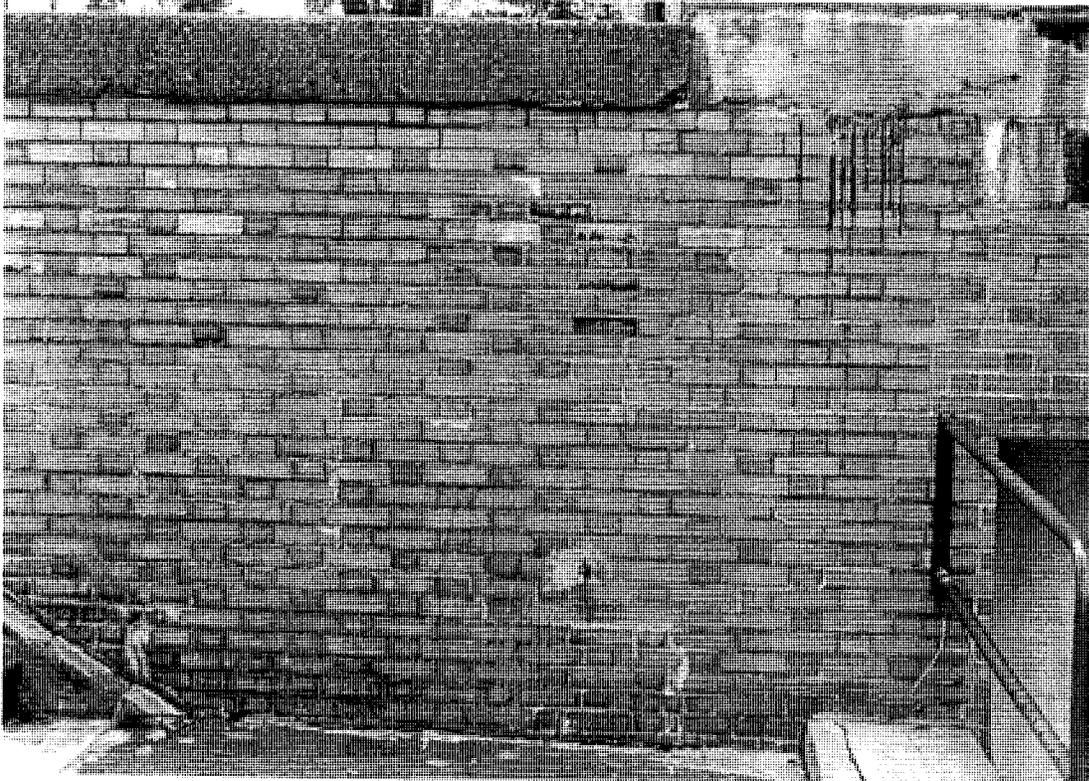


Figure 6-4

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Open mortar joints and efflorescence in brick

Cause of Problem: Water penetration through concrete slab

Suggested Remedy: Cut and point; waterproof concrete slab or replace concrete slab

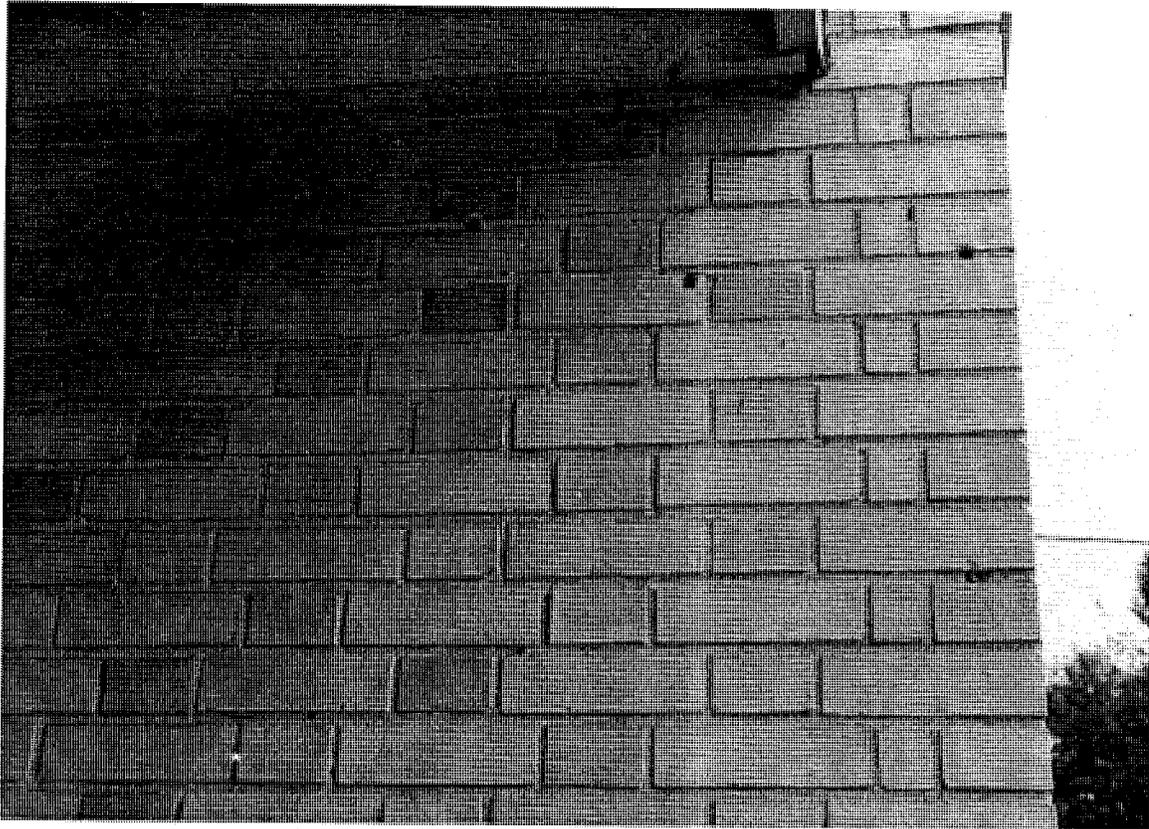


Figure 6-5

Location: South Elevation of Building 6 at East End

Problem: Damaged brick

Cause of Problem: Water penetration and freezing near metal anchors

Suggested Remedy: Remove anchors and fill with pointing mortar



Figure 6-6

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Damaged concrete capstones

Cause of Problem: Water penetration and freezing; rusting of iron railings

Suggested Remedy: Demolish and rebuild



Figure 6-7

Location: West Side of Entryway on North Elevation of Building 6

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild



Figure 6-8

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild



Figure 7-1

Location: West Elevation of Building 7 at South End

Problem: Bitumen waterproofing (and/or paint) on brick

Cause of Problem: Poor maintenance procedures

Suggested Remedy: Poultice with solvents

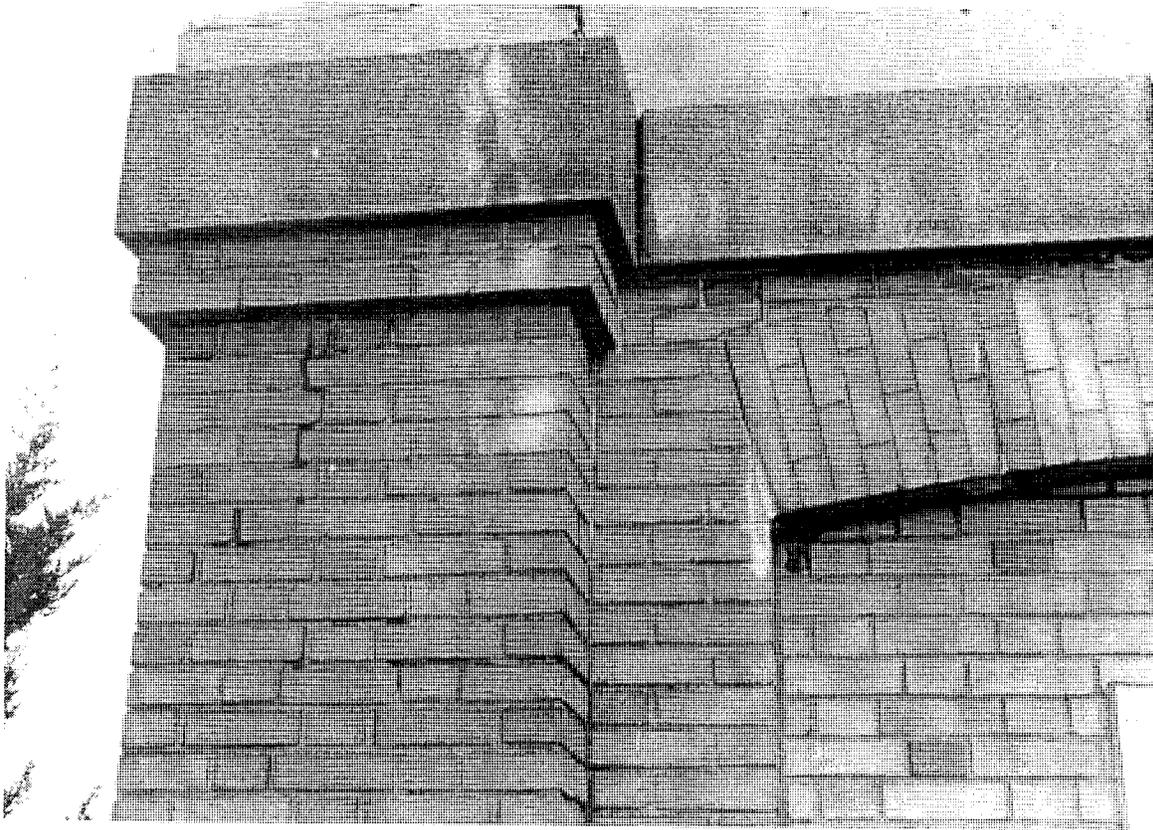


Figure 7-2

Location: South Elevation of Building 7 at West End

Problem: Open mortar joints in brick

Cause of Problem: Water penetration and freezing

Suggested Remedy: Cut and point

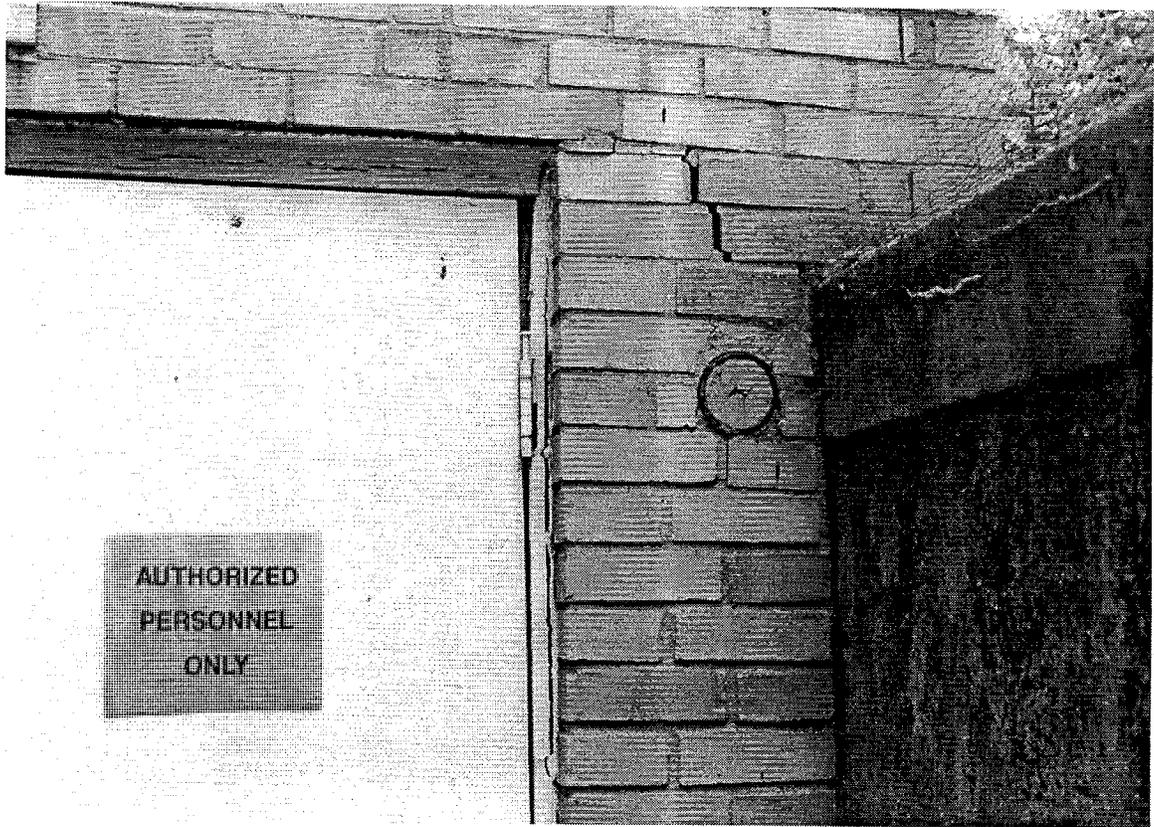


Figure 7-3

Location: North Side of Entryway on West Elevation of Building 7

Problem: Open mortar joints in brick

Cause of Problem: Water penetration and freezing; rusting of door lintel

Suggested Remedy: Remove brick and assess condition of lintel; replace if necessary and reset brick with mortar to match existing in color, texture and profile

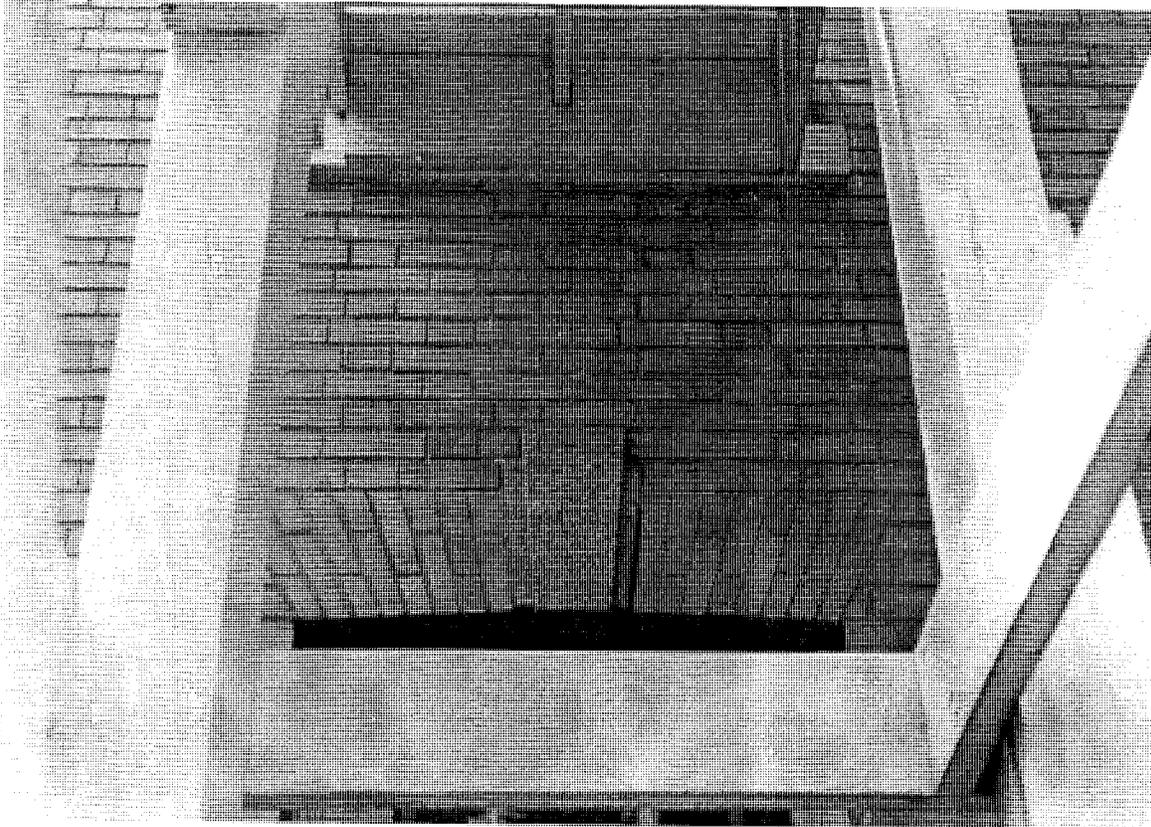


Figure 7-4

Location: North Elevation of Building 7 in Central Area

Problem: Open mortar joints

Cause of Problem: Water penetration and freezing

Suggested Remedy: Cut and point

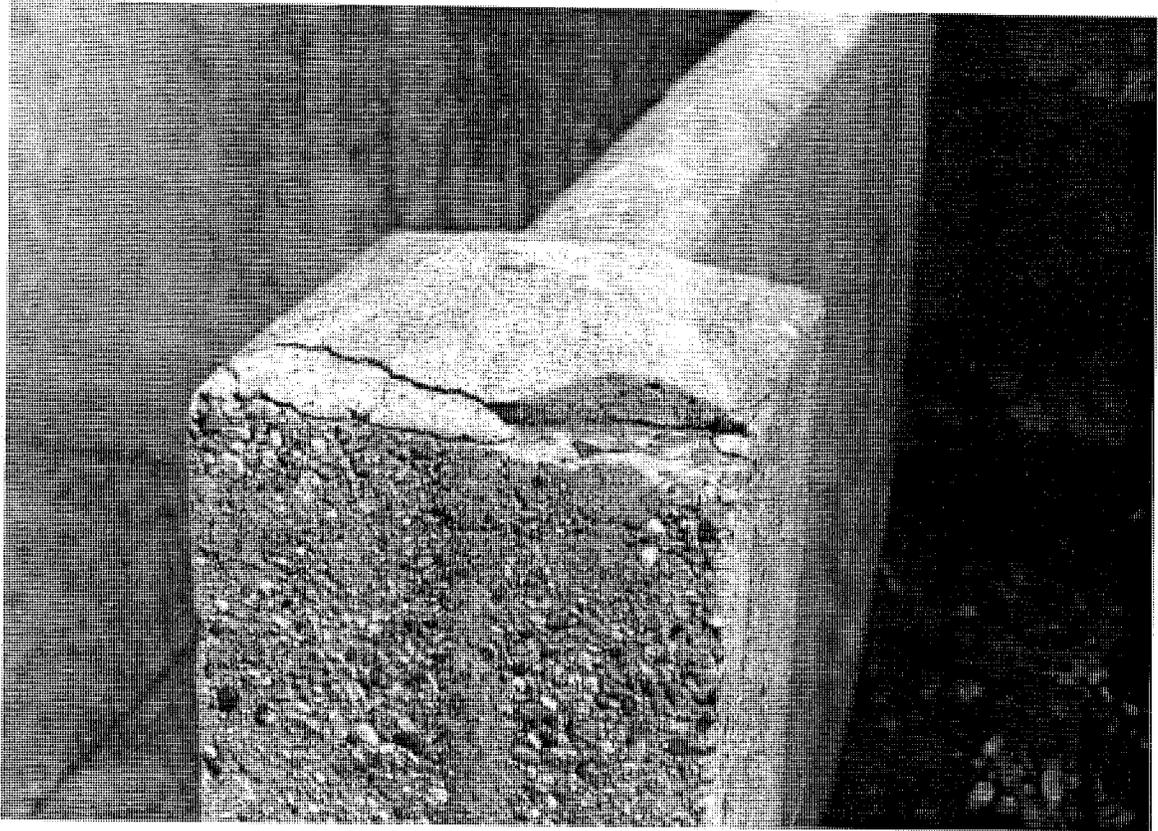


Figure 7-5

Location: East Elevation of Building 7 at North End (patio wall)

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Repair with concrete patching material

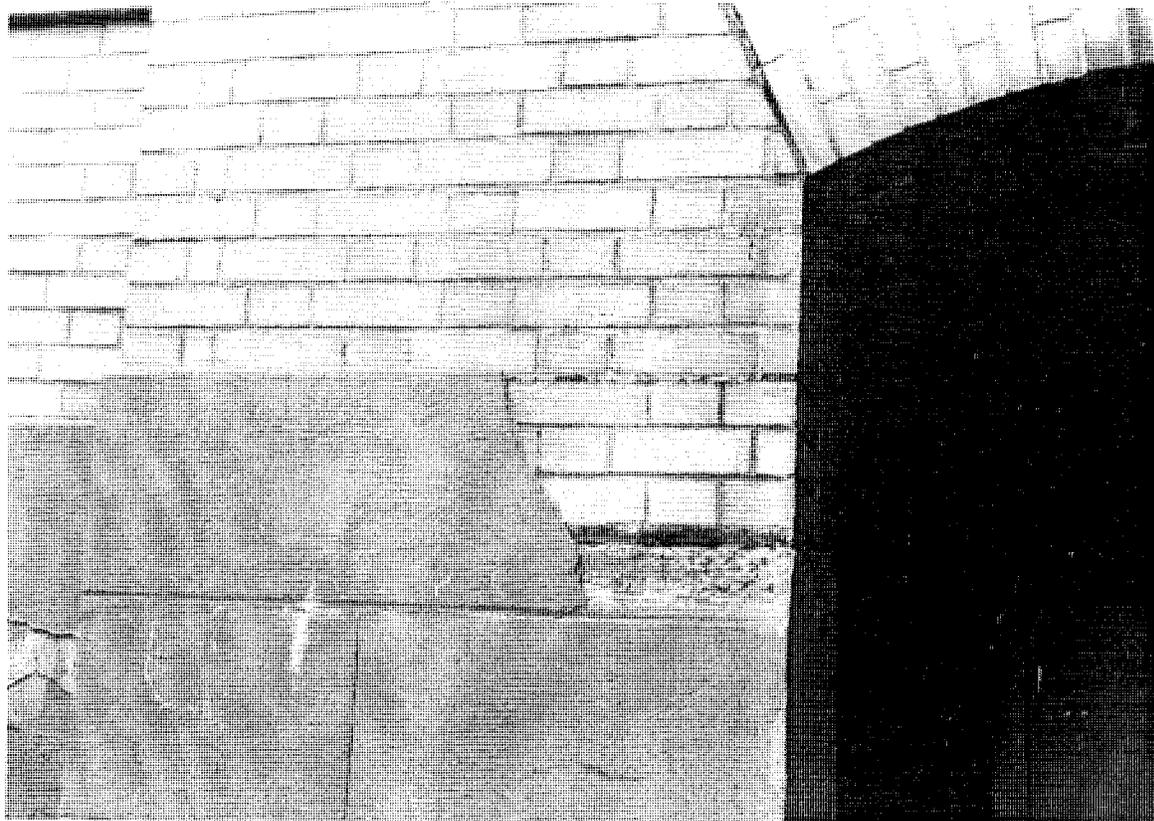


Figure 7-6

Location: South Elevation of Building 7 at West End

Problem: Damaged and failing stucco

Cause of Problem: Water penetration and freezing

Suggested Remedy: Repair with new stucco



Figure 7-7

Location: West Elevation of Building 7 along North Areaway

Problem: Bulging and efflorescing concrete retaining wall

Cause of Problem: Water penetration and freezing; pressure from soil

Suggested Remedy: Demolish and rebuild



Figure 7-8

Location: West Elevation of Building 7 at Central Entryway

Problem: Damaged and deteriorating concrete piers

Cause of Problem: Water penetration and freezing

Suggested Remedy: Repair with concrete patching material



Figure 7-9

Location: North Elevation of Building 7 at West End (Walkway Wall)

Problem: Damaged and deteriorating concrete capstone

Cause of Problem: Water penetration and freezing

Suggested Remedy: Remove and replace

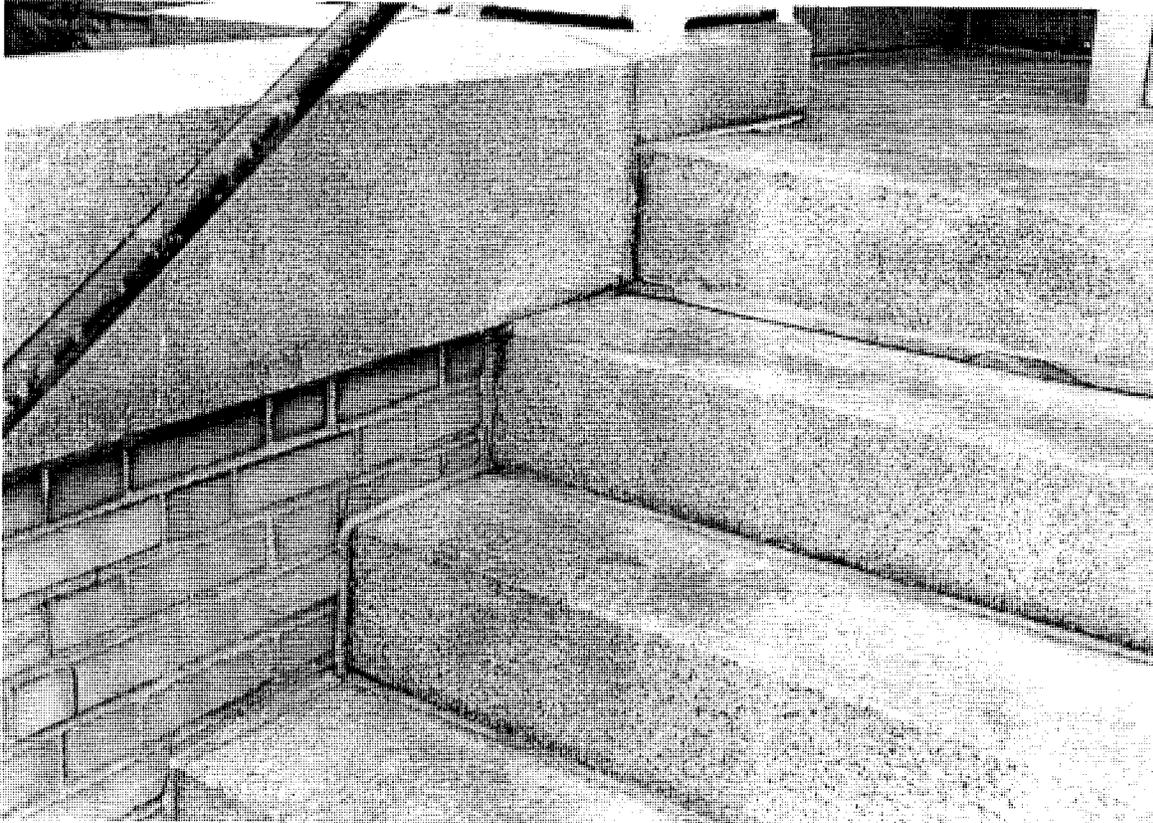


Figure 7-10

Location: West Elevation of Building 7 at Central Entryway

Problem: Open or caulked joints

Cause of Problem: Water penetration and freezing; improper maintenance procedures

Suggested Remedy: Remove, cut and point



## SUMMARY

This mortar analysis addresses the brick and stone water table pointing mortars found on Buildings 1, 3-7 of the Potomac Annex. Generally, the sampled mortars are in good condition and most appear to be original to the buildings. Aesthetically, it appears that the brick and water table pointing mortars for Buildings 1,5,6,& 7 were identical. The mortars found on Buildings 3 & 4, which indicate a different color range than the remaining buildings' mortars, appear to be original except for the water table pointing mortar of Building 4. The pointing mortar joint profiles (both vertical and horizontal) for all buildings are slightly concave. This chapter describes the analytical protocol used to study the mortars. Each mortar is considered separately and the physical and aesthetic characteristics of each are described and documented. All original mortars are to be replicated according to the results of this analysis.

## INTRODUCTION

The purpose of mortar analysis is to determine the compositions of existing mortars used in Buildings 1,3,4,5,6, and 7 at the Potomac Annex. This information is utilized in developing the specification for the mortar to be used in repointing work at these buildings.

Repointing masonry is essential in order to ensure that the building facades are water-tight. The composition of the mortar is important for several reasons. Mortar can be classified as "hard" or "soft", according to the amount of cement in its composition. This classification also reflects the compressive strength of the mortar (providing the aggregate content is held constant). Repointing mortar should be of the same or slightly less compressive strength than the original mortar. Too hard a mortar can cause the brick to crack because the bricks are held too rigidly in place. The aggregate colors the mortar and provides texture.

When undertaking any new repointing campaign, it is important to attempt to reproduce the color, texture, and profile existing pointing. Color and texture can be derived from the original mortar composition, while the profile comes from tooling the joint in the same manner as the original. The color and texture of the original mortar may be reproduced with mortars which are identical in composition or with mortars whose compositions are different from the original mortars.

## ANALYTICAL PROTOCOL

Samples were removed from Buildings 1,3,4,5,6, and 7 using a small hammer and chisel. Samples were analyzed by several methods. Before removal, both the color of the mortar and the joint profile were noted.

### *X-Ray Diffraction*

- ✓ approximately 100 milligrams of each sample is ground in an agate mortar and pestle to a fine powder.
- ✓ the fine powder is sprinkled on double-sticky tape which itself is adhered to a petrographic glass slide.
- ✓ the slide is placed in the sample holder of the Philips 1710 diffractometer.

The diffractometer operates at 40 kilivolts and 30 milliamps and scans are obtained from 3-63 degrees of Bragg angle. The scans are obtained by the Sietronics software which collects the diffractograms and determines the position and intensity of the resulting peaks. These data are digitally transferred to the Fein-Marquart Search-Match program for phase identification.

### *Wet Chemical Methods*

- ✓ samples are dried in a convection oven at 80 degrees centigrade for 12 hours, equilibrated to room temperature and relative humidity (approximately 50% RH and 20 degrees Celsius) and weighed.
- ✓ samples are lightly crushed so as not to crush the aggregate and thereby change the sizes of these particles.
- ✓ samples are transferred to erlenmeyer flask and digested in excess 1 molar hydrochloric acid for 1 hour noting effervescence if it occurs.
- ✓ acid insoluble residue are obtained by filtration and washing with distilled water.
- ✓ residues are dried to constant weight at 80 degrees centigrade in a convection oven and equilibrated to room temperature and relative humidity and weighed.
- ✓ color and granulation (by sieving) of the resulting residue is noted.
- ✓ calculation/estimation of the original mortar composition.

Acid-soluble fractions in mortars comprise calcite - from lime or in the aggregate - or gypsum which may be present due to the conversion of calcite to gypsum by acid rain or sulfur dioxide in combination with water. It is not often that aggregates comprise calcite.

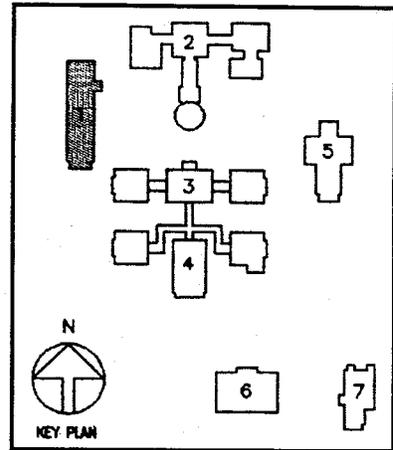
Acid-insoluble fractions in mortar usually comprise the aggregate and cement components (or less acid-soluble lime components).

**Building 1 - Brick Pointing Mortar**

**Designation:** 1POTM (Figure 7-1)  
**Location:** Northeast corner of Building 1 at eye level  
**Integrity:** Appears to be original  
**Description:** White-grey with fine aggregate; some dark inclusions  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 1/2" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite (see uPDSM Report 1POTM at the back of this chapter.)  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2 lime:acid insolubles



Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	27
60	38
100	22
140	6
180	1
200	2
Pan	4

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is in generally good condition and is well bonded except in step or stress cracks

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: quartz-sand with a sieve ratio similar to the above analysis. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 1/2" wide, 1/16" deep, concave - both vertical and horizontal

**Building 1 - Granite Water Table Pointing Mortar**

**Designation:** 1POTMWT (Figure 7-2)  
**Location:** Northeast basement corner of Building 1 at eye level  
**Integrity:** Appears to be original  
**Description:** White-grey with fine aggregate and some dark inclusions  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite, muscovite mica, feldspar (see uPDSM Report 1POTMWT at the back of this chapter.)  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	33
60	47
100	13
140	3
180	0
200	2
Pan	4

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly lime and sand. The sand is more varied than 1POTM and contains some feldspar and mica. Some yellow ochre appears to be present and cement appears to be absent.

**Deterioration:** The mortar is lost in many areas due to movement and hardness of granite; more frequent repointing may be required at the water table.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: quartz sand, by volume. The sand should contain muscovite mica and some mafic minerals and have a sieve ratio similar to the above analysis. Mineral oxide pigments may be added to attain the proper color.

**Recommended**

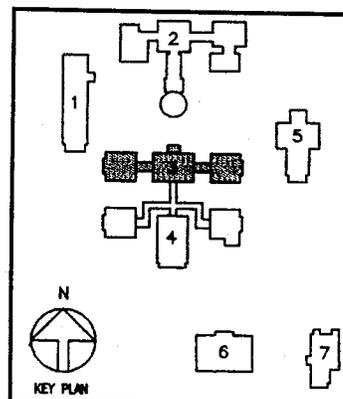
**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 3 - Brick Pointing Mortar**

**Designation:** 3POTM (Figure 7-3)  
**Location:** Southeast corner of Building 3  
**Integrity:** Appears to be original  
**Description:** Grey-to-light tan with fine aggregate  
 Munsell Color Notation - Mortar: 10 YR 8/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite (see uPDSM Report 3POTM at the back of this chapter.)  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:1.7 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	14
60	39
100	27
140	7
180	4
200	3
Pan	7

Munsell Color Notation - Acid Insolubles: 10 YR 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is in generally good condition except in areas of step or stress cracks.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: quartz sand by volume; the sand should contain muscovite mica with a sieve ratio similar to the above analysis. Mineral oxide pigments may be added to attain the proper color.

**Recommended**

**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 3 - Limestone Water Table Pointing Mortar**

**Designation:** 3POTMWT (Figure 7-4)  
**Location:** Southeast corner of Building 3  
**Integrity:** Appears to be original  
**Description:** White-grey with fine to medium aggregate  
 Munsell Color Notation - Mortar: 5 Y 8.5/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite, (see uPDSM report 3 POTMWT at the back of this chapter)  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds.

Volumetric Analysis: 1:2.7 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	32
60	46
100	15
140	3
180	1
200	2
Pan	2

Munsell Color Notation - Acid Insolubles: 10 YR 7/4

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** Mortar in the water table joints is often missing or has been replaced.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: :sand (by volume) using sand similar to the above sieve analysis.

**Recommended**

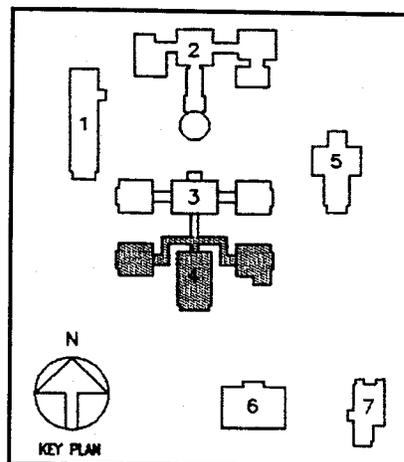
**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 4: Brick Pointing Mortar**

**Designation:** 4POTM (Figure 7-5)  
**Location:** Northwest corner of Building 4  
**Integrity:** Appears to be original  
**Description:** Grey-to-light tan with fine aggregate  
 Munsell Color Notation - Mortar: 10 YR 8/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:**  
X-ray Diffraction: quartz, calcite (see uPDSM report 4POTM at the back of this chapter).  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:1.7 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	13
60	41
100	26
140	8
180	4
200	4
Pan	6

Munsell Color Notation - Acid Insolubles: 10 YR 8/1

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is in generally good condition and is well bonded except in areas of step or stress cracks.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: quartz sand (by volume) with a sieve ratio similar to the above analysis. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 4 - Limestone Water Table Pointing Mortar**

**Designation:** 4POTMWT (Figure 7-6)  
**Location:** Northwest corner of Building 4  
**Integrity:** Appears to be non-original  
**Description:** Tan with medium aggregate  
 Munsell Color Notation - Acid Insolubles: 2.5 Y 8.5/2

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz (see uPDSM report 4POTMWT at the back of this chapter).  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:8 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	7
40	45
60	29
100	11
140	3
180	1
200	2
Pan	1

Munsell Color Notation - Acid Insolubles: 10 YR 6/4

**Comments:** The mortar appears to be mostly quartz-sand and lime, but much of the lime has been lost. Weak/non-crystalline materials are probably iron oxides such as yellow ochre present in the sand.

**Deterioration:** Much of the water table mortar has been lost and the existing pointing mortar appears to be non-original. The losses are due to the high level of run-off over the vertical joints of the water table.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: quartz sand by volume. The sand should match that of 3POTMWT.

**Recommended**

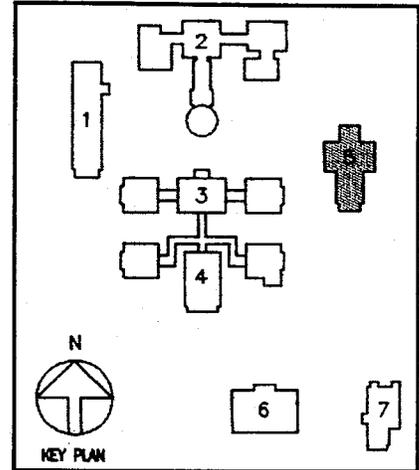
**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 5 - Brick Pointing Mortar**

**Designation:** 5POTM (Figure 7-7)  
**Location:** Northeast corner of Building 5  
**Integrity:** Appears to be original  
**Description:** White-grey with fine aggregate and some dark inclusions  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 7/16" - 1/2" width, 1/16" depth, concave

**Analyses:**  
X-ray Diffraction: quartz, calcite, gypsum, feldspar (see uPDSM Report 5POTM at the back of this chapter.)  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2 lime:acid insolubles



Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	29
60	34
100	23
140	5
180	2
200	4
Pan	3

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is generally in good condition and is well bonded except in areas of step or stress cracks. Acid rain has converted some of the lime to gypsum although this does not appear to be a significant problem.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand, by volume, with a sieve ratio similar to the above analysis. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 7/16" wide, 1/16" deep, concave - both vertical and horizontal

**Building 5 - Granite Water Table Pointing Mortar**

**Designation:** 5POTMWT (Figure 7-8)  
**Location:** Northeast corner of Building 5  
**Integrity:** Appears to be non-original  
**Description:** Tan with medium aggregate  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite (see uPDSM Report 5POTMWT at the back of this chapter.  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2.5 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	7
40	24
60	42
100	21
140	4
180	1
200	1
Pan	1

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is lost in many areas due to movement and hardness of the granite; more frequent repointing may be required in the water table.

**Repointing**

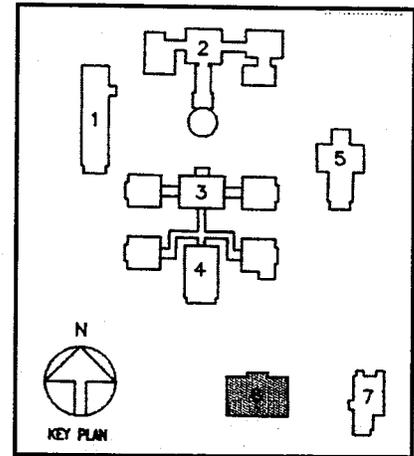
**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand with a sieve ratio similar to 5POTM. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 6 - Brick Pointing Mortar**

- Designation:** 6POTM (Figure 7-9)
- Location:** North facade of Building 6, west of entrance, near first basement window
- Integrity:** Appears to be original
- Description:** White-grey with fine aggregate and some dark inclusions  
Munsell Color Notation - Mortar: 5 Y 9/1
- Profile:** 7/16" width, 1/16" depth, concave
- Analyses:**  
X-ray Diffraction: quartz, calcite, gypsum (see uPDSM Report 6POTM at the back of this chapter).  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	26
60	40
100	24
140	4
180	-
200	3
Pan	3

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

- Comments:** The mortar appears to be mostly quartz-sand and lime.
- Deterioration:** The mortar is in generally good condition and is well bonded except in areas of step or stress cracks. Acid rain has converted some of the lime to gypsum, although this does not appear to be a significant problem.
- Repointing**
- Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand with a sieve ratio similar to the above analysis. The proper color can be achieved with mineral oxide pigments.
- Recommended Profile:** 7/16" wide, 1/16" deep, concave - both vertical and horizontal

**Building 6 - Granite Water Table Pointing Mortar**

**Designation:** 6POTMWT (Figure 7-10)  
**Location:** North facade of Building 6, west of entrance, near first basement window  
**Integrity:** Appears to be non-original  
**Description:** Tan with medium aggregate  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite, clay, mica (see uPDSM Report 6POTMWT at the back of this chapter.  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:1.5 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	35
60	38
100	14
140	7
180	1
200	1
Pan	4

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** This is a replacement mortar with a composition that is different from other mortars at the site.

**Deterioration:** The mortar is lost in many areas due to movement and hardness of the granite; more frequent repointing may be required in the water table.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand with a sieve ratio similar to 6POTM. The proper color can be achieved with mineral oxide pigments.

**Recommended**

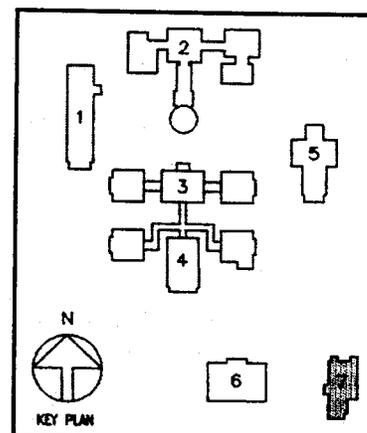
**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

**Building 7 - Brick Pointing Mortar**

**Designation:** 7POTM (Figure 7-11)  
**Location:** Northwest corner of Building 7  
**Integrity:** Appears to be original  
**Description:** White-grey with fine aggregate, some dark inclusions  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 7/16" - 1/2" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite, muscovite mica (see uPDSM Report 7POTM at the back of this chapter).  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:2 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	-
40	28
60	35
100	20
140	8
180	2
200	4
Pan	3

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is in generally good condition and is well bonded except in areas of step and stress cracks.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand with a sieve ratio similar to the above analysis. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 7/16" wide, 1/16" deep, concave - both vertical and horizontal

**Building 7 - Granite Water Table Pointing Mortar**

**Designation:** 7POTMWT (Figure 7-12)  
**Location:** Northwest corner of Building 7  
**Integrity:** Appears to be non-original  
**Description:** Grey with medium aggregate  
 Munsell Color Notation - Mortar: 5 Y 9/1

**Profile:** 3/8" width, 1/16" depth, concave

**Analyses:** X-ray Diffraction: quartz, calcite, muscovite mica (see uPDSM Report 7POTMWT at the back of this chapter.  
Wet Chemistry: vigorous efflorescence upon addition of acid; solution becomes yellow-green with acid indicating the presence of reactive iron compounds  
Volumetric Analysis: 1:1.5 lime:acid insolubles

Sieve Analysis of Acid Insolubles:

Mesh Size	Weight Percent
10	6
40	36
60	39
100	9
140	3
180	0
200	2
Pan	5

Munsell Color Notation - Acid Insolubles: 2.5 Y 8/2

**Comments:** The mortar appears to be mostly quartz-sand and lime.

**Deterioration:** The mortar is lost in many areas due to movement and hardness of the granite; more frequent repointing may be required in the water table.

**Repointing**

**Composition:** 1:1:6 (by volume) ratio of hydrated lime: Portland Cement: sand with a sieve ratio similar to 5POTM. The proper color can be achieved with mineral oxide pigments.

**Recommended**

**Profile:** 3/8" wide, 1/16" deep, concave - both vertical and horizontal

### REPLICATION

When repointing, it is important to match the existing mortars' aesthetic and physical characteristics and the existing joint profile. When contemplating removal of existing deteriorated pointing mortar, only the most careful and sensitive methods should be used. Generally, removal of joint mortar by hand is preferable; however, electric powered tools may be utilized by specially trained masons. A guideline specification for joint removal with saws is referenced in the GSA-NCR Preservation Notebook - 04500: Masonry Restoration. Methods of executing new mortar joints are referenced in the Specifications in Chapter 10 of this document.

Since the sand component for each of these replication mixes represents the majority of the material used and the sand in a mortar has a significant impact on the color a mortar will ultimately impart, it is very important to match as closely as possible the color, grain shape, grain size, and grain size distribution of the original sands. Also, the sand for the mixes should be clean, and free from loam, silt, soluble salts, and organic matter, and conform to ASTM C-44. Additional refinements to the mortar recipe may be necessary to achieve an acceptable color to match existing mortar. Pigments may be added if they are alkali resistant oxides manufactured for use in cement mixes. Careful color matching of the mortar is particularly important when partially repointing mortar. Sample mortars and mock-up panels should be approved by the Contracting Officer before general repointing work begins.



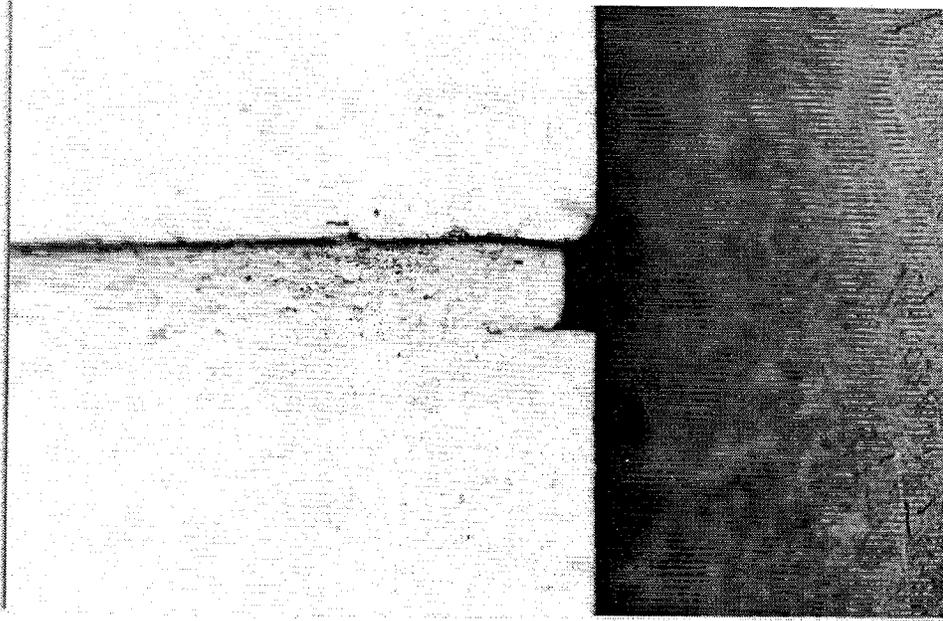


Figure 7-1

Building 1 - Brick Pointing Mortar

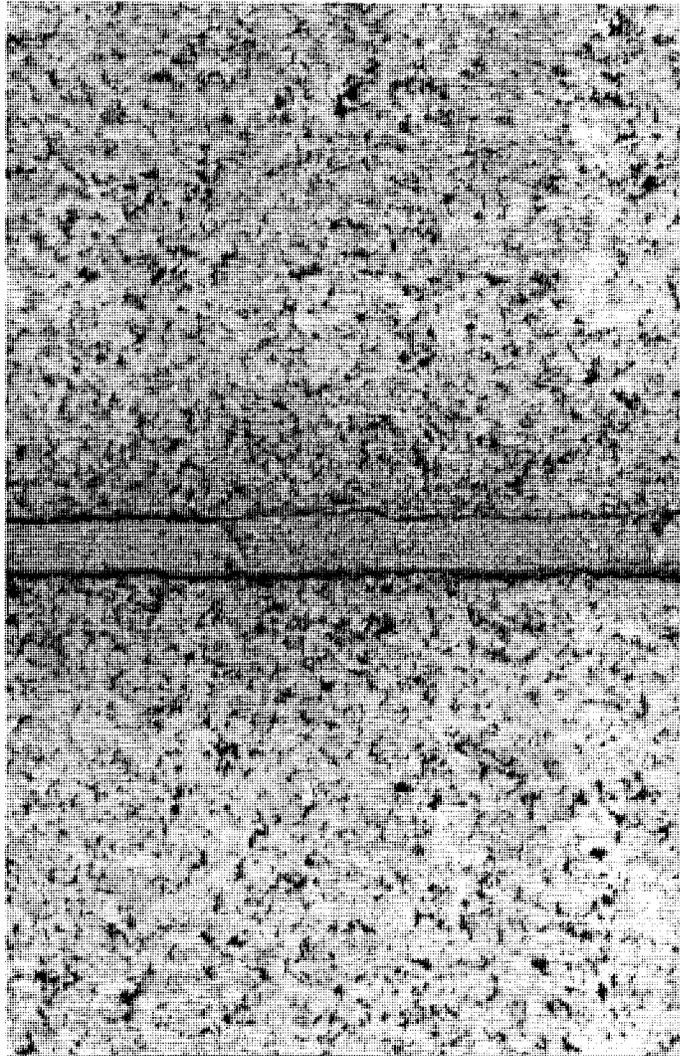


Figure 7-2

Building 1 - Granite Pointing Mortar

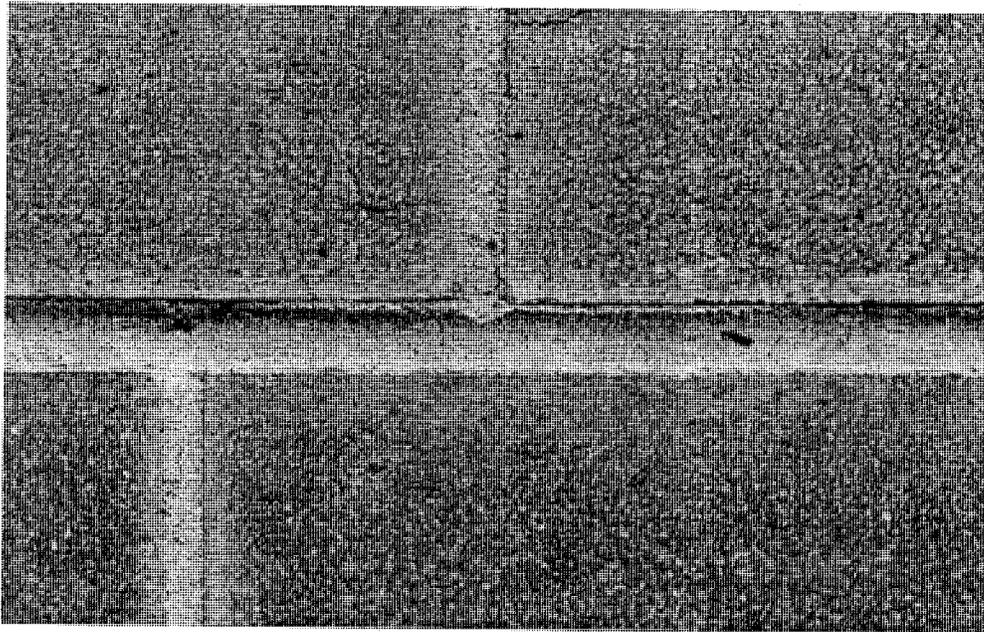


Figure 7-3

Building 3 - Brick Pointing Mortar

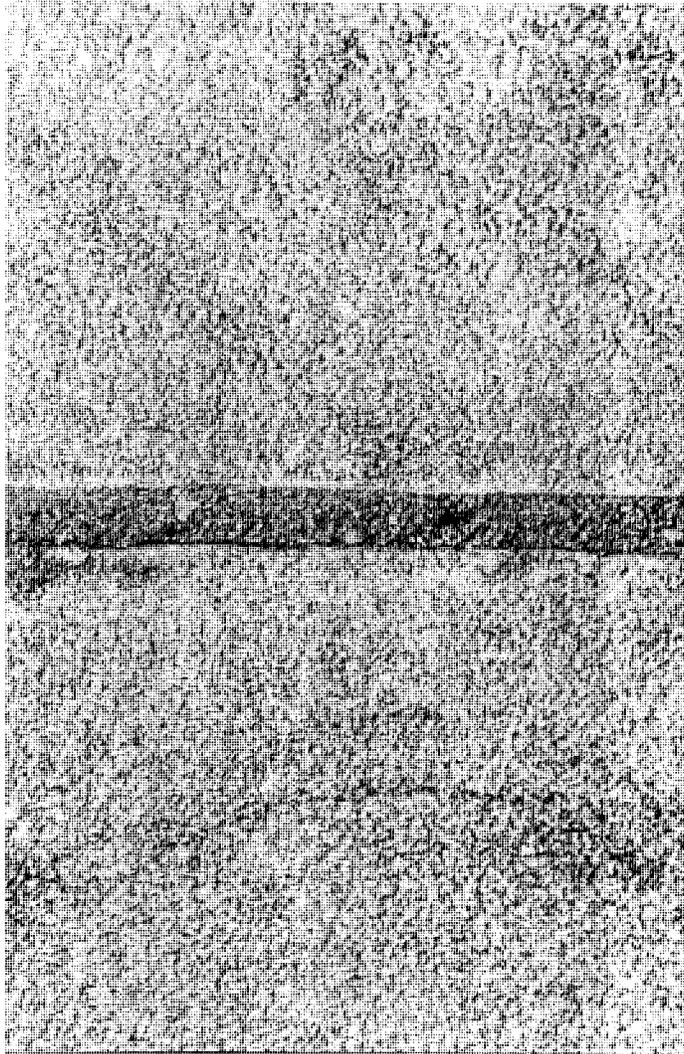


Figure 7-4

Building 3 - Limestone Pointing Mortar

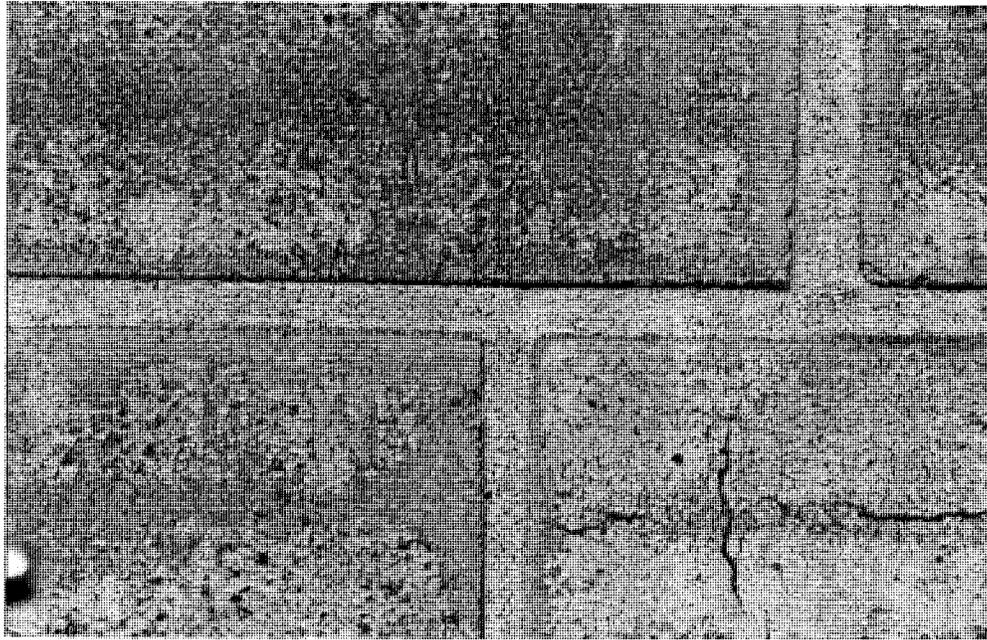


Figure 7-5

Building 4 - Brick Pointing Mortar

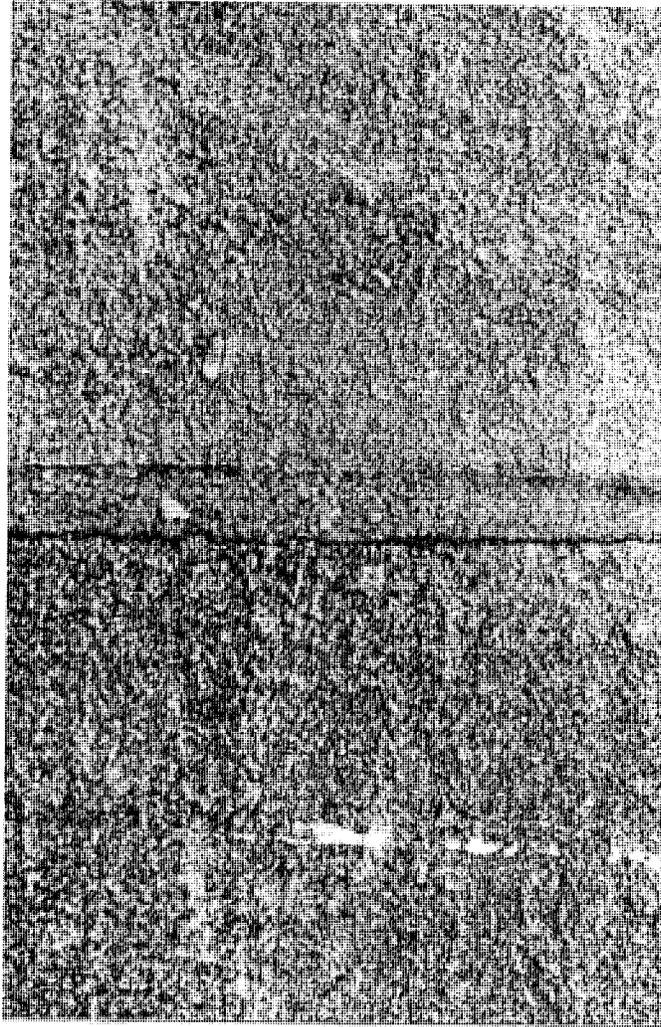


Figure 7-6

Building 4 - Limestone Pointing Mortar

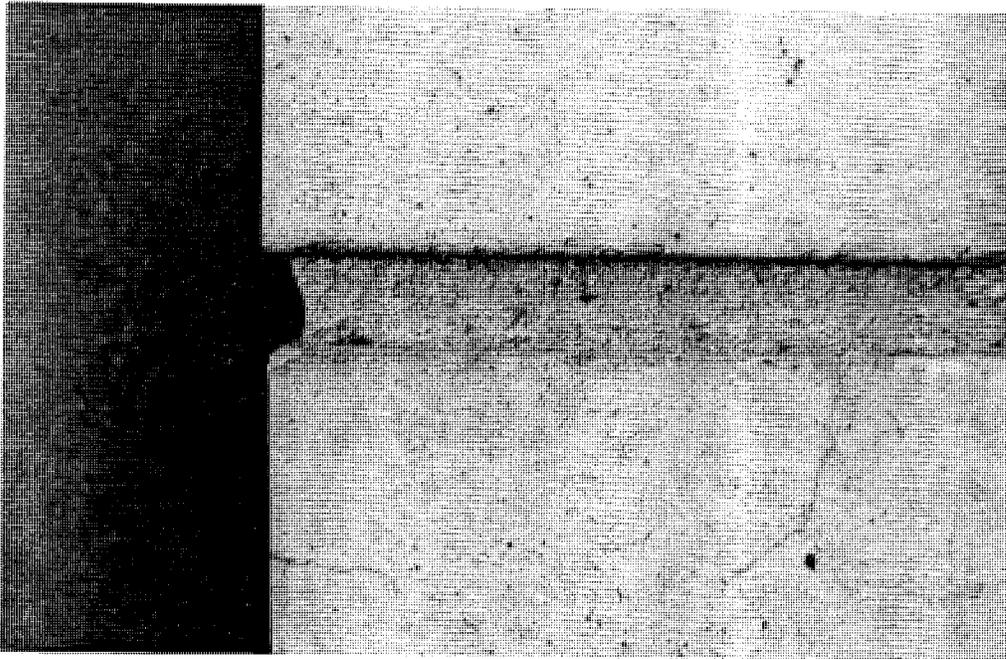


Figure 7-7

Building 5 - Brick Pointing Mortar

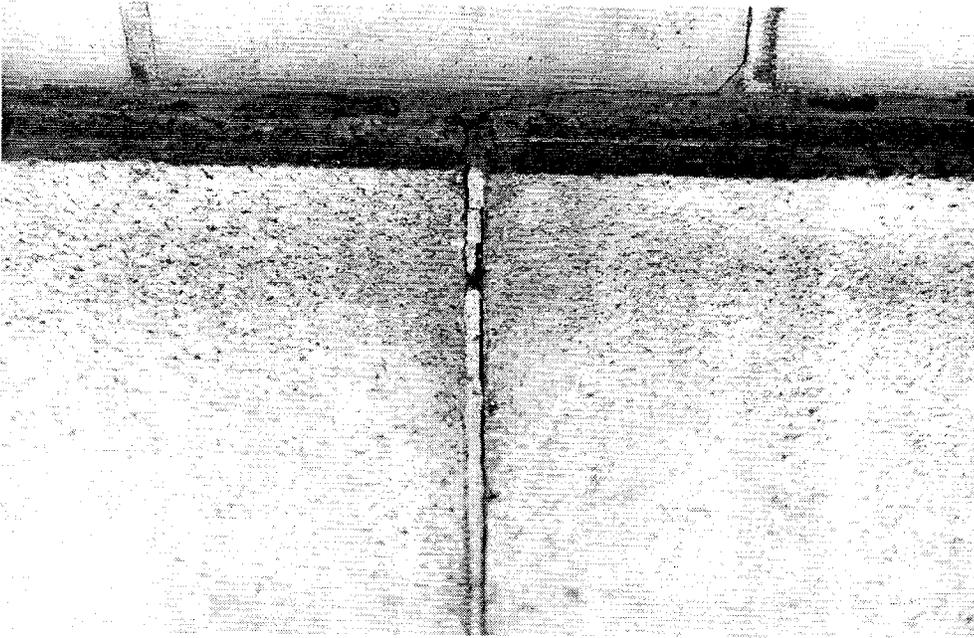


Figure 7-8

Building 5 - Granite Pointing Mortar

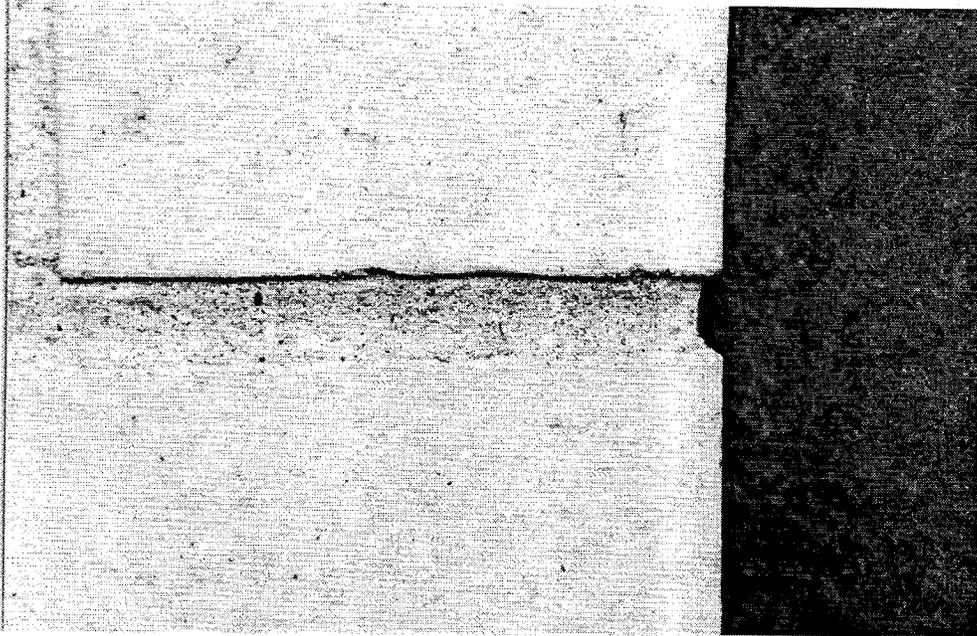


Figure 7-9

Building 6 - Brick Pointing Mortar

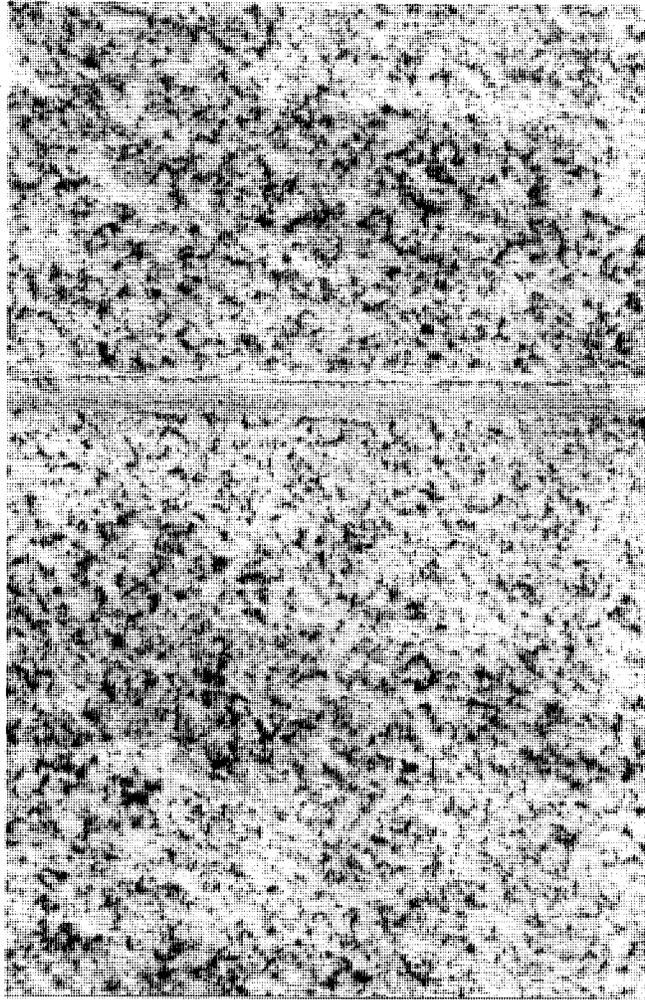


Figure 7-10

Building 6 - Granite Pointing Mortar

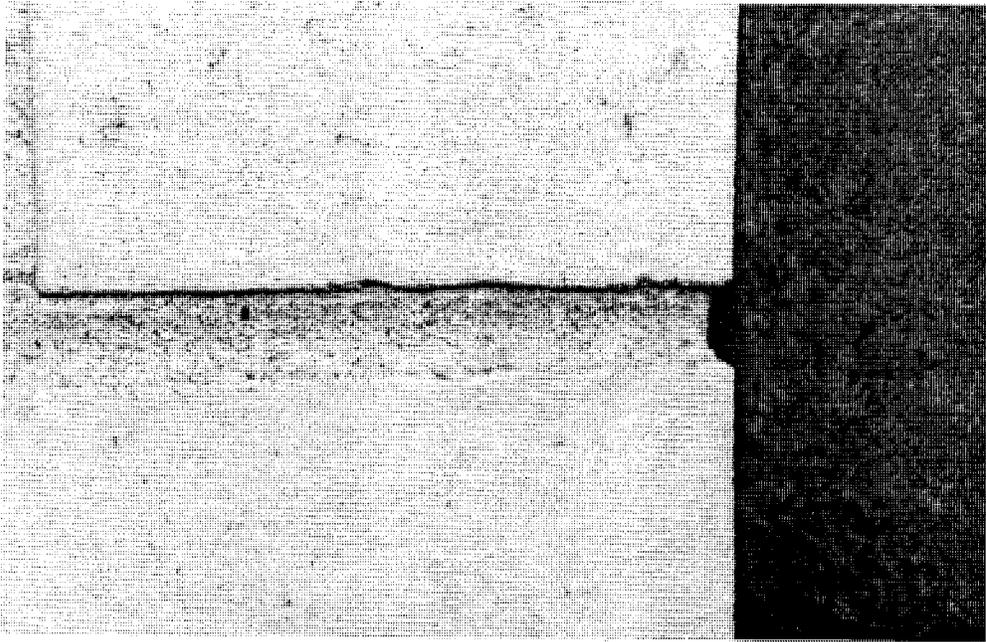


Figure 7-11

Building 7 - Brick Pointing Mortar

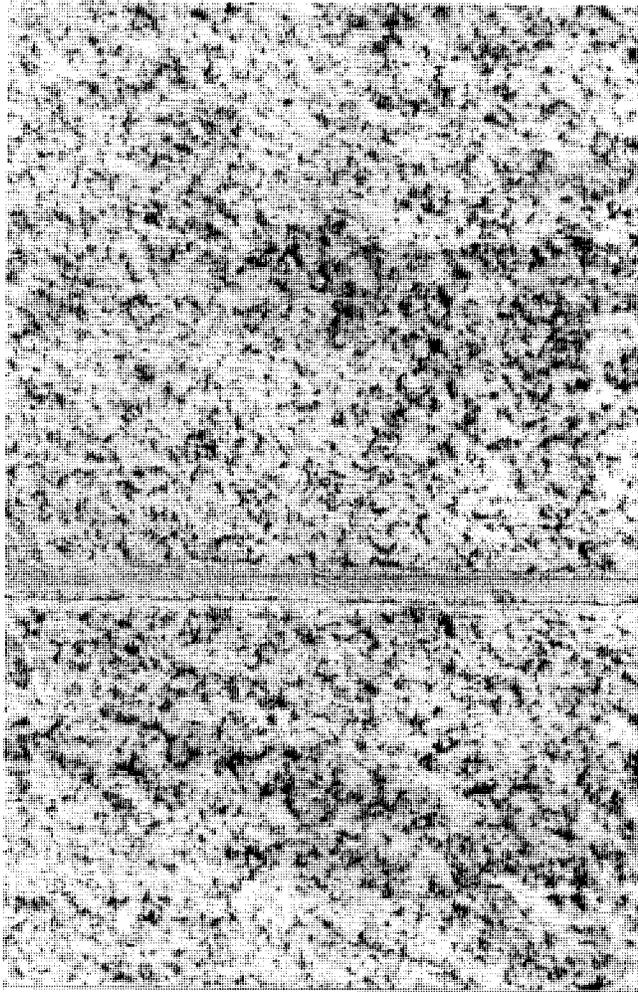
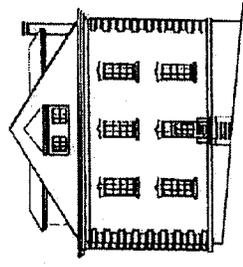


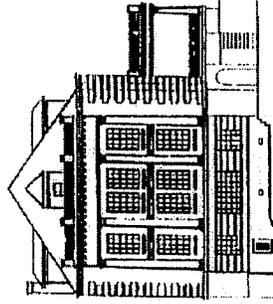
Figure 7-12

Building 7 - Granite Pointing Mortar

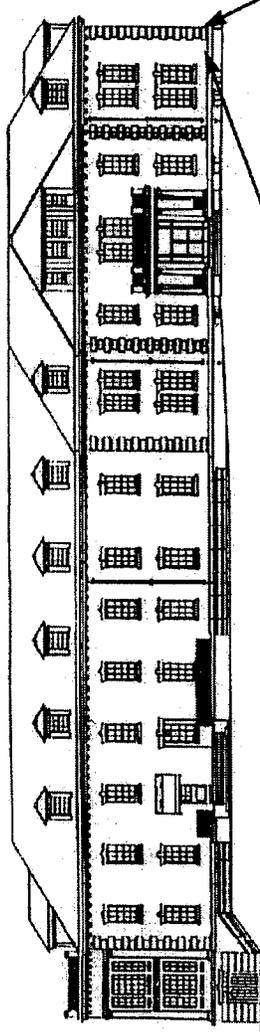
MORTAR SAMPLE LOCATIONS



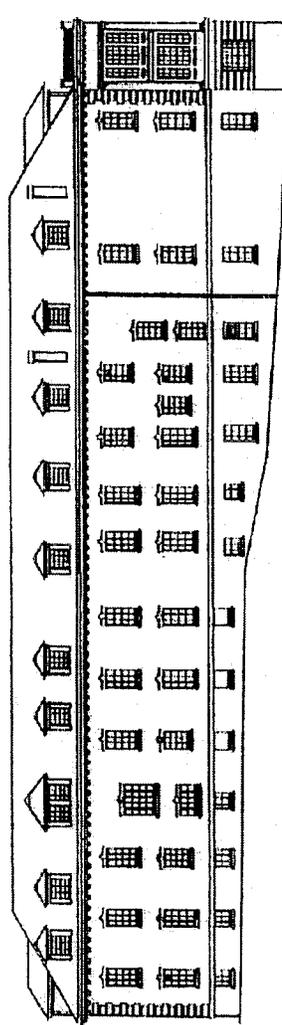
North Elevation



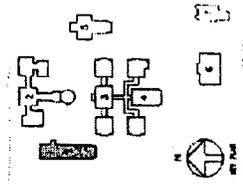
South Elevation



East Elevation

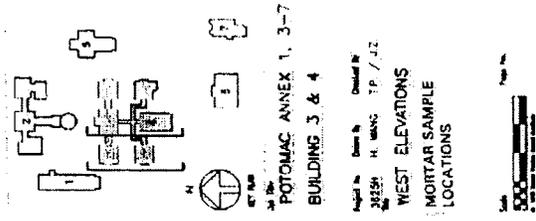
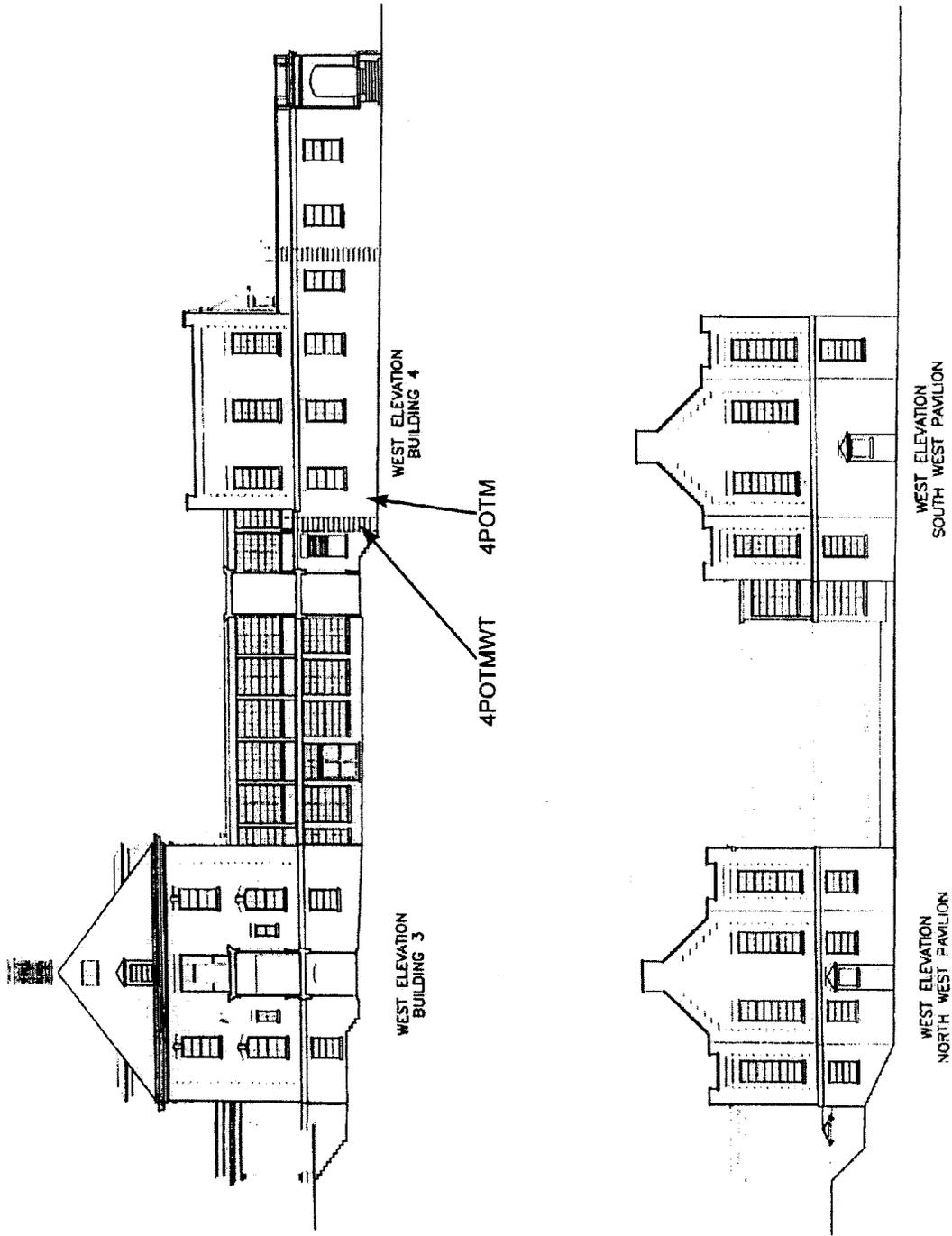


West Elevation

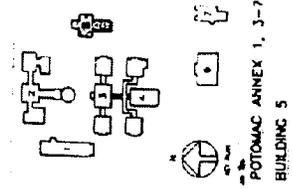
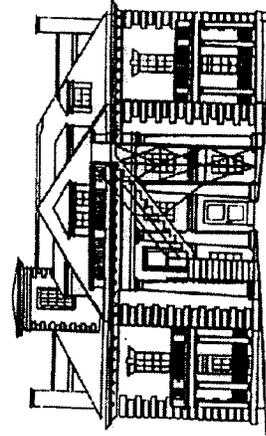
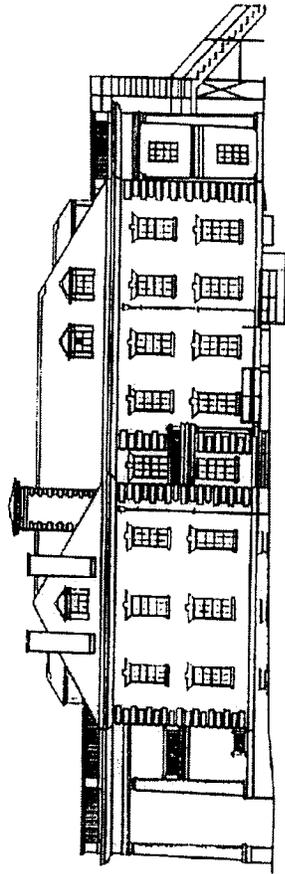
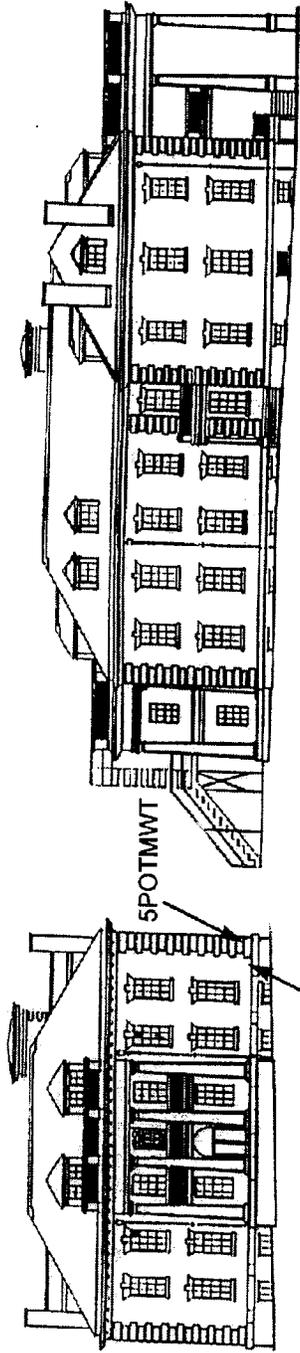


POTOMAC ANNEX 1, 3-7  
BUILDING 1

Project No. 100-100-100  
Scale 1/8" = 1'-0"  
ELEVATIONS  
MORTAR SAMPLE  
LOCATIONS  
Date 10/1/97

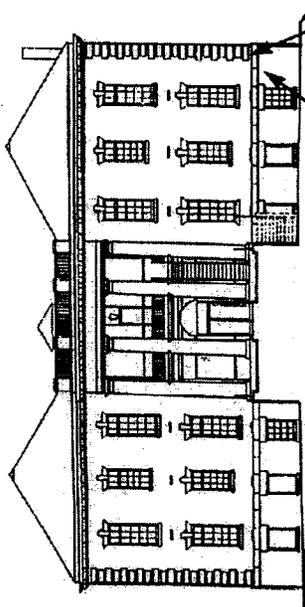




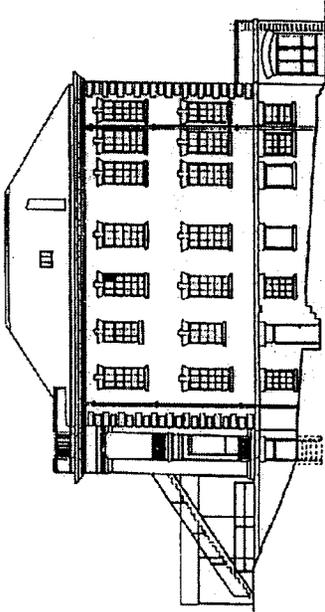


Prepared by: *[Signature]*  
 Date: 1/17/12  
 Scale: 1/8" = 1'-0"  
 ELEVATIONS

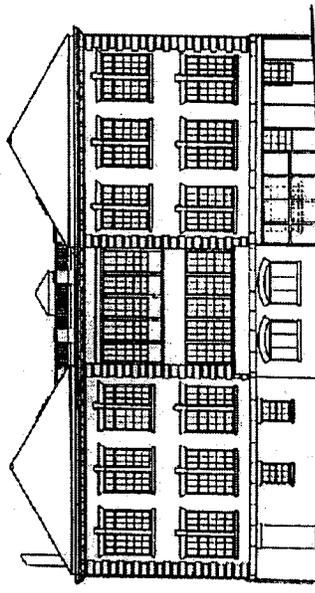




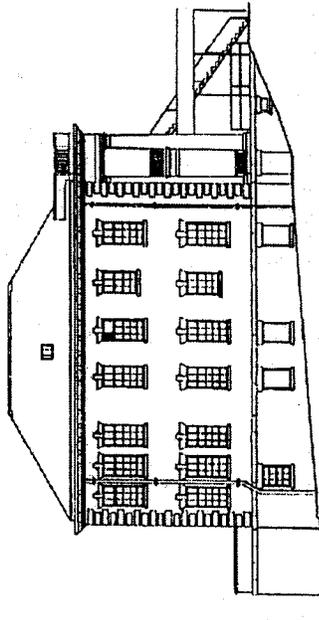
North Elevation



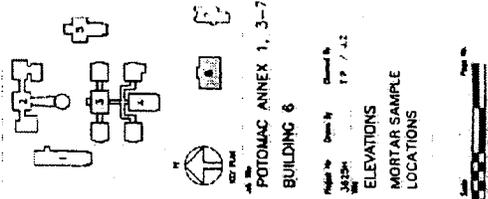
West Elevation

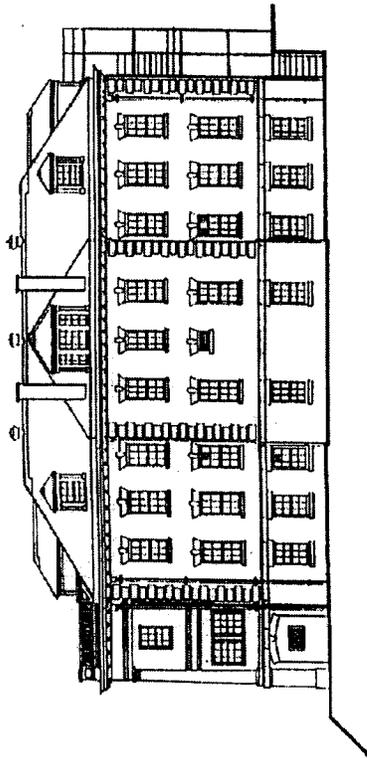


South Elevation

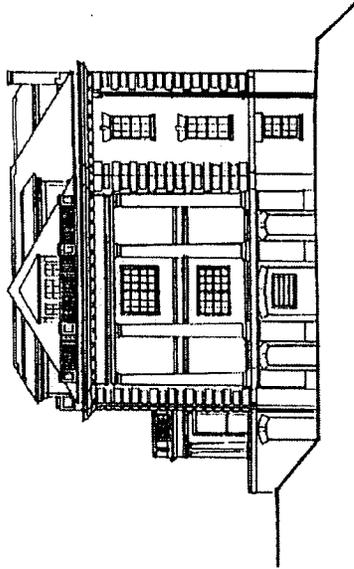


East Elevation

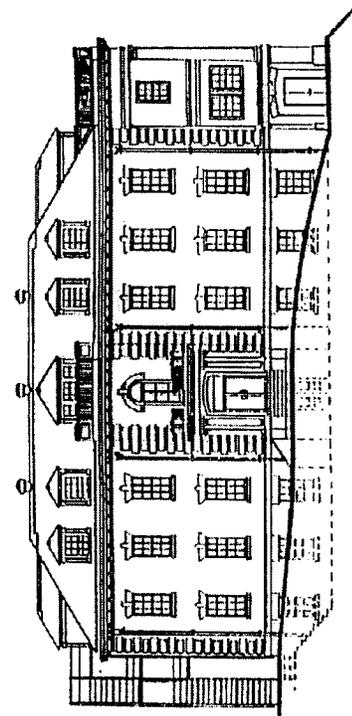




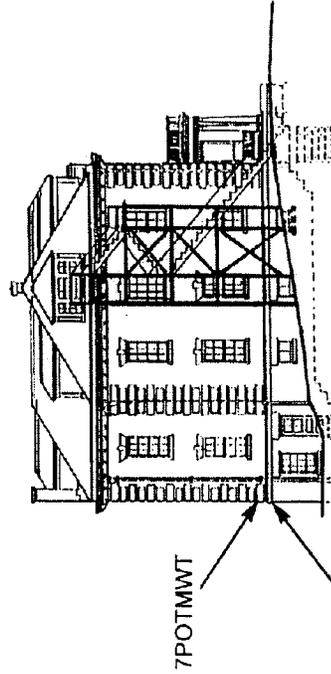
East Elevation



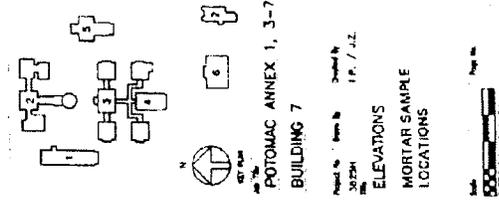
South Elevation



West Elevation



North Elevation



1POTMWT - uPDSM REPORT

uPDSM Report 1potmwt

11:05,11/26/96

Input Pattern : Building 1 - granite water table pointing mortar

d	I	d	I	d	I	d	I	d	I		
9.950	4	3.854	4	2.6790	3	2.2351	7	1.9796	2	1.6710	3
4.985	2	3.341	100	2.4927	4	2.1263	5	1.9134	4	1.5406	16
4.255	19	3.193	3	2.4545	6	2.0934	4	1.8740	4	1.5369	8
4.026	1	3.036	30	2.2807	8	1.9936	3	1.8166	13		

23 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
33-1161*	176	10/1	95	*Silicon Oxide / Quartz, syn = SiO2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
24-0027D	74	7/1	19	Calcium Carbonate / Calcite = CaCO3 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
7-0042I	30	3/1	4.5	*Potassium Aluminum Silicate Hydroxide / Muscovite-3T = (K,Na)(Al,Mg,Fe)2(Si3.1Al0.9)O10(OH)2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
41-1480I	17	3/0	2.5	*Sodium Calcium Aluminum Silicate / Albite, calcian, ordered = (Na,Ca)Al(Si,Al)3O8 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474

Summary Report:

d	Full I	Resid I	33-1161: 95% d	24-0027: 19% I	7-0042: 5% d	41-1480: 3% d	I
9.950	4	None			9.97	4.5	
4.985	2	None			4.99	2.5	
4.255	19	None	4.257	21			
4.026	1	None					
3.854	4	None					4.0314 0.68
3.341	100	None	3.342	95	[3.873 0.45]	[3.8718 0.15]	
3.193	3	None			[3.331 4.5]	[3.3694 0.23]	
" "	"	"				3.1973 1.7	
3.036	30	None				3.1817 2.5	
2.6790	3	3					
2.4927	4	None			<2.564 1.1>		
2.4545	6	None	2.457	7.6	[2.499 0.54]	[2.4919 0.05]	
2.2807	8	None	2.282	7.6	[2.457 0.36]	[2.4454 0.03]	
2.2351	7	None	2.237	3.8	[2.284 3.5]	[2.3001 0.08]	
2.1263	5	None	2.127	5.7	[2.254 0.27]		
2.0934	4	None			[2.136 0.54]	[2.1338 0.10]	
1.9936	3	None			2.094 5.2	[2.1058 0.12]	
" "	"	"			1.999 2.0	[1.9993 0.03]	
1.9796	2	None	1.9792	3.8	[1.966 0.36]	" " "	
1.9134	4	None					
" "	"	"			1.9261 0.8		
1.8740	4	None			1.9071 3.3		
1.8166	13	None	1.8179	13	1.8726 6.6	[1.885 0.09]	[1.8801 0.08]
1.6710	3	None	1.6719	3.8			[1.8270 0.17]
			<1.6591 1.9>	<1.6040 2.9>			
1.5406	16	None	1.5418	8.5			[1.5343 0.03]
1.5369	8	8					

\* = Obscured <...> = Missing [...] = Previously Removed

1POTM - uPDSM REPORT

uPDSM Report 1potm

12:33,11/3/95

Input Pattern: Building 1 - brick pointing mortar

d	I	d	I	d	I	d	I	d	I		
4.232	21	2.7250	1	2.4500	2	2.1220	2	1.9060	1	1.8160	4
3.329	100	2.6190	1	2.2770	4	2.0870	1	1.8730	1	1.6690	1
3.031	5	2.4900	1	2.2320	1	1.9770	1	1.8360	1	1.5360	1

18 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
33-1161*	129	11/0	39	*Silicon Oxide / Quartz, syn = SiO2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
24-0027D	41	5/1	5.4	Calcium Carbonate / Calcite = CaCO3 Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474

Summary Report:

d	Full I	Resid I	33-1161: d	39% I	24-0027: d	5% I
4.232	21	None	4.257	8.7	<3.852	1.6>
3.329	100	None	3.342	39		
3.031	5	None			3.030	5.4
2.7250	1	1				
2.6190	1	1				
2.4900	1	None			2.495	0.38
2.4500	2	None	2.457	3.2		
2.2770	4	None	2.282	3.2	[2.284	0.97]
2.2320	1	None	2.237	1.6		
2.1220	2	None	2.127	2.4		
2.0870	1	None			2.094	1.5
1.9770	1	None	1.9792	1.6		
1.9060	1	None			1.9071	0.92
1.8730	1	None			1.8726	1.8
1.8360	1	1				
1.8160	4	None	1.8179	5.5		
1.6690	1	None	1.6719	1.6		
" "	"	"	1.6591	0.8		
1.5360	1	None	1.5418	3.5		

\* = Obscured <...> = Missing [...] = Previously Removed

3POTMWT - uPDSM REPORT

uPDSM Report 3potmwt

11:08,11/26/96

Input Pattern : Building 3 - limestone water table pointing mortar

d	I	d	I	d	I	d	I	d	I
4.251	11	3.032	10	2.4404	4	2.1263	2	1.9149	2
3.847	1	2.5008	1	2.2729	6	2.0925	2	1.8748	2
3.341	100	2.4558	4	2.2340	2	1.9747	2	1.8139	5
								1.6716	2
								1.6010	2
								1.5401	5

18 lines in pattern.

Identified Phases:

JCPDS# SI ML/X At% Identity . . .

33-1161\* 161 12/1 65 \*Silicon Oxide / Quartz, syn = SiO2  
 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474

5-0586\* 58 7/0 9.5 \*Calcium Carbonate / Calcite, syn = CaCO3  
 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474

Summary Report:

d	I	Full Resid	33-1161: 65%	I	5-0586: 10%	I
4.251	11	None	4.257	14		
3.847	1	None			3.86	1.1
3.341	100	None	3.342	65		
3.032	10	None			3.035	9.5
2.5008	1	None			2.495	1.3
2.4558	4	None	2.457	5.2		
2.4404	4	4				
2.2729	6	None	2.282	5.2	[2.285	1.7]
2.2340	2	None	2.237	2.6		
2.1263	2	None	2.127	3.9		
2.0925	2	None			2.095	1.7
1.9747	2	None	1.9792	2.6		
1.9149	2	None			1.927	0.48
" "	"				1.913	1.6
1.8748	2	None			1.875	1.6
1.8139	5	None	1.8179	9.0		
" "	"		1.8021	0.6		
1.6716	5	None	1.6719	2.6		
			<1.6591	1.3>		
1.6010	1	None	1.6082	0.6	[1.604	0.76]
1.5401	9	None	1.5418	5.8		

\* = Obscured <...> = Missing [...] = Previously Removed

3POTM - uPDSM REPORT

µPDSM Report 3potm

9:48,12/3/96

Input Pattern: Building 3 - brick pointing mortar

d	I	d	I	d	I	d	I	d	I
4.251	16	3.036	18	2.2351	3	1.9119	3	1.6716	3
3.844	3	2.4927	3	2.1263	3	1.9073	3	1.5415	6
3.341	100	2.4545	13	2.0907	3	1.8748	3	1.5373	3
3.248	4	2.2796	6	1.9779	3	1.8179	7		

19 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
33-1161*	176	10/0	80	*Silicon Oxide / Quartz, syn = SiO2
	Ierr:400,500		derr:4.0	Bground:3 dmax/min:17.57/1.474
5-0586*	81	6/0	19	*Calcium Carbonate / Calcite, syn = CaCO3
	Ierr:400,500		derr:4.0	Bground:3 dmax/min:17.57/1.474

Summary Report:

	Full	Resid	33-1161: 80%	5-0586: 19%
d	I	I	d	I
4.251	16	None	4.257	18
3.844	3	None		3.86
3.341	100	None	3.342	80
3.248	4	4		
3.036	18	None		3.035
2.4927	3	None		2.495
2.4545	13	None	2.457	6.4
2.2796	6	None	2.282	6.4
2.2351	3	None	2.237	3.2
2.1263	3	None	2.127	4.8
2.0907	3	None		2.095
1.9779	3	None	1.9792	3.2
1.9119	3	None		1.913
1.9073	3	3		
1.8748	3	None		1.875
1.8179	7	None	1.8179	11
1.6716	3	None	1.6719	3.2
1.5415	6	None	1.5418	7.2
1.5373	3	3		

\* = Obscured <..> = Missing [...] = Previously Removed

5POTMWT - uPDSM REPORT

uPDSM Report 5potmwt

11:14, 11/26/96

Input Pattern Building 5 - granite water table pointing mortar

d	I	d	I	d	I	d	I	d	I		
4.271	40	3.040	19	2.2404	4	1.9763	12	1.6727	4	1.5420	18
4.211	15	2.4968	3	2.1263	5	1.9157	5	1.6677	4		
3.870	1	2.4532	5	2.1177	7	1.8769	5	1.6593	5		
3.353	100	2.2818	12	2.0934	4	1.8172	19	1.6061	2		

21 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	Att	Identity . . .
5-0490D	226	12/0	99	Silicon Oxide / Quartz, low = SiO2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
33-1161*	40	3/0	58	*Silicon Oxide / Quartz, syn = SiO2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
5-0586*	78	7/0	19	*Calcium Carbonate / Calcite, syn = CaCO3 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474

Summary Report:

d	Full I	Resid I	5-0490: 99% d	I	33-1161: 58% d	I	5-0586: 19% d	I
4.271	40	None	4.26	35				
4.211	15	None			4.257	13		
3.870	1	None					3.86	2.3
3.353	100	None	3.343	99	[3.342	58]		
3.040	19	None					3.035	19
2.4968	3	None					2.495	2.6
2.4532	5	None	2.458	12	[2.457	4.6]		
2.2818	12	None	2.282	12	[2.282	4.6]	[2.285	3.4]
2.2404	4	None	2.237	6.0	[2.237	2.3]		
2.1263	5	None	2.128	8.9				
2.1177	7	None			2.127	3.5		
2.0934	4	None					2.095	3.4
1.9763	12	None	1.980	6.0	[1.9792	2.3]		
1.9157	5	None					1.927	0.9
" "	"	"					1.913	3.2
1.8769	5	None					1.875	3.2
1.8172	19	None	1.817	17	[1.8179	8.1]		
1.6727	4	None	1.672	7.0				
1.6677	4	None			1.6719	2.3		
1.6593	5	None	1.659	3.0	[1.6591	1.2]		
1.6061	2	None	1.608	1.0	[1.6082	0.6]	[1.604	1.5]
1.5420	18	None	1.541	15	[1.5418	5.2]		

\* = Obscured <...> = Missing [...] = Previously Removed

5POTM - uPDSM REPORT

uPDSM Report Spots

0:36,1/11/80

Input Pattern: Building 5 - brick pointing mortar

d	I	d	I	d	I	d	I	d	I
7.523	4	3.184	3	2.7760	2	2.2340	2	1.9110	4
6.144	2	3.060	7	2.6750	2	2.1230	6	1.8730	3
4.237	25	3.024	41	2.4880	4	2.0910	4	1.8140	12
3.846	7	2.9460	2	2.4500	9	2.0440	1	1.6700	2
3.333	100	2.8610	3	2.2730	14	1.9770	2	1.6040	1

28 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity
33-1161*	178	13/0	83	*Silicon Oxide / Quartz, syn = SiO2
				Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
5-0586*	92	9/2	30	*Calcium Carbonate / Calcite, syn = CaCO3
				Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
21-0816*	37	5/1	8.7	*Calcium Sulfate Hydrate / Gypsum = CaSO4.2H2O
				Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
41-1481I	16	4/0	3.6	Sodium Calcium Aluminum Silicate / Anorthite, sodian, disordered = (Ca,Na)(Si,Al)4O8
				Ierr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474

Summary Report:

d	I	Full	Resid	33-1161: 83%	5-0586: 30%	21-0816: 9%	41-1481: 4%
d	I	d	I	d	I	d	I
7.523	4	None	None			7.61	3.9
6.144	2	2					
4.237	25	None	4.257	18		[4.28 7.8]	
3.846	7	None			3.86	3.6	[3.9037 0.29]
3.333	100	None	3.342	83		[3.80 0.70]	[3.3644 0.36]
3.184	3	None				3.17	0.35*
"	"	"					3.2052
"	"	"					3.1772
3.060	7	None					3.6
3.024	41	None			3.035	30	3.07
2.9460	2	None					2.6
"	"	"					[3.0324 0.40]
"	"	"					"
2.8610	3	None			2.845	0.9	2.9511
2.7760	2	None					0.54
2.6750	2	None					2.9331
2.4880	4	None					0.36
"	"	"					[2.8324 0.36]
2.4500	9	None	2.457	6.6			[2.7860 0.04]
2.2730	14	None	2.282	6.6			[2.6519 0.25]
2.2340	2	None	2.237	3.3			
2.1230	6	None	2.127	5.0			
2.0910	4	None					
2.0440	1	None					
1.9770	2	None	1.9792	3.3			
"	"	"					
1.9110	4	None					
1.8730	3	None					
1.8140	12	None	1.8179	12			
"	"	"	1.8021	0.8			
1.6700	2	None	1.6719	3.3			
"	"	"	1.6591	1.7			
"	"	"					
1.6040	1	None	1.6082	0.8			
1.5400	5	None	1.5418	7.5			
1.5350	3	3					
1.5220	1	None					
"	"	"					
"	"	"					

\* = Obscured <...> = Missing [...] = Previously Removed

6POTMWT - uPDSM REPORT

2.29  
2.23  
2.12  
2.09  
  
1.97  
1.91  
1.87  
1.81  
1.81  
1.66  
1.65  
1.65  
1.54  
1.53

uPDSM Report 6potmwt

11:17,11/26/96

Input Pattern Building 6 - granite water table pointing mortar

	d	I	d	I	d	I	d	I	d	I
1.81	5.447	2	3.034	7	2.4545	3	1.9763	1	1.6699	3
1.66	4.255	11	2.7744	2	2.2796	3	1.9119	2	1.6577	2
1.65	3.847	2	2.6884	1	2.2329	6	1.8748	1	1.6544	1
1.65	3.336	100	2.6272	2	2.1272	1	1.8179	8	1.5406	5
1.54	3.234	1	2.4914	1	2.0916	1	1.8132	5	1.5373	3

25 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
33-1161*	174	11/0	58	*Silicon Oxide / Quartz, syn = SiO2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
5-0586*	63	6/0	8.5	*Calcium Carbonate / Calcite, syn = CaCO3 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
2-0056D	9	3/8	1.4	Potassium Aluminum Silicate Hydroxide / Illite = KAl2Si3AlO10(OH)2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474
10-0492I	2	4/3	3.2	*Potassium Magnesium Aluminum Silicate Hydroxide / Phlogopite-3T = KMg3(Si3Al)O10(OH)2 Ierr:400,500 derr:4.0 Bground:1 dmax/min:17.67/1.474

Summary Report:

d	Full I	Resid I	33-1161: d	58% I	5-0586: d	9% I	2-0056: d	1% I	10-0492: d	3% I
5.447	2	2					<9.96	1.4>	<10.10	3.2>
							<4.97	1.1>		
							<4.47	1.4>		
4.255	11	None	4.257	13			[4.30	0.28]		
3.847	2	None			3.86	1.0	[3.87	0.84]		
							<3.75	1.1>	<3.408	1.4>
							<3.44	1.1>		
3.336	100	None	3.342	58			[3.32	1.4]	[3.354	3.2]
3.234	1	None					3.22	1.1		
3.034	7	None			3.035	8.5				
							<2.99	1.1>		
2.7744	2	None					2.77	0.84		
2.6884	1	None							2.710	0.45
2.6272	2	None							2.643	0.32
" "	"	"							2.618	0.96
2.4914	1	None			2.495	1.2	<2.56	1.4>		
2.4545	3	None	2.457	4.6			[2.50	0.28]	[2.511	1.6]
							[2.45	0.56]		



7POTMWT - uPDSM REPORT

uPDSM Report 7potmwt

11:20,11/26/96

Input Pattern : Building 7 - granite water table pointing mortar

d	I	d	I	d	I	d	I	d	I		
9.950	13	3.319	28	2.6931	2	2.2383	4	1.8769	7	1.5770	3
4.973	6	3.252	3	2.5171	2	2.1272	7	1.8206	10	1.5411	12
4.263	21	3.191	2	2.4968	5	2.0943	5	1.7349	4	1.5373	5
3.850	4	3.038	40	2.4571	40	1.9302	3	1.6727	2		
3.346	100	2.7794	2	2.2829	10	1.9134	6	1.6051	2		

28 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
3-0490D	173	10/2	92	Silicon Oxide / Quartz, low = SiO2 derr:4.0 Bground:2 dmax/min:17.67/1.474
24-0027D	116	8/0	38	Calcium Carbonate / Calcite = CaCO3 derr:4.0 Bground:2 dmax/min:17.67/1.474
6-0263I	58	9/*	12	*Potassium Aluminum Silicate Hydroxide / Muscovite-2H1 = KAl2(Si3Al)O10(OH,F)2 derr:4.0 Bground:2 dmax/min:17.67/1.474

Summary Report:

d	I	Full Resid	3-0490: 92%	24-0027: 38%	6-0263: 12%	
d	I	I	d	I	d	I
9.950	13	None			9.95	11
4.973	6	None			4.97	3.6
4.263	21	None	4.26	32	<4.47	2.4>
3.850	4	None			[4.30	0.5]
					[3.88	1.7]
					<3.73	2.2>
3.346	100	None	3.343	92	<3.48	2.4>
3.319	28	None			[3.34	3.0]
3.252	3	3			3.32	12
3.191	2	None				
3.038	40	None			3.19	3.6
					<2.987	4.2>
2.7794	2	None			<2.859	3.0>
2.6931	2	2			2.789	2.4
					<2.566	6.6>
2.5171	2	None			2.505	1.0
2.4968	5	None			[2.491	1.7]
2.4571	40	None	2.458	11	[2.465	1.0]
					<2.384	3.0>
2.2829	10	None	2.282	11	[2.284	6.8]
2.2383	4	None	2.237	5.5	[2.254	1.2]
					[2.132	2.4]
2.1272	7	None	2.128	8.3	<1.993	5.4>
2.0943	5	None			[1.941	0.5]
			<1.980	5.5>		
1.9302	3	None			1.9261	1.5
1.9134	6	None			1.9071	6.4
1.8769	7	None			1.8726	13
1.8206	10	None	1.817	16	[1.871	0.5]
1.7349	4	None			[1.822	0.5]
"	"	"			1.746	0.5
"	"	"			1.731	1.0
1.6727	2	None	1.672	6.4	[1.662	1.4]
			<1.659	2.8>	<1.646	3.0>
1.6051	2	None	1.608	0.9	[1.604	5.6]
1.5770	3	None			1.5821	0.8
1.5411	12	None	1.541	14	[1.573	0.9]
1.5373	5	None				
					1.541	0.5
					<1.504	3.6>

\* = Obscured <...> = Missing [...] = Previously Removed

7POTM - uPDSM REPORT

u\*hh

uPDSM Report 7potm

14:54,5/295

Input Pattern : Building 7 - brick pointing mortar

d	I	d	I	d	I	d	I	d	I	d	I
9.952	4	3.033	69	2.4530	11	2.0930	9	1.6710	1		
4.445	1	2.7820	3	2.2820	13	1.9770	4	1.6200	2		
4.244	35	2.7340	2	2.2340	5	1.9130	9	1.5980	3		
3.851	5	2.6230	4	2.1940	1	1.8720	8	1.5400	11		
3.341	100	2.4910	7	2.1270	4	1.8160	6	1.5200	2		

25 lines in pattern.

Identified Phases:

JCPDS#	SI	ML/X	At%	Identity . . .
33-1161*	174	11/1	96	*Silicon Oxide / Quartz, syn = SiO2 Tterr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
24-0027D	111	9/0	43	Calcium Carbonate / Calcite = CaCO3 Tterr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474
7-0042I	17	4/3	5.4	*Potassium Aluminum Silicate Hydroxide / Muscovite-3T = (K,Na)(Al,Mg,Fe)2(Si3.1Al0.9)O10(OH)2 Tterr:400,500 derr:4.0 Bground:1 dmax/min:29.24/1.474

Summary Report:

d	Full I	Resid I	33-1161: 96% d	24-0027: 43% I	7-0042: 5% d	5% I
9.952	4	None			9.97	5.4
4.445	1	None			<4.99	3.0>
" "	"	"			4.49	1.1
4.244	35	None	4.257	21	4.46	1.1
3.851	5	None				
3.341	100	None	3.342	96	[3.873	0.54]
3.033	69	None			[3.331	5.4]
2.7820	3	3			3.030	43
2.7340	2	2				
2.6230	4	4				
2.4910	7	None			2.495	3.0
2.4530	11	None	2.457	7.7	[2.499	0.65]
2.2820	13	None	2.282	7.7	[2.457	0.43]
2.2340	5	None	2.237	3.8	[2.284	7.7]
2.1940	1	None			[2.254	0.32]
2.1270	4	None	2.127	5.8	2.197	0.22
2.0930	9	None			[2.136	0.65]
1.9770	4	None	1.9792	3.8	<1.999	2.4>
1.9130	9	None			[1.966	0.43]
" "	"	"			1.9261	1.7
					1.9071	7.3
1.8720	8	None			1.8726	15
1.8160	6	None	1.8179	13	[1.885	0.11]
1.6710	1	None	1.6719	3.8		
			<1.6591	1.9>		
1.6200	2	None			1.6259	0.9
1.5980	3	None	1.6082	1.0	[1.614	0.22]
1.5400	11	None	1.5418	8.6	[1.6040	6.5]
1.5200	2	None			1.5247	1.3
					[1.521	0.32]

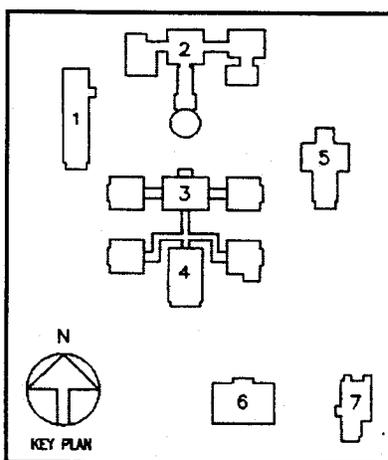
\* = Obscured <...> = Missing [...] = Previously Removed



## PURPOSE OF CLEANING

The primary purposes of cleaning are to preserve a building's materials and features and to recapture the building's aesthetic balance, which may be disguised by soiling that has altered the hue, value, or chroma of these elements. Generally, the soiling issues for the Potomac Annex Buildings are minimal-to-moderate and their impact is largely cosmetic. However, if these conditions are allowed to persist, the eventual damage to building materials is likely. The least destructive cleaning method shall be used in all cases even when such methods will not restore materials to their appearance when new. This materials cleaning analysis addresses various soiling issues observed at the Potomac Annex Buildings. Most soiling types occurred consistently on several of the buildings; for this reason, existing soiling issues are broken down into those occurring on buildings 1,5,6,& 7 and those occurring on Buildings 3 & 4. For each grouping of buildings, the existing soiling conditions are first summarized and then cleaning tests results are discussed. Generally, the degree of soiling for each cleaning issue varies only slightly, so that the recommendations associated with the following cleaning tests are sufficient to remove both the "worst" and "least damaging" degrees of soiling. The specifications for these cleaning methods can be found in Chapter 10.

## BUILDINGS 1, 5, 6 and 7: SUMMARY OF EXISTING SOILING ISSUES



The existing problems of cleaning on these similar buildings are the following:

- Light soiling of the brick (Figure 8-1)
- Light soiling of the granite elements (Figure 8-1)
- Soiling by gypsum and flyash of the undersides of granite (and brick) elements and window lintels and sills (Figure 8-2)
- Soiling of granite and brick by bitumen-based materials (Figure 8-3)
- Rust Stains on Granite

These conditions and problems have also been documented in *Chapter 6. Materials Conservation Analysis*. The "before" and "after" conditions for each cleaning test are shown below. The recommended appearance after cleaning will also be indicated for those cases in which a clean appearance is attainable by existing cleaning technologies.

**BUILDINGS 1, 3, 5, 6 AND 7: CLEANING TESTS*****Light Soiling of Brick***

A representative area of soiling of the brick was chosen on the east elevation of Building 6 near the northeast corner (note location of elevation drawing of Building 6).

The condition of the brick can be seen in Figure 8-4. Two methods of cleaning were chosen: 1) Application of detergent (ProSoCo's 1026) followed by low-pressure power wash; 2) Application of alkaline pre-wash followed by an acid after-wash with low-pressure power wash after each step. The conditions for each test are outlined below.

**Method 1**

1. Application of detergent using natural bristle brushes with a dwell time of 10 minutes
2. Removal of detergent and soiling with low pressure power wash (approximately 400 psi)
3. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

**Method 2**

1. Application of an alkaline pre-wash (ProSoCo's 766) diluted 3:1 by volume water:cleaner using natural bristle brushes with a dwell time of 20 minutes
2. Removal of pre-wash with low pressure power wash
3. Application of acid after-wash (PROSOCO'S Restoration Cleaner) diluted 3:1 by volume water:cleaning solution using natural bristle brushes with a dwell time of 5 minutes
4. Removal of after-wash with low pressure power wash
5. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

**Conclusion/Recommendation**

The result of cleaning the light soiling of the brick with Method 1 is shown in Figure 8-5. This method achieved good cleaning results while being safe for the brick. The result of cleaning the light soiling of the brick with Method 2 is shown in Figure 6. This method also achieved good cleaning, but is more aggressive than Method 1. Therefore, the more gentle Method 1 is recommended for cleaning the brick on Building 1, 3, 5, 6 and 7.

***Light Soiling of Granite***

A representative area of soiling of the granite was chosen on the east elevation of Building 6 near the northeast corner (note location on elevation drawing of Building 6).

The condition of the granite can be seen in Figure 8-7. Two methods of cleaning were chosen: 1) Application of detergent (PROSOCO'S 1026) followed by low pressure power wash; 2) Application of alkaline pre-wash followed by an acid after-wash with low pressure power wash after each step. The conditions for each test are outlined below.

#### Method 1

1. Application of detergent using natural bristle brushes with a dwell time of 10 minutes
2. Removal of detergent and soiling with low pressure power wash (approximately 400 psi)
3. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

#### Method 2

1. Application of an alkaline pre-wash (PROSOCO'S 766) diluted 3:1 by volume water:cleaner using natural bristle brushes with a dwell time of 20 minutes
2. Removal of pre-wash with low pressure power wash
3. Application of acid after-wash (PROSOCO'S Restoration Cleaner) diluted 3:1 by volume water:cleaning using natural bristle brushes with a dwell time of 5 minutes
4. Removal of after-wash with low pressure power wash
5. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

#### Conclusion/Recommendation

The result of cleaning the light soiling of the granite with Method 1 is shown in Figure 8-8; no cleaning of the granite was achieved by this method. The results of Method 2 are documented in Figure 9. Good cleaning of the granite was achieved by this method; therefore the appearance resulting in the application of Method 2, as represented by Figure 8-9, is the recommended cleaning technique.

#### ***Soiling of Granite (and Brick) Elements by Gypsum and Flyash***

While these deposits are somewhat disfiguring, they are not, at this time, sufficient enough to cause damage to the brick or the granite. However, removal at this time may prevent future deterioration and the eventual need for more intrusive and potentially damaging cleaning methods.

#### Method

A representative area of this soiling of the granite was chosen on the east elevation of Building 6 (note location of elevation drawing of Building 6). The water misting method was used for cleaning this condition. The method consists in the application of a fine spray of water at low pressure for extended periods of time (4-24 hours). The method relies on the solubility of gypsum

in water. Gypsum entraps flyash which imparts the dark coloration to the deposits. As the gypsum is dissolved the soiling is removed with it.

#### Conclusion/Recommendation

The result of cleaning the brick and granite with this method after 6 hours is shown in Figure 8-10 which shows an uncleaned area next to a cleaned area. This is a safe and effective method and the appearance after cleaning as seen in Figure 8-10 should be the representative appearance.

#### ***Soiling of Granite and Brick by Bitumen-Based Materials***

A representative area of the bitumen-based soiling of granite and brick was identified on east elevation of Building 6 (Figure 8-11). This soiling is visually disfiguring and may lead to staining of the brick and granite if not removed. PROSOCO'S Asphalt and Tar Remover was tested for the removal of these deposits using the following method.

#### Method

1. Mix Asphalt and Tar Remover to a paste-like consistency with attapulgite
2. Apply paste to surface and cover with aluminum foil and secure with tape and allow a dwell time of 4 hours
3. Remove paste and dislodge bitumen-based soiling with paint scraper taking care not to damage the stone or brick substrate
4. Wash substrate with detergent and natural bristle scrub brush

#### Conclusion/Recommendation

The results of the cleaning tests are also shown in Figure 8-11 (uncleaned area on the left and cleaned area on the right). Good cleaning has been achieved with no damage to the substrate; this result may be considered as the representative cleaned substrate.

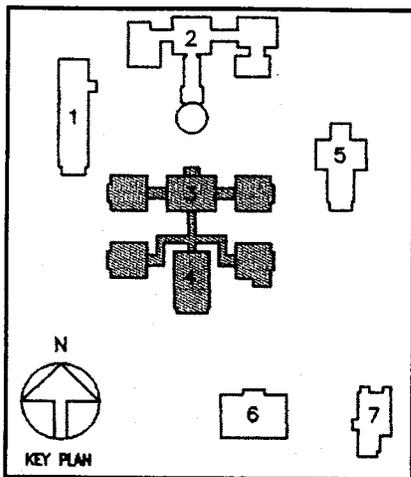
#### ***Rust Stains on Granite Band Course***

While these deposits are somewhat disfiguring, they are not now sufficient to cause damage to the granite; rather, their impact is primarily cosmetic. However, removal at this time may prevent the future need for more intrusive and potentially damaging cleaning methods.

#### Method

Ammonium thioglycolate will effectively remove iron staining of marble, granite, and other stone. The method consists in the application in poultice form of a 10% solution of ammonium thioglycolate in water for 30 minutes. The poultice is then removed and the surface rinsed with low pressure water.

## BUILDINGS 3 &amp; 4: SUMMARY OF EXISTING PROBLEMS



The existing problems of cleaning on these similar buildings are the following:

*Soiling of the brick* (Figure 8-12)

*Soiling of the limestone* (Figure 8-13)

*Rust stains on Limestone*

These conditions and problems have also been documented in Chapter 6 Materials Conservation Analysis. The “before” and “after” conditions for each cleaning test are discussed below. The recommended appearance after cleaning will also be shown for those cases in which a cleaned surface appearance is attainable with existing cleaning technologies.

## BUILDINGS 3 &amp; 4: CLEANING TESTS

*Soiling of Brick*

As can be seen in Figure 8-13 the soiling of the brick on Buildings 3 and 4 is heavier than that of Buildings 1, 3, 5, 6 and 7. Similar cleaning methods used on Building 6 have been tested on a representative area of Building 3.

Method 1

1. Application of detergent using natural bristle brushes with a dwell time of 10 minutes
2. Removal of detergent and soiling with low pressure power wash (approximately 400 psi)
3. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

Method 2

1. Application of an alkaline pre-wash (PROSOCO'S 766) diluted 3:1 by volume water:cleaner using natural bristle brushes with a dwell time of 20 minutes
2. Removal of pre-wash with low pressure power wash
3. Application of acid after-wash (PROSOCO'S Restoration Cleaner) diluted 3:1 by volume water:cleaning using natural bristle brushes with a dwell time of 5 minutes
4. Removal of after-wash with low pressure power wash
5. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

Method 3 (increased concentrations of cleaning solutions)

1. Application of an alkaline pre-wash (PROSOCO'S 766) diluted 1:1 by volume water:cleaner using natural bristle brushes with a dwell time of 20 minutes
2. Removal of pre-wash with low pressure power wash
3. Application of acid after-wash (PROSOCO'S Restoration Cleaner) diluted 1:1 by volume water:cleaning using natural bristle brushes with a dwell time of 5 minutes
4. Removal of after-wash with low pressure power wash
5. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

Conclusion

The result of cleaning the soiling of the brick with Method 2 is shown in Figure 8-15 (the before condition is seen on the middle-left side of Figure 12). No cleaning has been achieved by this method. The result of cleaning the soiling of the brick with Method 1 is shown in Figure 8-14 (the before condition is seen on the left side of Figure 8-12). No cleaning has been achieved by this method. The result of cleaning the soiling of the brick with Method 3 is shown in Figure 16 (the before condition is seen on the middle right side of Figure 8-12). No cleaning has been achieved by this method.

Since none of these cleaning methods was successful, a second regimen of tests was performed. Their methodology and results are discussed below.

*Analyses of Soilants on Brick*

The poor results obtained by these three previous methods suggested that other cleaning methods might be required for the conditions of soiling on these brick surfaces. Therefore, analyses were performed on the brick to determine the nature of the soiling.

A sample was removed from Building 4 and examined with a scanning electron microscope and energy dispersive spectroscopy (SEM-EDS) to determine elemental compositions of the soilants. Materials on the interior and exterior surfaces of the brick were determined and compared.

Analyses of clean and darkened brick interiors revealed the body of the brick to consist of mainly silicon and aluminum with some potassium, iron, titanium, and traces of magnesium, calcium, and sulfur. The overall exterior surfaces of both clean and darkened brick were found to contain significantly higher levels of sulfur and calcium (i.e. gypsum). The darkened areas of the exterior surface, however, also showed a much higher level of iron.

Black particles were noticed on the surface of the brick which were found to contain high levels of iron (magnetite?). Black and dark red particles were also noted within the body of brick which contained higher levels of iron than the overall composition but not as high as the black particles on the surface.

Most of the darkening of the surface appeared to be associated with cracks and fissures on the exterior glassy surface of the brick. Analyses of black material from these cracks and fissures on the exterior glassy surface of the brick revealed high levels of calcium and sulfur (i.e. gypsum) as well as iron.

In cross-section the darkening of the brick generally was seen to extend about one-half a millimeter into the brick. Several areas were seen with green material at interface between the darkened exterior and the light interior. Analysis of some of this green material revealed high levels of potassium, calcium, sulfur and phosphorus. These elements, particularly phosphorus, are often associated with biological organisms. The green substance was not found on any of the surfaces of the samples.

Based on these analyses the soilants appear to be either unusual in their compositions - gypsum, iron oxide, biological growth - or lodged within cracks in the brick. Therefore, other cleaning tests were carried to address the possible sources of soiling: 1) Gypsum, 2) Iron oxide, 3) Biological growth. The methods also have long contact times and, therefore, might also address the problem of particles lodged in cracks in the brick.

#### *Additional Cleaning Tests on Brick Soiling on Buildings 3 and 4*

##### Method 4

The water misting method was used for cleaning the surface of the brick on the east elevation of Building 4. The method consists in the application of a fine spray of water at low pressure for extended periods of time (4-24 hours). The method relies on the solubility of gypsum in water. Gypsum entraps flyash which imparts the dark coloration to the deposits. As the gypsum is dissolved the soiling is removed with it.

##### Method 5

Ammonium thioglycolate is known to remove iron staining of marble and other stone. The method consists in the application in poultice form of a 10% solution of ammonium thioglycolate in water for 30 minutes. The poultice is then removed and the surface rinsed with low pressure water. This method would address the second source of soiling identified in the analysis of the brick - iron oxide or "rust".

##### Method 6

Biological growth is the last possible source the soiling identified in the analysis of the brick. These growths (or the decayed and dried black deposits from dead biological growths) can often be altered by oxidizing agents. Therefore, three solutions of hydrogen peroxide are prepared - 5, 10, and 20% v/v in water. Cotton matting is saturated with each of these solutions and placed on the brick surface for four hours. The surface is then rinsed with low-pressure water.

### Conclusions/Recommendations

Figure 17 shows the brick before cleaning with method 4 (misting method) and Figure 18 result after 24 hours of misting. Little or no cleaning of the brick was achieved. For testing method 5, a representative area was chosen on the south elevation of Building. The poultice was applied as outlined above, and the result was poor, the poultice can be seen in Figure 19. The poor result of cleaning by Method 6 is seen in Figure 20.

None of the examined cleaning methods proved to be a successful soilant removal technique. At this time, no recommendation can be made to adequately clean the surfaces of the brick without unduly and irreparably damaging the bricks' surfaces. Given that the numerous cleaning methods yielded either marginal or disappointing results, it appears likely that this soiling issue is inorrectable.

Abrasive cleaning techniques should not be used since their application may likely damage the substrate beyond repair. Future testing, if it is deemed necessary, may consist of an application of PROSOCO's BIODKLEAN, which is specifically formulated for eliminating biological growth.

### *Soiling of Limestone*

Soiling on the limestone is visually disfiguring, but does not represent a material deterioration hazard to the stone; the four following cleaning tests were performed:

#### Method 1

The water misting method was used for cleaning the limestone on a representative surface of the east elevation of Building 4 (note location on elevation drawing of Building 4). The method consists in the application of a fine spray of water at low pressure for extended periods of time (4-24 hours). The method relies on the solubility of gypsum in water. Gypsum entraps flyash which imparts the dark coloration to the deposits. As the gypsum is dissolved the soiling is removed with it.

#### Method 2

1. Application of detergent using natural bristle brushes with a dwell time of 10 minutes
2. Removal of detergent and soiling with low pressure power wash (approximately 400 psi)
3. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

#### Method 3

1. Application of an alkaline pre-wash (PROSOCO'S 766) diluted 3:1 by volume water:cleaner using natural bristle brushes with a dwell time of 20 minutes

2. Removal of pre-wash with low pressure power wash
3. Application of acid after-wash (PROSOCO'S Restoration Cleaner) diluted 3:1 by volume water:cleaning using natural bristle brushes with a dwell time of 5 minutes
4. Removal of after-wash with low pressure power wash
5. Rinsing surfaces to remove remnants of detergent with low pressure water (approximately 60 psi)

#### Method 4

Cleaning was also tested with PROSOCO'S 1217 poultice applied four 6 hours followed by low pressure power wash (approximately 400 psi).

#### Conclusions

Figure 17 shows the limestone (and the brick) before cleaning and Figure 18 after cleaning with Method 1 (the misting method). Little or no cleaning was achieved by this method after 24 hours. The result of cleaning the limestone with Method 2 on the north elevation of Building 4 are shown in Figure 21. Good cleaning was achieved by this method without harm to the substrate. The condition before cleaning is represented by the surrounding uncleaned areas. The result of cleaning the limestone Method 3 are shown in Figure 22. Good results were obtained by this method although it is somewhat more aggressive than the detergent cleaning. The "before" cleaning condition is represented by the surrounding uncleaned area. The result of cleaning with Method 4 is shown in Figure 23. Good results were obtained by this method which is intermediate in aggressiveness to detergent and alkali pre-wash - acid after-wash methods. "Before" cleaning conditions are represented by the surrounding uncleaned area.

Equally effective cleaning results are achieved by the least aggressive method - detergent cleaning/power wash (Method 2) - the results obtained by this method should be considered as the representative surface to be attained by cleaning.

#### ***Rust Stains on Limestone***

While these deposits are somewhat disfiguring, they are not now sufficient to cause damage to the limestone; rather, their most significant impact is cosmetic. However, removal at this time may prevent the future need for more intrusive and potentially damaging cleaning methods.

#### Method

Ammonium thioglycolate will effectively remove iron staining of marble, granite, and other stone. The method consists in the application in poultice form of a 10% solution of ammonium thioglycolate in water for 30 minutes. The poultice is then removed and the surface rinsed with low pressure water.



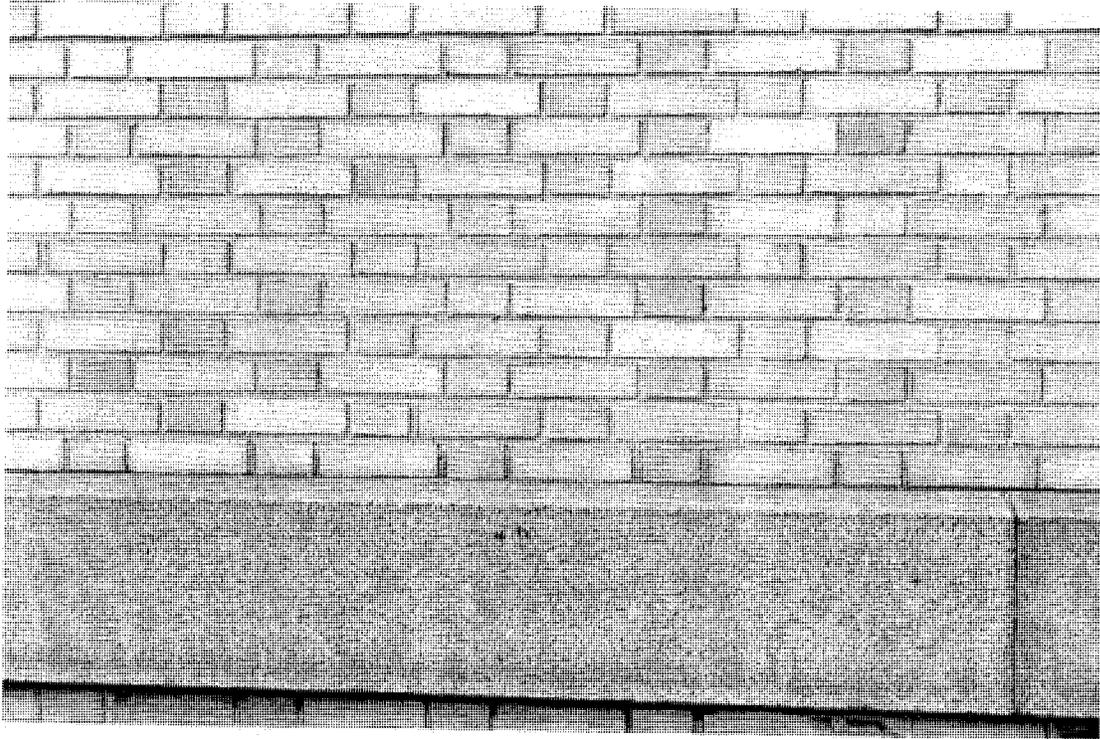


Figure 8-1

The brick and granite on Buildings 1, 5, 6 and 7 is only lightly soiled as seen here on the elevation of Building 1.

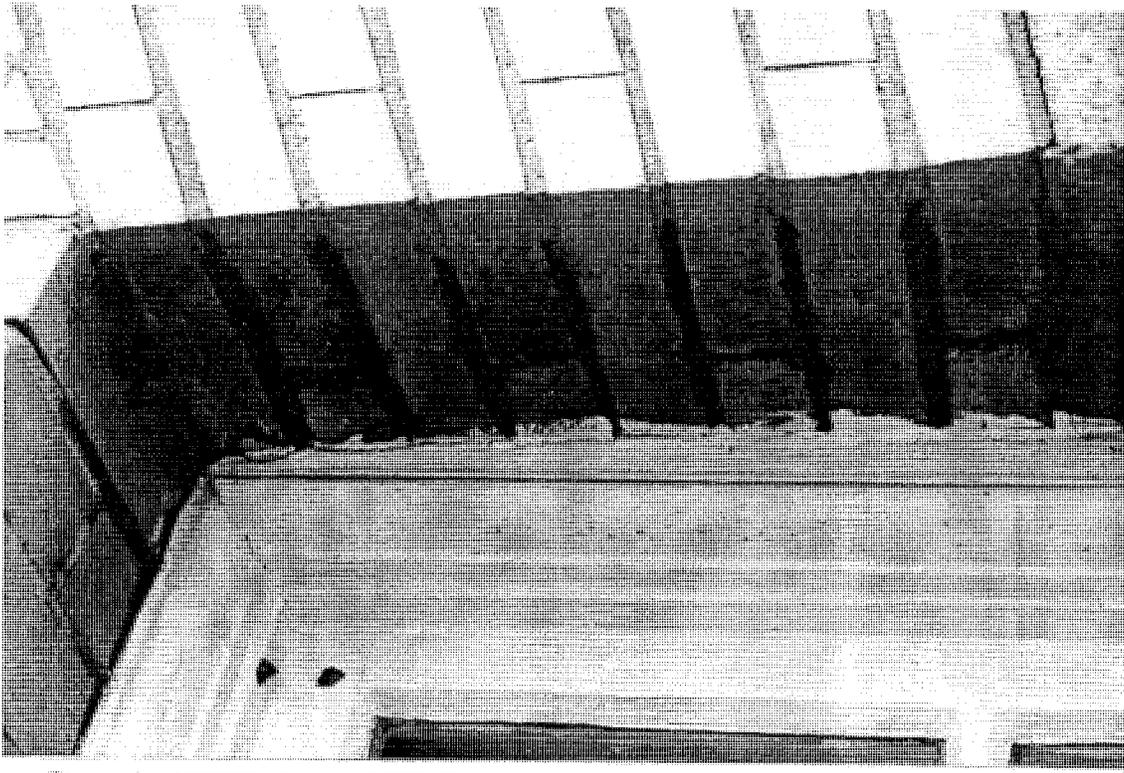


Figure 8-2

Gypsum and flyash have deposited on the undersides of window lintels and sills as seen here on the elevation of Building 3.



Figure 8-3

Bitumen-based materials have been accidentally splashed onto the brick and granite as seen here on the elevation of Building 7.



Figure 8-4

Condition of the lightly soiled brick on the east elevation of Building 5 before commencing cleaning tests.

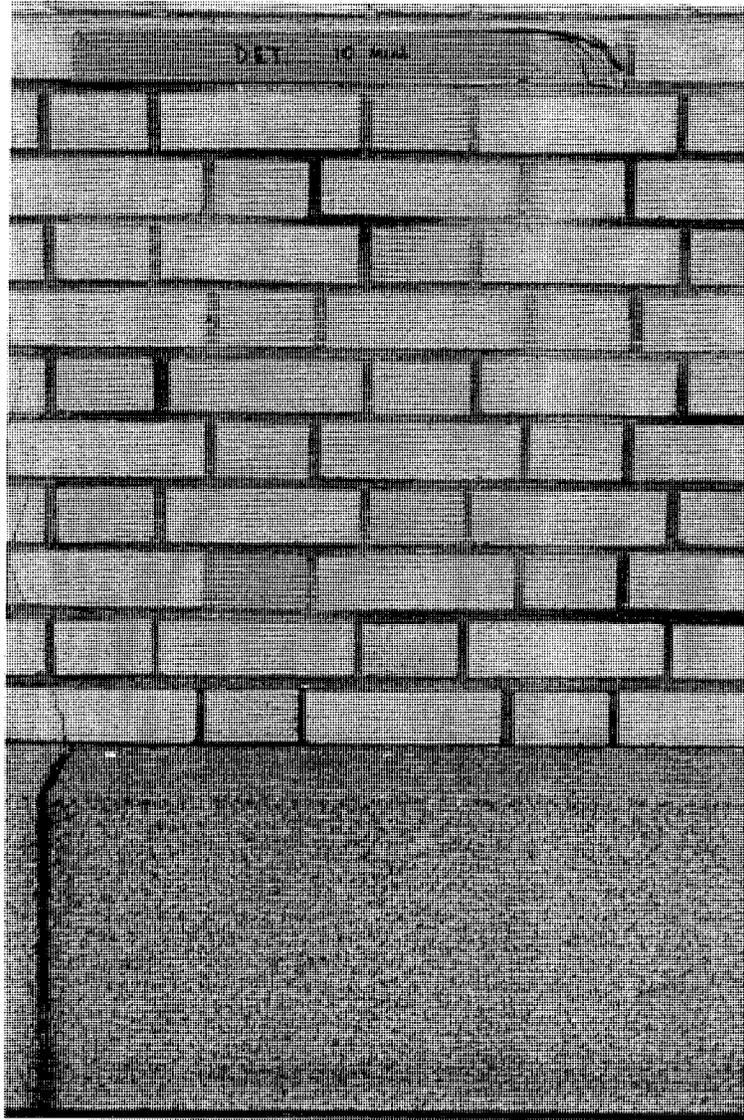


Figure 8-5

Condition of lightly soiled brick on the east elevation of Building 5 after cleaning with detergent (10 minute dwell time) and power wash (approximately 400 psi). Good results are obtained with little risk of damaging the brick.

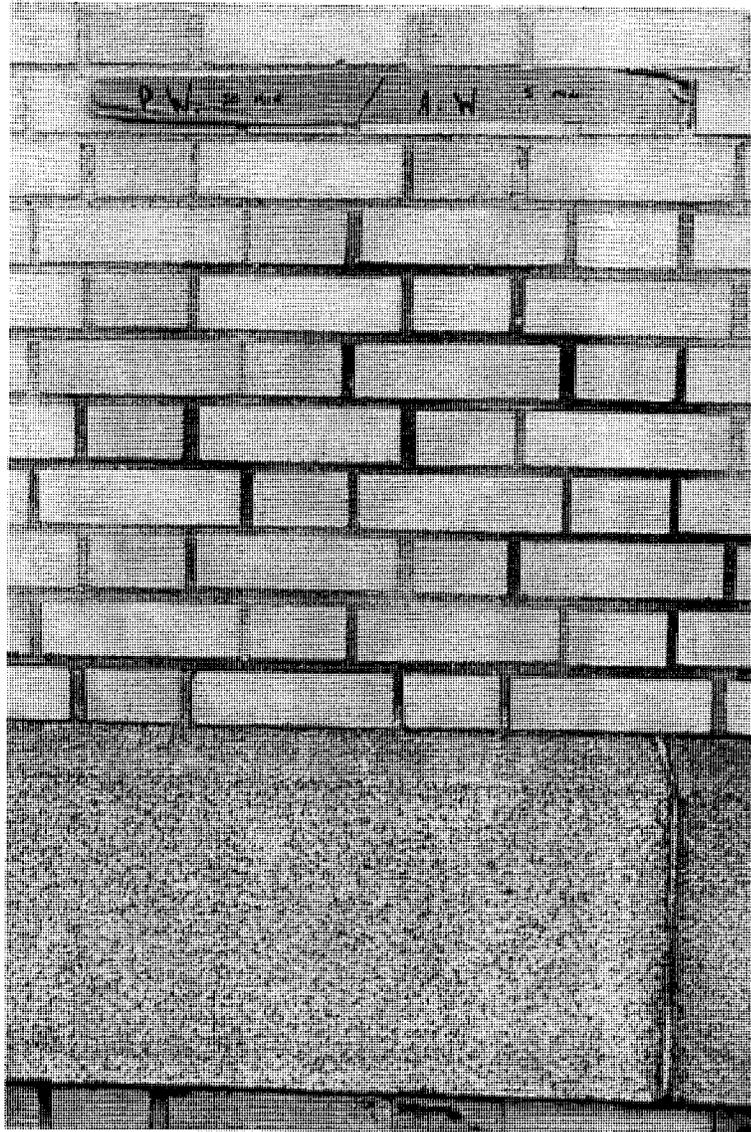


Figure 8-6

The light soiling of the brick on the east elevation of Building 5 was also cleaned by an alkaline pre-wash/acid after-wash system. The results of the cleaning are good but this system is more aggressive than the detergent cleaning which also achieved good results as seen in Figure 5. Therefore, the detergent cleaning is the recommended method for cleaning the lightly soiled brick on Buildings 1, 5, 6 and 7.

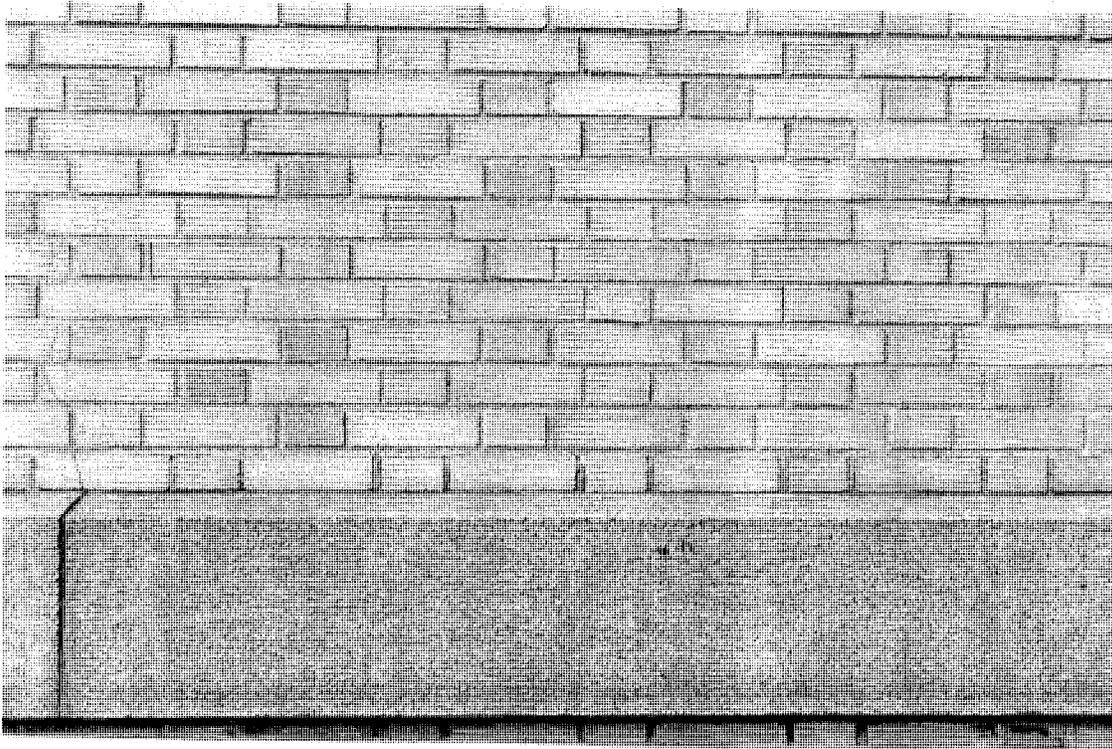


Figure 8-7

The granite water tables (as well as other granite elements) on Buildings 1, 5, 6 and 7 are lightly soiled as seen here on the east elevation of Building 5 before cleaning tests commenced.

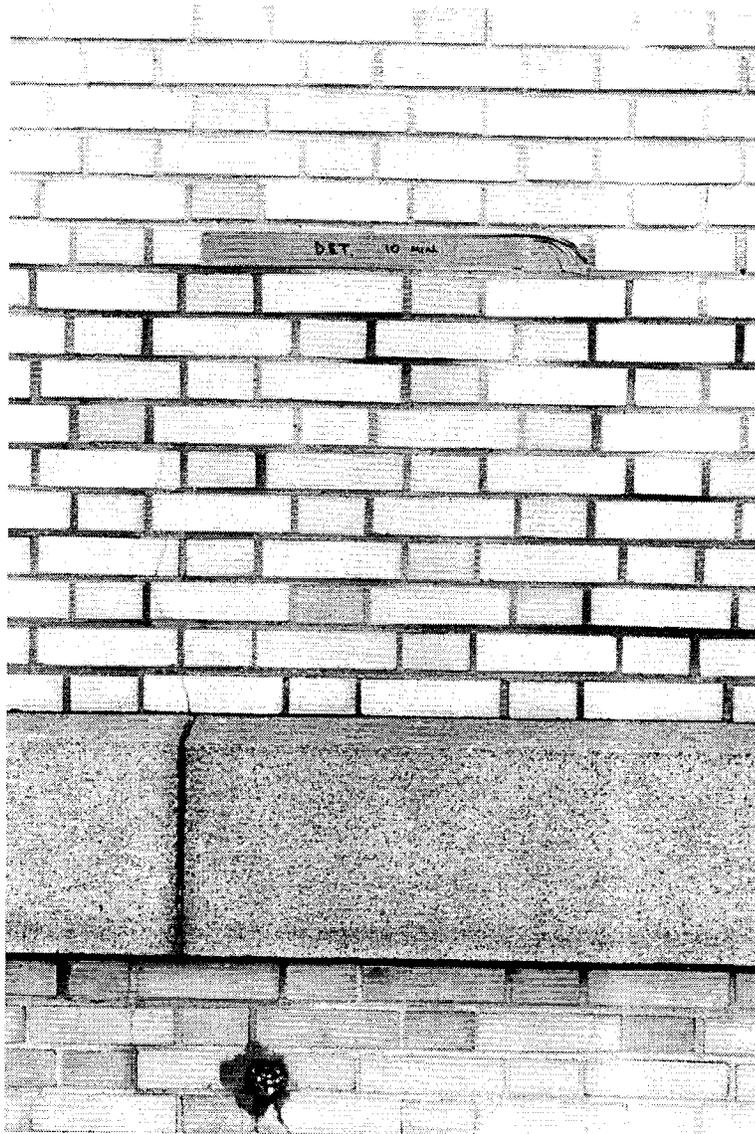


Figure 8-8

The detergent cleaning of the granite water table on the east elevation of Building 5 was unsuccessful.

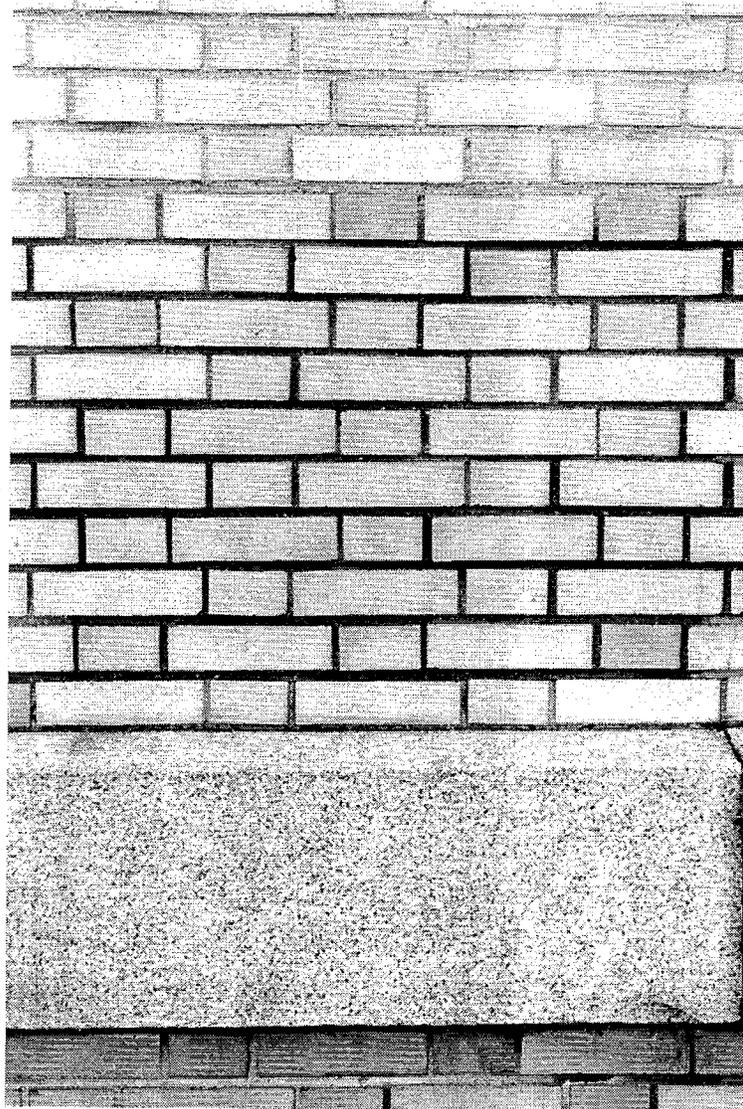


Figure 8-9

The lightly soiled granite was cleaned well by the alkaline pre-wash/acid after-wash system as seen here on the east elevation of Building 5. This method is recommended for the cleaning of all granite elements on Buildings 1, 5, 6 and 7.



Figure 8-10

The water misting method was used to remove gypsum and flyash from the undersides of window lintels as shown here on the east elevation of Building 5. Good results were obtained after 6 hours (before cleaning condition can be seen on the right). This is a safe and effective method for removing this soiling and is the recommended techniques for this condition.

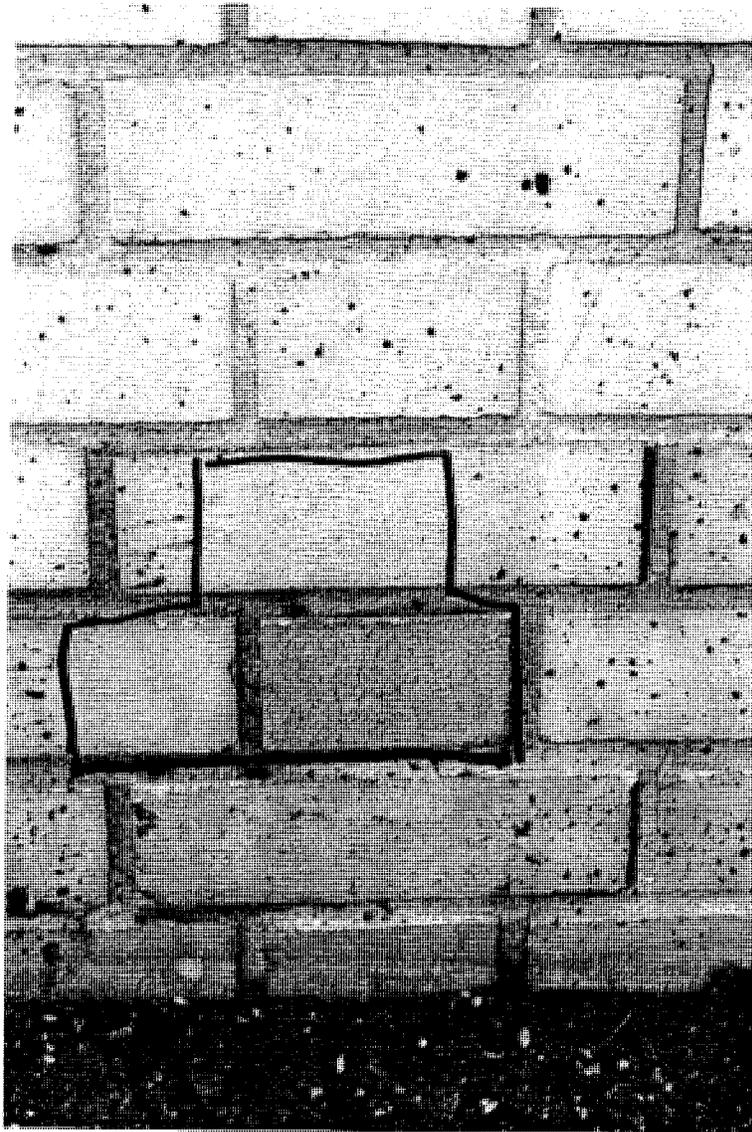


Figure 8-11

Bitumen-based deposits as shown here on the elevation of Building 5 were cleaned with PROSOCO'S Asphalt and Tar Remover - a solvent-based cleaner. The applied as a paste in attapulgate for 4 hours the deposit was then dislodged with paint scrapers taking care not to scrape the brick. The results shown here (uncleaned area on the left and cleaned area on the right) are good and this is the recommended method for removing these deposits.

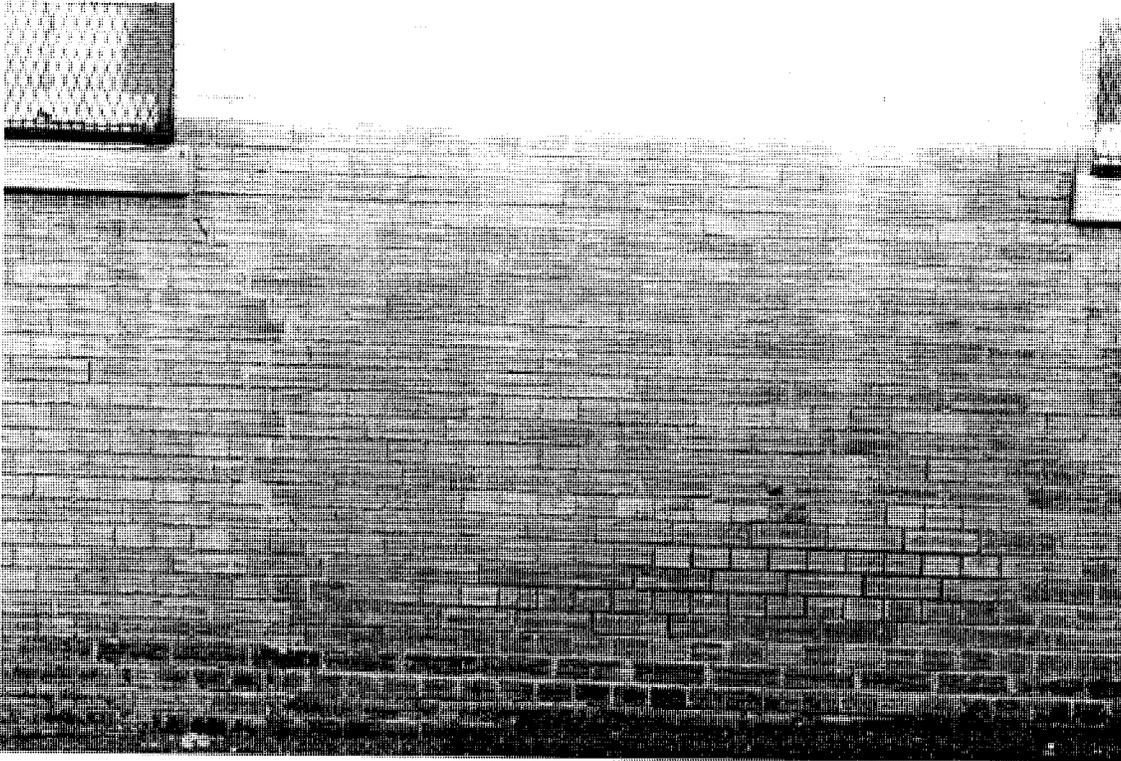


Figure 8-12

The soiling of the brick on Building 3 and 4 is more severe than on Buildings 1, 5, 6 and 7 as seen here on the elevation of Building 3. The brick on Buildings 3 and 4 is also different from the brick on Building 1, 5, 6 and 7.



Figure 8-13

The water tables (and other decorative elements) on Buildings 3 and 4 are limestone. This limestone is moderately soiled as seen here on the elevation of Building 3.

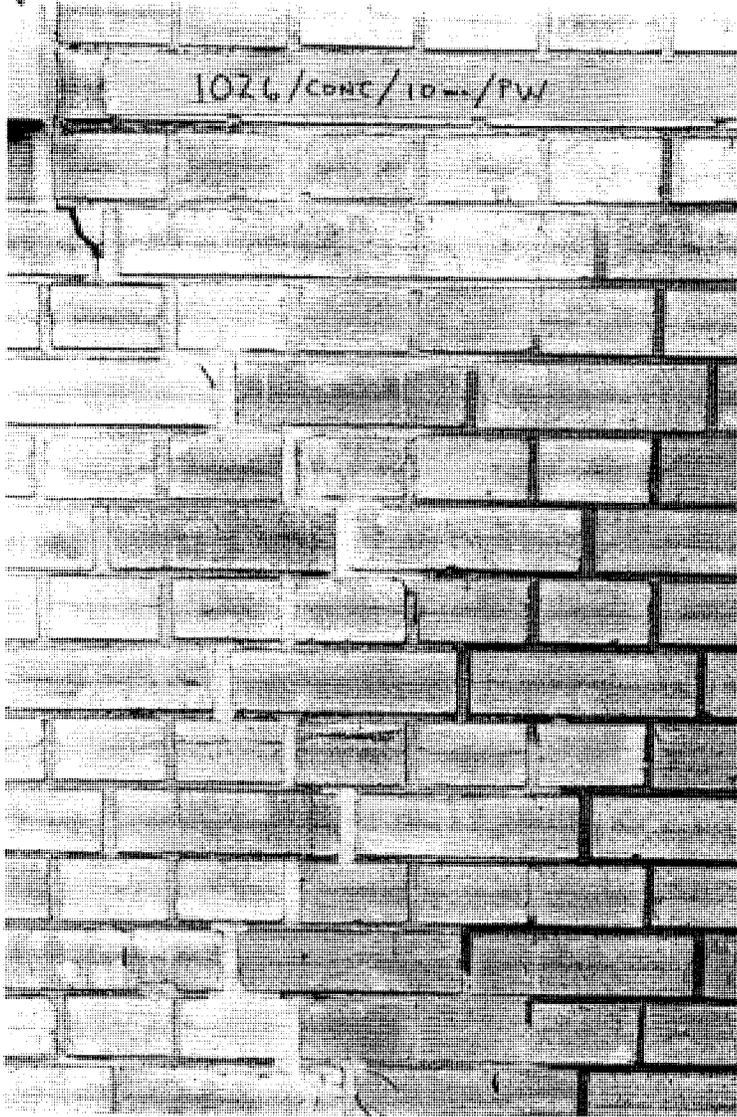


Figure 8-14

A cleaning test was executed with PROSOCO'S 1026 detergent on the brick of the south elevation of Building 3. No cleaning was achieved by this method (the left side of Figure 12 shows this area before cleaning).

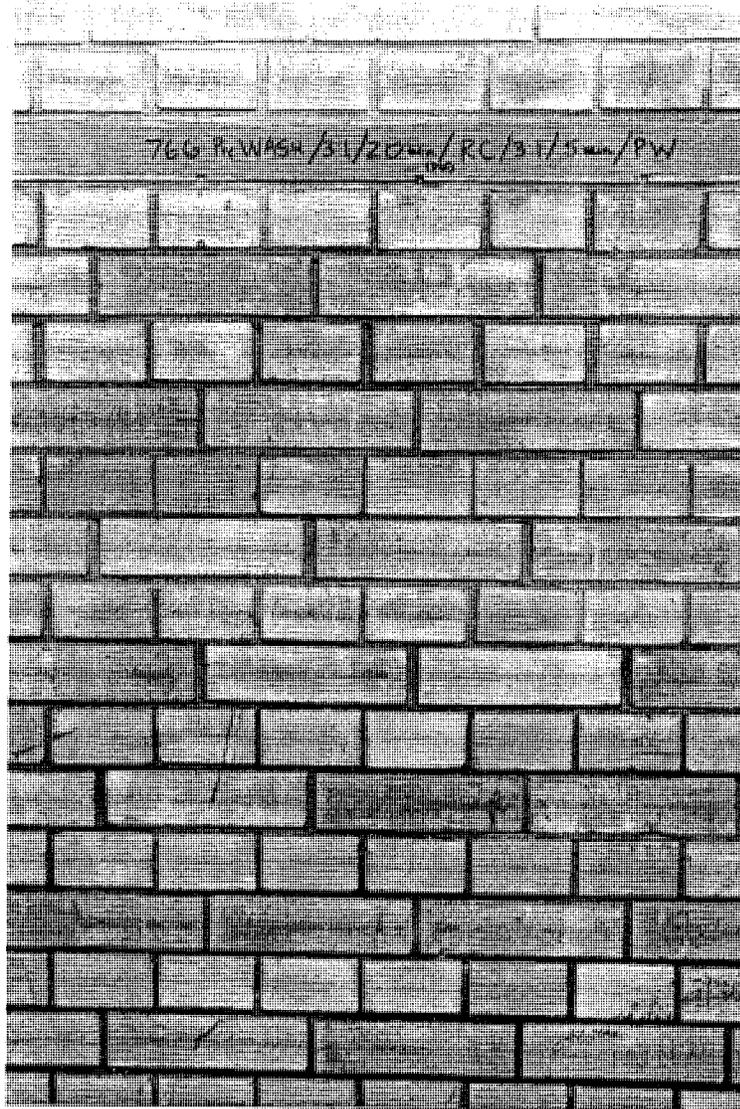


Figure 8-15

Cleaning tests on the brick of Building 3 were also executed with an alkaline pre-wash/acid after-wash system. The results shown here on the south elevation of Building 3 indicate that no cleaning was achieved by this method.

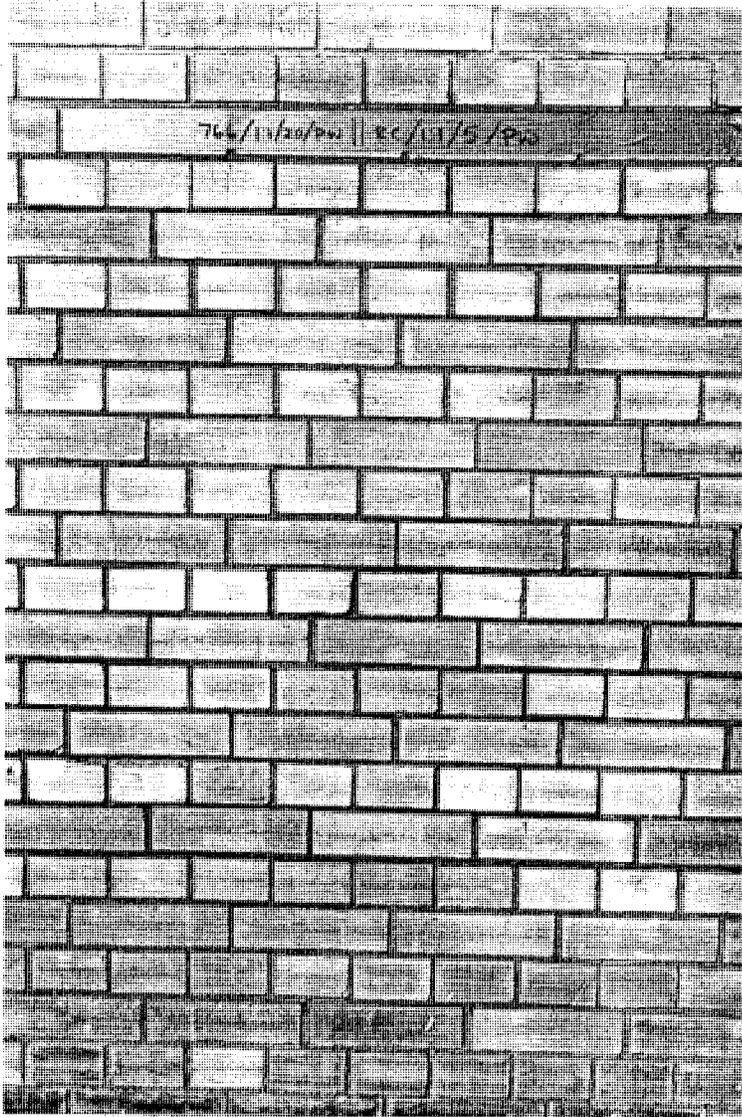


Figure 8-16

Cleaning tests were executed on the brick of Building 3 using increased concentrations in the alkaline pre-wash/acid after-wash system. Again, no cleaning was achieved as shown here on the south elevation of Building 3.

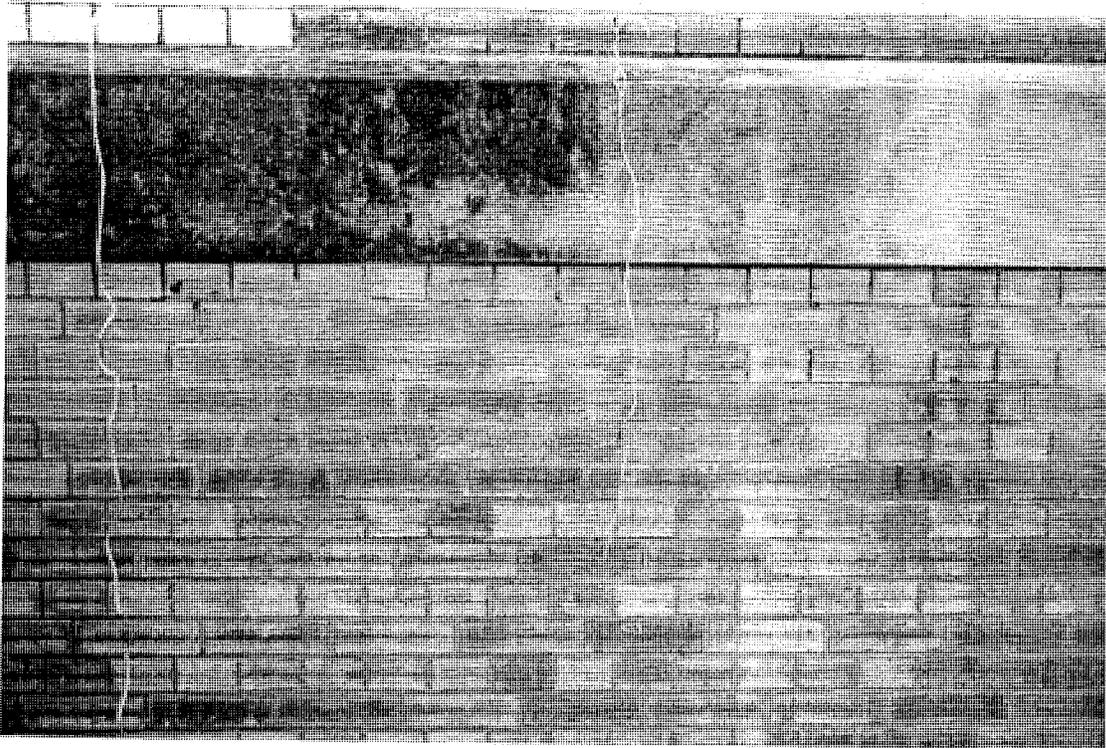


Figure 8-17

A section of the brickwork on the east elevation of Building 4 was cleaned with the water misting method. On the lower left the brick (and the limestone water table) can be seen before cleaning.



Figure 8-18

After 24 hours of water mist here on the east elevation of Building 4 the appearance of neither brick nor the limestone water table has altered significantly.

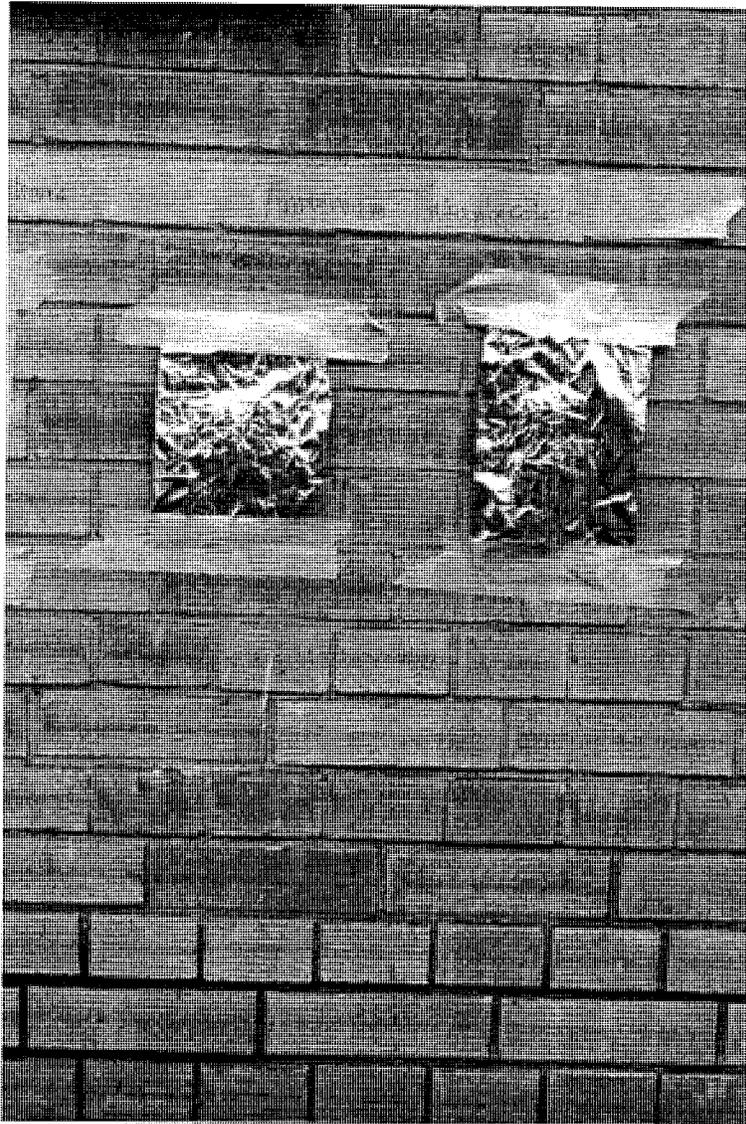


Figure 19

Application of ammonium thioglycolate poultice to brick to remove soiling from Buildings 3 & 4. Note the typical soiling conditions immediately adjacent to the poultices at Building 3.

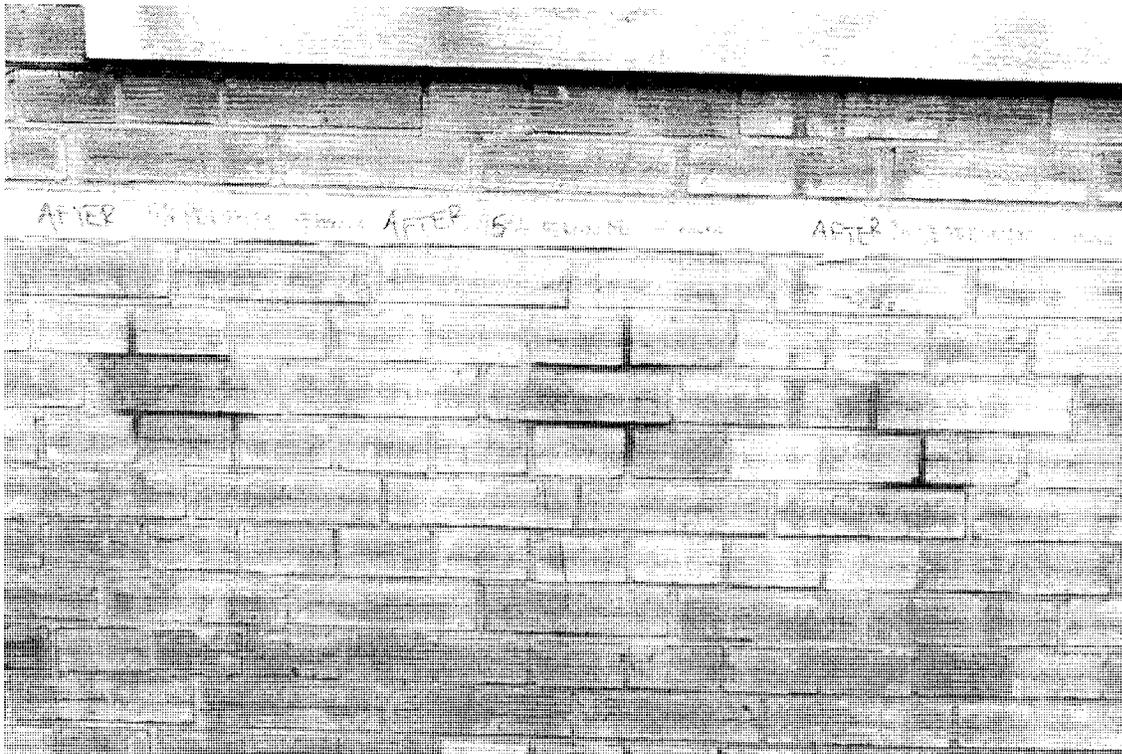


Figure 20

Unsuccessful results of the hydrogen peroxide cleaning tests; there was little or no change from “before” and “after” on Building 3.

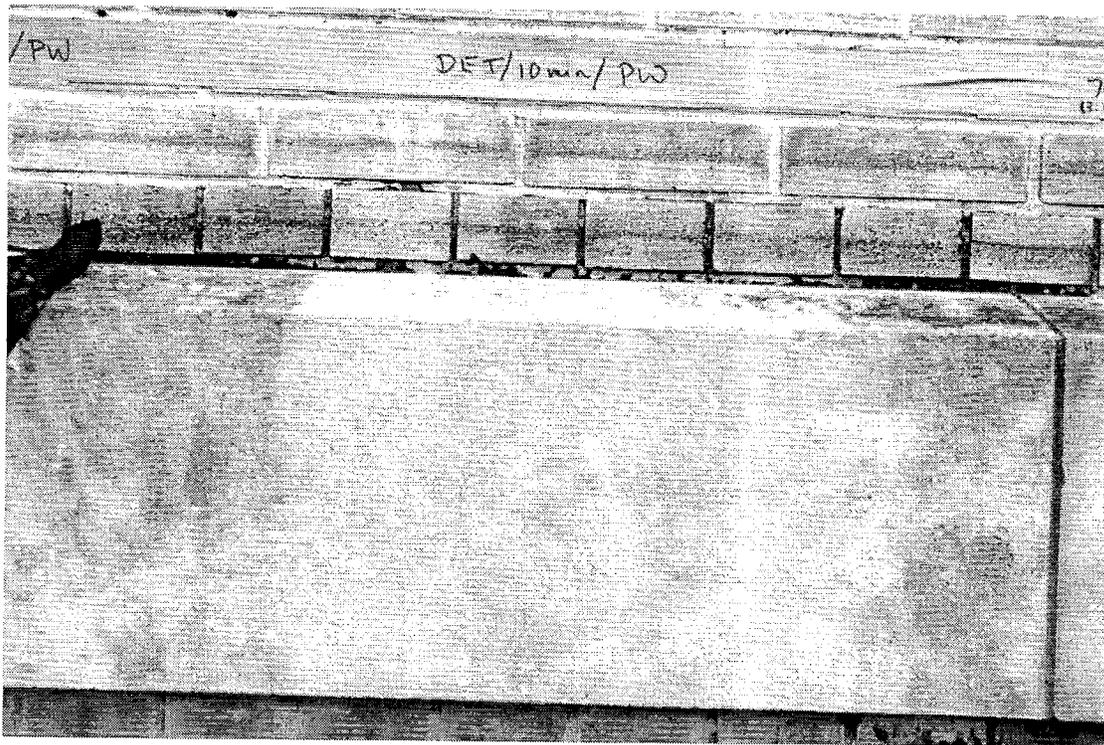


Figure 8-21

A section of the limestone water table on the north elevation of Building 4 was cleaned by several methods. Here can be seen the result when cleaning with a detergent followed by power washing. Good cleaning is achieved with little harm to the substrate. The before cleaning condition can be seen to the left and the to the right of the cleaned area.

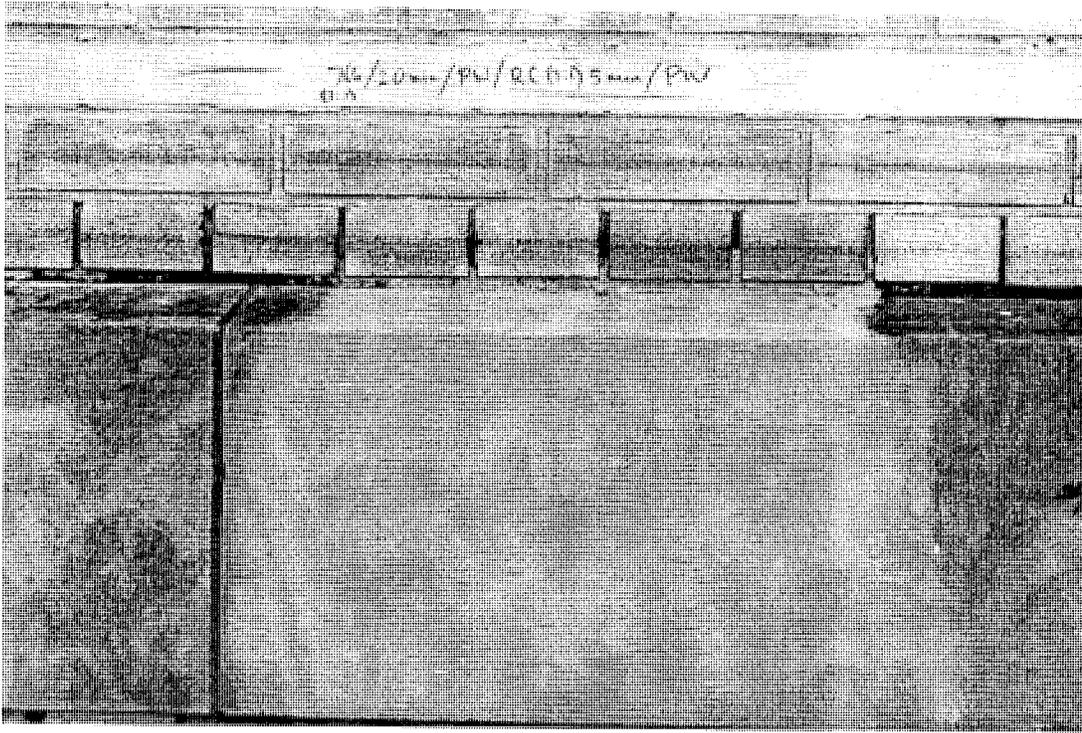


Figure 8-22

A section of the limestone water table on the north elevation of Building 4 was also cleaned by the alkaline pre-wash/acid after-wash method. Good cleaning is also achieved but the method is more aggressive on the substrate. The before cleaning condition can be seen to the left and the to the right of the cleaned area.

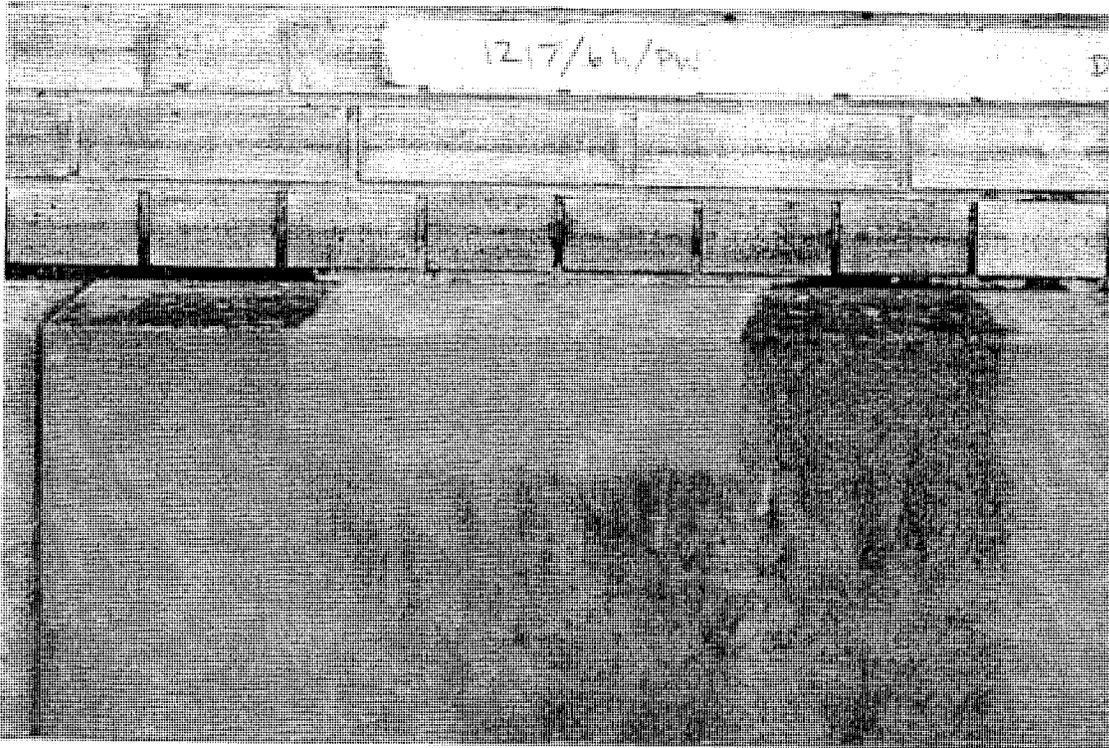


Figure 8- 23

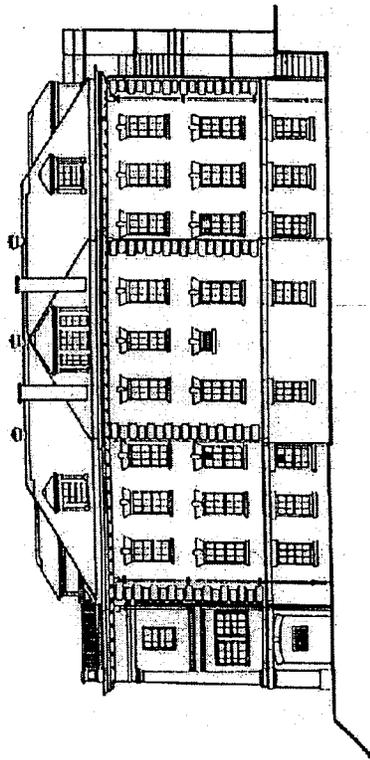
A section of the limestone water table on the north elevation of Building 4 was also cleaned using PROSOCO'S 1217 poultice for 6 hours followed by power washing. Good cleaning is also achieved by this method which is intermediate in aggressiveness to the detergent and alkaline pre-wash/acid after-wash methods. The before cleaning condition can be seen to the left and the to the right of the cleaned area.



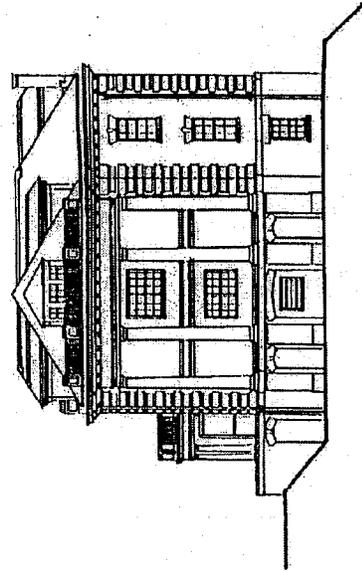
POTOMAC ANNEX BUILDINGS 1, 3-7

CHAPTER 8. MATERIALS CLEANING ANALYSIS

CLEANING TEST LOCATIONS

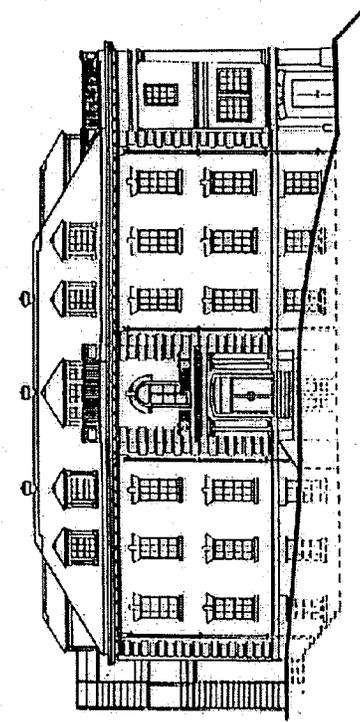


East Elevation

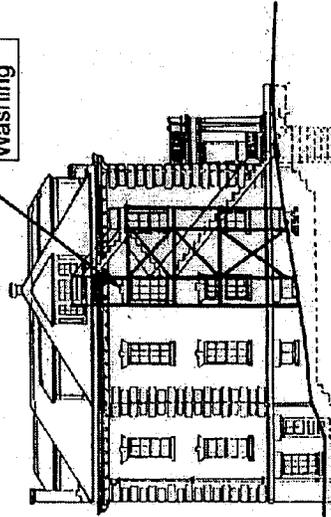


South Elevation

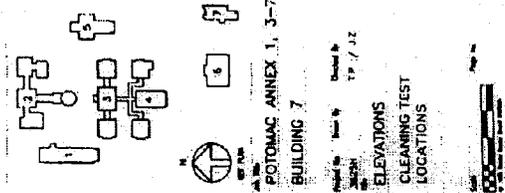
Gypsum & Flyash -- Method 1, Water Washing



West Elevation



North Elevation



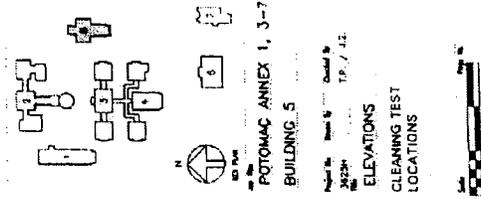
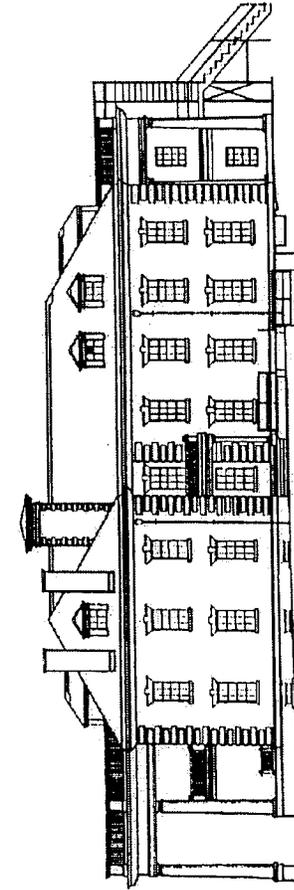
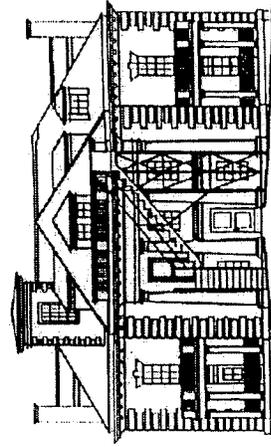
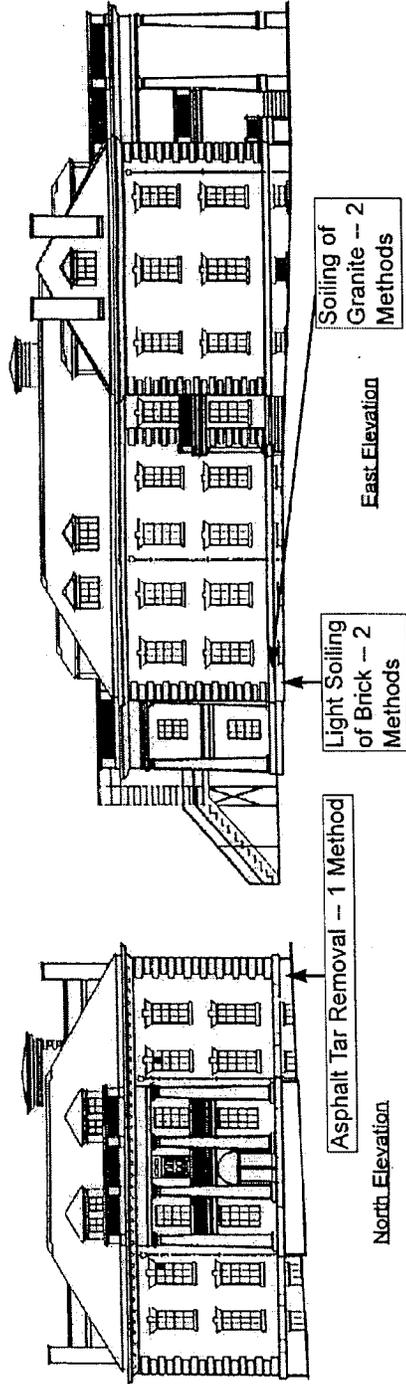
POTOMAC ANNEX 1, 3-7  
BUILDING 7

Scale: 1/4" = 1'-0"  
Date: 12/1/97

ELEVATIONS  
CLEANING TEST  
LOCATIONS

CHAPTER 8. MATERIALS CLEANING ANALYSIS

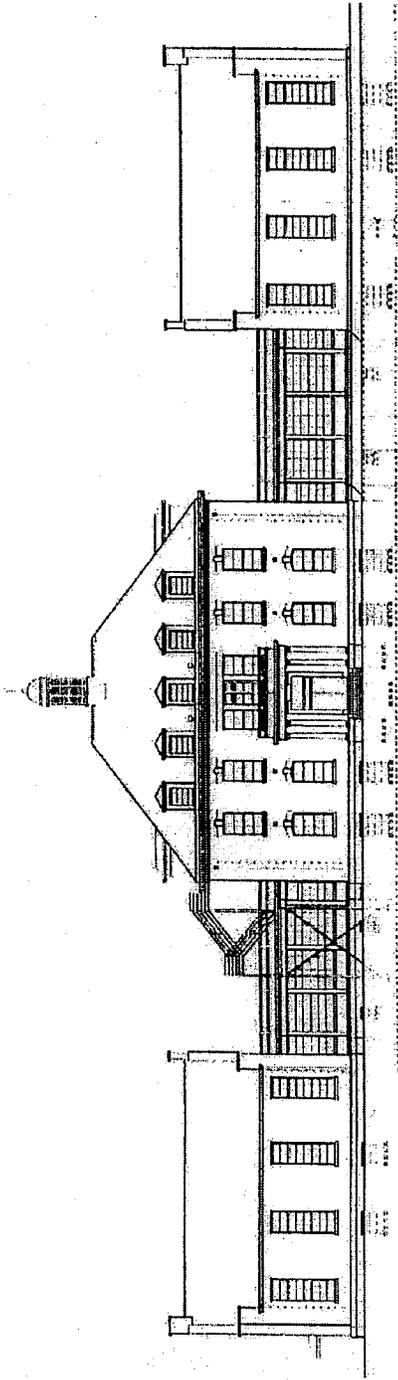
POTOMAC ANNEX BUILDINGS 1, 3-7



CHAPTER 8. MATERIALS CLEANING ANALYSIS

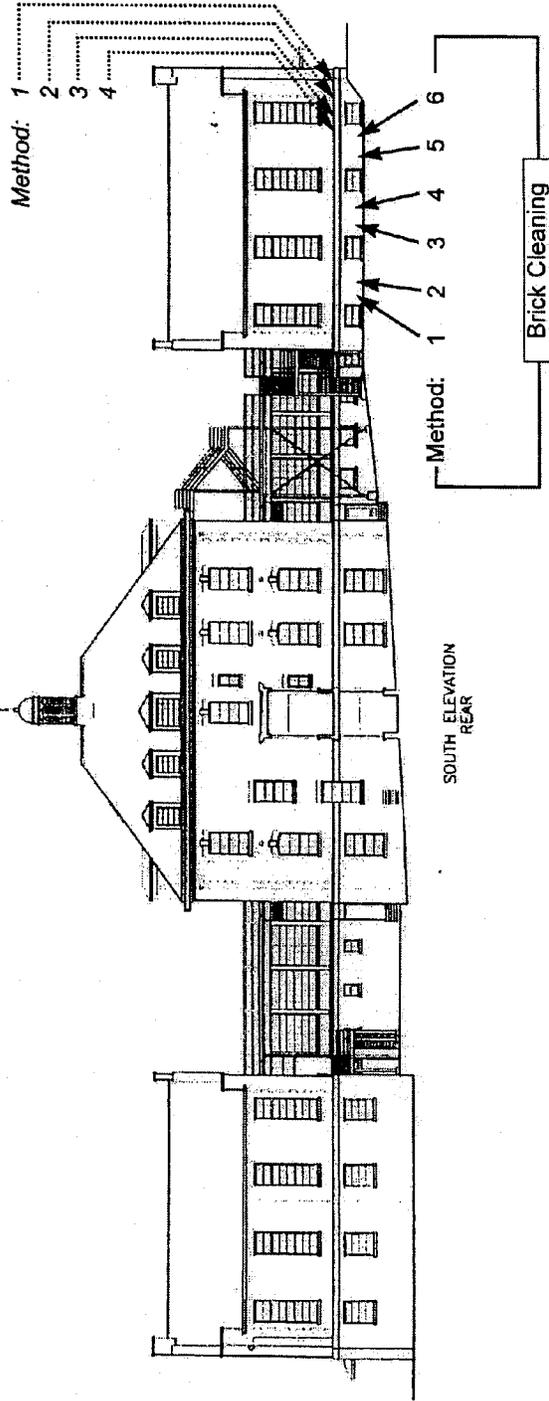
POTOMAC ANNEX BUILDINGS 1, 3-7

CLEANING TEST LOCATIONS

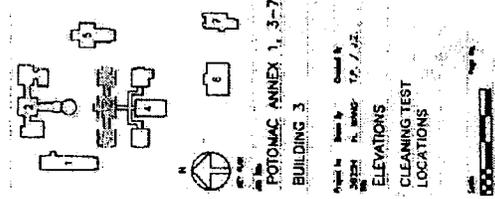


NORTH ELEVATION FRONT

Limestone Cleaning



SOUTH ELEVATION REAR







## INTRODUCTION

Buildings 1, 3, 4, 5, 6 and 7 at the Potomac Annex were constructed for the Naval Medical Hospital between 1904-1911. They were designed in a conservative Georgian Revival style--well conceived and well executed. As a group, the buildings are significant both historically and architecturally. Much of their significance relies on their grouping, and on their relationship to the Observatory (Building 2), which is a National Historic Landmark. The exteriors of the buildings retain a high degree of integrity, but all have suffered from unsympathetic alterations and lack of maintenance or poor maintenance practices. The most common conditions noted on the exteriors of the building include paint failure and various masonry disorders. On the interiors, most of the circulation spaces--corridors, stair halls and lobbies--recall in some manner the original spatial configurations of the buildings. However, there are many floor plan changes, particularly in Building 6. The most common intrusion on interior spaces is suspended ceilings, which frequently obscure historic finishes, and interfere with the spatial quality of the rooms and with the appearance of the windows. Many partitions have also been added throughout the buildings, and stairs have been enclosed.

### *Inventory of Significant Spaces and Details*

GSA requested that building features and spaces be assigned to a zone, which would govern future treatment. The 1982 Inventory of Significant Spaces Report provided by GSA was consulted in establishing the zones, and the categories used here were established in that report. A few changes were made in zone assignments based on additional information gathered through research and survey for this HSR. The Secretary of the Interior's Standards for Rehabilitation should also be referred to when undertaking work on any of the buildings.

Areas of each building have been divided into three preservation categories:

1. *Restoration Zones: Areas of particular architectural significance to be restored, through careful investigation, to the most historically significant appearance.*

Exterior elevations of all the buildings have been designated as Restoration Zones, because the exteriors of the buildings are so intact and because they work together as a complex. Any work done to one has an impact on the whole. A few interior spaces and landscape features have also been noted for restoration

2. *Rehabilitation Zones: Areas that contain significant details or elements which should be retained or restored as part of any repair project.*

Secondary exterior features such as areaways have been identified for rehabilitation. Most of the interior circulation spaces--corridors, stair halls and lobbies--have been called out as rehabilitation spaces because they retain some level of integrity, and they recall in some manner the original spatial configurations of the buildings. While the office spaces are called out for renovation, the perimeter walls are identified for rehabilitation.

3. *Renovation Zones: Areas that do not contain historically significant details, and can be repaired or altered to insure the usefulness and stability of the building, so long as the areas of restoration and rehabilitation are not affected.*

Basement spaces and toilet rooms are generally called out for renovation. Although offices and ancillary spaces have been designated as Renovation Zones, the perimeter walls are called out for rehabilitation to protect original windows, frames and baseboards.

### ***Recommendations for Maintenance, Repair and Restoration***

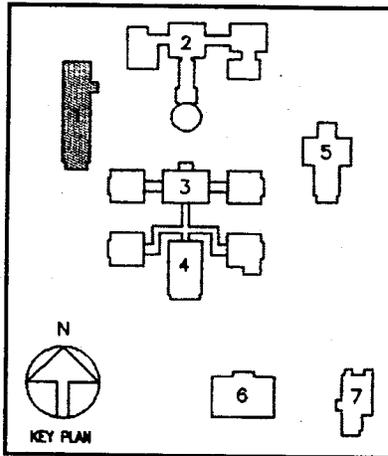
Recommendations for treatments to the buildings recognize their current use as offices, as well as their historic character. Maintenance and repair recommendations are meant to bring the buildings up to sound condition and to ensure the future of their productive lives. The restoration and alteration recommendations are intended to enhance the historic and architectural character of the buildings without inconveniencing the occupants. For the exteriors of all the buildings it is recommended that all repair work be done as soon as possible. Masonry should be cleaned and repointed as necessary. Windows should be repaired and painted; their condition does not warrant replacement. Original paint colors should be utilized on all the wood work. Recommendations for design changes can be undertaken when the budget allows. This is particularly true for the restoration of missing elements and the redesign of the enclosed sunporches on most of the buildings.

Because the interiors have been so altered over time, few interior spaces have been identified for restoration. While the interior office spaces are called out for renovation, the perimeter walls are identified for rehabilitation. This allows for the reconfiguration of inner spaces but requires the retention of original windows and window frames, and does not allow for interference by suspended ceilings of the windows and ceiling heights. These recommendations will allow for the continuing compatible and flexible use of the buildings while identifying particular spaces or features, which should be preserved.

Please note that no specific recommendations are made here for roof repairs, please refer to "Water Leakage Study," (RDC-24102), 7 December 1993. The survey indicated many areas of water damage to both interiors and exteriors due to poor roof drainage, faulty flashing, and lack of maintenance. This is an area that should be given priority by GSA.

For detailed recommendations on masonry repairs and cleaning please refer to Chapters 6,7,& 8. For detailed recommendations on paint colors, please refer to Chapter 5. Specifications are addressed in Chapter 10.

## BUILDING 1: FEMALE NURSES' QUARTERS

*Exterior Inventory*

Most of the exterior of Building 1 is designated a Restoration Zone including its mass, form, fenestration, main entry, sun porch and other material and features as noted below. Only the areaways are noted as Rehabilitation Zones, and there are no Renovation Zones.

## A. Restoration Zones

1. Roof
  - form
  - material (slate)
  - dormers
  - chimney
  - flashing (copper)
2. Masonry
  - brick
  - granite
  - cast stone
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornice
  - columns
  - balustrade
  - original color (white)
5. Copper leaders and down spouts
6. Entry porch (north east)
  - form
  - wood elements as noted
  - masonry platform and steps
  - door (replace existing to match original)

7. Entry porch (southeast)
  - form
  - masonry platform and steps
  - replace awning
8. Sun porch (south)
  - form
  - wood elements as noted in survey
  - masonry elements as noted in survey
  - windows
9. Original light fixture

#### B. Rehabilitation Zones

1. Areaways
  - plan
  - curbs
  - pipe rails

#### C. Renovation Zones

There are no Renovation Zones on the exterior Building 1.

### ***Building 1 - Exterior - Recommendations***

#### Restoration

It is recommended that the main entry be restored to its original appearance as noted in the original architectural drawings. This will entail the removal of the obtrusive aluminum and glass vestibule, repair of the surrounding historic fabric and the installation of a new wood and glass door and surround.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

The one remaining original light fixture in the basement areaway should be repaired and retained in place.

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. Granite elements should be cleaned. Rebuild window wells at the basement level.

The cementitious coating on the main entry stair and porch is obtrusive and is probably obscuring surface and/or structural deterioration. It is recommended that these elements be removed and recast.

The concrete areaways are in very poor condition and should be rebuilt.

#### Alterations

The metal awning over the south first-floor entry on the east facade should be removed and replaced with a more compatible protection.

The vent protruding from the window opening north of the above-noted entry should be removed and the window height should be re-established.

The metal and brick stoop serving the entry on the north side of the building should be replaced with a new one of design, materials and quality compatible with the rest of the building.

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

The existing covered walk way between Buildings 1 and 3 should be replaced with a more compatible and functional structure.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

***Building 1 - Interior Inventory*****A. Restoration Zones**

1. Surgeon General's Office (former nurse's living room)
  - volume
  - wood floors
  - baseboards
  - wall and ceiling finishes (plaster)
  - doors
  - dropped ceiling beams
  - historic color (light brown and white)
2. South Stair Hall
  - volume
  - stair case
  - finishes (paint and varnish)

**B. Rehabilitation Zones**

1. Entry hall
  - volume
  - relationship to stairs
  - original wall and ceiling finishes (restore plaster)
  - dropped ceiling beams
2. Main stairs
  - volume
  - original wall and ceiling finishes (plaster)
  - hand rails
3. Corridors
  - double-loaded configuration
  - doors
  - door frames
  - baseboards
  - chair rails
  - picture moldings
4. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards
  - chair rails
  - picture moldings
5. Sun porches
  - volume
  - exposed brick
  - exposed columns
  - tongue-and-groove plank walls and ceilings

### C. Renovation Zones

1. Offices and ancillary spaces
2. Basement spaces
3. Toilets

#### *Building 1 - Interior Recommendations*

##### Restoration

There are two areas identified for restoration in this building: the Surgeon General's office (Room 1119) and the south stair, which is adjacent to this office.

The Surgeon General's office, which is located in the 1926 addition of this building, is the former nurses' living room. It retains its original spatial configuration and many of its architectural features including the fireplace and over-mantel, the dropped beam ceiling and pilasters, wood floor and french-doors leading to the sun porch room. It is recommended that the non-original closet and toilet, which flank the fireplace, be removed. This will expose the windows on the west side of the room. (Another space nearby could be found to accommodate a more appropriate shower for the Surgeon General.) Light fixtures to match the original sconces (see historic drawings) should be installed over the mantel. The non-original wood panels should be removed from the french doors leading to the sun porch and the doors should be rehabilitated. Obtrusive flush-panel varnished doors leading into other interior spaces from the Surgeon General's office should be replaced with painted doors to match original doors in the building. The finishes in this room should be painted the original colors: tan walls with white trim. The highly obtrusive fluorescent light fixtures should be replaced with fixtures more compatible with the architectural quality of the space.

The south stair is an original feature of the 1926 addition. It is in good condition and should be recognized as an important feature, not to be altered in future rehabilitations. The vinyl anti-skid surfaces are obtrusive and it is recommended that carpet be installed on the stairs; this will be more compatible with the design of the stair and will provide the added benefit of baffling sound.

##### Repair

All interior finishes should be repaired as needed.

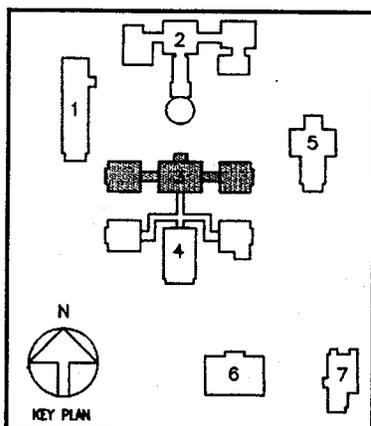
##### Alteration

Future work to the second floor of this building must not in any way damage the structural chords or web members of the trusses described in the existing conditions survey. The web members consist of the vertical steel rods and the 6" x 6" wood diagonals. The presence of these members precludes placing door openings anywhere along the truss other than in the center where currently located.

Future alterations to the building should recognize the following Rehabilitation Zones:

- Main stair (north side): The main stair has been radically altered; however, it is in its original location and is a main feature of the building. Future work should include probes to determine if any of the original stair remains. It should be preserved if possible.
- Main entry hall: The main entry hall has been radically altered; however, it is a major space in the building. Future work should include the removal of the highly obtrusive paneling and suspended acoustic tile ceilings. Original plaster and dropped beams should be rehabilitated if possible.
- First-, second- and third-floor corridors: The corridors should retain their double-loaded configuration and original doors, frames and wood trim. In the event that a central air conditioning system is installed, it is recommended that the feeder duct could be run down the corridor with a soffit so as not to require a dropped ceiling.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Sun porches: Future rehabilitations of the sun porches should retain their original spatial configuration and leave exposed the original architectural elements including the columns; the exposed brick wall surfaces; and original tongue-and-groove wood plank wall covering and plaster ceilings.

## BUILDING 3: HOSPITAL BUILDING

*Exterior Inventory*

Most of the exterior of Building 3 is designated a Restoration Zone including its mass; form; relationship to Building 4, the pavilions and the solarium; main entry porch; fenestration; and other materials and features as noted below. The areaways are designated Rehabilitation Zones. There are no Renovation Zones on the exterior of this building.

## A. Restoration Zones

1. Roof
  - form
  - material (replace asphalt shingles with slate)
  - dormers
  - chimney
  - flashing (copper)
  - cupola
  - skylights
2. Masonry
  - brick
  - limestone
  - granite
  - bluestone
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornice
  - columns
  - balustrade
  - original color (white)
5. Copper leaders and down spouts

6. Entry porch
  - Form
  - wood elements as noted in the survey
  - masonry platform and steps
  - door (replace existing to match original)
7. Copper vents under windows

#### B. Rehabilitation Zones

1. Areaways
  - plan
  - curbs
  - pipe rails

#### C. Renovation Zones

There are no Renovation Zones on the exterior of Building 3.

### ***Building 3 - Exterior Recommendations***

#### Restoration

It is recommended that the entry on the north porte cochere be restored to its original appearance as noted in the original architectural drawings. This will entail the removal of the obtrusive aluminum and glass vestibule, repair of the surrounding historic fabric and the installation of new wood and glass doors and surrounds.

The missing balustrades on the north porte cochere and the northeast and northwest solarium corridors should be replicated.

All visible roofs should be restored to their original condition using materials to match the original. Skylights and vents should be preserved.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. All brick and stone elements should be cleaned. Rebuild window wells at the basement level.

The inappropriate brick and mortar repairs and infill throughout the building should be repaired to match the original.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Those that are missing should be replaced to match existing.

The areaways are in poor condition and should be rebuilt.

### Alterations

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

The existing covered walk way between Buildings 1 and 3 should be replaced with a more compatible and functional structure.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

### ***Building 3 - Interior Inventory***

#### A. Restoration Zones

1. Entry hall
  - volume
  - relationship to stairs
  - original wall and ceiling finishes (plaster)
  - dropped ceiling beams
  - brackets
  - historic colors (terra cotta and white)

2. Main stairs
  - volume
  - stair case
  - finishes

#### B. Rehabilitation Zones

1. Corridors
  - double-loaded configuration
  - doors
  - door frames
  - baseboards
2. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards
  - chair rails
3. Remaining evidence of original ventilating system
  - ducts
  - vents
  - frames for skylights in third-floor ceiling
  - fans

#### C. Renovation Zones

1. Offices and ancillary spaces
2. Basement spaces
3. Toilets

### ***Building 3 - Interior Recommendations***

#### Restoration

The entry hall and main stair hall in Building 3 are noted for restoration.

In the entry hall the following characteristics should be preserved and restored, if possible: the volume; the spatial relationship to the main stair; the original wall and ceiling finishes; the dropped ceiling beams; the brackets; the historic colors (terra cotta and white). The characteristics of the main stair hall to be preserved and restored include its volume; the stair case itself and the finishes.

#### Repair

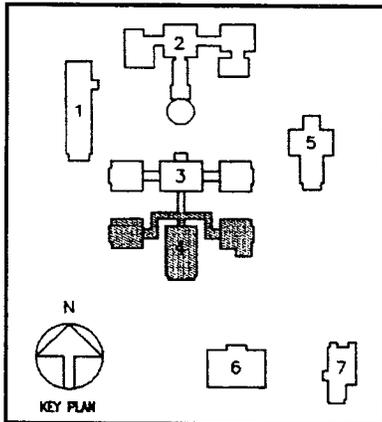
All interior finishes should be repaired as needed.

Alteration

Future alterations to these buildings should recognize the following Rehabilitation Zones:

- First-, second- and third-floor corridors: The corridors should retain their double-loaded configuration and original doors, frames and wood trim. In the event that a central air conditioning system is installed, it is recommended that the feeder duct could be run down the corridor with a soffit so as not to require a dropped ceiling.
- First-floor offices and ancillary spaces in the pavilions. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that non-original full-height partitions and suspended ceilings be removed.
- First-floor corridor spaces in the solaria. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that any non-original partitions and suspended ceilings be removed.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Remaining evidence of historic ventilating system should be preserved: including ducts, vents, frames for skylights in third-floor ceilings, fans.

## BUILDING 4

*Exterior Inventory*

Most of the exterior of Building 4 is designated a Restoration Zone including its mass; form; relationship to Building 3, the pavilions and the solarium; colonnaded porch; fenestration; and other materials and features as noted below. The roofs, skylight and areaways are designated Rehabilitation Zones. There are no Renovation Zones on the exterior of this building.

## A. Restoration Zones

1. Masonry
  - brick
  - limestone
  - granite
  - mortar
2. Windows
  - sash
  - frames
  - original color (dark green)
3. Wood Elements
  - cornice
  - columns
  - balustrade
  - original color (white)
4. Copper leaders and down spouts
5. Colonnaded Porch
  - form
  - wood elements as noted
  - masonry platform and steps
  - door (replace existing to match original)

## B. Rehabilitation Zones

1. Roof form
2. Skylight for operating room

## C. Renovation Zones

There are no Renovation Zones on the exterior of Building 4.

### *Building 4 - Exterior Recommendations*

#### Restoration

It is recommended that the entry on the south colonnaded porch be restored to its original appearance as noted in the original architectural drawings. This will entail the removal of the obtrusive aluminum and glass vestibules, repair of the surrounding historic fabric and the installation of new wood and glass doors and surrounds.

The one remaining original light fixture on the south colonnaded porch should be repaired and retained in place.

All visible roofs should be restored to their original condition using materials to match the original. Skylights and vents should be preserved.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. All brick and stone elements should be cleaned. Rebuild window wells at the basement level.

The inappropriate brick and mortar repairs and infill throughout the building should be repaired to match the original.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Those that are missing should be replaced to match existing.

The areaways are in poor condition and should be rebuilt.

### Alterations

It is recognized that the old operating room in Building 4 is used for office space currently; and that the original skylight facing south was probably not an effective building feature. Therefore, it is not recommended that this feature be restored. However, both the interior and exterior of this feature should be redesigned to reflect its original appearance, without discomfort to the occupants.

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

### ***Building 4 - Interior Inventory***

#### A. Restoration Zones

There are no Restoration Zones on the interior of Building 4.

#### B. Rehabilitation Zones

1. First-floor offices and ancillary spaces (former operating room)
  - plan
  - volume
  - ceiling height
  - doors
  - door frames
  - baseboards
2. Skylight area in operating room should be re-designed to recall the original
3. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards

#### C. Renovation Zones

1. Basement spaces
2. Toilets

***Building 4 - Interior Recommendations***Restoration

No restoration is recommended for any features or spaces in Building 4.

Repair

All interior finishes should be repaired as needed.

Alteration

Future alterations to these buildings should recognize the following Rehabilitation Zones:

- First-floor offices and ancillary rooms in Building 4 (original operating room). The features to be preserved include the plan, the volume, the ceiling height, the doors and door frames, and baseboards. Although there are remnants of the original ceramic tile on the walls, its integrity is compromised and it does not warrant preservation. Recommended treatment for the skylight in this space is addressed in the exterior section.
- First-floor offices and ancillary spaces in the pavilions. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that non-original full-height partitions and suspended ceilings be removed.
- First-floor corridor spaces in the solarium. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that any non-original partitions and suspended ceilings be removed.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Remaining evidence of historic ventilating system should be preserved: including ducts, vents, frames for skylights in third-floor ceilings, fans.

## WARD PAVILIONS

### *Exterior Inventory*

Most of the exteriors of the pavilions are designated Restoration Zones including their mass; form; relationship to Buildings 3 and 4, and the solarium; fenestration; and other materials and features as noted below. The areaways are designated Rehabilitation Zones. There are no Renovation Zones on the exterior of this building.

#### A. Restoration Zones

1. Roofs
  - form
  - material (slate)
  - chimneys
  - flashing (copper)
  - vents
2. Masonry
  - brick
  - limestone
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornices
  - original color (white)
5. Copper leaders and down spouts
6. Copper vents under windows
7. Brick air intakes on outward-facing elevations

#### B. Rehabilitation Zones

1. Flat roof form
2. Closures for exhaust fans should be redesigned

#### C. Renovation Zones

There are no Renovation Zones on the exterior of the Ward Pavilions.

### *Ward Pavilions - Exterior Recommendations*

#### Restoration

All visible roofs should be restored to their original condition using materials to match the original. Skylights and vents should be preserved.

Enclosures for the exhaust fan openings in the pavilions should be replaced with more compatible materials.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. All brick and stone elements should be cleaned. Rebuild window wells at the basement level.

The inappropriate brick and mortar repairs and infill throughout the building should be repaired to match the original.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Those that are missing should be replaced to match existing.

#### Alterations

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

***Ward Pavilions - Interior Inventory***

## A. Restoration Zones

1. Fire places

## B. Rehabilitation Zones

1. First-floor offices and ancillary spaces (former ward pavilions)
  - plan
  - volume
  - ceiling height
  - doors
  - door frames
  - baseboards
2. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards

## C. Renovation Zones

1. Basement spaces
2. Toilets

***Ward Pavilions - Interior Recommendations***Restoration

The locations of the fireplaces in the pavilions are noted in Chapter 4. They should be restored to their historic condition.

Repair

All interior finishes should be repaired as needed.

Alteration

Future alterations to these buildings should recognize the following Rehabilitation Zones:

- First-floor offices and ancillary spaces in the pavilions. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that non-original full-height partitions and suspended ceilings be removed.

- First-floor corridor spaces in the solarium. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that any non-original partitions and suspended ceilings be removed.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Remaining evidence of historic ventilating system should be preserved: including ducts, vents, frames for skylights in third-floor ceilings, fans.

**SOLARIUM CORRIDORS***Solarium Corridors - Exterior Inventory*

## A. Restoration Zones

1. Masonry
  - brick
  - limestone
  - mortar
2. Windows
  - sash
  - frames
  - original color (dark green)
3. Wood elements
  - cornices
  - balustrade on northeast and northwest corridors
  - structural elements
  - doors
  - original color (white)
4. Copper leaders and down spouts

## B. Rehabilitation Zones

1. Flat roof form
2. Areaways
  - plan
  - curbs
  - pipe rails

## C. Renovation Zones

There are no Renovation Zones on the exteriors of the Solarium Corridors.

*Solarium Corridors - Exterior Recommendations*Restoration

The missing balustrades on the northeast and northwest solarium corridors should be replicated.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. All brick and stone elements should be cleaned. Rebuild window wells at the basement level.

The inappropriate brick and mortar repairs and infill throughout the building should be repaired to match the original.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Those that are missing should be replaced to match existing.

The areaways are in poor condition and should be rebuilt.

### Alterations

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

### *Solarium Corridors - Interior Inventory*

#### A. Restoration Zones

There are no Restoration Zones in the interior of the Solarium Corridors.

## B. Rehabilitation Zones

1. First-floor corridors
  - plan
  - volume
  - ceiling height
  - door frames
2. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards
3. Stairs (southeast and southwest corridors)
  - volume
  - stair cases

## C. Renovation Zones

1. Basement spaces
2. Toilets

*Solarium Corridors - Interior Recommendations*Repair

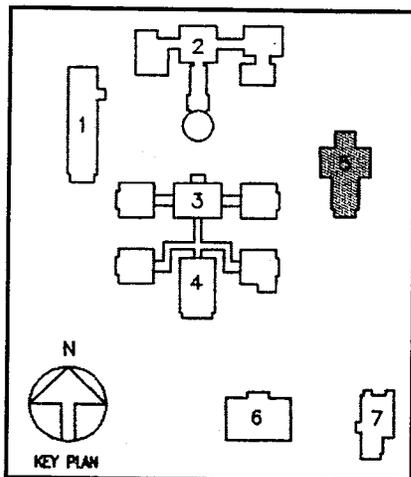
All interior finishes should be repaired as needed.

Alteration

Future alterations to these buildings should recognize the following Rehabilitation Zones:

- First-floor corridor spaces in the solarium. The features to be preserved include the plan, volume, ceiling height, doors, door frames, and baseboards. It is recommended that any non-original partitions and suspended ceilings be removed.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Remaining evidence of historic ventilating system should be preserved: including ducts, vents, frames for skylights in third-floor ceilings, fans.

## BUILDING 5: SICK OFFICERS' QUARTERS

*Exterior Inventory*

Most of the exterior of Building 5 is designated a Restoration Zone including its mass, form, porte cochere, secondary entry porches, fenestration, and other materials and features as noted below. Recognizing that the sun porches are currently used for office space, it is not recommended to restore them to their original open configuration. Instead, it is recommended to redesign the infill to be more compatible with the architectural character of the building; therefore, the sun porch on this building is designated a Rehabilitation Zone. The areaways are designated Rehabilitation Zones. There are no Renovation Zones on the exterior of this building.

## A. Restoration Zones

1. Roof
  - form
  - material (slate)
  - dormers
  - chimney
  - flashing (copper)
  - elevator penthouse
2. Masonry
  - brick
  - granite
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornice
  - columns
  - balustrade
  - doors
  - original color (white)
5. Leaders/Down spouts
6. Porte Cochere
  - wood elements as noted
  - masonry platform and steps
  - door (replace existing on first floor to match original)

7. Secondary entry porches (east and west)
  - wood elements as noted
  - masonry platform and steps

#### B. Rehabilitation Zones

1. Sun porch (south)
  - wood elements as noted
  - recommend redesign of infill
2. Areaways
  - plan
  - curbs
  - pipe rails

#### C. Renovation Zones

There are no Renovation Zones on the exterior Building 5.

### ***Building 5 - Exterior Recommendations***

#### Restoration

The porch platform, steps and balusters on the porte cochere should be restored to the original configuration as noted in the historic drawings.

The main entry door in the porte cochere should be restored to its original appearance as noted in the original architectural drawings. The original south door is still extant, and can be used as the model. This will entail the removal of the obtrusive aluminum and glass vestibule, repair of the surrounding historic fabric and the installation of a new wood and glass door and surround.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

The concrete steps on the secondary porches should be replaced with granite to match the historic condition.

The highly obtrusive wood fire escape on the south side should be removed and replaced with a less obtrusive fire escape, or preferably, an interior fire stair.

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be

installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. Granite elements should be cleaned. Rebuild window wells at the basement level.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Those that are missing should be replaced to match existing.

The concrete areaways are in poor condition and should be rebuilt.

### Alterations

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric. If possible, close off the north side of the building from vehicular traffic; the existing space is too narrow.

Recognizing that the sun porches are now used as office space, it is not recommended to restore them to their original open configuration. However, it is recommended that the infill be replaced with one designed to be more compatible with the historic condition. This should include incorporation of a balustrade at each level and glazing above, which has a more open quality.

### ***Building 5 - Interior Inventory***

#### A. Restoration Zones

1. Main stair at first and second floors  
    volume  
    stair case
2. Fireplaces
3. Original door in south corridor--first floor

## B. Rehabilitation Zones

1. Entry hall
  - volume
  - relationship to stairs
  - original wall and ceiling finishes (plaster)
  - dropped ceiling beams
  - baseboards
2. Main stairs at third floor
  - volume
  - stair case
3. Corridors
  - double-loaded configuration
  - doors
  - door frames
  - baseboards
  - chair rails
4. Perimeter walls (inner surface of exterior wall)
  - window frames
  - baseboards
  - chair rails
5. Sun porches (south)
  - volume
  - exposed brick
  - exposed columns

## C. Renovation Zones

1. Offices and ancillary spaces
2. Basement spaces
3. Toilets

***Building 5 - Interior Recommendations***Restoration

There are three categories of features to be restored in Building 5: the main stair at the first and second floors; the fireplaces; and the original door at the south end of the south corridor. The main stair is original, although it has been enclosed on the second and third floors. Its condition is sound and any work done in the future should be done to maintain the stair and its open relationship to the main lobby on the first floor. While the stair has been enclosed on the second floor, the original hand rails are still visible from the stair itself. If possible, the stair should be re-opened at this level. If not, the hand rail should be left exposed in its current condition.

The locations of the fireplaces are identified in Chapter 4. These should be restored to their original condition.

The original door at the south end of the south corridor should be restored and maintained in place.

### Repair

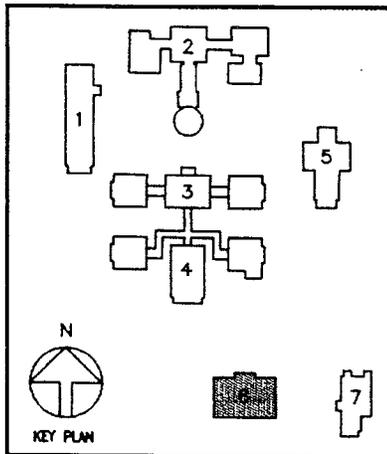
All interior finishes should be repaired as needed.

### Alteration

Future alterations to the building should recognize the following Rehabilitation Zones:

- Main entry hall: The main entry hall has been altered; however, it is still a major space in the building. Future work should respect the relationship between this space and the stair; the original plaster; and the dropped ceiling beams.
- First-, second- and third-floor corridors: The corridors should retain their double-loaded configuration and original doors, frames and wood trim. In the event that a central air conditioning system is installed, it is recommended that the feeder duct could be run down the corridor with a soffit so as not to require a dropped ceiling.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Sun porches: Future rehabilitations of the sun porches should retain their original spatial configuration and leave exposed the original architectural elements including the columns and the exposed brick wall surfaces.
- Main stair at the third floor: This stair has been fully enclosed; however, it is in its original location. Its volume and material should be preserved, but it is not necessary to open the space.

## BUILDING 6: CONTAGIOUS DISEASES HOSPITAL

*Exterior Inventory*

Most of the exterior of Building 6 is designated a Restoration Zone including its mass, form, entry porch, fenestration, and other materials and features as noted below. Recognizing that the porte cochere on the south side of the building is now used as interior space, it is not recommended to restore it to its original configuration. Instead, it is recommended to redesign the entry to be more compatible with the architectural character of the building. Therefore, the porte cochere is designated to be a Rehabilitation Zone. The areaways are designated for rehabilitation. There are no Renovation Zones on the exterior of this building.

## A. Restoration Zones

1. Roof
  - form
  - material (slate)
  - dormers
  - chimney
  - flashing (copper)
2. Masonry
  - brick
  - granite
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornice
  - columns
  - balustrade
  - original color (white)
5. Leaders/Down spouts
6. Entry porch
  - wood elements as noted
  - masonry platform and steps
  - door (replace with compatible design)
7. Metal vents under the windows

## B. Rehabilitation Zones

1. Flat roof form
2. Porte cochere
  - volume
  - mass
  - masonry as noted above
  - original masonry openings
3. Areaways
  - plan
  - curbs
  - pipe rails

## C. Renovation Zones

There are no Renovation Zones on the exterior of Building 6.

### ***Building 6 - Exterior Recommendations***

#### Restoration

The existing original features and qualities of the exterior of this building are identified as restoration zones. However, because no adequate documentation exists for missing features, it is not recommended to restore them. Compatible design changes are recommended in the alterations section below.

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. Granite elements should be cleaned. Rebuild window wells at the basement level.

All copper leaders and down spouts should be inspected for condition and repaired as necessary. Missing elements should be replaced to match the existing.

The cementitious coating on the main entry porch is obtrusive and is probably obscuring surface and/or structural deterioration. It is recommended that these elements be removed and recast.

The concrete areaways are in poor condition and should be rebuilt.

### Alterations

The original elevation drawings do not clearly define the design of the entry on either the first or second levels of the main entry porch. However, the existing glass and aluminum infill is highly obtrusive. It is recommended that a new infill and entry be installed. Since the original intention appears to have been some kind of folding partitions, it is possible that a glazed infill could be appropriate. However, the detailing should be more in keeping with the architectural character of the building.

The canvas canopy at the main entry porch should be removed.

The glass and aluminum vestibule on the south porte cochere should be redesigned to respect the original mass of the masonry structure and the masonry opening.

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

Provide a landscape buffer around the perimeter of the building. Refer to historic photographs for the desired appearance. At the least, provide three feet of planted buffer with a curb to separate parking area from the building. This will lessen the occasion for impact damage to the building fabric.

### ***Building 6 - Interior Inventory***

#### A. Restoration Zones

There are no Restoration Zones in the interior of Building 6.

#### B. Rehabilitation Zones

1. Perimeter walls (inner surface of exterior wall)  
window frames  
baseboards

#### C. Renovation Zones

1. Offices and ancillary spaces
2. Corridors

3. Stairs
4. Toilets

### *Building 6 - Interior Recommendations*

#### Restoration

Because the interior of this building has been so heavily altered, there are no areas noted for restoration.

#### Repair

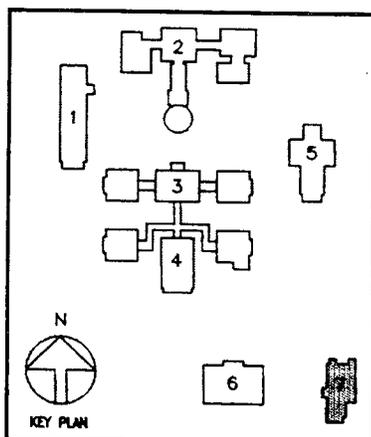
All interior finishes should be repaired as needed.

#### Alteration

Future alterations to the building should recognize the following Rehabilitation Zones:

- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.

## BUILDING 7: HOSPITAL CORPS' QUARTERS

*Exterior Inventory*

Most of the exterior of Building 7 is designated a Restoration Zone including its mass, form, entry porch, fenestration, and other materials and features as noted below. Recognizing that the sun porches are currently used for office space, it is not recommended to restore them to their original open configuration. Instead, it is recommended to redesign the infill to be more compatible with the architectural character of the building; therefore, the sun porches on this building are designated a Rehabilitation Zone. The areaways are designated Rehabilitation Zones. There are no Renovation Zones on the exterior of this building.

## A. Restoration Zones

1. Roof
  - form
  - material (slate)
  - dormers
  - chimney
  - flashing (copper)
2. Masonry
  - brick
  - granite
  - mortar
3. Windows
  - sash
  - frames
  - original color (dark green)
4. Wood elements
  - cornice
  - columns
  - balustrade
  - doors
  - original color (white)
5. Leaders/Down spouts
6. Entry porch
  - wood elements as noted
  - masonry platform and steps
  - door (replace existing to match original)

## B. Rehabilitation Zones

1. Sun porch (south)
  - wood elements as noted
  - masonry elements as noted
  - recommend redesign of infill
2. Areaways
  - plan
  - curbs
  - pipe rails

## C. Renovation Zones

There are no Renovation Zones on the exterior Building 7.

### ***Building 7 - Exterior Recommendations***

#### Restoration

It is recommended that the main entry be restored to its original appearance as noted in the original architectural drawings. This will entail the removal of the obtrusive aluminum and glass vestibule, repair of the surrounding historic fabric and the installation of a new wood and glass door and surround.

All window air conditioning units should be removed (and a central air-conditioning system should be installed).

The highly obtrusive wood fire escape on the north side should be removed and replaced with a less obtrusive fire escape, or preferably, an interior fire stair.

#### Repair

The existing original windows and frames should have the paint removed and be repaired. They should then be repainted the original dark green color. It is recommended that screens be installed in the lower half of the window openings so that the windows may be operated in warm weather. The frames of the screens should be color finished to match the windows.

All wood ornamental elements should be inspected for areas needing repair. They should then be repaired, scraped and painted white to match the historic color. Any reconstruction of elements should match the historic condition.

All stress cracks in the masonry should be identified and repaired. All open joints in the masonry should be repointed with mortar to match existing. Spalled and broken masonry units should be replaced to match the existing. Granite elements should be cleaned. Rebuild window wells at the basement level.

The main entry stair and porch are failing and should be rebuilt using materials to match the original design.

The concrete areaways are in very poor condition and should be rebuilt.

The open drain running across the lawn should be replaced with a french drain.

### Alterations

Recognizing that the sun porches are now used as office space, it is not recommended to restore them to their original open configuration. However, it is recommended that the infill be replaced with one designed to be more compatible with the historic condition. This should include incorporation of a balustrade at each level and glazing above, which has a more open quality.

Brass sconces and hanging light fixtures should be replaced with new fixtures, which provide adequate light and which are in keeping with the scale and design of the architectural character of the building.

### ***Building 7 - Interior Inventory***

#### A. Restoration Zones

1. Entry hall
  - volume
  - relationship to stairs
  - original wall and ceiling finishes (plaster)
  - dropped ceiling beams
2. Main stairs at first floor
  - volume
  - original wall and ceiling finishes (plaster)
  - hand rails

#### B. Rehabilitation Zones

1. Main stairs at second and third floors
  - volume
  - stairs case
2. Corridors
  - double-loaded configuration
  - doors
  - door frames
  - baseboards
3. Perimeter walls (inner surface of exterior wall)
  - window frames

- baseboards
- 4. Sun porches
  - volume
  - exposed brick
  - exposed columns

#### C. Renovation Zones

1. Offices and ancillary spaces
2. Basement spaces
3. Toilets

### ***Building 7 - Interior Recommendations***

#### Restoration

There are two areas identified for restoration in this building: the main entry hall and the main stair at the first-floor level. The characteristics of the main entry hall, which should be preserved and restored, if possible, are: its volume; its relationship to the stair; its original wall and ceiling finishes; original doors and door frames; dropped ceiling beams. The volume of the stair, its open quality, the original hand rails should be preserved and restored.

#### Repair

All interior finishes should be repaired as needed.

#### Alteration

Future alterations to the building should recognize the following Rehabilitation Zones:

- First-, second- and third-floor corridors: The corridors should retain their double-loaded configuration and original doors, frames and wood trim. In the event that a central air conditioning system is installed, it is recommended that the feeder duct could be run down the corridor with a soffit so as not to require a dropped ceiling.
- Perimeter walls: Future renovation to inner office spaces should recognize that perimeter walls are rehabilitation zones. That entails the preservation of original windows, frames and baseboards. Dropped ceilings should be avoided if possible. If their installation is necessary, they should be placed not less than several inches from the tops of the window frames.
- Sun porches: Future rehabilitations of the sun porches should retain their original spatial configuration and leave exposed the original architectural elements including the columns; the exposed brick wall surfaces; and original tongue-and-groove wood plank wall covering and plaster ceilings.

- Main stair above the first-floor level. The stairs on the upper floors have been altered and enclosed. They need only be repaired in the future.

**POTOMAC ANNEX BUILDINGS - SITE AND LANDSCAPE**

It is recommended that a thorough landscape history be written for this site before undertaking any major work. The following recommendations are geared toward preserving the remaining vestiges of early sitework, but should not be considered exhaustive.

Although the north part of the site still retains some vestiges of its 19th-century appearance, it does not appear that restoration to that period is warranted for the following reasons:

- The site was so heavily altered during the 20th century.
- The hospital complex sets the tone for the historic 20th-century appearance of the site.
- The site was reduced significantly by the deaccessioning of 5 acres to the east, and by the construction of the thruway to the north, damaging the overall shape of the 19th-century landscape.
- While the old Observatory (Building 2), is the central focus, the site took on its present appearance in 1902.

However, there are areas and features that should be considered significant, and worthy of preservation; these are listed under restoration.

**A. Restoration Zones**

1. The area directly to the north of Building 2 including the circular drive and path bisecting it.
2. The flagstaff and sculpture of Benjamin Rush
3. Cast iron light fixtures and fire call boxes
4. Japanese cherry trees
5. Mature trees

**B. Rehabilitation Zones**

1. Perimeters around all the buildings.

**C. Renovation Zones**

1. The south parking lot

### *Site and Landscape - Recommendations*

#### Restoration

Research the appearance of the site. Restore the north section to its 1902 appearance, to the degree possible. Include possibility of restoring cherry trees, although they post-date 1902.

Make an inventory the existing cast iron light fixtures and fire call boxes. Restore the existing fixtures and use them as the basis for any future lighting plan.

Identify older mature trees and plan for future maintenance and replacement, if required.

#### Rehabilitation

Reduce the amount of parking throughout the site.

At the least, provide for lawn buffers at the perimeters of the buildings to protect them from vehicle impact.

#### Renovation

The south parking lot is down the hill from most of the buildings. It is located where outbuildings connected with the hospital once stood. It is not recommended to restore this area. When any work is done to the parking area, all efforts to mitigate its impact on the site should be made. This includes possible plantings and sensitive lighting and walkways.

## MAINTENANCE GUIDELINES FOR BUILDINGS MANAGEMENT

On November 13, 1995, Mr. Ike Brown, Facilities Manager for the Potomac Annex, was interviewed concerning the following issues:

- Gutters, leaders and storm drainage system;
- Window and door sealants;
- Exterior walks and paving;
- Floor tiles, cleaning methods;
- Wooden mantelpieces, cleaning methods;
- Window cleaning methods;
- Brass hardware, cleaning methods;
- Painting schedule; and
- Regular cleaning, dusting and vacuuming.

Significant maintenance issues were apparent as a result of this interview. These problems are related to funding and contractual requirements for seasonal maintenance. The daily and weekly cleaning and maintenance procedures appear to be appropriate with the exceptions noted below.

Gutters leaders & storm drainage: Mr. Brown indicated that there is no regular cycle of maintenance for the gutters, leaders and storm drains. GSA is responsible for this work. However, it is considered a major work item rather than cyclical maintenance issue. Mr. Brown makes recommendations to GSA when he believes repairs and maintenance are needed. Given the process by which money is released, there is often a delay of a year or more before work is done. According to Mr. Brown, the last time the drainage system was cleaned and repaired was "4 or 5 years ago." The results of this approach to a basic maintenance item is noted wherever there is standing water on the roofs and water damage on the exteriors and interiors of buildings throughout the site.

Recommendation

Establish regular cycle of maintenance for cleaning and making minor repairs to drainage system on all buildings. All gutters, leaders and storm drains should be cleaned at least once a year in the late autumn after the leaves have fallen. Drainage systems should be inspected every spring for damage caused by winter snow and ice; repairs should be made immediately.

Window and door sealants: As with the storm drainage system, caulking and weatherstripping of doors and windows is not done on a regular basis but rather treated as an extraordinary expense requiring special authorization.

Recommendation

Establish a regular cycle of caulking and weatherstripping. This is ideally done in late autumn in preparation for winter weather.

Exterior walks and paving: Basic maintenance of exterior walks and paving are treated as extraordinary expenses requiring special authorization. Hence, there is no ongoing maintenance of these features. Maintenance is only done in connection with occasional repairs.

Recommendation

Establish a regular cycle of minor repairs. During spring, summer and fall, pull weeds on a regular basis (once a week or more during the height of the growing season). Repair cracks, potholes, etc., as they occur.

Floor tiles: Floor tiles normally occur in bathrooms, kitchen areas and basements. Normal wet mopping is done by housekeepers every day. Where wood elements, such as door and window frames, meet the floor, a metal strip is inserted between the floor and the base of door or window frames to prevent moisture from wicking up into wood.

Recommendation: The use of a metal strip to prevent moisture from wicking up into the wood grain would appear to be inadequate. In areas where ceramic tile and wood occur together, tiles should be cleaned with as dry a mop as possible. Do not use so much water that puddles are left on the floor. Place a plywood board against the wall where the wood meets the tile to protect the wood from splashing.

Wood Mantelpieces: Wood mantelpieces are dusted everyday with normal furniture polish. No special treatment is used.

Recommendation: The use of furniture polish should be avoided as this leaves a build-up that is difficult to clean. Woodwork should be dusted with a clean, dry duster without any polish or additives.

Windows: Windows are cleaned twice a year. Normal window cleaner and methods used.

Recommendation: These measures appear to be adequate as a regular housekeeping task. No significant pressure should be applied to glass during the cleaning process. Loose sealants, glazing putty and broken panes should be repaired immediately.

Brass hardware: Brass polish is used on brass hardware when needed (once every couple of months.) Normal polishing and cleaning methods used.

Recommendation: Brass polish should not be used as this leaves a smear and white marks on the surrounding wood. Brass should be allowed to patinate naturally. Only dusting and occasional buffing with a clean, dry cloth is necessary.

Painting: A regular interior painting cycle of seven years has been established. Full paintings and touch-ups actually occur more frequently. The build up of many layers of paint is starting to cause problems with paint adhesion. In addition, interior detail has been obscured by excessive paint build up. It is also clear from visual inspection that paint is not removed sufficiently, or when it is removed, it is done with inappropriate methods.

Recommendation: Woodwork should be stripped, repaired and repainted. Between paintings, woodwork with a semi-gloss finish should be cleaned regularly, especially in high-traffic areas. Too frequent painting should not be used as a substitute for regular cleaning. In future repaintings, the surface must include adequate preparation including cleaning, scraping of all loose paint, and feathering edges before new paint is applied.

RECOMMENDATION FOR CONFORMANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA)  
OF 1990

“With regard to existing historic preservation programs, the regulations state that a public entity shall give priority to programs that allow physical access to individuals with disabilities, but in cases where alterations would result in a substantial loss or impairment of ‘significant historic features of an historic property’ or would ‘result in a fundamental alteration in the nature of a service, program, or activity, or in undue financial and administrative burdens’, then following alternative methods of choosing program accessibility would be acceptable.”<sup>1</sup>

1. Using audiovisual materials and devices to depict those portions of an historic property that cannot otherwise be made accessible;
1. assigning persons to guide individuals with disabilities into or through portions of historic properties that cannot otherwise be made accessible; or
1. adopting other innovative methods.

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<sup>1</sup>“Americans with Disabilities Act: Facilities Compliance Workbook.” John Wiley & Sons, Inc.: New York. 1992.

**PRIORITIZED MATRIX OF RECOMMENDATIONS**



POTOMAC ANNEX, BUILDING 1 - PRIORITIZED SUMMARY OF REPAIRS

MATERIALS / ELEMENTS			REPAIR AND ALTERATION WORK ITEMS			SPEC. SECTION			PRIORITY		
									REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM
Storm Drainage			Test and clean all gutters, downspouts and catch basins. Replace as required						1		
Roof			Refer to RDC 48102 for roof repairs/replacement.								
Brick			Repoint all open and failed mortar joints and earlier repointing that does not match original joint profile and mortar				Masonry repointing and repairs		3		
			Remove and reset displaced, spalled or cracked bricks.				Masonry repointing and repairs		3		
Concrete			Repair bulging retaining wall. Excavate, waterproof, rake out and repoint all brick mortar joints				Masonry repointing and repairs		3		
			Repair cracks in foundation wall with current concrete patching techniques.				Conc. repair and replacement		3		
			Demolish existing concrete slabs at the entrance portico (north entrance) and the south entrance stoop. Replace with freshly poured concrete.				Conc. repair and replacement		10		
			Rebuild concrete window wells.				Conc. repair and replacement		10		
Granite			Demolish existing concrete capstones and replace with new. Incorporate sleeve detail for iron railings where applicable				Conc. repair and replacement		10		
			Demolish and rebuilt concrete areaway walls and arches at south entrance, east elevation.				Conc. repair and replacement		10		
			Rake out and repoint failing mortar joints				Masonry repointing and repairs		3		
			Clean granite where required				Masonry repointing and repairs		10		
Cast Stone			Rake out and repoint failing mortar joints			Masonry repointing and repairs		3			
Wood			Scrape prime and paint all wood elements where paint is failing and on regular maintenance schedule							3	
			Replace dormer windows. Refer to RDC 48102 for specification								3
Wood Windows			Remove existing AC units. Repair, repaint and caulk				Window Relab.		3		
			At south entrance, east elevation replace window with double hung unit to match existing.								10
Iron Railings			Scrape prime and paint. Reset in existing concrete				Painting			3	
Electric Conduit			Explore alternate method to distribute power								10

1 - work in 1 year

3 - work in 3 years

10 - work in 10 years

probract.xls

POTOMAC ANNEX, BUILDING 1 - PRIORITIZED SUMMARY OF REPAIRS				PRIORITY		
MATERIALS / ELEMENTS	REPAIR AND ALTERATION WORK ITEMS	SPEC. SECTION	REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM	
Doors	Remove existing entrance assembly. Replace with new door to match original. Include entire assembly.				10	
Landscape	Reinstate buffer between building and parking.				10	
Exterior Lighting	Install new lighting at porches that is more in scale and style.				10	
Spatial Arrangements	Recreate original dropped beam configuration in entrance hall. Surgeon general office - restore french doors. Remove closets. Relocate toilet. Install new pair of entrance doors to match original adjacent paneled doors. Replace lighting.				10	
Plaster	Repaint walls, ceilings, windows and doors	Painting		10		

1 = work in 1 year  
 3 = work in 3 years  
 10 = work in 10 years

POTOMAC ANNEX, BUILDINGS 3 & 4 - PRIORITIZED SUMMARY OF REPAIRS			PRIORITY		
MATERIALS / ELEMENTS	REPAIR AND ALTERATION WORK ITEMS	SPEC. SECTION	REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM
Storm Drainage	Test and clean all gutters, downspouts and catch basins. Replace as required.		1		
Roof	Refer to RDC 48102 for roof repairs/replacement				
Brick	Repair all open and failed mortar joints. Match original mortar in joint profile, texture and color.	Masonry repointing and repairs	3		
	Remove and reset all displaced, spalled or cracked bricks.	Masonry repointing and repairs	3		
	Clean buff brick.	Masonry repointing and repairs		10	
Limestone	Clean limestone keystones, lintels, capstones and sills.	Masonry repointing and repairs		10	
	Rake out and repoint all open and failed mortar joints. Match original mortar in joint profile, texture and color. Replace all pointing work that has too much portland cement in its mix.	Masonry repointing and repairs	3		
Bluestone	Rebuild window wells	Conc. repair and replacement	1		
Wood	Scrape, prime and paint all wood elements where paint is failing	Painting		10	
Concrete	Rebuild concrete retaining wall and stairs on north elevation	Conc. repair and replacement	3		
	Rebuild concrete slab at main entrance portico	Conc. repair and replacement	3		
Iron Railings	Scrape prime and paint. Reset in existing concrete	Conc. repair and replacement	3		
Building Systems	Preserve all remaining elements of original ventilation system				

1 = work in 1 year  
 3 = work in 3 years  
 10 = work in 10 years

POTOMAC ANNEX, BUILDING 5 - PRIORITIZED SUMMARY OF REPAIRS		PRIORITY			
MATERIALS / ELEMENTS	REPAIR AND ALTERATION WORK ITEMS	SPEC. SECTION	REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM
Storm Drainage	Test and clean all gutters, downspouts and catch basins. Replace as required.		3		
Roof	Refer to RDC-4B102 for roof repairs/replacement				
Brick	Repoint all open and failed mortar joints and earlier repointing work that does not match original mortar in profile, texture and color	Masonry repointing and repairs	3		
	Remove and reset displaced, spalled or cracked brick.	Masonry repointing and repairs	3		
Concrete	Rebuild concrete steps on west elevation under porte cochere	Conc. repair and replacement	10		
	Replace concrete capstones on west porch. Match existing in profile and size	Conc. repair and replacement	3		
	Incorporate sleeve detail for iron railings where applicable.				
Granite	Rake out and repoint failing mortar joints	Masonry repointing and repairs	3		
	Clean granite where required.	Masonry repointing and repairs		10	
Wood (except porte cochere)	Scrape, prime and paint all wood elements where paint is failing	Painting		10	
Wood Windows	Remove all air conditioners permanently. Strip paint. Reglue all joints.	Wood window rehabilitation	10		
	Replace glass. Install weatherstripping. Paint. Reinstall.				
Iron Railings	Scrape prime and paint. Reset in existing concrete.	Painting	3		
Doors	Remove existing glass entrance assembly on north. Replace with new assembly (door, sidelights and transom) to match original.				10
Landscape	Reinstate buffer between building and parking				10
Exterior Lighting	Install new lighting at porches and entrance portico that is more in scale and style.				10
Fire Escapes	Remove				10
Sun Porch (south)	Restore infill between columns				10
Porte Cochere	Repair wood elements. Strip fill. Install dutchman. Prime and paint	Painting	3		
	Iron column. Scrape, prime and paint		3		
	Reset granite.	Masonry repointing and repairs	3		
Building Systems	Open stair on first floor				10
	Develop plans for interior fire exit stair on south end of corridor				10
	Design new central air conditioning system.				10
Plaster	Scrape, prime and paint walls, ceilings, windows, trim and doors	Painting		10	

1 = work in 1 year

3 = work in 3 years

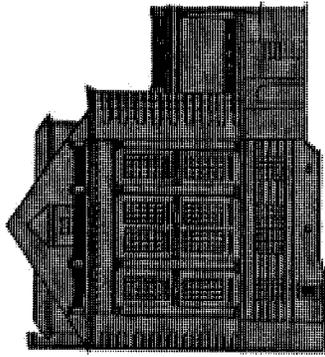
10 = work in 10 years

POTOMAC ANNEX, BUILDING 6 - PRIORITIZED SUMMARY OF REPAIRS		PRIORITY				
MATERIALS / ELEMENTS	REPAIR AND ALTERATION WORK ITEMS	SPEC. SECTION	REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM	
E X T E R I O R	Storm Drainage	Test and clean all gutters, downspouts and catch basins. Replace as required. Refer to RDC 48102 for roof repairs/replacement.		3		
	Roof					
	Brick	Repoint all open and failed mortar joints. Match original mortar in profile, texture and color.	Masonry repointing and repairs	3		
		Remove and reset displaced, spalled or cracked brick.	Masonry repointing and repairs	3		
		Remove obsolete embedded metal anchors. Fill all holes with mortar	Masonry repointing and repairs	3		
	Concrete	Rebuild existing steps and walkways on northwest. Incorporate sleeve detail for iron railings where applicable.	Conc. repair and replace			10
	Granite	Rake out and repaint failing mortar joints.	Masonry repointing and repairs	3		
		Clean granite where required.	Masonry repointing and repairs		10	
	Wood	Scrape, prime and paint all wood elements where paint is failing.	Painting		10	
	Wood Windows	Remove all air conditioners permanently. Strip paint. Reglue all joints. Replace glass. Install weatherstripping. Paint. Reinstall.	Wood windows rehabilitation	10		
Scrape prime and paint. Reset in existing concrete.		Painting	3			
Doors	Remove existing glass entrance assembly on north. Replace with new assembly (door and sidelights) to match original				10	
Exterior Lighting	Install new lighting at entrance portico that is more in scale and style.				10	
I N T E R I O R	Building Systems	Reconfigure dropped ceilings to expose window transoms.				10

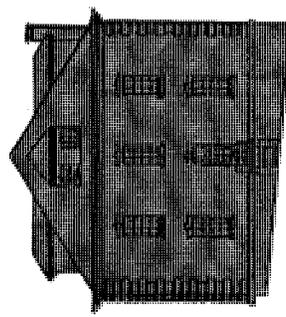
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 10 = work in 10 years

POTOMAC ANNEX, BUILDING 7 - PRIORITIZED SUMMARY OF REPAIRS			PRIORITY		
MATERIALS / ELEMENTS	REPAIR AND ALTERATION WORK ITEMS	SPEC. SECTION	REPAIR ITEM	MAINTENANCE ITEM	DESIGN ITEM
Storm Drainage	Test and clean all gutters, downspouts and catch basins. Replace as required.		3		
Roof	Refer to RDC 48102 for roof repairs/replacement				
Brick	Repoint all open and failed mortar joints. New mortar shall match original in profile, color and texture. Remove and reset displaced, spalled or cracked brick.	Masonry repointing and repairs Masonry repointing and repairs	3 3		
Concrete	Rebuild concrete walkways and wall capstones. Match existing. Rebuild concrete retaining wall on west elevation Repair concrete bases for brick piers Pour new slab for entrance portico. Replace concrete slab on grade at patio on east elevation	Conc. repair and replace Conc. repair and replace Conc. repair and replace Conc. repair and replace Conc. repair and replace	10 3 3 3		10
Granite	Rake out and repoint failing mortar joints. Clean granite where required	Masonry repointing and repairs Masonry repointing and repairs	3 10		
Stucco	Remove from brick.		3		
Wood	Scrape, prime and paint all wood elements where paint is failing	Painting			
Wood Windows	Remove all air conditioners permanently. Strip paint. Reglue all joints. Replace glass. Install weatherstripping. Paint. Reinstall	Wood windows rehabilitation	10		
Doors	Remove existing glass entrance assembly on west. Replace with new assembly (door, sidelights and transom) to match original.				10
Landscape	Improve drainage on east. Remove soil and install perforated drain pipe in gravel at low point below grade. Repair drainage ditch along walkway		3 3		
Exterior Lighting	Install new lighting at entrance portico that is more in scale and style				10
Fire Escapes	Remove				10
Plaster	Scrape, prime and paint walls, ceilings, window trim and doors	Painting		10	
Building Systems	Design new central air conditioning system				10

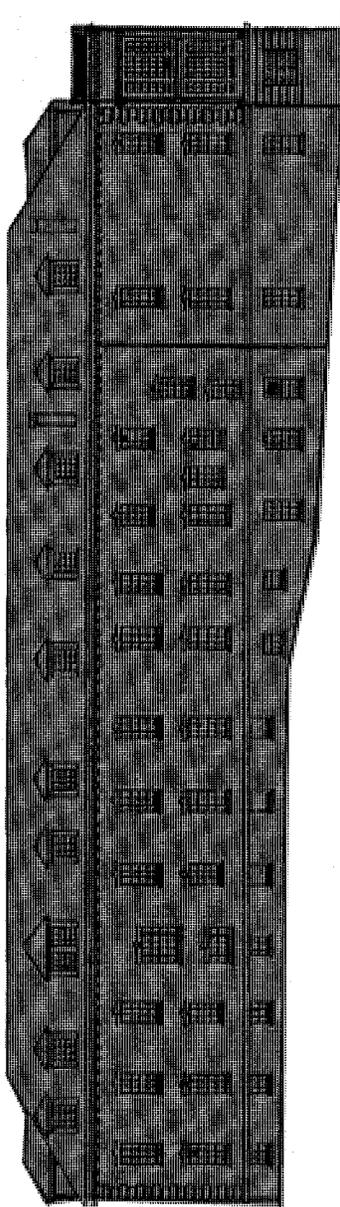
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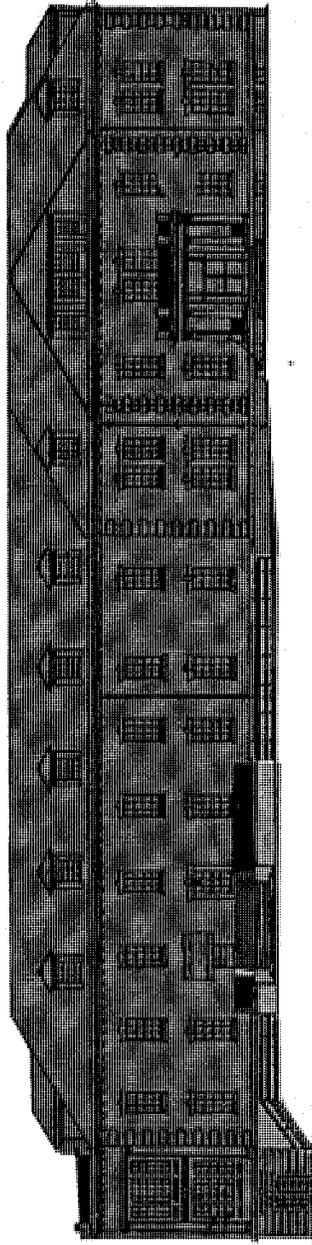
South Elevation



North Elevation



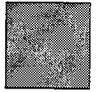
West Elevation



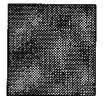
East Elevation



Renovation Zone

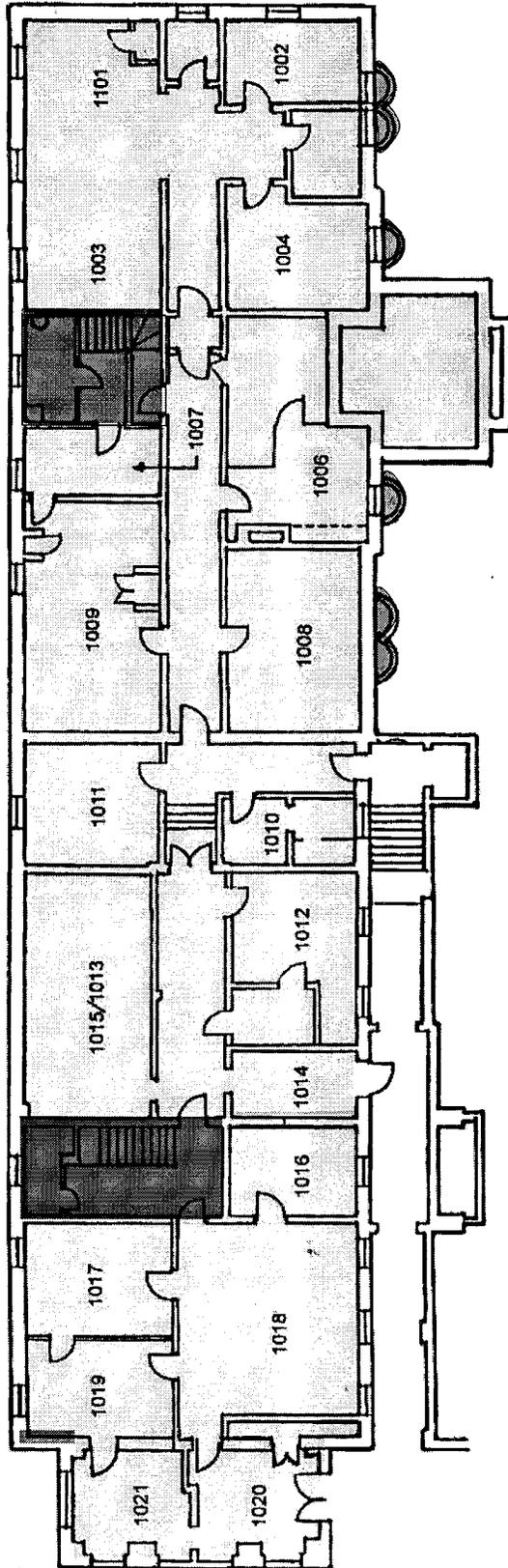


Rehabilitation Zone



Restoration Zone

# Building 1



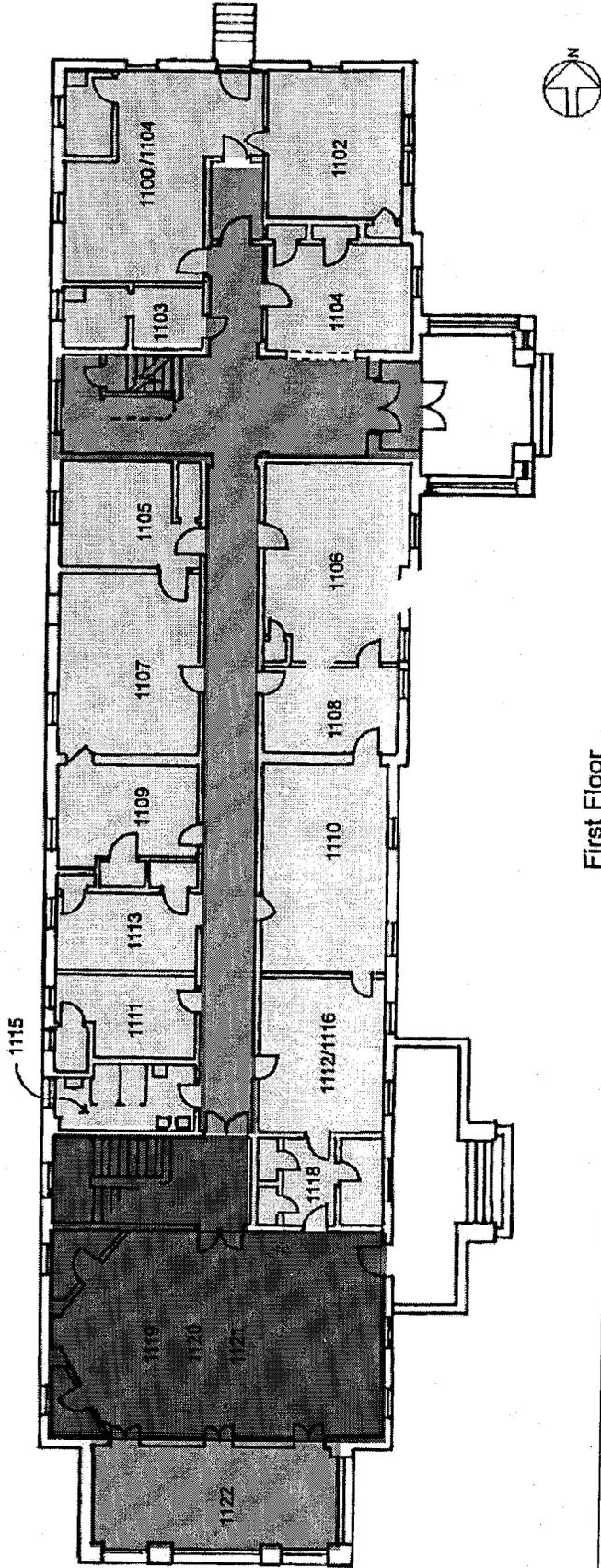
Basement

Building 1

Restoration Zone

Rehabilitation Zone

Renovation Zone

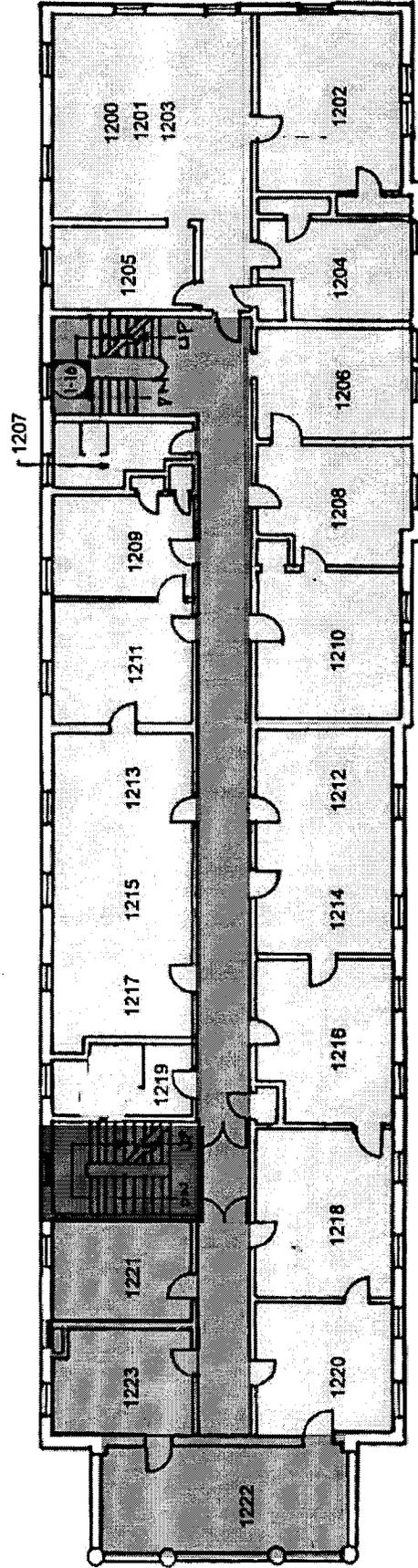


# Building 1

Restoration Zone

Rehabilitation Zone

Renovation Zone



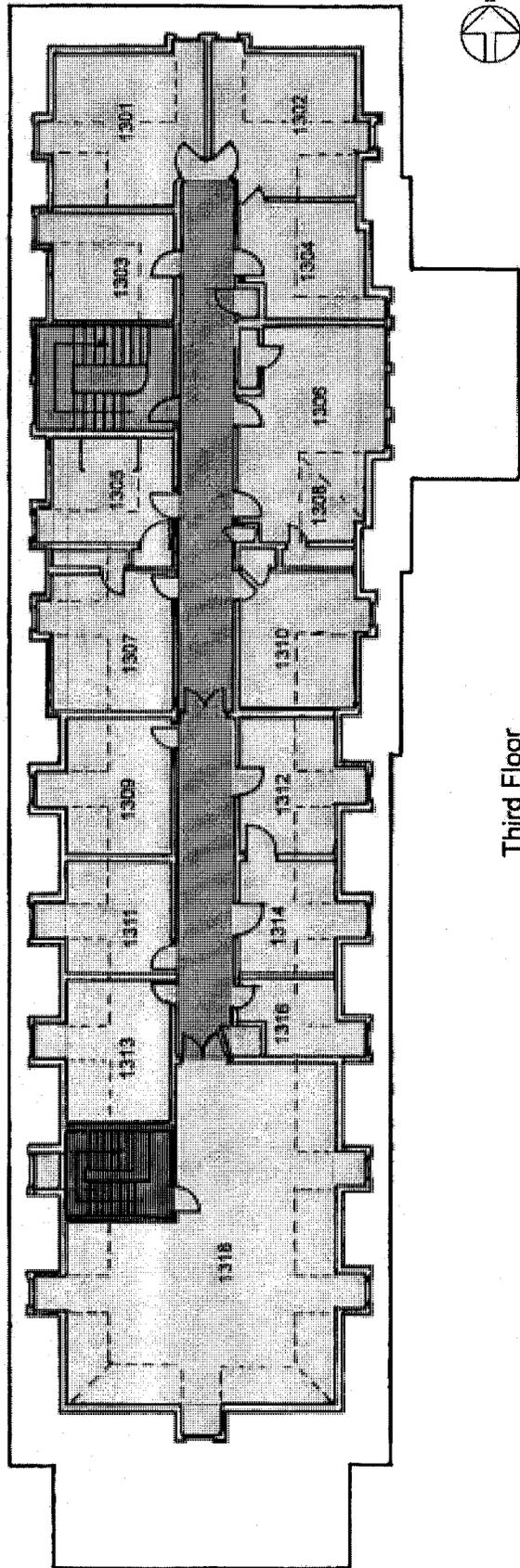
Second Floor

**Building 1**

Restoration Zone

Rehabilitation Zone

Renovation Zone



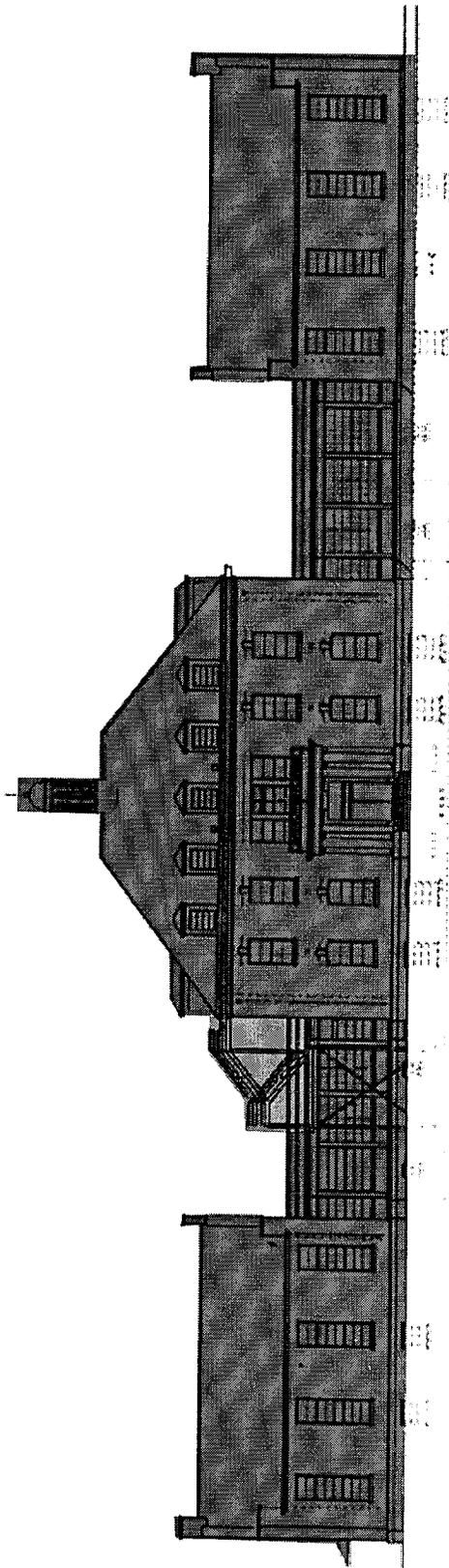
Third Floor

**Building 1**

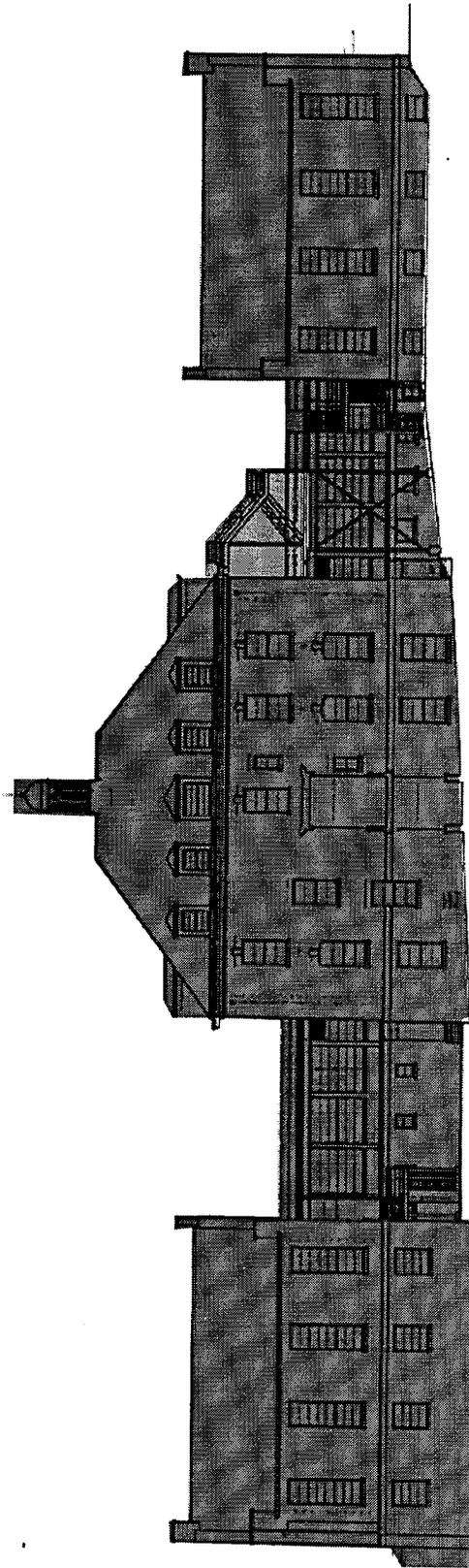
Restoration Zone

Rehabilitation Zone

Renovation Zone

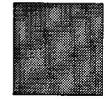


NORTH ELEVATION  
FRONT



SOUTH ELEVATION  
REAR

### Building 3



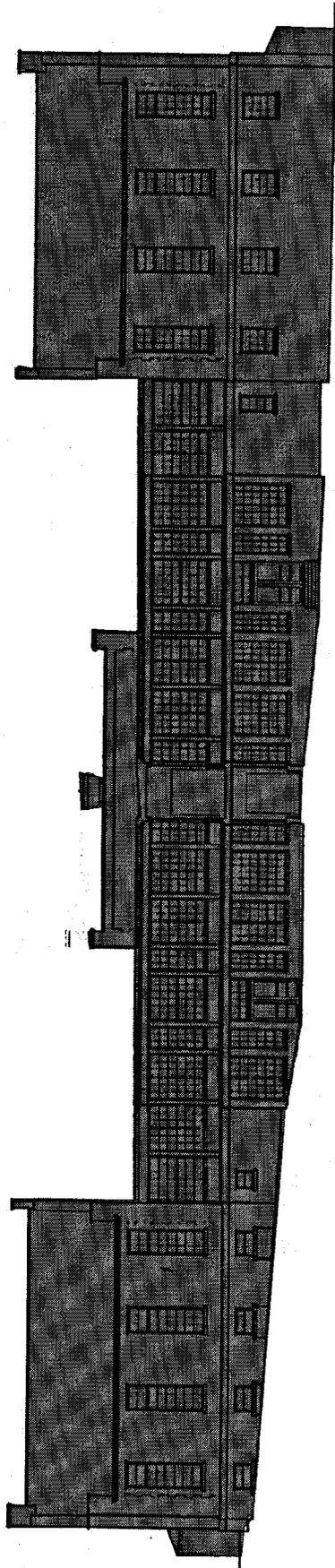
Restoration Zone



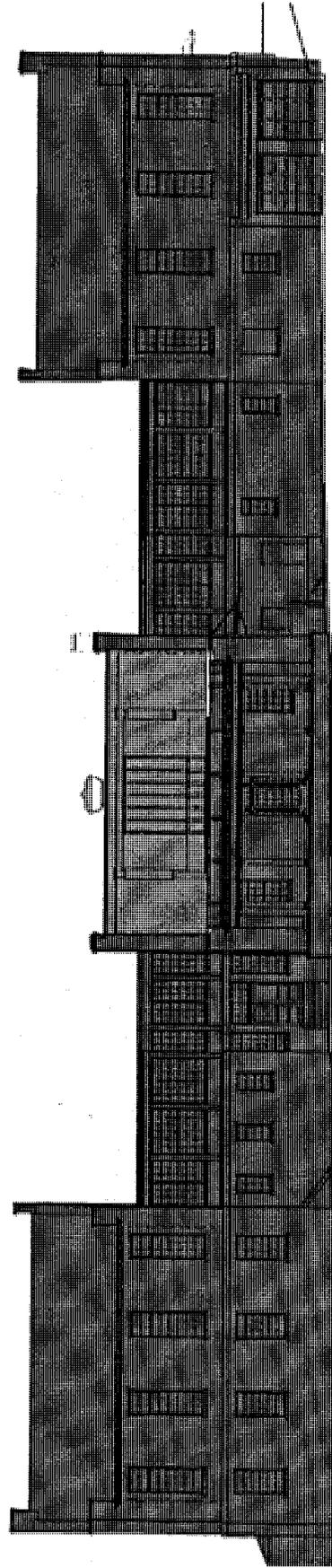
Rehabilitation Zone



Renovation Zone



NORTH ELEVATION



SOUTH ELEVATION



Restoration Zone

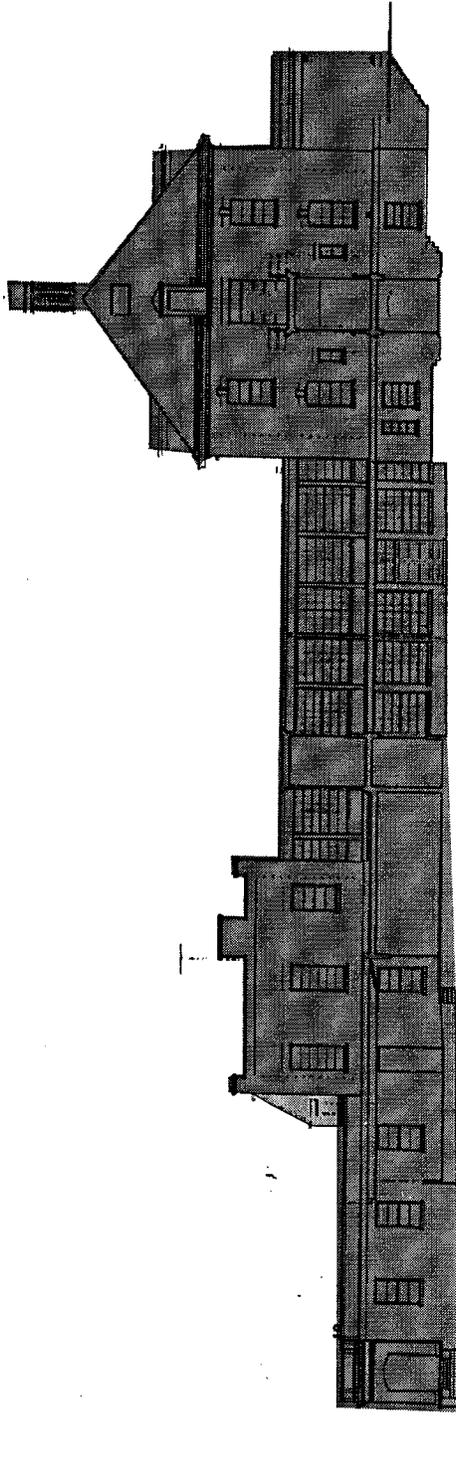


Rehabilitation Zone



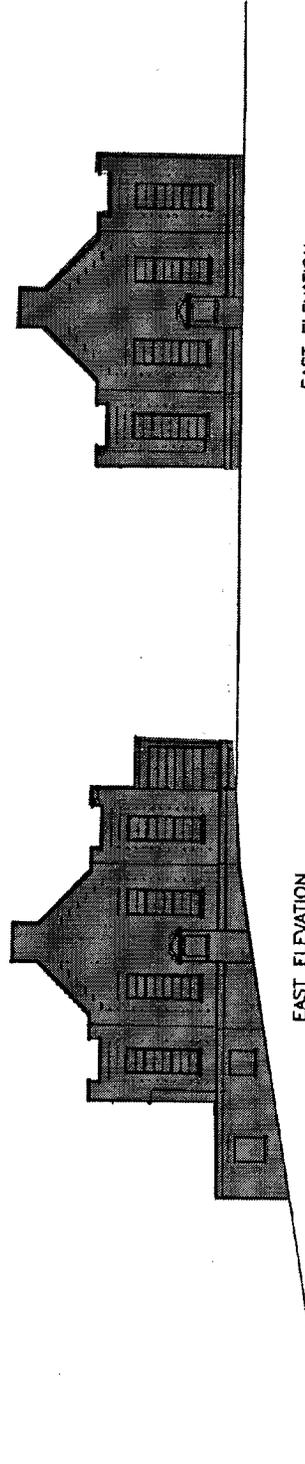
Renovation Zone

**Building 4 and Pavillions**



EAST ELEVATION  
BUILDING 4

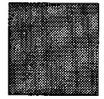
EAST ELEVATION  
BUILDING 3



EAST ELEVATION  
SOUTH EAST PAVILION

EAST ELEVATION  
NORTH EAST PAVILION

### Building 3



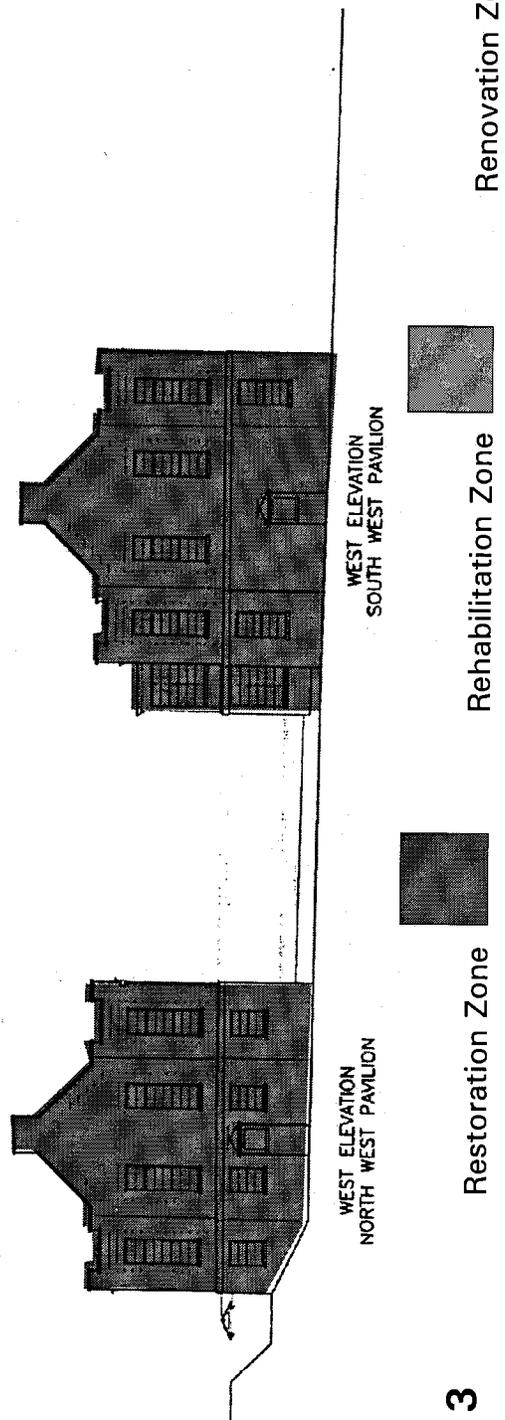
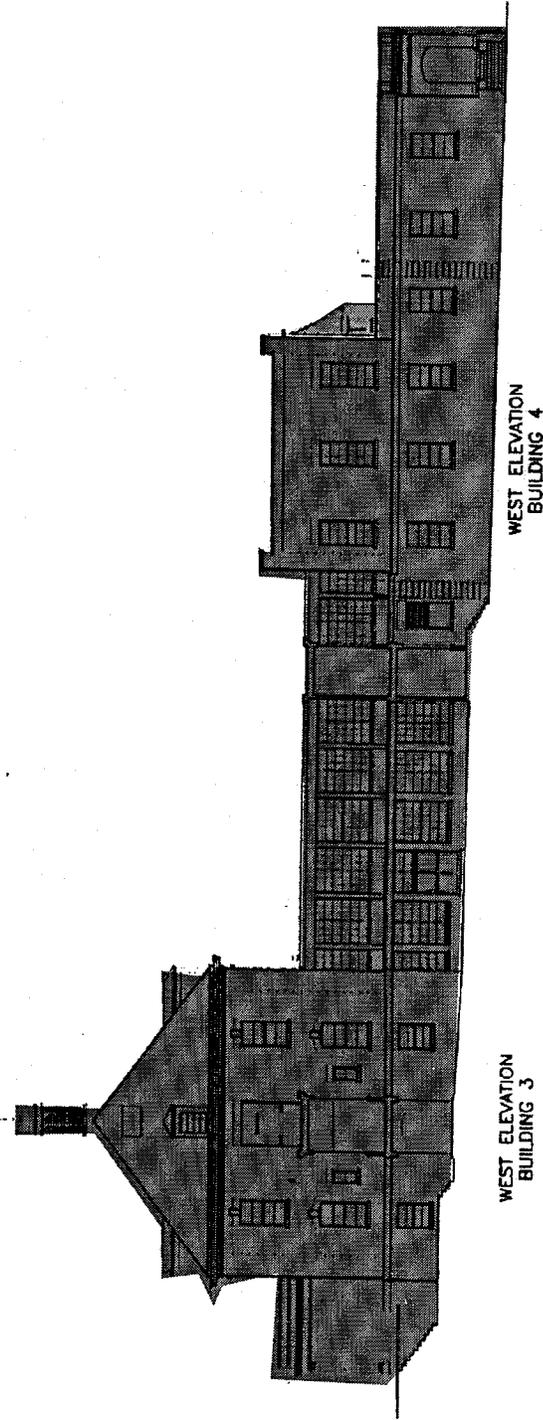
Restoration Zone



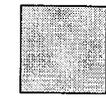
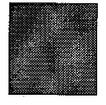
Rehabilitation Zone

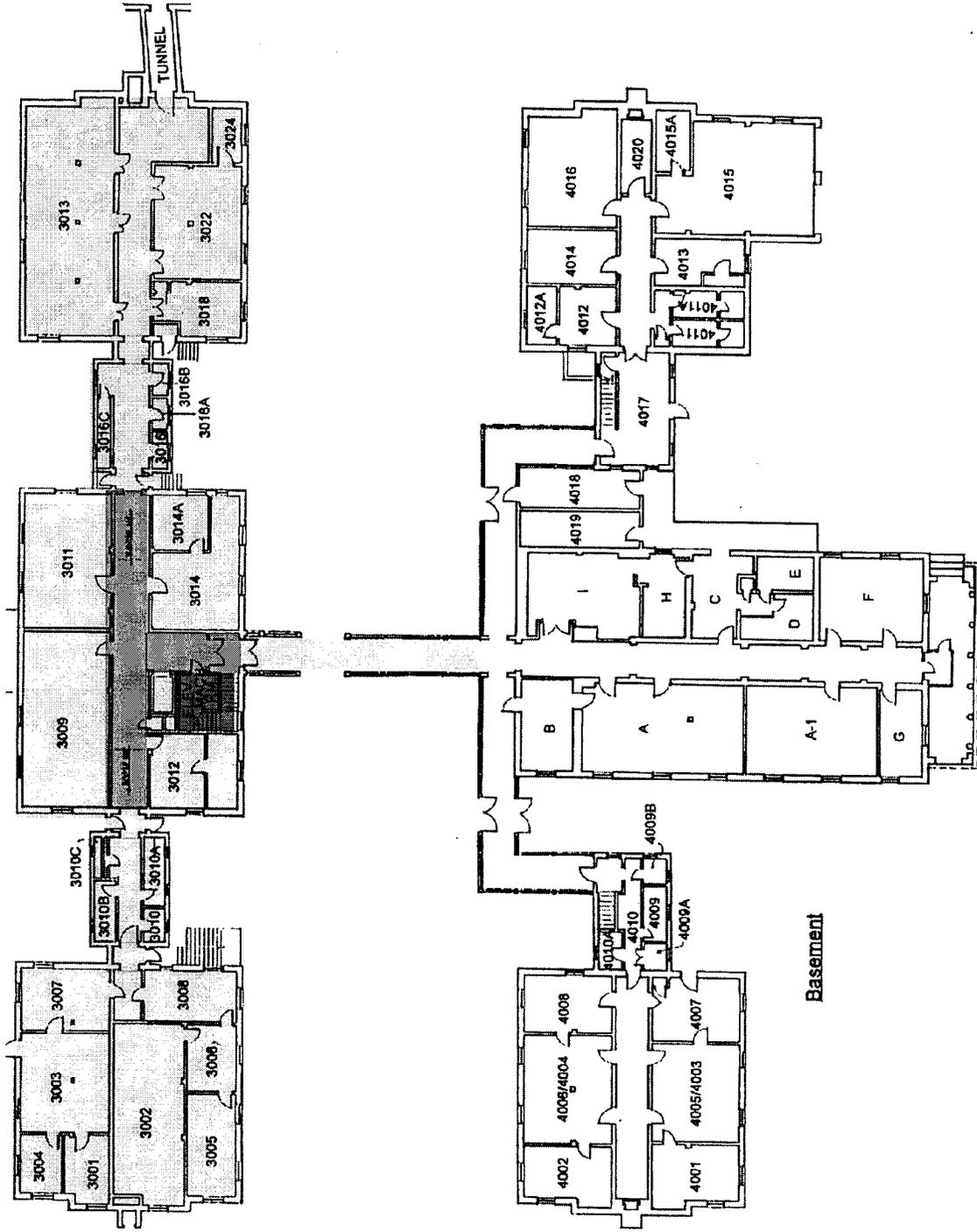


Renovation Zone



### Building 3





Restoration Zone

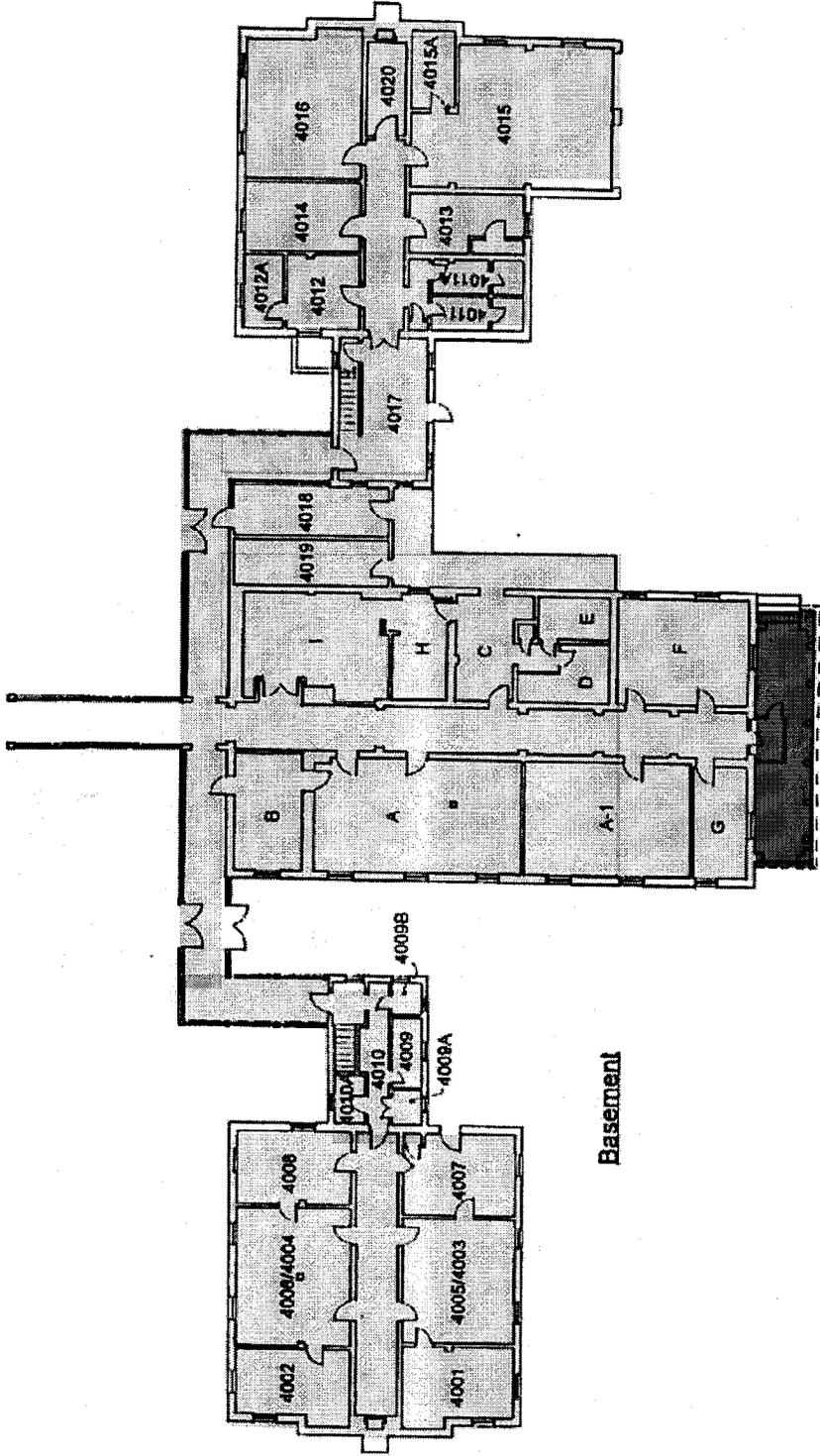


Rehabilitation Zone



Renovation Zone

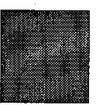
### Building 3



Renovation Zone

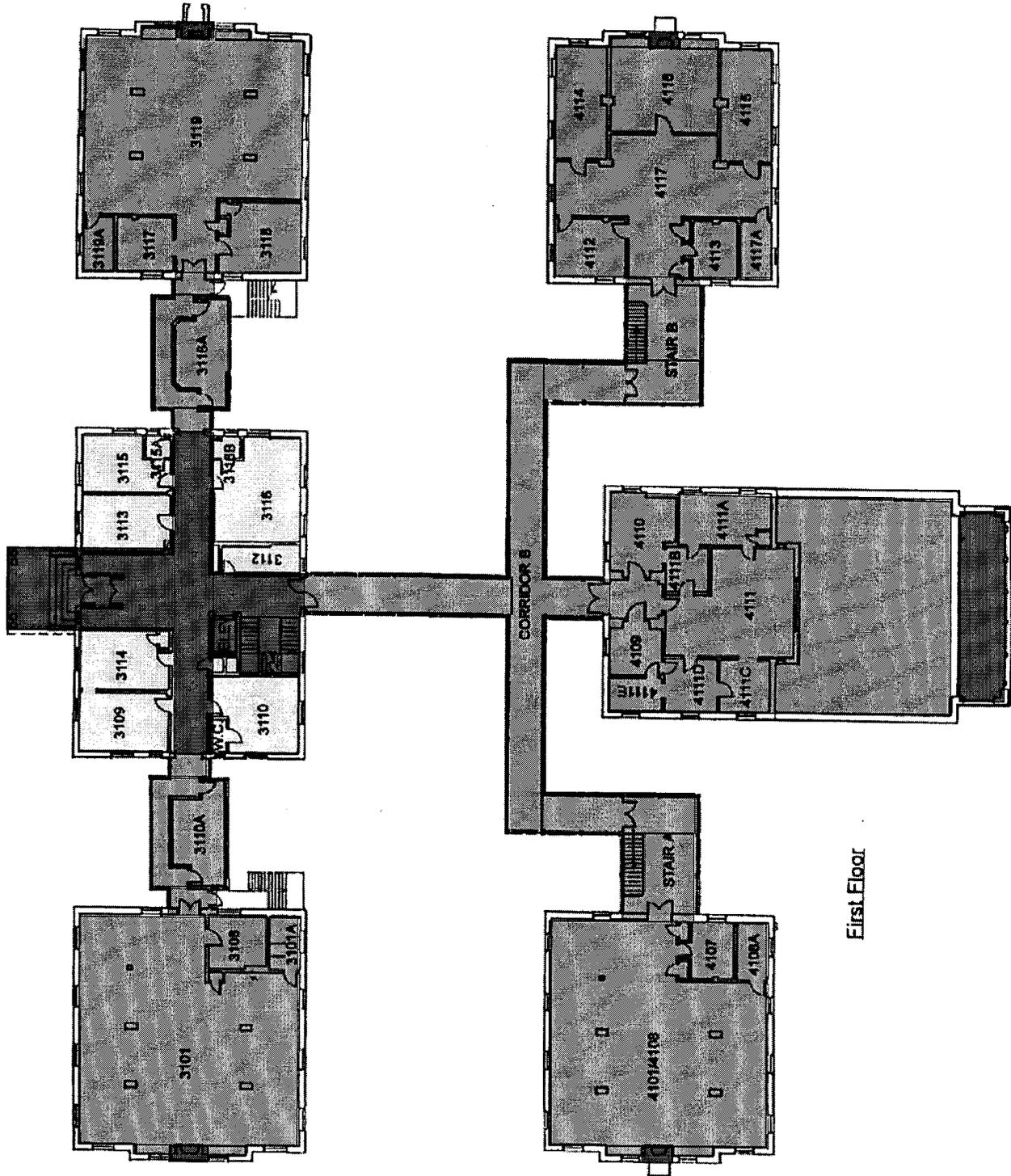


Rehabilitation Zone



Restoration Zone

**Building 4**



First Floor



Renovation Zone

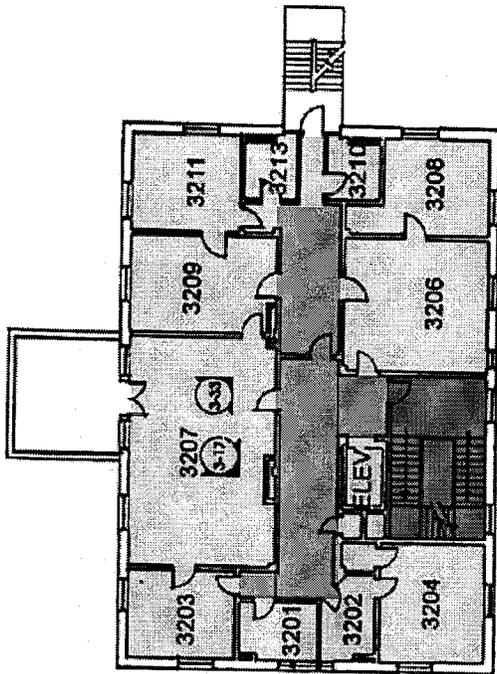


Habilitation Zone



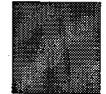
Restoration Zone

# Buildings 3 & 4

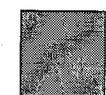


Second Floor

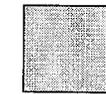
**Building 3**



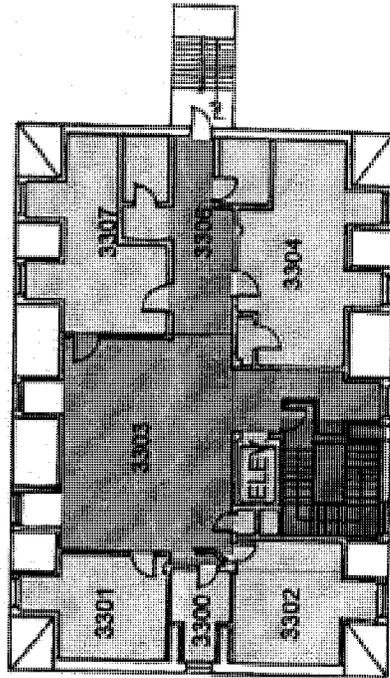
Restoration Zone



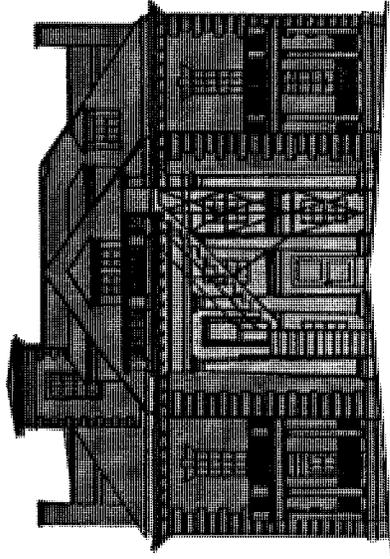
Rehabilitation Zone



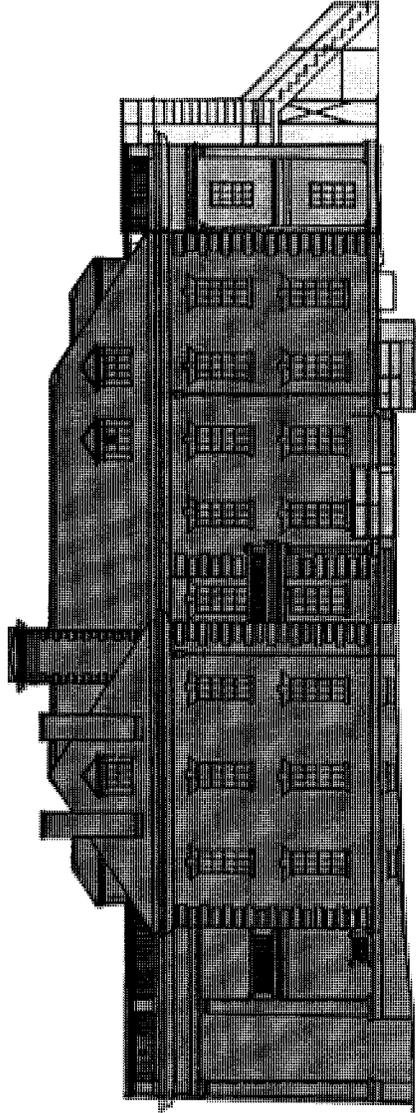
Renovation Zone



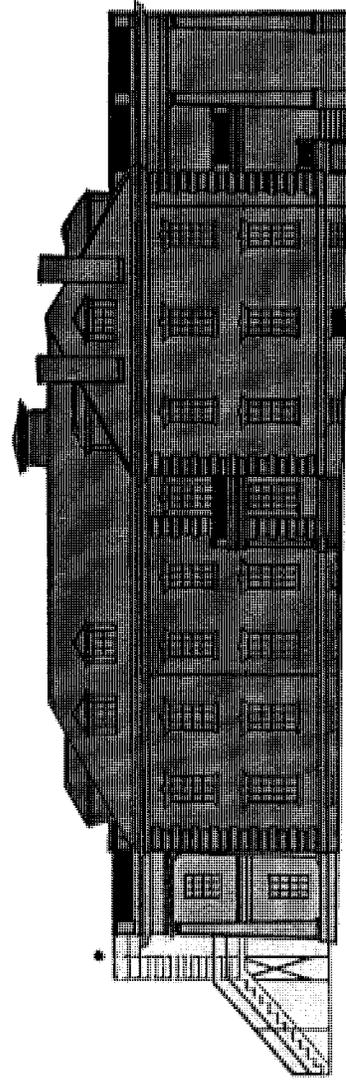
Third Floor



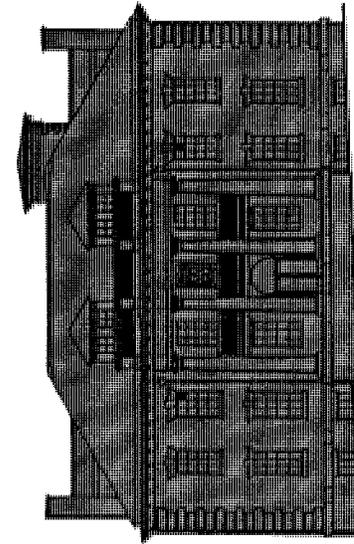
South Elevation



West Elevation

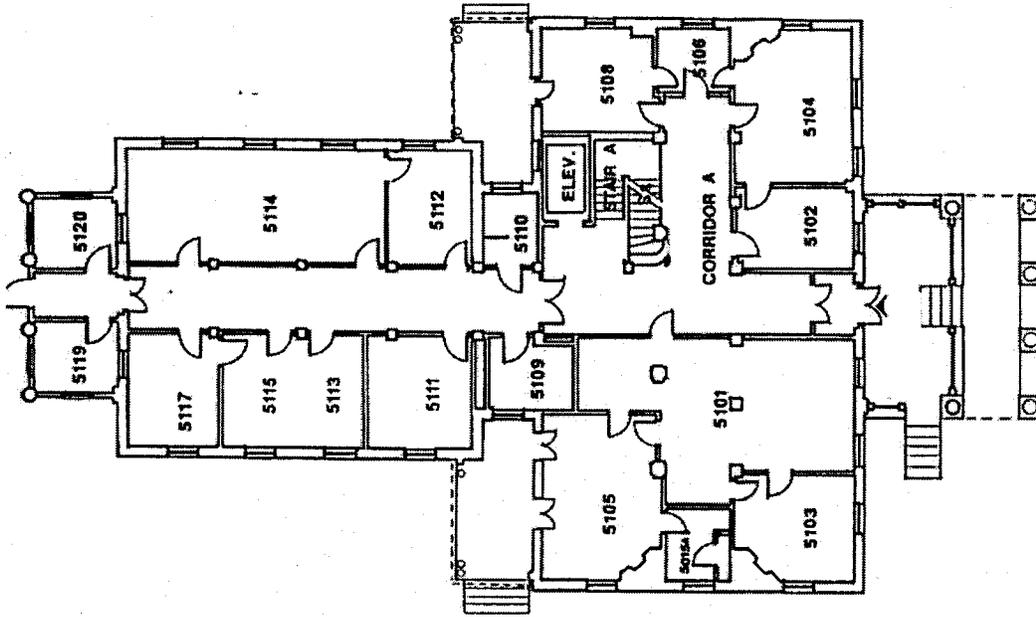


East Elevation

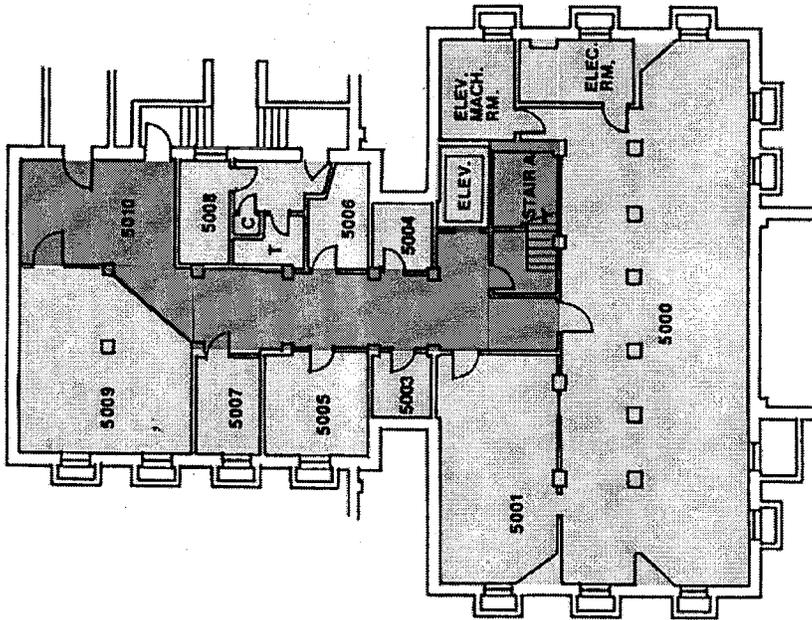


North Elevation





First Floor



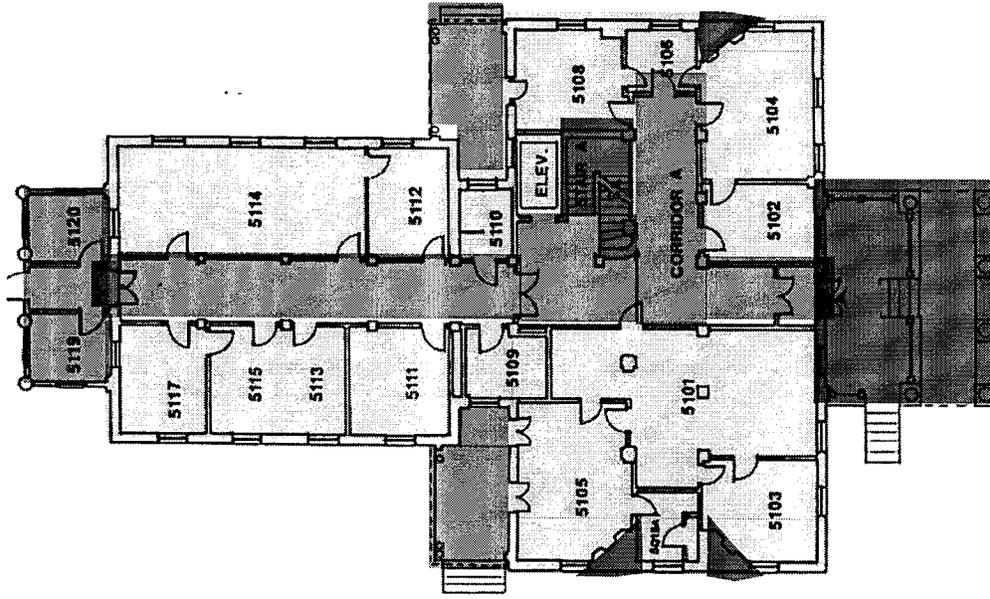
Basement

# Building 5

Restoration Zone

Rehabilitation Zone

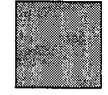
Renovation Zone



First Floor



Restoration Zone

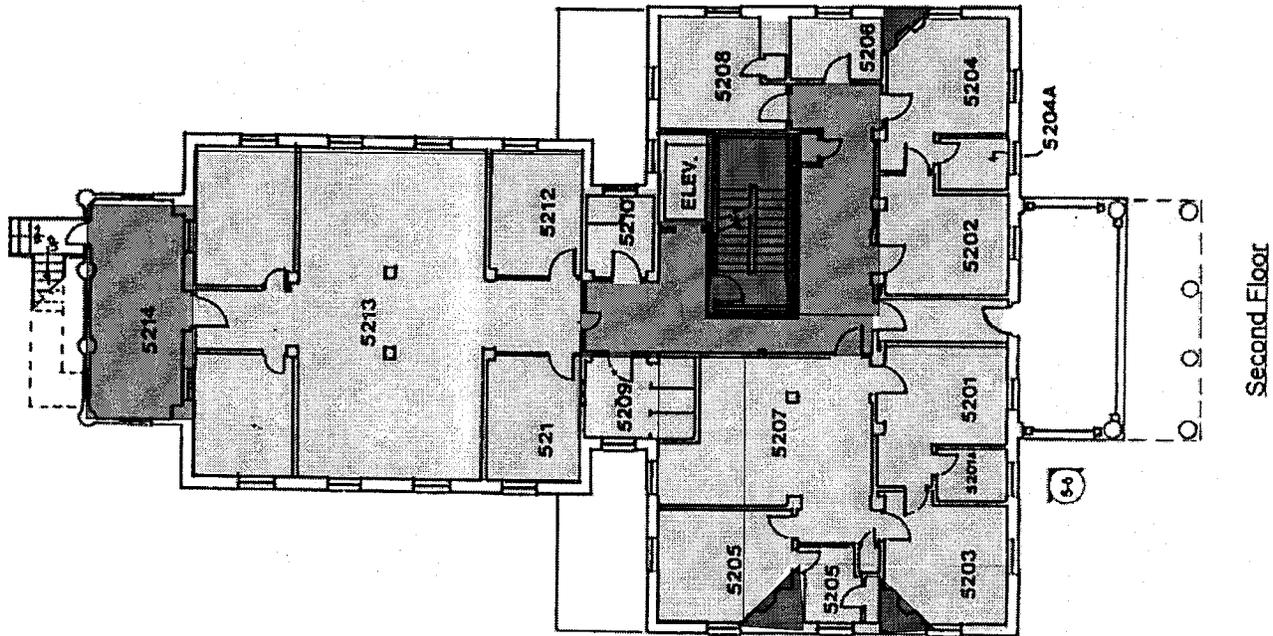
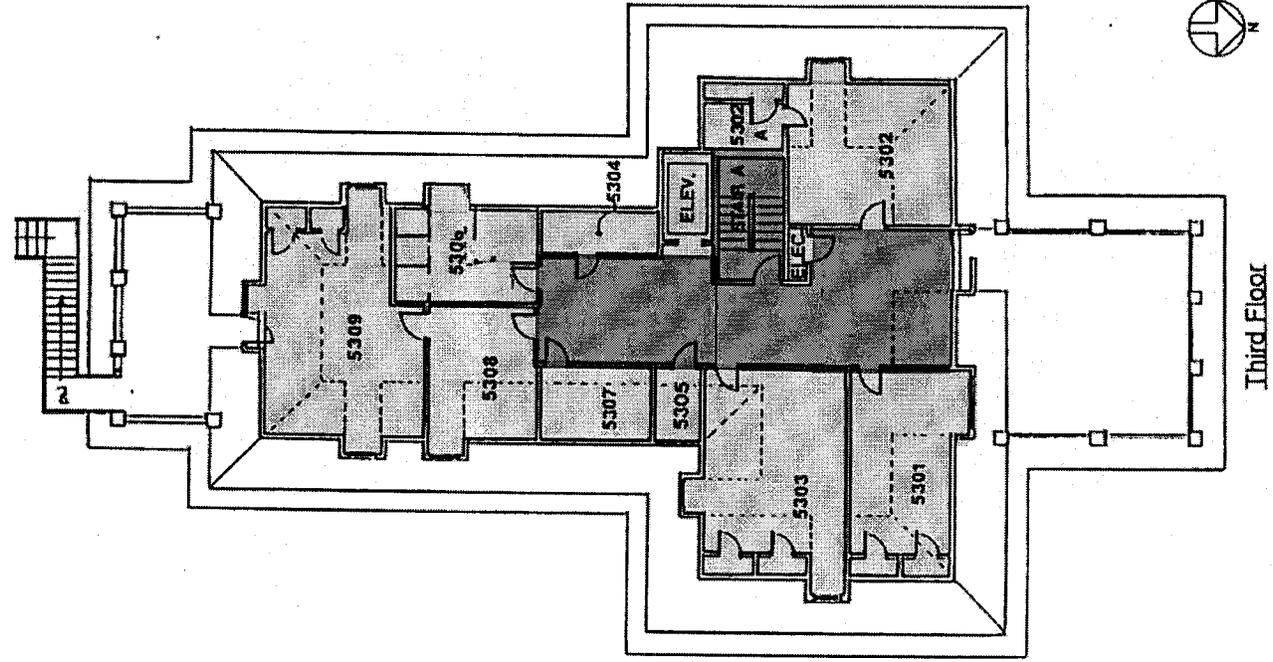


Rehabilitation Zone



Renovation Zone

# Building 5



Restoration Zone

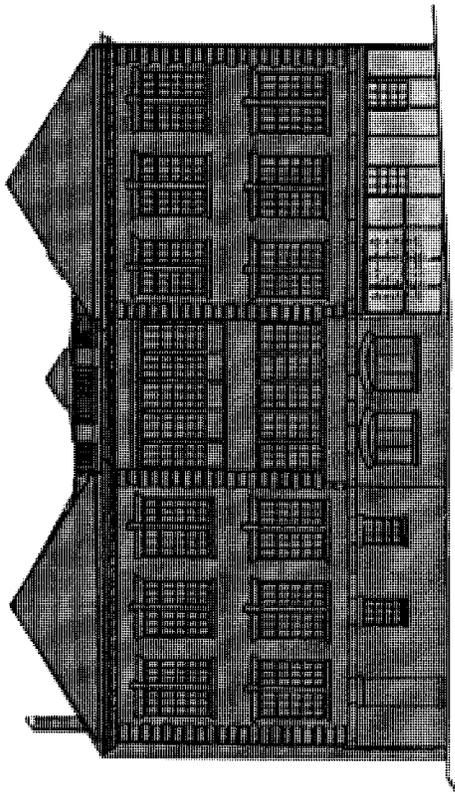


Rehabilitation Zone

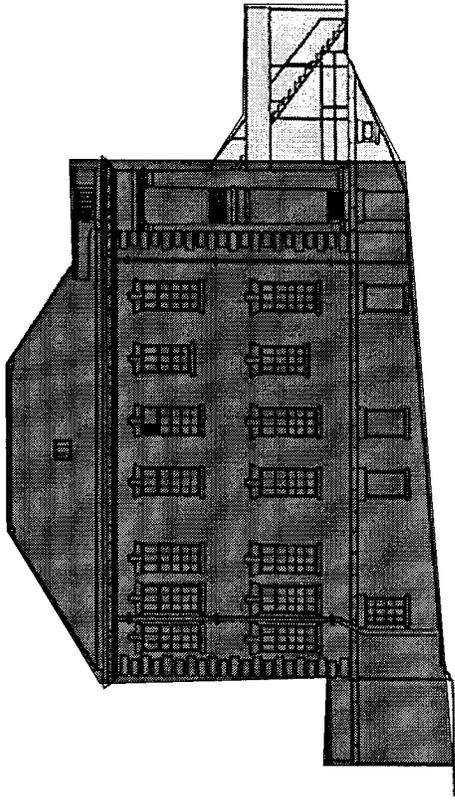


Restoration Zone

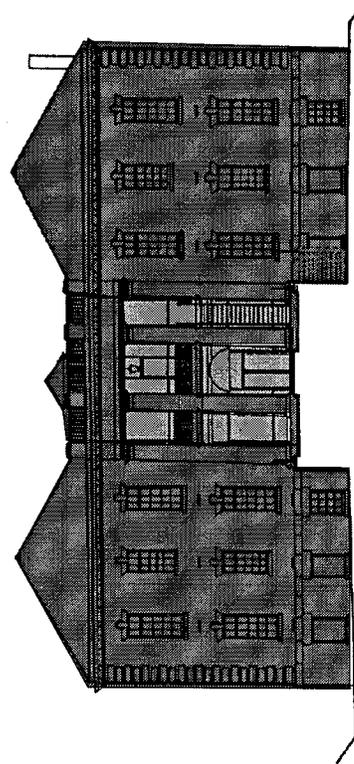
# Building 5



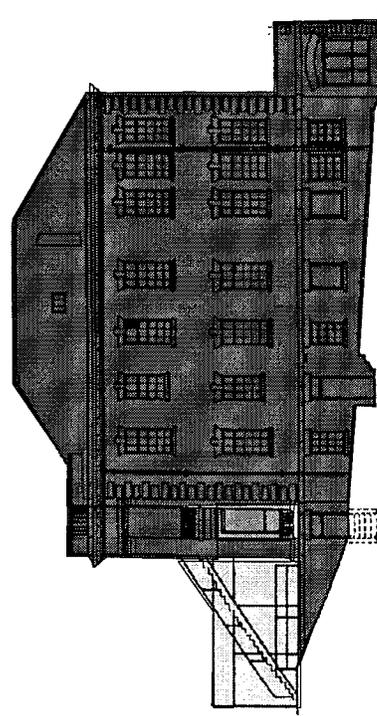
South Elevation



East Elevation



North Elevation



West Elevation



Restoration Zone

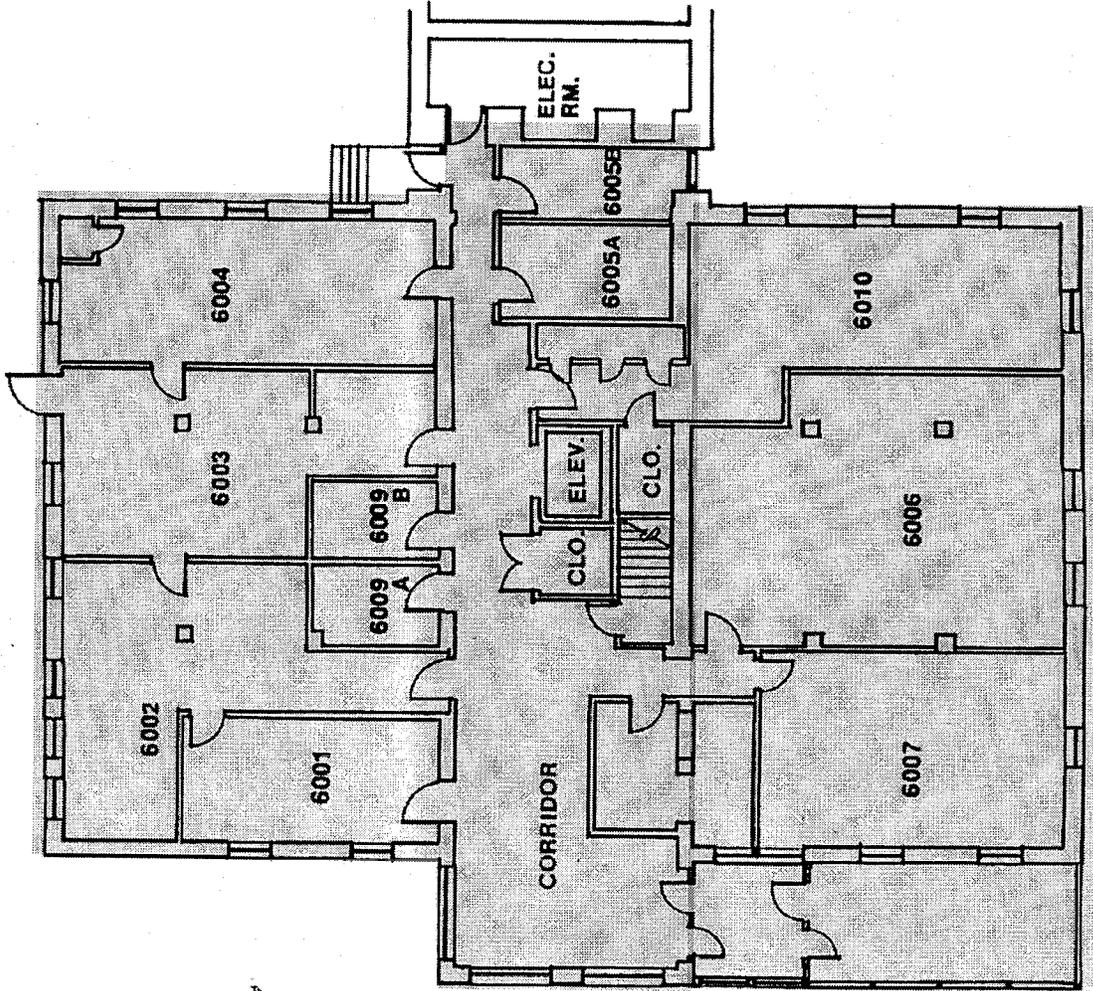


Rehabilitation Zone



Renovation Zone

**Building 6**



Basement



Restoration Zone

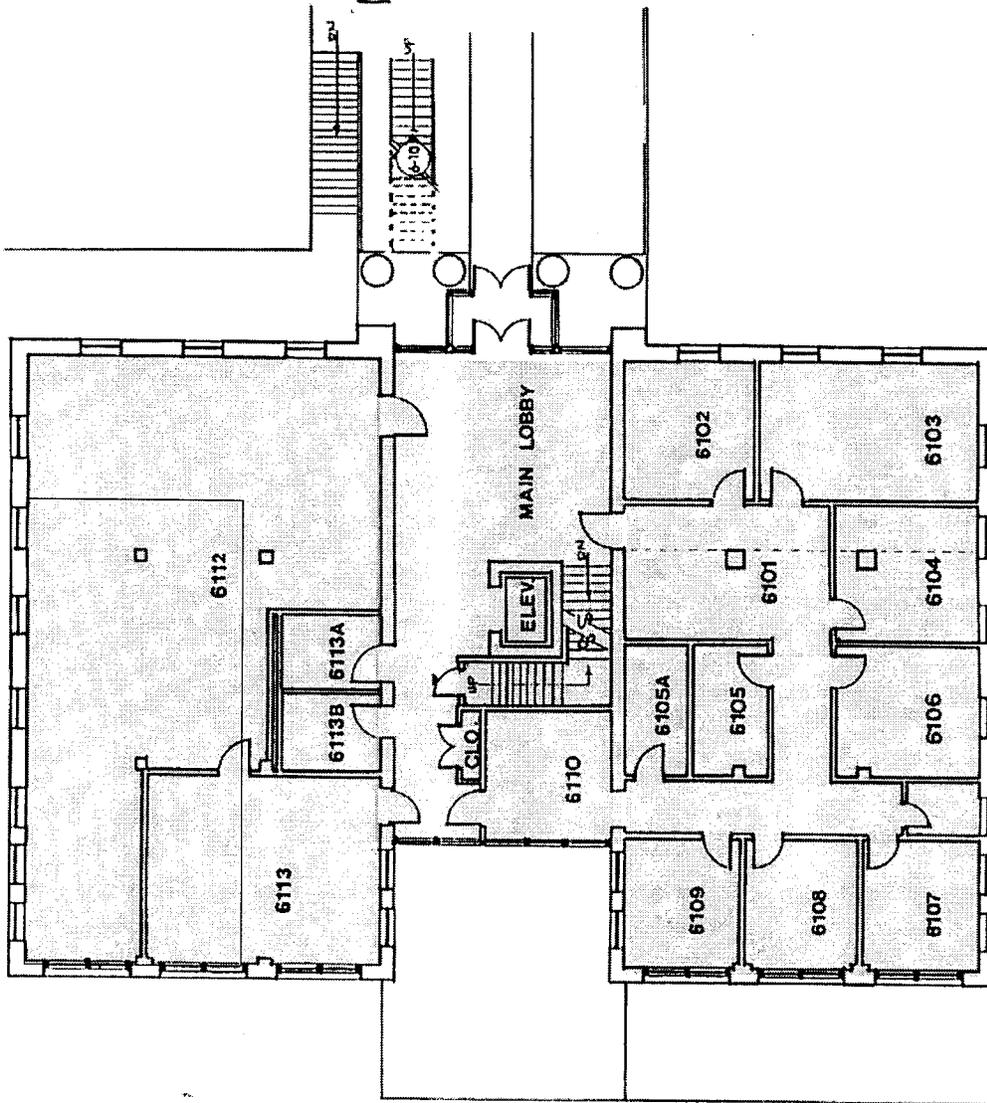


Rehabilitation Zone

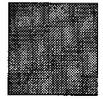


Renovation Zone

# Building 6



First Floor



Restoration Zone

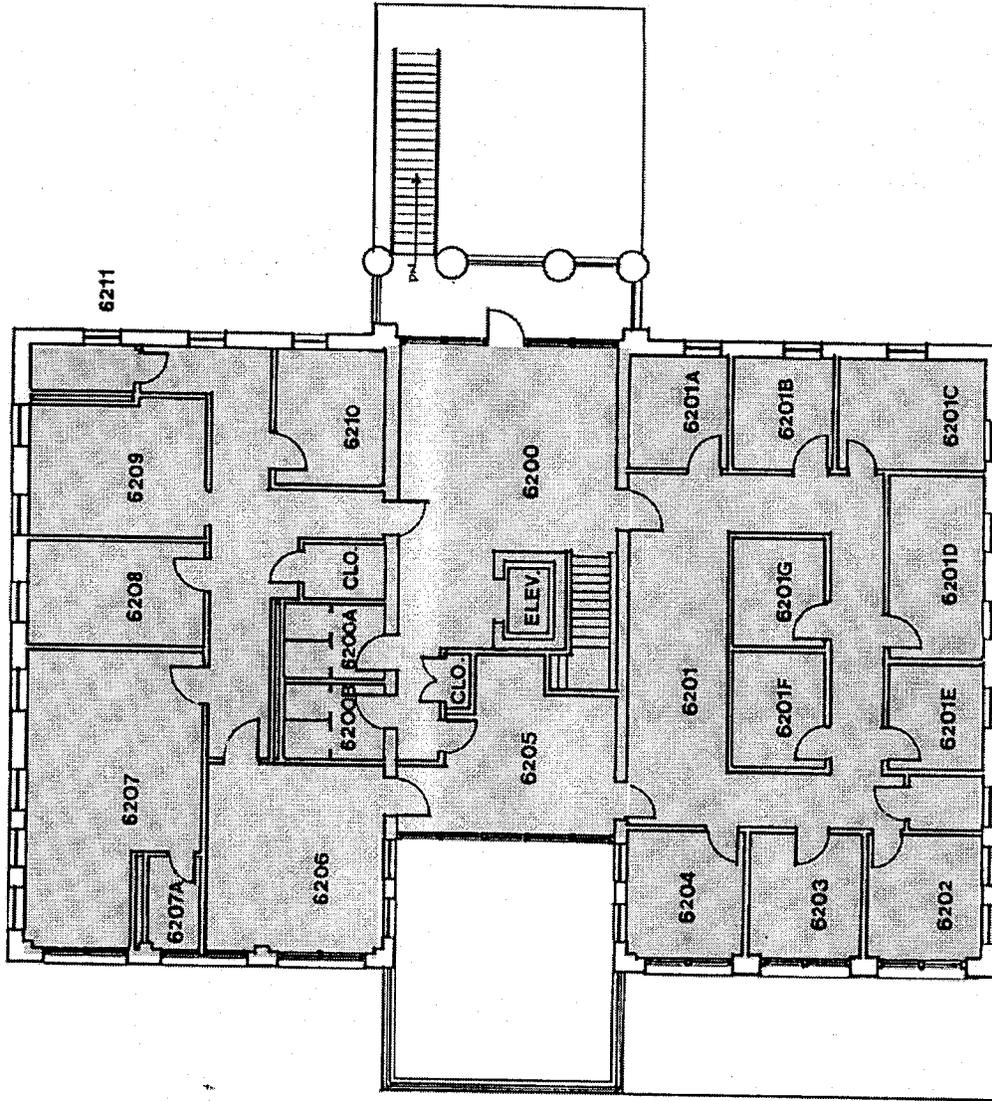


Rehabilitation Zone



Renovation Zone

# Building 6



Second Floor



Restoration Zone

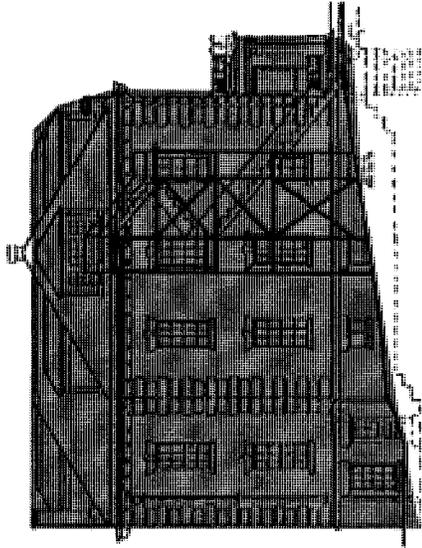


Rehabilitation Zone

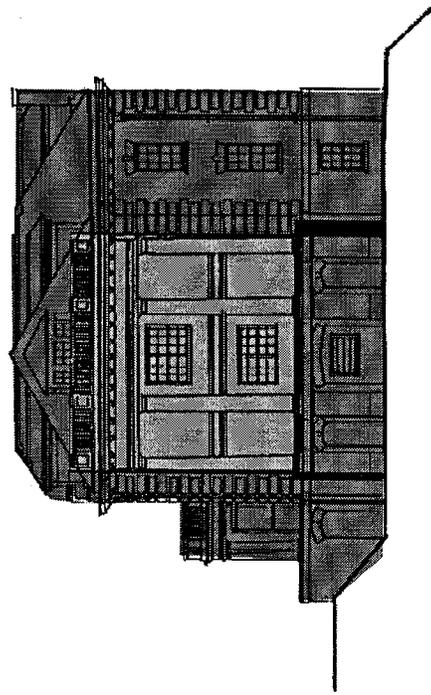


Renovation Zone

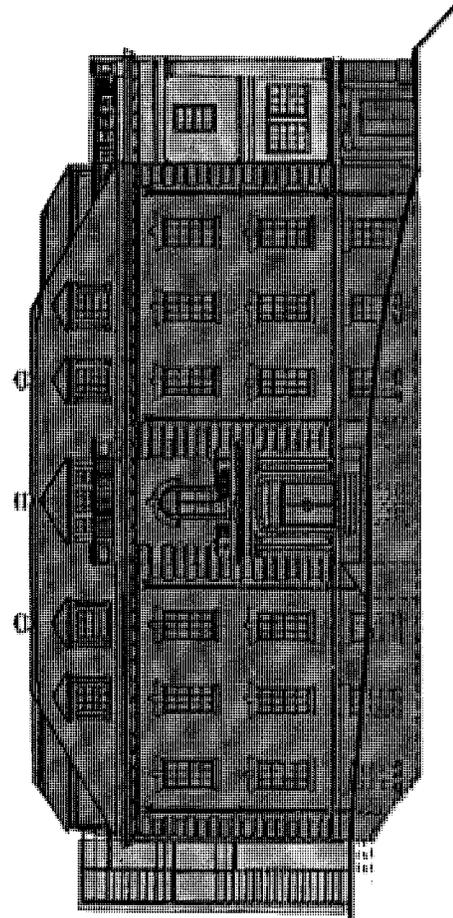
# Building 6



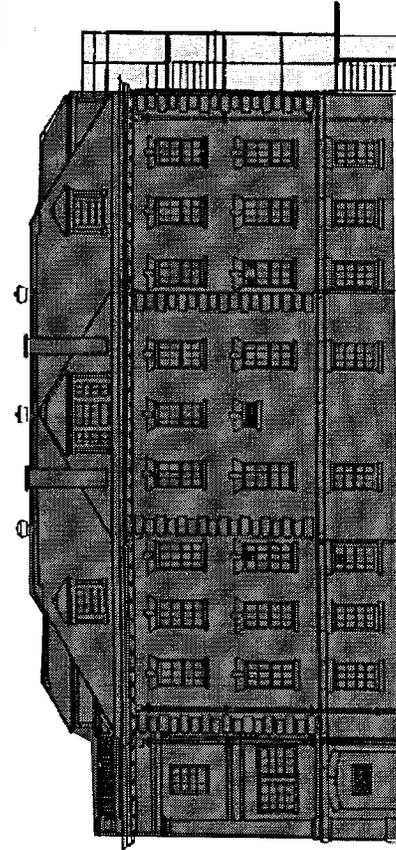
North Elevation



South Elevation



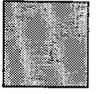
West Elevation



East Elevation



Renovation Zone

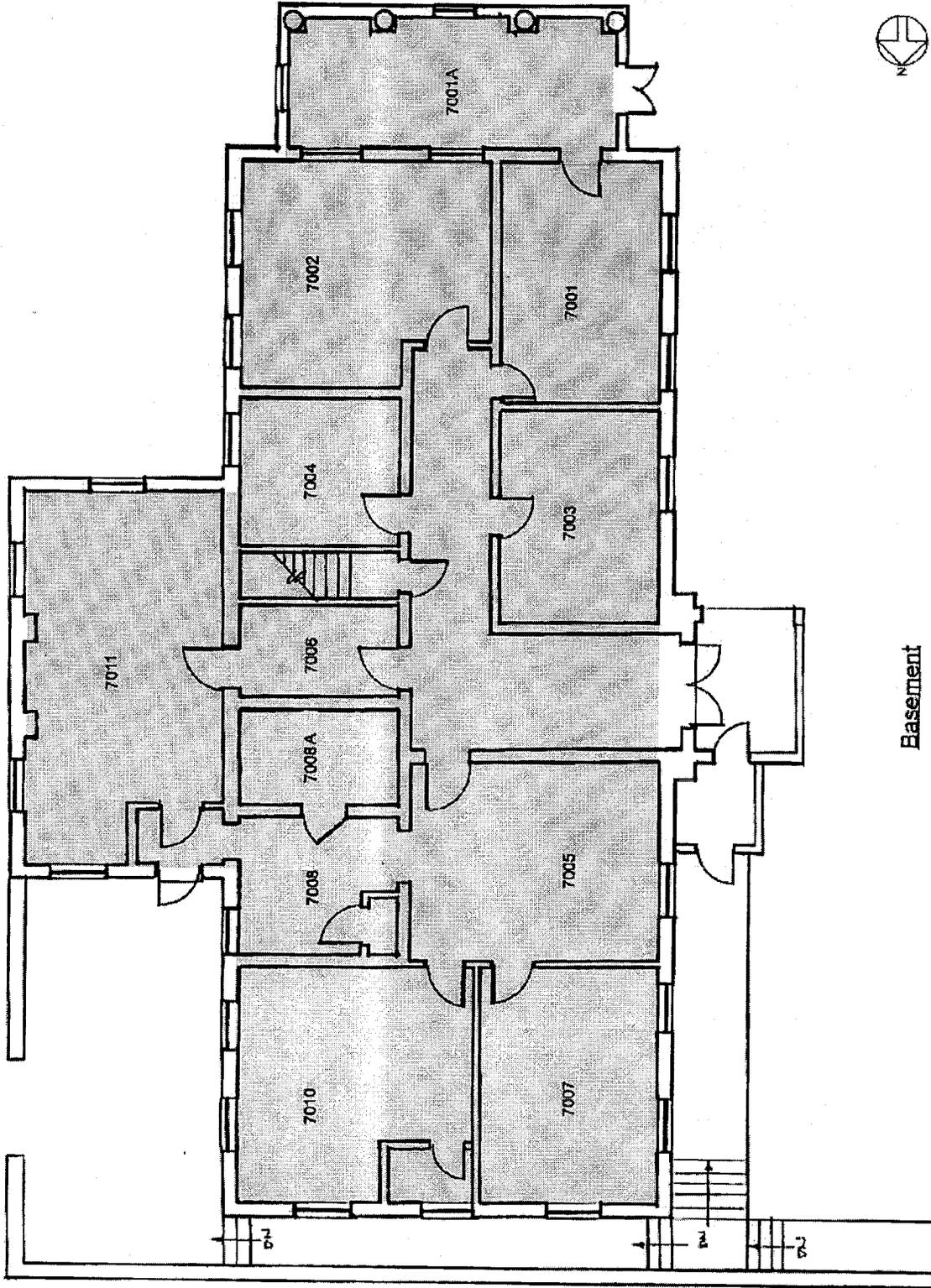


Rehabilitation Zone



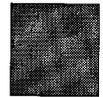
Restoration Zone

**Building 7**



**Building 7**

Restoration Zone



Rehabilitation Zone

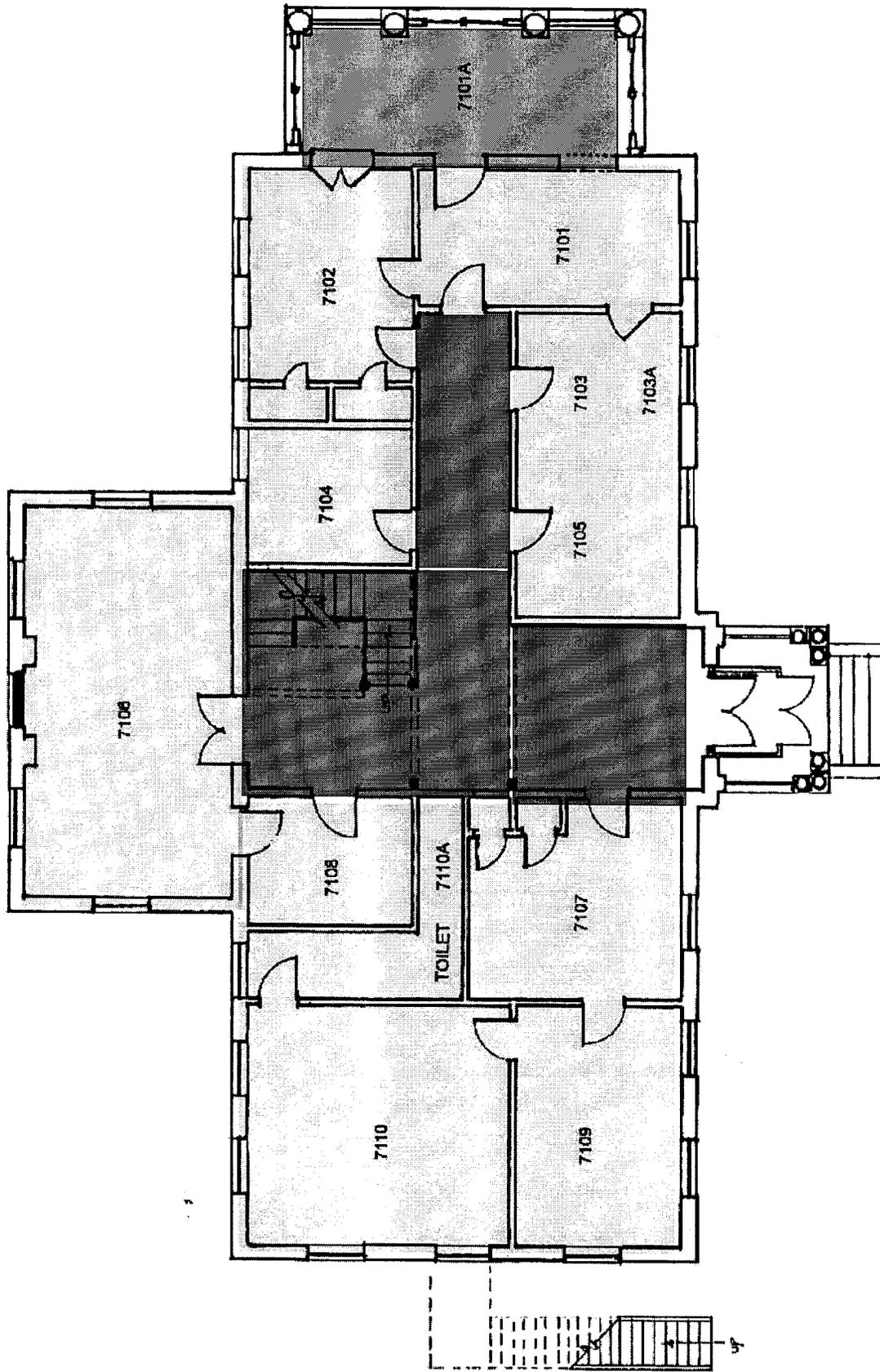


Renovation Zone



Basement





First Floor



Renovation Zone

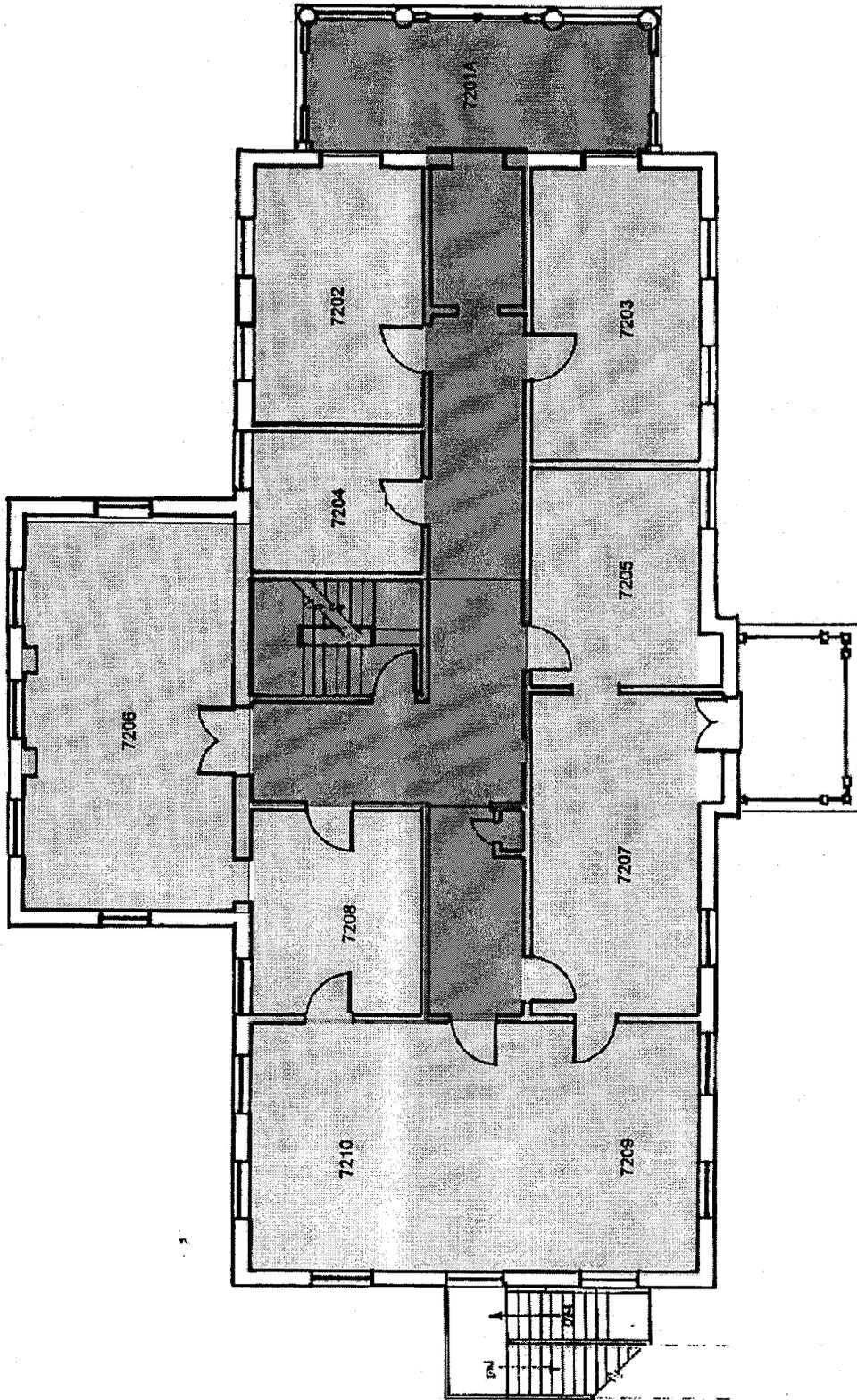


Rehabilitation Zone

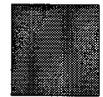


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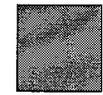
Building 7



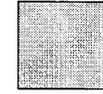
Second Floor



Restoration Zone

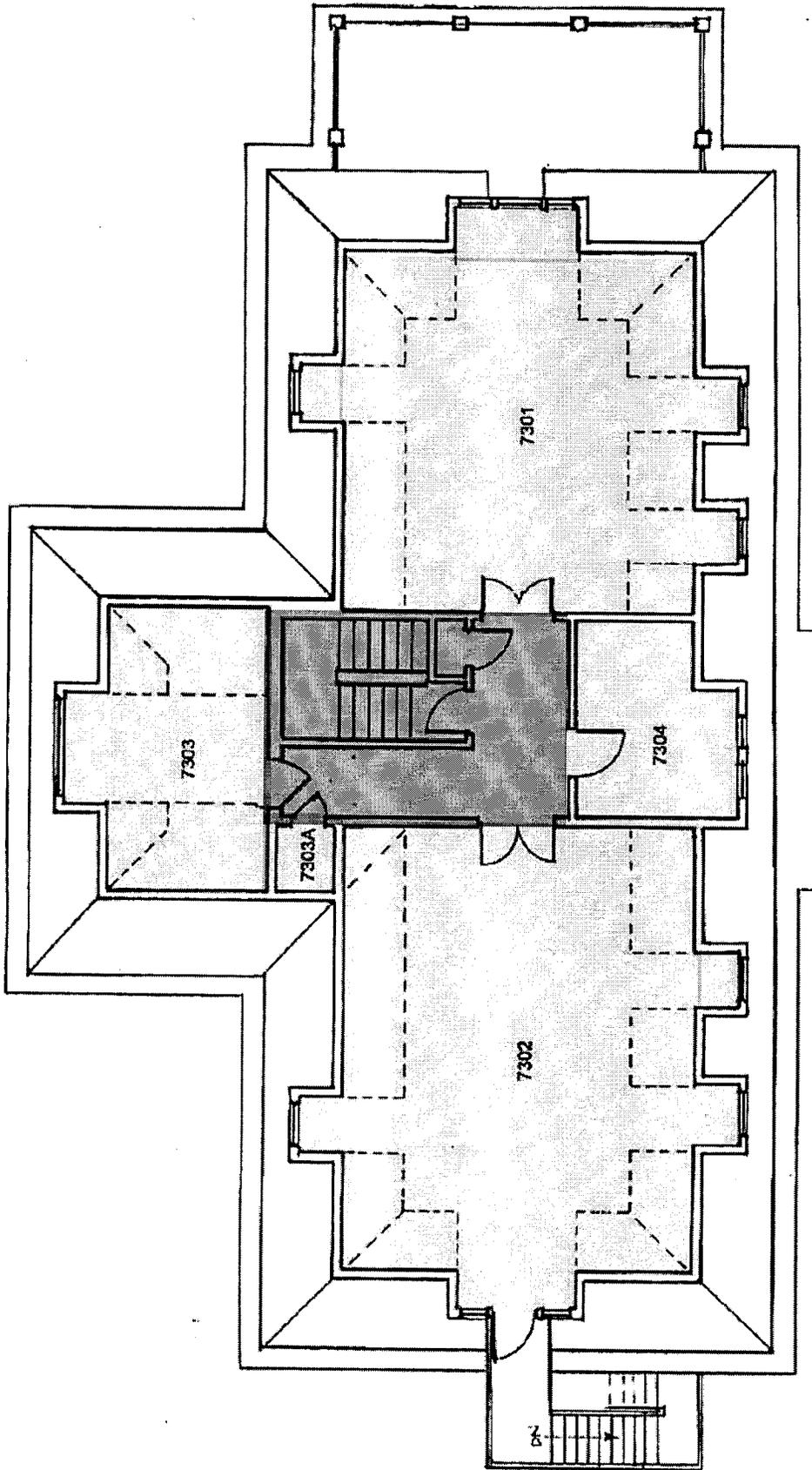


Rehabilitation Zone



Renovation Zone

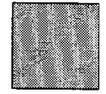
# Building 7



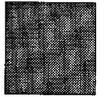
Third Floor



Restoration Zone



Rehabilitation Zone



Renovation Zone

Building 7



## LIST OF SPECIFICATIONS

Concrete Repair and Replacement  
Door and Window Hardware Refinishing  
Joint Sealers  
Masonry Cleaning \* (1,5,6,7: Light soiling on brick and granite, gypsum and flyash on granite, bitumen stains on granite, rust stains on granite, 3&4: soiling on brick, rust stains on limestone)  
Masonry Repointing and Repairs  
Painting  
Wood Repair and Replacement  
Rehabilitating Wood Windows and Doors  
Replacing a Wood Window Sill  
Epoxy Repair for Deterioration and Decay in Wooden Members  
Repairing Cracks and Checks in Wood Wall Ornament  
Repairing Scratches, Gouges, and Dents in Wood Wall Ornament  
Dutchman Repair of Wood Floorboards  
Removing Paint from Wood Features Using Thermal Methods  
Chemically Removing Paint from Wood Features  
Replacing Broken Glass in Wood and Metal Windows  
Repairing Double-Hung Window Sash Weights and Cords/Chains  
Installing Weatherstripping on Metal Double-Hung Windows

**NOTE:**

Reference in the specifications to materials by trade names is to establish a standard of quality. It is not intended to exclude other manufacturers whose materials or procedures are equivalent to those named, in the judgement of the Contracting Officer or his/her designated representative. Contractor proposals for alternative materials or procedures shall be submitted for approval. Testing of the proposed materials or procedures shall be performed at the contractor's expense, at the discretion of and at a time and location selected by the Contracting Officer or his/her designated representative. Acceptance or rejection of the proposed materials or procedures by the Contracting Officer or his/her designated representative shall be final.

## CONCRETE REPAIR AND REPLACEMENT

### PART 1- GENERAL

#### 1-1 USE OF DOCUMENTS:

These specification sections have been written for deficiencies identified in Chapters III through VIII. An extensive existing conditions survey of the buildings and the corresponding historical/ architectural research, undertaken in 1994, was the basis for determining the scope of work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

#### 1-2 WORK INCLUDES:

- A. Replacement of sidewalks and areaway paving.
- B. Replacement of areaway walls and arches; concrete slab and steps at portico and south entrance porch and window wells.
- C. Replacement of pre-cast capstones at portico.
- D. Repair of cracks in foundation walls.
- E. Repair and waterproofing of concrete column bases.
- F. Resetting of iron railings.
- G. Related work specified elsewhere.
  - 1. Masonry Repointing and Repairs
  - 2. Joint Sealers

#### 1-3 SUBMITTALS

- A. Product Data: Submit selected manufacturer's technical data for each product indicated including published recommendations for their application and use.
- B. Sample: Submit for verification purposes, samples of all materials required for the work of this section, whether specified or not. Size of samples shall be 250 ml. (1 cup) of each.
- C. Shop drawing of pre-cast concrete capstone.

- D. Submit qualifications and experience for masonry work.

#### 1-4 QUALITY ASSURANCE

- A. Work must be performed by a firm having not less than 5 continuous years experience in concrete work. Provide documentation for at least one project similar in scope and size to this project, and on a building of similar type.
  - 1. In acceptance or rejection of the work, no allowance will be made for lack of skill or competence on the part of the workers.
- B. Codes and Standards: Comply with the most stringent codes, for strength, testing and concrete placement, of all applicable agencies having jurisdiction.

#### 1-5 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing legible labels as to type and names of products and manufacturers. There shall be no broken bags.
  - 1. Store in accordance with manufacturer's recommendations.
- B. Protection: Protect materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials. Store in a dry location or in waterproof containers on raised platforms. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

#### 1-6 PROJECT CONDITIONS

- A. Protection of building's elements: Protect paving, landscaping, walls, ironwork, ledges and windows from drippings and spillage.
- B. Protection of surroundings: Protect persons, motor vehicles, a adjacent surfaces of the building and construction site, and surrounding buildings from damage or injury which could result from the performance of the work.
- C. Clean-up: Site shall be left broom clean at the end of each work day.

**PART 2 - PRODUCTS****2-1 CONCRETE MATERIALS****A.. Reinforcing Steel**

1. Welded plain cold-drawn steel wire fabric conforming to ASTM A185: 6" x 6", W1.4 x W1.4. Furnish in flat sheets, not rolls.
2. Galvanized steel reinforcing bars conforming with ASTM A615.

**B. Raw materials for mixing of concrete:**

1. Portland Cement: ASTM C150, Type I.
2. Sand: Clean, sharp sand free of loam, silt, soluble salts and organic matter, conforming to ASTM C33.
3. Coarse aggregate: Clean, hard, sharp, durable particles of broken stone ranging in size up to ¾" and free of any chemicals, dirt, silt, and clay, mica, salts and organic matter, conforming to ASTM C33.
4. Water: Potable, free of deleterious amounts of oils, alkalis and organic matter.
5. Admixtures: Use of admixtures is not permitted.

**C. Setting Accessories:**

1. Anchors: Fabricated from type 304 stainless steel.
2. Setting Buttons: Lead or plastic buttons of the thickness required to maintain a uniform joint width.
3. Mortar: Conforming to ASTM C270, Type N mortar. Color to match that of surrounding concrete surfaces. Joint profile to be flush with adjacent surfaces.
4. Sealant: See *Joint Sealers*.

**D. Design Mix: Provide a concrete mix that will yield 4000 psi at 28 days. It shall have as low a water/cement ratio and be as watertight as possible, yet be workable. Adjust color of cement and aggregate to match existing cast-in-place concrete.**

**2-2 PRE-CAST CAPSTONES**

- A. Units shall be of approved shape conforming to *2-1 Concrete Materials* above.
- B. Design strength to be 4000 psi at 28 days as tested in accordance with ASTM C31-91 and C39-86.
- C. The mix shall be established by a qualified commercial testing laboratory to provide an average compressive strength sufficiently higher than 4000 psi to minimize the frequency of strength tests below the 4000 psi design strength. The mix design shall be established in accordance with the procedures outlined in ACI 318-89, Chapter 4.

**2-3 MISCELLANEOUS MATERIALS**

- E. Joint Fillers: Asphalt Impregnated Sealant.
- F. Formwork:
  - 1. Forms shall conform to the lines, dimensions and shapes of existing concrete to be demolished.
  - 2. Make forms clean and free from foreign material before placing concrete.
  - 3. Do not use earth cuts as forms for vertical surfaces, unless approved by the contracting officer.
  - 4. Comply with ACI 301, Chapter 4, Paragraph 4.2. Formwork drawings shall bear the seal of a Professional Engineer registered in the state in which the project occurs.
  - 5. Comply with ACI 301, Chapter 4, Paragraph 4.3 for tolerances.
  - 6. Comply with ACI 301, Chapter 4, Paragraph 4.4 for preparation of form surfaces.
  - 7. Use non-staining mineral oil of form lacquer.

**2-4 CONCRETE MIXING**

- G. Ready-mixed concrete to comply with ASTM C94.
  - 1. All concrete mixed in transit mixer shall be mixed continuously until discharged. Mix ready-mixed concrete for a period of not less than ten (10) minutes. At least three (3) minutes of mixing period shall occur

immediately prior to discharging at job. Introduction of additional water into transit type mixers after leaving the plant will not be permitted. Load truck mixers at only that capacity which will insure a uniform batch at the slump specified. In the event that mixing in any truck mixer is not uniform in the opinion of the Architect, the truck may either be rejected and not used on the project, or, if warranted, allowed to mix only batches which will assure delivery of a uniform concrete.

2. If a mixer truck has been used for other projects prior to use on this project, thoroughly clean drum of the previous mix.
- H. Job mixed concrete: Mix materials for concrete in appropriate drum type batch machine mixer. Mixing shall be for a minimum of 1 minute for mixtures up to 1 cu. yd. capacity with an increase of 15 seconds mixing for each  $\frac{1}{2}$  cu. yd., or fraction thereof. The mixing period should be measured from the time all solid materials are in the mixer drum, provided all of the water is added before  $\frac{1}{4}$  of the mixing time has elapsed. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1 minute, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum  $1\frac{1}{2}$  minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof.
- I. Test concrete for compressive strength following ASTM C31. Cure in the laboratory.

## PART 3 - EXECUTION

### 3-1 REPLACEMENT OF SIDEWALKS AND PAVING

- A. Surface Preparation
1. Remove existing concrete and base.
  2. Install granular base, 6" minimum depth, compacted in two layers. Check for unstable areas and need for additional compaction. Do not begin concrete work until such conditions have been corrected and surfaces are ready to receive concrete.
- B. Concrete Placement
1. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete."
  2. Do not place concrete until base has been checked for line and grade.

3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of walls and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, or reinforcement. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
4. Deposit and spread concrete in a continuous operation between transverse joints.

C. Joints

1. General: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the center line, unless otherwise indicated. Follow recommendations of ACI for spacing.
2. Provide ½" asphalt impregnated expansion joint filler at walls set ½" below surface of concrete and caulk with elastomeric sealer.

D. Concrete Finishing

1. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
2. After floating, test surface for trueness with a straightedge. Distribute concrete as required to remove surface irregularities, tool marks and refloat repaired areas to provide a continuous smooth finish, sloped to drain where required.
3. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing to match original.
4. Non-slip Aggregate Finish: Apply non-slip aggregate finish to concrete stair treads, platforms, ramps, and walks.

After completion of float finishing, and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as herein specified.

After curing, lightly work surface with a steel wire brush, or an abrasive stone, and water to expose non-slip aggregate.

E. Curing

1. General: Protect freshly placed concrete and patching compound from premature drying and excessive cold or hot temperatures.
2. Start: Start curing process one day after installation of concrete or when the concrete has reached 1450 psi.
3. Protect and cure finished concrete paving. Use water-based acrylic membrane curing and sealing compound complying with ASTM C309, Type I, Class B.

### 3-2 REPLACEMENT OF AREAWAY WALLS AND ARCHES

A. Preparation

1. Excavate earth surrounding walls and arches. Completely demolish existing concrete taking care to protect and support any adjacent surfaces. Remove all demolished concrete, debris and other materials from the area.
2. Construct formwork to adequately support the concrete during placement. Surface of formwork shall be plywood, conforming to NBS PS-1, minimum 3/4 inch thick or lumber, No. 2 common or better and placed to impart the surface of the concrete with a texture matching the existing concrete.
3. Secure form where surfaces will be exposed in the finished work with supertie fiberglass formtie system or equivalent. For other forms use either bolts or wires such that no metal is closer than 1-1/2 inch from the finished concrete surface. Use stainless steel or other inert material for all ties to remain within concrete.

B. Concrete Placement

1. Depositing: Comply with ACI 301, Chapter 8, Paragraph 8.3. Deposit concrete within 5 feet of its final position in uniform layers not exceeding 18 inches. No more than 30 minutes shall elapse between layer placements.
2. Consolidation: Consolidate concrete to maximum density using internal vibration. Insert and withdraw vibrators vertically drawing out entrapped air and excess water. Do not use vibrators to transport concrete within forms.

## C. Joints

1. Comply with ACI 301, Chapter 6, Paragraph 6.1 and 6.2.
2. Form all construction joints with a sheer key. In wall, do not space construction joints more than 60 feet apart.
3. Install joint filler to allow the required dimension for sealant.

## D. Curing

1. Comply with ACI 301, Chapter 12, ACI 308 and ACI 302 Chapter 8.

## E. Form Removal

1. Do not remove forms until concrete has thoroughly hardened and has attained sufficient strength to support its own weight and construction live loads to be placed thereon, without damage to the structure. Replace any work damaged due to inadequate maintenance or improper or premature for removal.
2. Where use of metal form ties extending to within less than 1-1/2 inch of the face of permanently exposed concrete has been unavoidable, cut off such ties at least 1-1/2 inch deep in the concrete, but not less than 72 hours after concrete has been cast. Remove forms by methods which will not spall the concrete or cause any injury whatsoever.

## F. Finishing

1. General Requirements of Flatwork: Strike-off top surfaces of all flatwork true and level to the required tolerances. Use construction techniques such as adjustment of pour size, adjustable screeds, pre-shoring/shoring/re-shoring and other appropriate means to ensure compliance with these requirements. Monitor and survey pour areas prior to, during and after concreting operations.
2. Flatwork Finish Levelness Tolerances: Construct flatwork such that, for every 10 feet distance from a permanent point of support (column, bearing wall, etc.) the finished slab surface shall be no more than 1/4 inch below a theoretical horizontal plane projected from that support.
3. Fill or grind completed floors as necessary to achieve specified finish tolerances. Filling, where required, shall be with a self-leveling cementitious product capable of being tapered to a feathered edge.

4. Float Finish: Level surface and remove excess laitance by tamping, screeding and preliminary wood floating. When the concrete has hardened sufficiently so that water and fine material will not be worked to the top, compact the surface the surface with disc type motor-driven float. Cut down high spots, fill low spots and leave surface with a smooth finish and true to the maximum flatness tolerance specified. Float finish surfaces scheduled to receive the following:

- a. Membrane waterproofing

### 3-3 REPLACEMENT OF PRE-CAST CAPSTONES

#### A. Preparation

1. Remove damaged and broken capstones and any mortar at locations where capstones are to be replaced.
2. Inspect surfaces to which the capstones are to be attached to assure that surfaces are plumb, level and free of dirt or other deleterious materials.
3. Verify all dimensions affecting the work.

#### B. Installation

1. Set new pre-cast capstones level and plumb in a full bed of mortar, and secure with anchors. Completely fill all anchor holes with mortar. Rake and point joints with mortar to match the existing joint profiles.
2. Place lead or plastic setting buttons of same thickness as capstone to avoid squeezing mortar out.
3. Place anchors a minimum of 3/4 inch away from the exposed face of the precast capstone.

#### C. Cleaning and Protection

1. Clean completed work with fiber brushes and clear water only.
2. Protect completed work from staining, damage and deterioration until final acceptance.

**3-4 REPAIR OF CRACKS IN FOUNDATION WALLS****A. Preparation**

1. Chip away defective areas until sound concrete is reached (but not less than 3/4 inch back from finished surface). Where reinforcing bars are present, cut back defective areas to depth of 3/4 inch behind the reinforcing bars.
2. Undercut to provide bond for patchwork.
3. Where reinforcing is corroded, remove corrosion and coat with rust-inhibitive metal primer. At locations where the reinforcing has severely corroded, the architect shall examine on a case by case basis and decide whether the deteriorated bar can just be cut out or whether it will be necessary to splice in a new bar to the existing sound bar.
4. Fully wet areas to be patched, extending to at least 6 inches beyond the patching concrete in all directions.

**B. Concrete Placement**

1. All patching throughout shall be done by one skilled worker. General contractor shall furnish performance bond that any patching will be guaranteed for 10 years.
2. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."
3. Place concrete in lifts by hand with tools appropriate to the size of the repair work required.
4. Texturize patch while still soft to match the adjacent concrete surfaces.
5. New patches shall be finished flush with adjacent surfaces. Patchwork shall be damp cured for period as specified. Surfaces shall be kept continuously set by covering with burlap, mats or sand, thoroughly saturated with water and covering kept wet by spraying or hosing. Place materials to provide complete surface coverage and lap all joints minimum 3 inches where necessary.

**3-5 REPAIR AND WATERPROOFING OF CONCRETE BASES**

- A. Patch following above.
- B. For large patches it is more efficient to pour the concrete into formwork.
- C. Waterproofing
  - 1. Excavate earth adjacent to concrete bases.
  - 2. Allow concrete to reach full cure at 28 days. Apply layer of waterproofing (bituthene) to concrete following manufacturer's directions.
  - 3. Back-fill with gravel, placing drainage tile and base. Let settle before adding earth.
  - 4. Back-fill with excavated earth.

END OF SECTION

**DOOR & WINDOW HARDWARE REFINISHING****PART 1- GENERAL****1-1 USE OF DOCUMENTS:**

These specification sections have been written for deficiencies identified in Chapters III through VIII. An extensive existing conditions survey of the buildings and the corresponding historical/architectural research, undertaken in 1994, was the basis for determining the scope of work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

**1-2 WORK INCLUDES:**

- A. Door and Window Hardware includes refinishing items of existing finish hardware to remain attached to doors and windows including knobs, handles, push bars, push plates, kick plates, hinges, locksets, and so forth.

**1-3 RELATED SECTIONS:**

Painting

**1-4 SUBMITTALS:**

- A. Product Data: Submit manufacturers technical product data for each product used. Include whatever information may be necessary to show compliance with requirements. Include instructions for maintenance of operating parts and finish.
- B. Samples: Prior to submittal of the final hardware schedule and prior to final finishing of hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule. Sample will be reviewed for design, color and texture only.

**1-5 QUALITY ASSURANCE:**

- A. Work must be performed by a firm having not less than three (3) years regular successful experience in comparable Work and employing personnel skilled in the processes and operations required.
  - 1. In acceptance and rejection of Work no allowance will be made for lack of skill or competence on the part of Workmen.

- B. Volatile Organic Compound: Content of materials is limited to the percentages prescribed for factory or for field application by the authorities having jurisdiction.

#### 1-6 PRODUCT HANDLING:

- A. Handle, store, distribute, protect and install in accordance with manufacturer's instructions. Deliver packaged materials in original containers with seals unbroken and labels intact. Deliver assemblies completely identified and with adequate protection for storage, handling and installation.
- B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control the handling and installation of hardware which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses; both before and after installation.
- C. Packaging and Marking: All hardware shall be shipped with proper fastenings for application. Each package of hardware shall be legibly marked indicating the part of the work for which it is intended. Marking shall correspond with the item numbers shown on the approved hardware schedule.

#### 1-7 JOB CONDITIONS:

- A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installations in the package. Deliver individually packaged hardware items at the proper locations (shop or project site) for installation.

### PART 2 - PRODUCTS

#### 2-1 MATERIALS:

- A. Abrasive Polishing Material: Fine grade Scotch-Brite pads and Bronze Wool.
- B. Non-abrasive polishing compound: Flitz Polish.
- C. Lacquer: Agateen #8A manufactured by Agate lacquer Co., Long Island City.
- D. Corrosion-Inhibiting Lacquer: Incralac manufactured by Stan Chem, Inc. East Berlin, Ct. 06023.
- E. Solvent stripper: Methylene chloride based stripper.

**2-2 FABRICATION:**

- A. Fasteners: Provide new bronze machine screws and other fasteners where missing, broken or defective. New fasteners shall match original in color, texture, size and shape.
- B. Field Checks: Make periodic checks during installation of finished hardware to ascertain the correctness of the installation. After completion of the work, certify in writing that all items of finish hardware have been installed, adjusted and are functioning in accordance with requirements specified herein.
- C. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of hardware.

**2-3 FINISHES:**

- A. All hardware shall have a brightly polished finish, unless otherwise noted.

**PART 3 - EXECUTION****3-1 REFINISHING**

- A. Scrub and wash all items with non-ionic detergent using a stiff bristle brush.
- B. Remove all existing coatings with methylene chloride based paint stripper.
- C. Polish using a non-abrasive polish such as Flitz Polish. Avoid using abrasive polishing unless required by local conditions of corrosion or surface damage non-responsive to Flitz Polish.
- D. Degrease using a solvent such as ethyl alcohol or toluene to remove polish residue.
- E. Apply a protective coating of clear lacquer using a spray gun. Use Incralac at all locations that may be exposed to weather (e.g. windows). Use Agateen 8A in protected interior locations.

**3-2 INSTALLATION:**

- A. Re-mount hardware units at original heights and locations.

**3-3 ADJUST AND CLEAN:**

- A. Adjust and check each operating item of hardware and each door and window, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application.
- B. Wherever hardware installation is made more than one (1) month prior to acceptance, return to the work during the week prior to acceptance and make a final check and adjustment to all hardware items in such areas. Adjust door control devices and compensate for final operation of heating and ventilating equipment.

END OF SECTION

## JOINT SEALERS

### PART 1 - GENERAL

#### 1-1 USE OF DOCUMENTS:

- A. These specification sections have been written for deficiencies identified in Chapters 3 through 8. An extensive existing conditions survey of the buildings and the corresponding historical/ architectural research, undertaken in 1994, was the basis for determining the Scope of Work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

#### 1-2 WORK INCLUDES:

- A. Application of joint sealers to the joints connecting the following materials:
  - 1. Concrete to concrete.
  - 2. Concrete to brick.
  - 3. Brick to wood.
  - 4. Wood to plaster.
  - 5. Wood to granite.
- B. Related Work Specified Elsewhere
  - 1. Masonry Repointing and Repairs
  - 2. Concrete Repair and Replacement.
  - 3. Painting.

#### 1-3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each joint sealer product required, including instructions for joint preparation and joint sealer application.
- B. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- C. Samples for Verification Purposes: Submit samples of each type and color of joint sealer required. Install joint sealer samples in 1/2" wide joints formed between two (2) 6" long strips of material matching the appearance of exposed surfaces adjacent to joint sealer in the work.

D. Test Reports:

1. Submit certified test reports for elastomeric sealants indicating that materials forming each joint substrate and joint backing have been tested for compatibility, adhesion and staining with proposed joint sealants.
2. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

**1-4 QUALITY ASSURANCE**

A. Compatibility with substrate: Applicator shall be responsible for verifying that sealants used are compatible with joint substrates.

B. Joint tolerance: Comply with the manufacturer's limitations for joint width/depth ratios.

C. Sample Installations and Mock-ups

1. Prior to pre-installation conference and commencing Work, provide sealants, joint fillers and other joint materials in conjunction with sample installations and mock-ups specified in other Sections.
2. Mock-ups shall include primary types of materials, substrates, surfaces, joint size, exposure and other conditions to be encountered in Work.
3. Preparation, priming, application and curing shall comply with manufacturer's recommendations and actual proposed methods.
4. Schedule mock-ups, with allowance for sufficient curing time, so that samples may be examined and necessary adjustments made at least one (1) week prior to date scheduled for commencing installation of Work.
5. Architect shall visually examine mock-ups for staining, dirt pickup, shrinkage, color, general workmanship and appearance.
6. Cut and pull sealant from each sample joint and examine for internal bubbles or voids, adhesion, and general compatibility with substrate.

**1-5 JOB CONDITIONS**

A. Weather Conditions: Do not proceed with installation of sealants under unfavorable weather conditions. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer for installation.

- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

## 1-6 SYSTEM PERFORMANCES

### A. General Material Requirements:

1. Where more than one of manufacturer's products comply with specified requirements, provide specific product recommended by manufacturer for particular application or condition of use in each case.
2. Where joint fillers, sealants or other required joint materials are not specifically shown or specified, provide materials as recommended by manufacturer for proper conditions of application and use as required to fulfill system requirements.
3. Elastomeric sealants:
  - a. Hardness or consistency: Determine proper hardness or consistency in consultation with manufacturer, considering joint movement and exposure for joint size indicated.
  - b. Modulus of elasticity: In general, provide sealants having lowest modulus of elasticity which is consistent with degree of exposure to wear, abrasion and vandalism. Sealants exposed to traffic must have strength and modulus sufficiently high to resist damage by traffic, including indentation by stiletto heels.
4. Maintain width to depth ratios and minimum sizes as per manufacturer.
5. Joint fillers: Determine proper size, shape, hardness and compressibility of joint fillers in consultation with manufacturer considering joint conditions, movement and proposed sealants.

### B. Performance Requirements:

1. General: Design, manufacture and install joint materials to establish and maintain watertight and airtight continuous joint systems.
2. Compatibility and adhesion: Provide only sealants, joint fillers, primers and other compounds which are compatible with each other and with joint surfaces and which will adhere to joint surfaces.
3. Ranges of hardness: In general, provide sealants within the following ranges (fully cured sealant at 75°F):

- a. For joints subject to maximum movement and nominal exposure to weather and abrasion (such as vertical wall joints not subject to vandalism): 15 to 25 Shore A durometer hardness.
  - b. For joints subject to moderate movements and severe weather exposure or moderate abrasion (such as horizontal joints exposed to light traffic or vertical joints exposed to vandalism): 25 to 40 Shore A durometer hardness.
  - c. For joints subject to minimum movement and severe abrasion (such as sidewalk joints): 35 to 60 Shore A durometer hardness.
- C. Color Requirements:
- 4. Fully concealed joints: Provide manufacturer's standard color which has best overall performance characteristics for required application.
  - 5. standard colors. Provide two custom colors to match Architect's sample if there is no acceptable match plan standard colors.

## 1-7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B. Store in protected and dry area in manufacturer's unopened protective shipping packaging.

## PART 2 - PRODUCTS

### 2-1 MANUFACTURERS:

- A. Sika
- B. Sonneborn

### 2-2 MATERIALS

- A. General: Provide colors indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors. Select sealants, filler and other related materials for compatibility with each other with joint substrates and other indicated exposures, as well as select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated and as indicated by testing.

- B. Elastomeric Sealants: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
1. Type I: One-part, self-leveling polyurethane sealant complying with the following:
    - a. Federal Specification TT-SOO230, type 1, Class A; ASTM C-920, Type S, Grade P, Class 25, Use T, M.
    - b. Colors from standard color chart as per Architect.
    - c. Use: concrete pavement expansion and contraction joints.
  2. Type II: One part nonsag urethane sealant complying with the following:
    - a. Federal specification TT-S-00230C, Type II, Class A; ASTM C-920, Type S Grade NS, Class 25, use NT, M and A.
    - b. Manufacturer's standard colors to match brick and granite.
    - c. Use: Brick to wood; granite to wood; granite to brick.
    - d. Color as per Architect.
  3. Acrylic latex walls suitable for interior use only with the following characteristics:
    - a. Use for wood to plaster/plasterboard joints.
    - b. Capable of being painted with latex or oil-base paints.
    - c. Quick drying (30 minutes)
    - d. Colorfast, non-staining; non-bleeding.
- C. Joint Fillers, Pavement Types:
1. Bituminous and Fiber Joint Filler (BF-JF): Provide resilient and non-extruding type premolded bituminous impregnated fiberboard units complying with ASTM D1751, FS HH-F-341, Type I and AASHTO M 213.

**D. Cellular/Foam Joint Fillers:**

1. **General:** Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are accepted for applications indicated by sealant manufacturer based on field experience and laboratory testing.
2. **Plastic Foam Joint-Fillers:** Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
  - a. Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.
3. **Bond-Breaker Tape:** Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

**E. Miscellaneous Materials:**

1. **Primer:** Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer substrate and field tests.
2. **Cleaners for Nonporous Surfaces:** Provide non-staining, chemical cleaner or type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
3. **Masking Tape:** Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

**PART 3 - EXECUTION****3-1 JOINT PREPARATION AND INSPECTION**

- A. Inspect joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Provide written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint

sealant work to proceed until unsatisfactory conditions have been corrected.

- B. Verify that concrete is twenty-eight (28) days old.
- C. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
  - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealants, dust, oil, grease, waterproofing, water repellents, water, surface dirt and frost, including paints, except for permanent, protective coatings tested and accepted for sealant adhesion and compatibility by sealant manufacturer.
  - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form release agents from concrete.
  - 4. Clean metal, glass, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- D. Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate test or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond, do not allow spillage or migration onto adjoining surfaces.
- E. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3-2 INSTALLATION

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified.

- B. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealants. Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements are shown or specified.
- C. Install sealant backer rod or joint filler for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- D. Install joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
1. Do not leave gaps between ends of joint-fillers.
  2. Do not stretch, twist, puncture or tear joint-fillers.
  3. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
- E. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion to sealant to back of joint.
- F. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, forcing the complete "wetting" of joint bond surfaces equally on opposite sides. Comply with ASTM C 962 and manufacturer's instructions as applicable to materials, applications conditions indicated.
- G. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability. Tool joints to configuration within manufacturer's recommended setting time. Confine sealant to joint areas by the use of masking tape or other precautions to prevent spillage or migration.
1. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
  2. For joints sealed with non-elastomeric sealants and caulking compounds,

fill joints to a depth in range of 75% to 125% of joint width.

3. If masking material used, remove immediately after tooling.
- H. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.
- I. Recess exposed edges of gasket and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed unit will not protrude from joints.
- J. Tool exposed surfaces of joints to compress sealants to form smooth, uniform beads with slightly concave surfaces and slightly below adjoining surfaces, except form slight cove with sealant at inverted corner. Use tooling agents only if recommended by sealant manufacturer.
- K. Pour self-levelling grade sealants in horizontal joints to level indicated or, if not indicated to a level 1/16" below adjoining surfaces.
- L. Against rough surfaces or in joints of uneven widths, avoid appearance of excess sealant by locating compound well back into joint wherever possible.

### 3-3 CURE, PROTECTION AND CLEANING

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damaged deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.
- C. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturer of joint sealers and of products in which joints occur.

END OF SECTION

**MASONRY REPOINTING AND REPAIRS****PART - GENERAL****1-1 USE OF DOCUMENTS:**

These specification sections have been written for deficiencies identified in Chapters 3 - 8. An extensive existing conditions survey of the buildings and the corresponding historical/ architectural research, undertaken in 1994, was the basis for determining the Scope of Work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

**1-2 WORK INCLUDES:**

- A. Repointing of brick, granite, cast stone and limestone  
Resetting of existing granite capstones  
Waterproofing brick retaining walls  
Replacement of cracked and spalled brick  
Removal of concrete stucco from brick  
Patching holes in brick  
Limestone Patching
- B. Related Work Specified Elsewhere
  - 1. Joint Sealers
  - 2. Masonry Cleaning
  - 3. Concrete Repair and Replacement

**1-3 SUBMITTALS**

- A. Product Data: Submit selected manufacturer's product data for each raw material used in mixing the mortar and for each type of, accessory, and other manufactured products.
- B. Samples: Submit, for verification purposes, samples of all materials used in the work of this section whether specified or not.
  - 1. Samples of raw materials used in mixing mortar and of each mortar mix used in the work of this section: submit 250 ml. (1 cup) of all raw materials and ½" x 2" sample of cured mortar mix.

- C. Submit qualifications and experience for masonry work.

#### 1-4 QUALITY ASSURANCE

- A. Source of Materials: Except as otherwise specified, obtain masonry materials from a single source for each type material required to ensure match of quality, color, pattern and texture.
- B. Qualifications of workmen: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts. Workmen must have a minimum of 5 years experience in masonry work, including repair work. Submit documentation of relevant experience.
  - 1. In acceptance or rejection of work, no allowance will be made for lack of skill on part of workmen.
- C. Furnish sample of repointing of brick and granite: approximately 2' long by 2' high showing the mortar and workmanship. Allow panel to dry 3 days to accurately reflect mortar color. Where there is spot repointing as in the repair of the stress cracks, there should be a sample of this repair at one of the locations.
  - 1. Do not start repointing until Architect has accepted sample panel.
  - 2. Use panel as standard of comparison for all similar work.
- D. Furnish sample of brick replacement and the patching of holes in brick.
  - 1. Architect must approve sample before work begins.

#### 1-5 DELIVERY STORAGE AND HANDLING

- A. All materials shall be delivered to the site and stored in accordance with manufacturer's recommendations and by methods which will prevent damage, deterioration and loss (including theft).
- B. Raw materials for mortar mixing shall be delivered, handled and stored in the following manner:
  - 1. Timing: Deliver raw materials in ample time to facilitate inspection and preparation of samples and test areas.

2. Packaging: Materials shall be delivered in unbroken bags, barrels, packages or in other approved and suitable containers, plainly marked and labeled with the name of the manufacturer and brand.
  3. Method: Deliver and handle all materials to prevent inclusion of any foreign matter and to prevent damage by water or breakage.
  4. Storage: Properly protect and store all perishable materials in weathertight structures with floor raised not less than one foot above grade. For shot intervals of time not exceeding seven days, cement may be stored on suitable raised platforms and covered with waterproof tarpaulins.
    - a. Remove cement that has hardened or partially set from the site and do not use in work.
    - b. Store sand in clean bins or on platforms having hard, clean surfaces and cover to prevent accumulation of water or freezing.
- C. Carefully pack, handle and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.
- D. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials at no additional cost to the Owner.

## 1-6 PROJECT CONDITIONS

- A. Protection of Adjoining Surfaces: Protect sills, ledges and projections from drippings or mortar. Care must also be taken to adequately protect existing masonry and surrounding materials during the work of this section.
1. Power operated rotary hand saws must be used by skilled workmen so that the existing brick to remain is not damaged. Demonstrate skill with rotary grinder. Size of the blade is critical for this work. Mechanics must have approval of Contracting Officers to use grinder.
- B. Protection of Work: During erection, cover walls with heavy waterproof sheeting at end of each day's work.
- C. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed. Immediately remove grout or mortar in contact with such masonry. Protect base of walls from rain splashed mud and mortar splatter by means of coverings spread on flat surfaces and over wall surfaces.

- D. Cold Weather limitations on the work: Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch. Remove all masonry determined to be damaged by freezing conditions.
1. Do not mix mortar or perform repairs when air or masonry temperatures are below 40° F or **when it is expected to drop below 40° F within 48 hours of the application of the mortar.** Do not mix mortar at temperatures above 80°F.
    - a. Use insulating blankets or heated enclosures for at least 24 hours as the temperature drops below 32°F.
  2. Raw materials for mortar mixing: Do not use frozen materials or materials mixed or coated with ice or frost. Do not use salt to thaw ice for any purpose. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents, and do not use any chlorides in mortar or grout.
- E. Protection from Rain: Protect completed masonry and masonry work in progress with a water-resistive membrane.

## PART 2 - PRODUCTS

### 2-1 MATERIALS FOR MORTARS

- A. Cements:
1. Portland cement shall conform to ASTM C-150, Types I or II. White and grey. White cement shall be non-staining with no sulfates or other impurities.
  2. The use of masonry cement mortars will not be permitted.
- B. Lime:
1. Hydrated masons lime shall be in accordance with ASTM C-207, Type S.
- C. Sand:
1. Sand shall be clean, hard, sharp, durable particles, containing a total of no more than 5% by volume of loam, mica, clay or other deleterious substances and free from organic matter.

2. Sand shall be graded from fine to coarse, in accordance with ASTM C-144 except that for joints less than 1/4" use aggregate graded with 100% passing through the No. 16 sieve. Consult the Architect as to color and grade of sand prior to commencing work.
  3. Sand used in repointing work shall match that recommended in *Mortar Analysis* section for each building.
- D. Pigments:
1. Use inorganic pigments that are insoluble in water and are free from acids and soluble salts. Submit samples of all pigments proposed for use in the work to the Architect. The maximum permissible quantity of most metallic oxide pigments is 10% of the cement content by weight.
- E. Water:
1. Use clean, potable water free of deleterious amounts of oils, acids, alkalis and organic matter.
- F. Setting Accessories:
1. Anchors: Fabricated from type 304 stainless steel.
  2. Setting Buttons: Lead or plastic buttons of the thickness required to maintain a uniform joint width.
  3. Mortar: Conforming to ASTM C270, Type N mortar. Color to match that of surrounding concrete surfaces. Joint profile to be flush with adjacent surfaces.
  4. Sealant: See *Joint Sealers*.

## 2-2 MORTAR MIXES

- A. All construction mortar shall comply with ASTM C270, proportion specification for types of mortar required, unless otherwise indicated.
1. Use Type N mortar for laying up of new face brick and repair work. Mortar proportions by volume: 1:1:6 cement/lime/sand, also see specific building mixes listed below. Match original mortar in color and texture.
- B. The use of admixtures will not be permitted.

C. The intent is to aesthetically match existing clean mortar. All mortar mixes must be approved by the Contracting Officer.

D. Repointing mortars:

1. Building 1:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

Granite, cast stone: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

2. Building 3:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 10 YR 8/1. The sand should match the sieve analysis for the original mortar.

Limestone: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 8.5/1. The sand should match the sieve analysis for the original mortar.

3. Building 4:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 10 YR 8/1. The sand should match the sieve analysis for the original mortar.

Limestone: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 2.5 Y 8.5/2. The sand should match the sieve analysis for the original mortar.

4. Building 5:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

Granite: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

## 5. Building 6:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

Granite: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

## 6. Building 7:

Brick: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

Limestone: select the color of the aggregate so that the mixed mortar sample, after drying, matches Munsell Standard 5 Y 9/1. The sand should match the sieve analysis for the original mortar.

**2-3 MASONRY UNITS**

- A. Replacement brick should match existing in color, texture and size. Grade shall be SW, face brick, conforming to ASTM 216.

**2-4 LIMESTONE PATCHING COMPOUND**

- A. Cementitious Patching Material: "M70 Stonerestoration Mortar" as manufactured by Jahn Restoration Techniques and Research, 34 Kloosterweg, 3232 L.C. Brielle-Holland (U.S.A. Agent: Cathedral Stone Company, 2505 Reed Street, N.E., Washington, D.C. 20018), or approved equal. M70 mortar should be custom color matched to the adjacent limestone surfaces to ensure the closest aesthetic match.

**PART3 - EXECUTION****3-1 MORTAR MIXING, GENERAL**

- A.. Measure by volume or equivalent weight. Do not measure by shovel. Use known measure.
- B. Mix ingredients in clean mechanical bather for 5 minutes. Dry ingredients should be mixed for 2 minutes of the above time before adding water.
- C. Let mortar set for 20 minutes prior to use to allow for initial shrinkage. Place

mortar within 2 hours of mixing. Do not retemper or use partially hardened material.

- D. Completely empty drum before the succeeding batch is placed therein.
- E. Where hydrated lime is used for mortars requiring lime content, Contractor to have option of using the dry mix method or first converting the hydrated lime into a putty.

### 3-2 MORTAR MIXING FOR REPOINTING & CONSTRUCTION MORTARS

- A. Follow above except pre-hydrate the mortar as follows:
  1. Pre-hydrate mortar by adding sufficient water to make a damp, stiff mortar.
  2. After 1-2 hours, re-mix mortar with additional water to give desire consistency. Use the least amount of water to produce a workable mortar. Do not make mixture too wet. Avoid bleeding of water and segregation of constituents. A mortar is workable if its consistency allows it to be spread with little effort and if it will readily adhere to vertical masonry surfaces.

### 3-3 BRICK REPLACEMENT

- A. Remove all defective brick. Support and protect remaining masonry. remove and replace any corroded ferric anchor pins with stainless steel pins that match the dimensions of the existing ferric pins.
- B. Install replacement bricks in full bed of mortar to be flush with the existing finish. Butter ends with sufficient mortar to fill head joints and shore into place. Fit units into bonding and coursing pattern of existing brick. Wet new bricks so that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.
- C. Allow to cure.
- D. Rout out 3/4" of new construction mortar. Point mortar joints in repaired areas with selected repointing mortar. Tool to match joint profile shown in *Chapter 7, Mortar Analysis* section for each building. Match existing mortar joints in color, texture and profile.

**3-4 REPOINTING OF BRICK, GRANITE, CAST STONE AND LIMESTONE**

- A. Examine areas designated for repointing work. Rake or cut as required.
- B. Inspection and Preparation:
1. Cut out and rake joints to be repointed a minimum depth of  $\frac{3}{4}$ " or back to sound, solid mortar.
  2. Remove mortar using a masonry or diamond blade narrower than the joint. Do not widen joint. Clean all mortar from surfaces within the joint or crack so that the new pointing mortar bonds to the masonry, not old mortar. Do not spall or chip brick. If work is found to be unacceptable, all raking will cease without additional cost to the Owner until deficiencies in tools, workmanship or method have been corrected to the Architect's satisfaction.
  3. Brush off all carbonates or sulfates with a stiff natural fiber brush.
  4. Brush, vacuum, blow out or flush joints to remove all dirt, loose debris or sealant.
- C. Application of Mortar:
1. Wet the entire brick surface, surface dry, prior to pointing. Contractor shall maintain a five (5) gallon pressure sprayer filled and on the scaffold at all times that the masonry work is in progress.
  2. Point all joints with mortar. Apply in layers not greater than  $\frac{1}{2}$ " until a uniform depth of  $\frac{3}{4}$ " is formed. Continue placing mortar in layers no larger than  $\frac{1}{2}$ " thick until flush with outer surface of the masonry. Pack entire joint leaving no voids.
  3. For joints 1" in depth or less, push mortar into the joint with a long, thin pointing trowel having a blade that is narrower than the width of the joint, in layers so that the depth of each layer does not exceed  $\frac{1}{2}$ ". After one layer of mortar has set, apply another layer as necessary to completely fill the joint. Compact each layer tightly. Do not let the previous layer dry out before applying succeeding layer.
  4. When stopping work at the end of each day or for other reasons, stagger the layers of mortar so that there will be no through joints in the pointing. Stagger the joints in the layers so that they are at least three inches (3") from each other. When new work joins that of the previous day, dampen the previous work so that a good bond will be formed.

- D. Joint Tooling:
1. Tool joint to match joint profile shown in *Chapter VII, Mortar Analysis* section for each building. Do not allow mortar to extend over the edges of the joint (feather edging). Stipple surface of the mortar with a soft bristle brush to match texture of surrounding joints.
- E. Curing:
1. Keep joints damp (80%-90% RH) for 72 hours or until set. This will be accomplished by thoroughly wetting the pointed areas at the beginning and end of each working day until 72 hours are passed.
- F. Cleaning:
1. Clean up all mortar drippings the day they are dropped.
- G. Corrective Measures:
1. Should shrinkage or tiny cracks occur in the surface of the joint, cut out the mortar and repoint following the requirements of these specifications to the satisfaction of the Architect.

### 3-5 REMOVAL OF CONCRETE STUCCO FROM BRICK

- A. Protection: Mask or protect all adjacent materials. Erect dams to channel liquid runoff away from the building. Protect all foliage and pedestrian and vehicular traffic areas and adjacent surfaces. Dispose of all debris following manufacturer's recommendations and comply with all local regulations.
- B. Stucco Removal: Remove sound stucco using hand tools only. Remove stucco to expose sound brick. Remove stucco from the face surfaces of the brick and from the joints to expose the brick bedding mortar.
- C. Remove all loose mortar in joints of existing brick substrate to a depth of  $\frac{1}{2}$ " to  $\frac{3}{4}$ ".
- D. Remove all dust, efflorescence and organic growth.
- E. Repoint brick joints in accordance with Section 3-4 **Repointing of Brick, Granite, Cast Stone, and Limestone.**

**3-6 PATCHING HOLES IN BRICK SURFACES****A.. Preparation:**

1. Examine areas designated to be patched. Remove metal inserts and any other debris found in the holes.
2. Brush, vacuum, blow out or flush holes to remove all dirt, loose debris or sealant. Do not spall or chip brick.

**B. Application of Mortar:**

1. Wet entire brick surface surrounding the hole to be filled.
2. Apply mortar to hole in layers not greater than 1/2" until the entire hole is filled, flush with the surface of the surrounding brick.

**C. Tooling:**

1. Texturize the surface of the mortar to match the surrounding brick surface while the mortar is still wet.

**D. Curing:**

1. Keep the patched areas damp (80%-90%RH) for 72 hours or until set. This will be accomplished by thoroughly wetting the patched areas at the beginning and end of each work day until 72 hours are passed.

**E. Cleaning:**

1. Clean up all mortar drippings the day they are dropped.

**F. Corrective Measures:**

1. Should shrinkage or tiny cracks occur in the surface of the joint, cut out the mortar and repoint following the requirements of these specifications to the satisfaction of the Architect.

**3-7 RESETTING OF GRANITE CAPSTONES****A. Preparation**

1. Remove displaced granite capstones and mortar as required.

2. Inspect subsurface to assure that they are plumb, level, and free of dirt or other deleterious materials.
3. Remove corroded ferric anchors and prepare anchor holes to receive new stainless steel anchors.
4. Verify all dimensions affecting the new work.

#### B. Installation

1. Set the capstones level and plumb in a full bed of mortar, and secure with stainless steel anchors. Completely fill all anchor holes with mortar. Rake and point joints with mortar to match the existing joint profiles.
2. Place lead or plastic setting buttons of same thickness as capstones to prevent mortar from squeezing out.
3. Place anchors a minimum of  $\frac{3}{4}$  inches away from the exposed face of the granite capstones.

#### C. Cleaning and Protection

1. Clean completed work with fiber brushes and clear water only.
2. Protect completed work from staining, damage and deterioration, until final acceptance.

### 3-8 LIMESTONE PATCHING

#### A. Losses Due To Impact

##### 1. Preparation

Cut back to sound stone with chisel and hammer. Score surface to receive patch to provide a mechanical key with patching material.

##### 2. Cleaning

Thoroughly clean all stone dust and debris from areas that are to be repaired with compressed air and then with a soft brush and water.

##### 3. Premoistening

Premoisten the stone with clean water and a stiff natural bristle brush to prevent patching mortar from drying out prematurely. Avoid over wetting stone, which

will inhibit adhesion. Contractor shall prepare test patches to determine the correct degree of moistening, as required for approval by the Contracting Officer's Representative.

#### 4. Mixing

Mix the cementitious patching material well in a dry state, then add water as directed in manufacturer's recommendations. The patching mortar should be shapable without using molds and as it is being applied should hold its shape immediately. Do not mix more material than can be used within 30 minutes.

#### 5. Application

Apply with a trowel so that the patch is slightly higher than adjacent surfaces. Jahn Patching Mortar can be put on from 3mm to any required thickness at once. Allow the patch to harden for 7 days, then carefully cut back and tool to match adjacent surfaces.

### 3-9 LIMESTONE REPAIR: DUTCHMAN

#### 1. Preparation

Where practicable, repair spalled, chipped, or cracked limestone with dutchman repairs. Cut back to sound stone, forming a prismatic void in the existing limestone with square corners. Support and protect remaining masonry. The dutchman should be sized to allow for a  $\frac{3}{4}$ " mortar joint between it and the adjacent limestone.

#### 2. Cleaning

Thoroughly clean all stone dust and debris from areas that are to be repaired by air and then with a soft brush and water.

#### 3. Installation

Install limestone dutchman in full bed of mortar to be flush with the existing finish. Butter the sides with sufficient mortar to fill head joints and shore into place. The dutchman should be laid flush with the surface of the adjacent limestone. Wet the new limestone so that units are nearly saturated but surface dry when laid. The mortar joints between the dutchman and the adjacent limestone should be flush and colored to match the color of the adjacent limestone.

#### 4. Curing

Allow to cure with manufacturer's recommendations.

END OF SECTION

## MASONRY CLEANING

### PART 1 - GENERAL

#### 1.1 USE OF DOCUMENTS

These specifications have been written for deficiencies identified in Chapter 6-8 and Chapter 9. An extensive existing conditions survey of the buildings and the corresponding historical/architectural research, undertaken in 1994, was the basis for determining the Scope of Work. No Contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

#### 1.2 WORK INCLUDES

##### A. BRICK

1. Light Soiling
2. Bitumen Based Stains
3. Gypsum and Flyash stains

##### B. GRANITE

1. Light Soiling
2. Rust Stains
3. Bitumen based stains
4. Gypsum and Flyash stains

##### C. LIMESTONE

1. Light Soiling
2. Rust Stains

#### 1.3 SYSTEMS DESCRIPTION

- A. Performance Requirement: The fundamental consideration for selection of appropriate cleaning materials and procedures shall be that the materials and techniques used do minimal or no damage to the masonry substrates while achieving the desired results.

1. Cleaning systems specified will effectively remove general soiling, localized staining, and residues from older stonework. Selection of specific cleaners shall be dependent on the nature and degree of surface soiling condition of the substrate and the results of mock-ups conducted at the job site.

#### 1.4 SUBMITTALS

- A. Qualification data for firms and persons specified under “Quality Assurance” article for approval and to demonstrate their capabilities and experience. Include list of completed projects with project name, address, telephone numbers, names of architects and owners, plus other information specified.
- B. Product Data: Submit for approval manufacturer’s technical data, including Material Safety Data Sheets (MSDS) for each product proposed for use including recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.
- C. Materials List: Submit for approval a list of materials for use in cleaning procedures.
- D. Cleaning Program: Submit for approval a written program for each phase of cleaning, including protection of surrounding materials on building and site during operations and coordination of Work of other trades and Contracts. Describe in details materials methods and equipment to be used for each phase of restoration work. Cleaning program shall incorporate results of mock-ups. Provide documentation of the procedures used in the preparation of the mock-ups. Including the following:
  1. Cleaning materials used including concentration, number of applications, method and order of applications.
  2. Equipment.
  3. Water and/or application pressures.
  4. Accessory materials.
- D. If alternative methods and materials to those indicated are proposed for any phase of restoration work, provide written description, including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this project.
- E. Test Reports: When directed by the Architect, submit laboratory test reports confirming physical and chemical characteristics or materials used in Work of this Section.

## 1.5 QUALITY ASSURANCE

- A. Restoration Specialist: Work must be performed by a firm having not less than ten (10) years regular successful experience in comparable masonry restoration projects and employing personnel skilled in the cleaning processes and operations indicated. Provide documentation of a minimum of 5 projects of similar scope.
1. In acceptance and rejection of Work no allowance will be made for lack of skill or competence on the part of the Workmen.
- B. Regulatory Requirements: Work shall be in compliance with applicable federal, state, and local codes and regulations.
- C. Field-Constructed Mock-Ups: Prior to start of cleaning program, prepare sample cleaning panels on travertine where directed by Contracting Officer. Obtain Architect's written acceptance of the sample before proceeding with general cleaning. Retain acceptable mock-up panels in undisturbed conditions, suitably marked, during construction as a standard for judging completed work.
1. Demonstrate materials and methods to be used for cleaning each type of conditions on sample panels of approximately 4 sq.ft. in area. Conduct mock-ups with materials and products specified under Part 2 - Products. Document products, procedures, and results.
  2. Test and evaluate proposed materials and techniques for protection of surrounding and adjacent non-masonry surfaces.
  3. Allow waiting period of duration indicated, but not less than seven calendar days, after completion of sample cleaning to permit drying and subsequent study of samples panels for negative reactions.
- D. Source of Materials: Obtain materials for masonry cleaning from a single source for each type materials required to ensure compatibility. Use of materials other than those specified shall require the advance written approval of the Architect.
1. Materials shall be supplied by a manufacturer having not less than ten (10) years regular successful experience in the formulation, manufacture and distribution of restoration cleaning treatments.

## 1.6 DELIVERY, STORAGE, HANDLING

- A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to types and names of products and manufacturers.
- B. Store materials at job site in a secure storage area as per contracting officer.

## PART 2 - PRODUCTS

### 2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Water: clean, potable, free of oils, acids, alkalis, salts, organic matter, and rust.
- B. Brushes: natural fiber or soft tampico fiber for washing
- C. Spray Equipment: as required at low pressure
- D. PROSOCO 1026 DETERGENT, or equivalent
- E. PROSOCO ASPHALT AND TAR REMOVER, or equivalent
- F. 10% solution of Ammonium Thioglycolate
- G. Attapulgate

### 3.1 PREPARATION FOR CLEANING

- A. Mock-ups: prior to general masonry cleaning, prepare mock-ups as specified in “Quality Assurance” article.
- B. Submit Cleaning Program as specified in “Submittals” article.
- C. Protect glass, paint, plaster, painted and unpainted metal trim, polished stone, and all other surrounding non-masonry surfaces from contact with chemical cleaners by covering with polyethylene film and waterproof masking tape or other proven protective measures firmly fixed and sealed to the surface.
  - 1. Comply with recommendation of manufacturers of chemical cleaners for protecting building surfaces against damage from exposure to their products.
  - 2. Provide for the removal and subsequent reinstallation of surface mounted items. Where removal is impossible, such items shall be protected in place.
  - 3. Prevent overspray (splashing) of the cleaning materials.
  - 4. All open joints shall be temporarily caulked or otherwise protected to prevent intrusion of washing waters into the wall structure.
  - 5. Protection can be eliminated, subject to the architect’s and contracting officer’s approval, if testing demonstrates no detrimental effect from exposure to cleaning solutions.

- D. Protect persons and surrounding surfaces of building from injury resulting from masonry restoration work.

### 3.2 CLEANING, GENERAL

- A. Dilution of the cleaning materials shall be with clean water according to manufacturer's printed instructions.
- B. Repeat entire cleaning procedure once, where required, to produce cleaning effect established by the mock-up. If desired effect has not been achieved, test stronger products in small areas with approval of architect.
- C. Proceed with cleaning in an orderly manner, work from the top to bottom from one end to the other.
1. Use only those cleaning methods indicated for each material and location.
  2. Perform each cleaning method indicated in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices; this action will produce an even effect without streaking or damage to stone surfaces.
  3. Rinse off chemical residue and soil by working upwards from bottom to top of each treated area at each stage or scaffold setting.

### 3.3 CLEANING BRICK

A. Moderate Soiling Cleaning Method (Only Buildings 1,5,6& 7)

1. Apply PROSOCO 1026 DETERGENT (or equivalent) with a soft bristled brush, allow to dwell for 10 minutes.
2. Rinse with pressure jet washing (approximately 400 psi)
3. Rinse again with low pressure water to remove remnants of detergent (approximately 60 psi)

B. Bitumen Based Stains

1. Mix PROSOCO ASPHALT AND TAR REMOVER (or equivalent) with enough attapulgite to create a paste-like consistency.
2. Apply paste to surface and cover with aluminum foil, then secure with masking tape; allow to dwell for 4 hours.

3. After dwell time, remove paste and dislodge bitumen-base soilant with paint scraper, taking care not to damage the brick substrate.
4. Wash surface with PROSOCO 1026 DETERGENT, or equivalent (follow instructions above).

#### C. Flyash and Gypsum Stains

1. Apply a fine misted spray of water to the effected surfaces; continue this for a period of six hours.

### 3.4 CLEANING GRANITE

#### A. Moderate Soiling Cleaning

1. Apply PROSOCO 1026 DETERGENT (or equivalent) with a soft bristled brush, allow to dwell for 10 minutes.
2. Rinse with pressure jet washing (approximately 400 psi)
3. Rinse again with low pressure water to remove remnants of detergent (approximately 60 psi)

#### B. Rust Stains

1. Mix a 10% solution of ammonium thioglycolate with enough attapulgite to create a paste-like consistency.
2. Apply paste to surface and cover with aluminum foil, then secure with masking tape; allow to dwell for 30 minutes.
3. After dwell time, remove paste, taking care not to damage the granite substrate.
4. Rinse with pressure jet washing (approximately 400 psi)
5. Rinse again with low pressure water to remove remnants of poultice (approximately 60 psi)

#### C. Bitumen based stains

1. Mix PROSOCO ASPHALT AND TAR REMOVER (or equivalent) with enough attapulgite to create a paste-like consistency.
2. Apply paste to surface and cover with aluminum foil, then secure with masking

tape; allow to dwell for 4 hours.

3. After dwell time, remove paste and dislodge bitumen-base soilant with paint scraper, taking care not to damage the granite substrate.
4. Wash surface with PROSOCO 1026 DETERGENT, or equivalent (follow instructions above).

D. Gypsum and Flyash stains

1. Apply a fine misted spray of water to the effected surfaces; continue this for a period of six hours.

### 3.5 CLEANING LIMESTONE

A. Light Soiling

1. Apply PROSOCO 1026 DETERGENT (or equivalent) with a soft bristled brush, allow to dwell for 10 minutes.
2. Rinse with pressure jet washing (approximately 400 psi)
3. Rinse again with low pressure water to remove remnants of detergent (approximately 60 psi)

B. Rust Stains

1. Mix a 10% solution of ammonium thioglycolate with enough attapulgit to create a paste-like consistency.
2. Apply paste to surface and cover with aluminum foil, then secure with masking tape; allow to dwell for 30 minutes.
3. After dwell time, remove paste, taking care not to damage the granite substrate.
4. Rinse with pressure jet washing (approximately 400 psi)
5. Rinse again with low pressure water to remove remnants of poultice (approximately 60 psi)

## PAINTING

### PART 1 - GENERAL

#### 1-1 USE OF DOCUMENTS:

These specification sections have been written for deficiencies identified in Chapters 4-8. An extensive existing conditions survey of the buildings and the corresponding historical/architectural research, undertaken in 1994, was the basis for determining this Scope of Work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

#### 1-2 WORK INCLUDES:

- A. Removal of existing paint.
- B. Surface preparation, priming and painting of elements listed in Chapter IX, according to the colors selected in the Paint Color Palette section of *Paint Analysis, Chapter 5*.
- C. "Paint" as used herein shall mean all coating systems materials, including fillers, primers, emulsions, enamels, varnishes, wood stains, glazes, sealers, and other applied materials whether used as prime, intermediate, finish or protective coats.
- D. Testing of all existing painted surfaces where work is scheduled for lead content.
- E. Disposal of lead dust, paint chips, and waste materials in compliance with hazardous waste regulations of authorities having jurisdiction.
- F. The following categories of work are not included as part of field-applied finish work.

**Pre-Finished Items:** Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified for such items as (but not limited to) finished mechanical equipment, including registers.

**Concealed Surfaces:** Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, duct shafts and elevator shafts.

Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.

Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.

- G. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.
- H. Related Work Specified Elsewhere
  - 1. Joint Sealers
  - 2. Masonry Repointing and Repairs
  - 3. Door and Window Hardware Refinishing

### 1-3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information for all materials including manufacturer's Safety Data Sheets (MSDS). In addition to actual material data, submit manufacturer's printed directions and recommendations for environmental conditions, surface preparation, priming, mixing, reduction, spreading rate, application and storage for each material proposed for use.
- B. Samples for verification purposes: Prior to beginning work, submit two paint samples of each color with texture to simulate actual conditions on representative samples of the substrate. Define each separate coat, including fillers and primers. Provide a listing of material and application for each coat of each finish sample. Resubmit samples as requested until an acceptable sheen, color, and texture of the paint is achieved.
- C.. Qualification data for firms and persons specified under "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name, address, names and telephone numbers of Architects and Owners, plus other information specified.
- D. Written verification of having had coded color chips computer matched to paints must be submitted to the Contracting Officer or his designated representative 48 hours prior to painting. These verifications must be written on paint manufacturer's stationery and hand signed by the individual conducting the computer color matching. No substitution for coded colors will be accepted.

**1-4 QUALITY ASSURANCE:**

- A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- B. Qualifications: Painting must be performed by a firm with not less than ten (10) years regular successful experience in painting projects of similar size and complexity. Provide documentation.
1. In acceptance and rejection of work no allowance will be made for lack of skill or competence on the part of workers.
- C. Coordination of work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect of problems anticipated using the materials specified.
- D. Computer Color Matching: All paint will be custom tinted by computer matching. Color selection must follow the codes indicated in the Paint Color Palette portion of *Paint Analysis* section for each building. Accurate color reproduction is accomplished by matching modern paints to the sample color chips corresponding to each code. There are two coding systems for describing color. They are the Munsell and Plochere color systems. The Contractor must obtain the coded color chips for each color indicated in the finish schedule. Chips are to be purchased directly from the one of following firm(s):

Munsell Color System  
2441 N. Calvert Street  
Baltimore, MD 21218  
(301) 243-2171

Plochere Color System  
1818 Hyperion Avenue  
Los Angeles, CA 90002  
(213) 661-0070

Coded color chips must be computer matched. Major paint manufacturers known to be capable of computer color matching include Sherman Williams, Benjamin Moore, and Glidden. Visual matching is not acceptable.

- E. Field Samples: On actual wall surfaces and other exterior and interior building components, duplicate painted finishes of approved samples. Simulate final lighting conditions for review of in-place work.
1. Final acceptance of colors will be from samples applied on the job.
- F. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- G. Volatile Organic Compound: Content of coatings and other materials is limited to the percentages prescribed for factory or for field application by the authorities having jurisdiction.
- H. Federal Specifications establish a minimum quality level for paint materials, except where other product identification is used. Provide written certification from the manufacturer that materials provided meet or exceed these criteria.
- I. Test for lead-based paint where there is sanding, welding or scraping of painted surfaces scheduled. Do not abate if painted surfaces are intact and in good condition. Follow OSHA regulations if lead is detected.
- J. Comply with the most stringent municipal and Federal regulations governing protection, disposal and access (scaffolding) at the site, at adjacent property (including cars in the street) and for the workmen.

## 1-5 DELIVERY STORAGE HANDLING

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information:

- Product name or title of material.
- Fed. Spec. number, if applicable.
- Manufacturer's stock number and date of manufacturer.
- Manufacturer's name.
- Contents by volume, for major pigment and vehicle constituents
- Application instructions.
- Color name and number.
- Manufacturer's recommended primer.
- Thinning instructions.

All original containers shall be removed from the job site after the contents have been used. In no case shall such containers be refilled.

- B. Store materials not in actual use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45 deg. F (7 deg. C). Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing where necessary. Keep storage area neat and orderly. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.
- C. Storage space for all materials used on the job shall be designated by the Contracting Officer or his designated representative. The Contractor shall provide a lock and key and shall secure local Fire Department permit if needed for the storage and use of paint materials. Paint and other flammable products shall not be stored in the building. Keep storage space neat and clean. Soiled or used rags, waste and trash shall be removed from the job site daily, at the end of each day's work. Every precaution shall be taken to avoid the danger of fire.

## 1-6 JOB CONDITIONS

- A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F (10 deg. C) and 90 deg. F (32 deg. C), unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg. F (7 deg. C) and 95 deg. F (35 deg. C), unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
  - 1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
- D. Do not apply paint in areas where dust is being generated or will be generated while the material is drying.
- F. Lead Paint Hazard: Follow latest regulations published by OSHA. In general,

provide polyethylene sheet masking attached securely to building to contain lead dust and paint residue. Extend 4 feet minimum from the building, covering the ground and any immovable objects and vegetation. Workmen shall be equipped with respirators for use during exposure to lead paint dust, complying with the requirements of ANSI Z88.2. Dispose of residue and waste materials in compliance with regulations of authorities having jurisdiction.

## PART 2- PRODUCTS

### 2-1 MANUFACTURERS

Benjamin Moore and Co. (Moore).  
Glidden Coatings and Resins (Glidden)  
McCloskey Varnish

### 2-2 MATERIALS

#### A. General:

1. Paint shall be well ground, shall not settle badly, cake or thicken in the container, shall be readily broken with a paddle to a smooth consistency and shall have easy brushing properties.
2. Paint shall arrive on the job ready-mixed except for tinting of undercoats and possible thinning.
3. All thinning and tinting materials, solvents and other materials used with paint shall be the best quality and kind recommended by the paint manufacturer.
4. Application equipment is not required to be new, but shall be adequate and commensurate for the work and workmanship required herein.
5. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
6. Gloss Ratings: Specular gloss of finished surface shall be within the following ranges when measured at 60 \* in accordance with ASTM D523:

<u>Degree of Gloss</u>	<u>Gloss Units</u>
Flat	Below 5
Eggshell	5 - 15

Semi-Gloss	50 - 60
Gloss	Above - 90

### 2-3 PRIMERS

- A. Interior Flat Latex-Based Paint: Flat latex paint used as a primer over concrete and masonry under alkyd flat and semigloss enamel:

Glidden: 5300 Ultra-Hide Flat Wall Paint  
Moore: Moore's Latex Quick-Dry Prime Seal.

- B. Interior Flat Latex-Based Paint: Flat latex paint used as a primer on plaster under flat, semigloss, and full-gloss alkyd finishes:

Glidden: 5019 PVA Primer Sealer  
Moore: Moore's Latex Quick-Dry Prime Seal.

- C. Galvanized Metal Primer: Primer used to prime interior and exterior zinc-coated (galvanized) metal surfaces:

Glidden: 5229 Glid-Guard All-Purpose Metal Primer  
Moore: Ironclad Galvanized Metal Latex Primer #155

### 2-4 UNDERCOAT ENAMELS

- A. Interior Enamel Undercoat: Ready-mixed enamel for use as an undercoat over a primer on plaster under full gloss or odorless semigloss enamels. Also for use as a deep color primer on the exteriors:

Glidden: 4500 Glid-Guard Enamel  
Moore: Moore's Alkyd Enamel Underbody #217

- B. Interior Enamel Undercoat: Ready-mixed enamel for use as an undercoat over wood and hardboard under an odorless alkyd semigloss enamel or full gloss alkyd enamel:

Glidden: 310 Glidden Wood Undercoater  
Moore: Moore's Alkyd Enamel Underbody

### 2-5 EXTERIOR FINISH PAINT MATERIAL

- A. Medium shade and deep Color Alkyd Resin Exterior Trim Paint: Medium deep color, ready-mixed high gloss paint for use on the exterior over prime-coated wood trim, doors, and shutters:

Glidden: 1901 Spred Lustre Dura Gloss Oil House Paint  
 Moore: Moore's House Paint

- B. Alkyd Gloss Enamel: Weather-resistant high-gloss enamel for use over primed ferrous metal surfaces:

Glidden: 4500 Glid-Guard Alkyd Industrial Enamel  
 Moore: Impervo Enamel

- C. Alkyd Gloss Enamel: Weather-resistant high-gloss enamel for use over primed, zinc-coated (galvanized) metal surfaces and aluminum:

Glidden: 4500-Line Glid-Guard Alkyd Industrial Enamel  
 Moore: Impervo Enamel

- D. Pigmented Varnish for wooden surfaces:

McCloskey Tung Seal Varnish in "Dark Oak"  
 Moore: Benwood Interior Penetrating Stains

- E. Clear Varnish for wooden surfaces:

McCloskey "Man-O-War Clear Marine Varnish - high gloss

## 2-6 INTERIOR FINISH PAINT MATERIAL

- A. Latex-Based Interior Flat Paint: Ready-mixed, latex-based paint for use as a flat finish over concrete and masonry surfaces, including filled concrete masonry block, mineral-fiber-reinforced cement panels, and plaster and over prime-coated gypsum drywall, ferrous metal, and zinc-coated (galvanized) metal surfaces:

Glidden: 3400 Spred Satin Latex Wall Paint.  
 Moore: Regal Wall Satin.

- B. Interior Odorless Alkyd Paint: Ready-mixed, low-odor interior semi-gloss finish for use over concrete, masonry, and plaster:

Glidden: Spred Lustre Alkyd Semi-Gloss Enamel.  
 Moore: Moore's Dulamel Eggshell

- C. Interior Semigloss Odorless Alkyd Enamel: Low-odor, semigloss, alkyd enamel for use over a primer and undercoat on concrete, masonry (including concrete masonry block), plaster, wood, and hardboard and both ferrous and zinc-coated (galvanized) metal surfaces and over a primer on gypsum drywall:

Glidden: 4200 Spred Lustre Alkyd Semi-Gloss Enamel.  
 Moore: Moore's Satin Impervo Enamel.

- D. Interior alkyd high-gloss enamel for use over a primer and undercoat on interior plaster surfaces, wood, and hardboard and ferrous and zinc-coated metal surfaces:

Glidden: 4500 Glid-Guard Alkard Industrial Enamel.  
 Moore: Impervo Enamel.

- E. Pigmented Varnish for wooden surfaces:

McCloskey Tung Seal Varnish in "Dark Oak"  
 Moore: Benwood Interior Penetrating Stains

- F. Clear Varnish for wooden surfaces:

Moore: One Hour Clear Finish - High Gloss

## 2-7 COLOR

All paint colors shall match the color recommendations found in the HSR Chapter 5: Paint Analysis, or, if no recommendation exists, match the existing finish of the surface to be painted.

## PART 3- EXECUTION

### 3-1 EXAMINATION

- A. Examine substrate and conditions under which removal, surface penetration, and painting will be performed for compliance with requirements for application of paint. Do not proceed with work until satisfactory conditions have been corrected in a manner acceptable to Applicator.

1. Start of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

## A. PREPARATION

### A. General:

1. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
2. Clean surfaces to be painted before applying paint or surface treatments.
3. Program cleaning and painting so that contaminants from cleaning will not fall onto wet, newly-painted surfaces.

### B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat materials with substances primed by others.
2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
  - a. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
  - b. Clean concrete floors to be painted with a 5 percent (5%) solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, and rinse; allow to dry and vacuum before painting.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
  4. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
    - a. Apply primer immediately after cleaning.
  5. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants.
- C. Materials Preparation: Carefully mix and prepare paint materials with manufacturer's directions.
1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, straining material before using.
  3. Use only thinners approved by paint manufacturer, and only within recommended limits.
- D. Tinting: Tint each undercoat with a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3-3 PAINT REMOVAL

#### A. PREPARATION

1. Remove hardware and accessories, plates, carpet and other in-place items. Provide surface-applied protection prior to commencement of paint removal activities on all adjacent decorative surfaces.
2. Provide protection for all other adjacent building elements, including cars on street, trees, shrubs, brick paving at walks.

**B. GENERAL**

1. Dwell time will vary according to number of paint layers and paint medium. Contractor shall perform tests to determine the optimum product and technique for each material, wood, brick and plaster.
2. Collect all gel and paint residues in solvent waste containers and dispose of according to regulations.
3. Repeat application until complete removal is achieved.

**C. PAINT REMOVAL FROM WOOD**

1. Apply gel remover thickly and evenly to wood surface. Allow dwell time as in mock-up procedures. Cover with aluminum foil or "Saran Wrap" to get maximum effect from solvent. Do not allow to dry.
2. Remove paint sludge with putty-type knife with rounded edges.
3. Remove gel paint from grains of the wood as the wood is scheduled for clear finishing.
4. Wipe down with denatured alcohol and cotton cheesecloth for removal of final paint residues.
5. Let surface dry for 3-5 days before refinishing.

**D. REMOVAL OF PAINT FROM PLASTER**

1. Follow the following:
  - a.. Avoid gauging surface or excessive scrubbing so as not to disturb detail.
  - b. Use dental picks or nut picks to pull paint out of decorated surfaces of medallion.
  - c. Prime with white flake shellac in denatured alcohol when all paint has been removed.

**3-4 APPLICATION****A. Preparation for Existing Wood**

1. Scrape existing wood surfaces to be painted with a flat blade scraper to

- remove all peeling or blistering paint finish. Sand surface to a smooth finish, flush with contiguous surfaces. To insure bonding of new paint materials, clean surfaces free of dirt, oil, dust, or other foreign substances with trisodium phosphate (TSP) cleaning solution. Rinse thoroughly with clean water to remove cleaner residue and soil. Lightly sand or treat existing surfaces with a chemical paint bonding agent.
2. Clean existing wood surfaces to receive a clear finish with mineral spirits to remove dirt, oil, or other foreign substances and wipe with a clean cloth. Wipe entire surface with a pre-impregnated tack rag and immediately apply finish.
- B. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
1. Paint colors, surface treatments, and finishes are indicated in Paint Color Palette portion of *Paint Analysis* in Chapters III-VIII.
  2. Provide finish coats that are compatible with primers used.
  3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has been cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even, smooth surface in accordance with the manufacturer's directions.
  4. Apply additional coats when undercoats, stains or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
  5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
  6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

7. Finish exterior doors on tops, bottoms and side edges same.
  8. Sand lightly between each succeeding enamel or varnish coat.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
- E. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.
- F. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
- G. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

### 3-5 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove

spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

### 3-6 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3-7 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
- B. Wood:
1. Alkyd Gloss Finish: Two (2) finish coats over primer with total dry film thickness not less than 3.5 mils.
    - Primer: Exterior Primer Coating (FS TT-P-25).
    - First Coat: Alkyd Gloss Enamel (TT-E-489).
    - Second Coat: Alkyd Gloss Enamel (TT-E-489).
  2. Low-Luster Finish: Two (2) finish coats over primer.
    - Primer: Exterior Primer Coating (FS TT-P-25).
    - First Coat: Exterior Acrylic Emulsion (FS TT-P-19).
    - Second Coat: Exterior Acrylic Emulsion (FS TT-P-19).
- C. Wood Trim:
1. Deep Color, High-Gloss Alkyd Finish: Two (2) finish coats over primer.
    - Primer: Exterior Primer Coating (FS TT-P-25).
    - First Coat: Deep Color Alkyd Resin Exterior Trim Paint (FS TT-P-37).
    - Second Coat: Deep Color Alkyd Resin Exterior Trim Paint (FSTT-P-37).
  2. Medium-Shade, High-Gloss Alkyd Finish: Two (2) finish coats over primer.

Primer: Exterior Primer Coating (FS TT-P-25).

First Coat: Medium-Shade, Ready-Mixed Exterior Oil Paint (FS TT-P-81).

Second Coat: Medium-Shade, Ready-Mixed Exterior Oil Paint (FS TT-P-81).

D. Ferrous Metal: Primer is not required on shop-primed items.

1. Full-Gloss Alkyd Enamel: Two (2) finish coats over primer.

Primer: Synthetic Rust-Inhibiting Primer (FS TT-P-664).

First Coat: Alkyd Gloss Enamel (FS TT-E-489).

Second Coat: Alkyd Gloss Enamel (FS TT-E-489).

2. Lusterless Alkyd Enamel: Two (2) finish coats over primer.

Primer: Synthetic Rust-Inhibiting Primer (FS TT-P-664).

First Coat: Lusterless Alkyd Enamel (FS TT-E-527).

Second Coat: Lusterless Alkyd Enamel (FS TT-E-527).

E. Zinc-Coated Metal:

1. High-Gloss Alkyd Enamel: Two (2) finish coats over primer.

Primer: Galvanized Metal Primer (FS TT-P-641).

First Coat: Alkyd Gloss Enamel (FS TT-E-489).

Second Coat: Alkyd Gloss Enamel (FS TT-E-489).

### 3-6 INTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Gypsum Drywall Systems:

1. Lusterless (Flat) Emulsion Finish: Two (2) coats.

Primer: Latex-Based Interior White Primer (FS TT-P-650).

Finish Coat: Latex-Based Interior Flat Paint (FS TT-P-29).

2. Semigloss Alkyd Enamel Finish: Three (3) coats with total dry film thickness not less than 2.5 mils.

Primer: Interior Latex-Based White Primer (FS TT-P-650).

First Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).

Second Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).

- C. Plaster:
1. Lusterless (Flat) Latex Finish: Two (2) coats.  
Primer: Latex-Based Interior Flat Paint (FS TT-P-29).  
Finish Coat: Interior Flat Odorless Alkyd Paint (FS TT-P-30).
  2. Semigloss Enamel Finish: Three (3) coats with total dry film thickness not less than 2.5 mils.  
Primer: Latex-Based Interior Flat Paint (FS TT-P-29).  
Undercoat: Interior Enamel Undercoat (FS TT-E-543).  
Finish Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).
- D. Woodwork and Hardboard:
1. Semigloss Enamel Finish: Three (3) coats.  
Undercoat: Interior Enamel Undercoat (FS TT-E-543).  
First Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).  
Second Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).
- E. Ferrous Metal:
1. Semigloss Enamel Finish: Two (2) coats over primer with total dry film thickness not less than 2.5 mils.  
Primer: Synthetic Rust-Inhibiting Primer (FS TT-P-664).  
Undercoat: Interior Enamel Undercoat (FS TT-E-543).  
Finish Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).

END OF SECTION

## WOOD REPAIR

### PART 1 - GENERAL

#### 1-1 USE OF DOCUMENTS

- A. These specification sections have been written for deficiencies identified in Chapters 3 through 8. An extensive existing conditions survey of the buildings and the corresponding historical/architectural research, undertaken in 1994, was the basis for determining the Scope of Work. No contract or construction work should incorporate these documents without further project specific editing, review of the existing conditions and updating of these technical specifications to cover recent techniques in the treatment of historic fabric.

#### 1-2 WORK INCLUDES

- A. Installing new interior and exterior doors to match original - Buildings 1, 3-7
- B. Install dutchman repairs to wood columns - Building 5
- C. Replace rusting metal column plinth with wooden plinth to match adjacent plinths - Building 5
- D. Repair windows and dormers as required - Buildings 1, 3-7

#### 1-3 QUALITY ASSURANCE

- A. Field Constructed Mock-ups: Prior to start of wood restoration work, prepare the following sample panels in building where directed by Architect. Obtain Architect's acceptance of visual qualities before proceeding with the work. Retain acceptable panels in undisturbed condition, suitably marked, during construction as a standard for judging completed work.
  1. Wood Repair: Prepare sample panels for each type of woodwork indicated to be patched, resurfaced, modified, or replaced. Prepare mock up panels on existing woodwork to demonstrate quality of materials and workmanship.

#### 1-4 REFERENCES

- A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards", Premium Grade, published by the Architectural Woodwork Institute (AWI), except as otherwise noted.

## 1-5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each product indicated including chemical analysis and recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.
- B. Restoration Program: Submit written program for each phase of the restoration process, including protection of surrounding materials on building during operations. Describe in detail materials, methods, and equipment to be used for each phase of restoration work.
- C. Shop Drawings: Submit shop drawings showing location of each item, dimensioned plans and elevations, large scale details, attachment devices, and other components.

## 1-6 PROJECT CONDITIONS

- A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for woodwork installations areas. Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
- B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

## 1-7 JOB CONDITIONS

- A. Determine that surfaces to which finishes are to be applied are even, smooth, sound, clean, dry and free from defects affecting proper application. Correct or report defective surfaces to Contracting Officer.

## PART 2 - MATERIALS

### 2-1 MATERIALS

- A. Replacement wood: match species, grade, grain pattern, and other special characteristics of existing woodwork.
- B. Patching Materials: Standard filler manufactured specifically for restorative patching of woodwork. Tint filler to match existing woodwork.
- C. Sandpaper: No.3/0 or No.5/0 garnet paper.

- D. Glue: White waterproof wood glue, complying with ASTM C3110, "Specification for Adhesive Wood in Non-Structural Glued Wood Products."
- E. Steel Wool: Grade 000 steel wool.
- F. Cloth: Clean cotton waste.
- G. Solvent: Combination - 75% toluene, 24% acetone, 1% butyl acetate.

### **PART 3 -EXECUTION**

#### **3-1 NEW OR REPLACEMENT MATERIALS**

- A. All replacement doors should conform to the descriptions found in Chapter 3 of this HSR.
- B. Condition woodwork to average prevailing humidity conditions in installation areas prior to installation
- C. Backprime woodwork on all surfaces which will be concealed with one coat of wood primer. Schedule delivery to allow time for application and drying of backprime coat before installation of woodwork.
- D. Remove miscellaneous hardware, nails, etc., from all existing woodwork as required to provide a first class installation of new or replacement woodwork.
- E. Prior to installation of new architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.
- G. Install the work plumb, level, true, and straight with now distortions. Shim as required using concealed shims.
- H. Cut to fit unless specified to be shop fabricated or shop cut to exact size. Where woodwork abuts other finished work, scribe and cut for accurate fit. Before making cutouts, drill pilot holes at corners.
- I. Standing and running trim: Install with minimum number of joints possible, using full length pieces, from maximum length of lumber available, to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and comply with Quality Standards for joinery.
- J. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads

are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

- K. Refer to DIVISION - 9 for final finishing of new or replacement woodwork.

### **3-2 REPAIR EXISTING MATERIAL**

#### **A. Replacing Deteriorated Material**

1. Carefully remove, at locations indicated, any damaged or deteriorated woodwork. Unless indicated otherwise, replace the entire length of the existing damaged piece to the next butt joint.
2. For partial replacement of existing pieces, use a neat, well-fitted level cut with grain aligned in transparent finished wood.
3. Install new pieces as described elsewhere in this section.
4. Finish replacement woodwork to match adjacent woodwork surfaces.
5. Refer to Division - 9 sections for final finishing of woodwork.

#### **B. Patching Existing Material**

1. Patch all holes and cracks in woodwork up to ½" across with wood filler tinted to match existing wood.
2. Carefully hand rub filled area with a fine grit sandpaper to match surface characteristics of adjacent woodwork.
3. Touch-up patch during finishing so that color and other appearance characteristics of filled area match the finish of adjacent woodwork. Refer to Division - 9 sections for final finishing of woodwork.
4. Patch holes and cracks in woodwork ½" and greater across and woodwork damaged from hardware changes with wood plugs or wood patches.
5. Rout out holed or cracked woodwork to receive plug or patch materials. Veneer type patches shall be a minimum of ¼" thick.
6. All repair plugs and patches in wood with a transparent finish shall have grain aligned.

**C. Resurfacing Existing Woodwork**

1. Remove all minor surface imperfections such as scratches, dents, etc., by rubbing surface with a fine grit sandpaper.
2. For holes and cracks, patch as described above.
3. Do not remove more than 1/16" thickness of materials. Maintain levelness of surface over entire width or length of woodwork piece.
4. Touch-up resurfaced area during finishing so that color and other appearance characteristics to match the finish of adjacent woodwork. Refer to Division - 9 for final finishing of woodwork.

END OF SECTION

## REHABILITATING WOOD WINDOWS AND DOORS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance for the rehabilitation of wood windows. Outlined are the steps one might go through to complete repairs. Each step is cross-referenced to one or more procedures which covers the particular problem. The cross-referenced procedures should be reviewed prior to beginning window repairs.
- B. The steps in the repair of deteriorated sash and doors include but are not limited to the following:
  - 1. Examination, survey and condition assessment of windows and doors.
  - 2. Removal of existing sash, doors, trim, etc.
  - 3. Repair of deteriorated wood through the use of epoxies, dutchmen and/or the replacement with new wood to match the existing appearance.
  - 4. Painting/refinishing sash, doors, and trim.
  - 5. Installation of repaired sash and doors.

#### 1-2 SUBMITTALS

- A. Shop drawings for each type of window, including 1/4-inch scale wall elevations, typical unit elevations at 3/4-inch scale, glazing details, and full-size details of typical composite members, include window rehabilitation, wood and hardware replacement, reglazing details and weatherstripping.
- B. The Contracting Officer reserves the right to require additional samples that show fabrication techniques and construction and design of hardware and accessories.

#### 1-3 SEQUENCING AND SCHEDULING

- A. Rehabilitation of windows and doors shall be completed before doing any interior restoration/rehabilitation work to insure weather-tight integrity of interior spaces.

## **PART 2---PRODUCTS**

### **2-1 MATERIALS**

NOTE: See specific procedures for materials and equipment requirements, and their manufacturers and sources.

## **PART 3---EXECUTION**

### **3-1 EXAMINATION**

- A. Conduct a window-by-window and door-by-door survey to determine existing conditions and identify the specific work needs of each window and door.
- B. For each window type, the survey should include color photographs which show design details for comparison to new work, and existing conditions.
  - 1. Full frame views, both interior and exterior.
  - 2. Close-up views of typical details, both interior and exterior.

### **3-2 ERECTION, INSTALLATION, APPLICATION**

- A. Carefully remove window stops, sash, doors and trim as required. Remove only those features which cannot be repaired on-site. All disassembled parts should be indelibly marked or stamped on hidden parts so they can be returned to their exact location.
- B. Replace rotted window sills as required.
  - 1. See "Replacing a Wood Window Sill"
- C. Repair, replace, or rebuild all rotted or deteriorated wood features. These can include but are not limited to stiles, rails, muntins, joints, frame, trim. New work shall match existing profiles or shapes in every respect and shall be flush with existing adjacent surfaces.
  - 1. See "Epoxy Repair for Deterioration and Decay in Wooden Members"
  - 2. See "Repairing Cracks and Checks in Wood Wall Ornament"
  - 3. See "Repairing Scratches, Gouges and Dents in Wood Wall Ornament"
  - 4. See "Dutchman Repair of Wood Floor Boards"
- D. Remove paint from both interior (where applicable) and exterior surfaces.

1. See "Chemically Removing Paint From Wood Features"
  2. See "Removing Paint From Wood Features Using Thermal Methods"
- E. Remove all deteriorated glazing putty and broken glass. Replace glass and reglaze with a flexible elastomeric glazing compound. Clean the existing historic glass. See "Replacing Broken Glass in Wood and Metal Windows"
- F. Reinstall windows. Inspect pull chains and weights at all double hung windows and adjust, clean or replace as required to ensure proper operation. Lubricate all working parts to assure smooth operation.
1. See "Repairing Double-Hung Window Sash Weights and Cords/Chains"
- G. Provide weatherstripping as required.
1. See "Installing Weatherstripping on Metal Double-Hung Windows"
- H. Refinish both interior and exterior sides of sash, doors, frames, and trim with appropriate paint, stain or natural finish as specified.
1. See "Painting".
- I. Hardware:
1. All window hardware shall be removed, marked for proper room number and location, boxed or packaged, and collected in a central location for the Contractor who shall polish all the hardware before reinstallation.
  2. All hardware to be removed before paint stripping, cleaned to bare metal and repaired to its original condition.
  3. Where hardware is missing or damaged, provide new hardware of same design and material as original hardware.

### 3-3 PROTECTION

- A. Begin and maintain protection and other precautions required through the remainder of construction period to ensure that newly rehabilitated window and door units will not be damaged throughout the remainder of any restoration or rehabilitation work.

**END OF SECTION**

## REPLACING A WOOD WINDOW SILL

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on replacing a severely deteriorated wood window sill.
- B. To arrest deterioration, repair sill with epoxy consolidant (see "Epoxy Repair for Deterioration and Decay in Wooden Members"). If sill is beyond repair, it must be replaced (see procedure outlined below).

#### 1-2 SYSTEM DESCRIPTION

- A. A wood window sill in good condition is free from decay and sloped away from the building to shed water. The connection between sill and jamb is tight and well caulked. The sub-sill should have a drip on the bottom that prevents water from entering the building under the window assembly.

#### 1-3 DEFINITIONS

- A. Window apron - A flat broad piece of finished lumber or trim placed directly under a window sill.
- B. Window stool - A horizontal board on a window sill which forms a base on which the casing rests.

### PART 2---PRODUCTS

#### 2-1 MATERIALS

- A. Lumber for new sill and subsill (match species, size and grain direction of original)

#### 2-2 EQUIPMENT

- A. Prybar
- B. Wide blade putty knives
- C. Back saw
- D. Chisel

- E. Hacksaw
- F. Router
- G. Caulk

### **PART 3---EXECUTION**

#### **3-1 ERECTION, INSTALLATION, APPLICATION**

- A. Remove stool and apron from interior of window. Pry apron off and tap stool out from under jambs.
  - 1. Insert the blade of a wide putty knife between the apron and the wall; carefully tap a prybar into the same gap, allowing the knife blade to protect the wall.
  - 2. Using the wall as a fulcrum, work the apron away from the wall until a nail is visible, hold the gap open with a piece of blocking or another prybar.
  - 3. Continue working at each nail location until the next nail is exposed. When all of the nails have been exposed, the apron should easily lift off.
- C. Attempt to tap sill out of place. If this is not possible, measure sill thoroughly for replacement then saw or chisel sill out carefully. Follow same directions to remove sub-sill, if required.

NOTE: The sill may be nailed at rail or under weatherstripping.

- D. Remove exposed portions of nails that secured the dados.
- E. If required, new sub-sill must be installed first. Rout a drip to underside of sub-sill to prevent water from entering wall from under window.
- F. Cut sill to match original and sand sill before installation. Bevel ends slightly to ease installation.
- G. Nail sill into casing from underneath. Countersink nail and fill hole with putty and seal. Seal edge of sill with caulk at jamb connection.
- H. Prime and paint (see "Painting").

**END OF SECTION**

## EPOXY REPAIR FOR DETERIORATION AND DECAY IN WOODEN MEMBERS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on stabilizing decayed wood members with epoxy consolidant and filler.
- B. Deterioration and decay in wood results from moisture infiltration, accompanying fungal growth and insect infestation. Paint, caulk, and sealant failures are also a major cause of wood deterioration.
- C. Some sources of moisture may include the original moisture in green wood, rainwater, condensation, ground water, piped water, and water released by water-conducting fungus through the process of decay itself.
- D. Epoxy repair may be appropriate if:
  - 1. the piece to be repaired is historically significant. Epoxy repair makes it possible to retain most of an original component by selectively repairing only the damaged area.
  - 2. if the piece is decorative and replacement would be too expensive or impossible.
- E. Epoxy repair may NOT be appropriate if:
  - 1. the piece is a structural member. Epoxy has adequate compression strength, but is not the best choice to repair a member in tension. In this case, replacement is usually a better option.
  - 2. the wood to be repaired is to remain unpainted, as the epoxy is quite different in appearance than wood. In this case, the wood should be selectively replaced.
  - 3. if the area to be repaired is large, as epoxy repair can be expensive.

### PART 2---PRODUCTS

#### 2-1 MANUFACTURERS

- A. Conservation Services  
8 Lakeside Trail  
Kinnelon, NJ 07405  
201/838-6412

- B. Abatron, Inc.  
5501 95th Ave.  
Kenosha, WI 53144  
800/445-1754 or 414/653-2000
- C. Roux Laboratories  
5344 Overmyer Dr.  
Jacksonville, FL 32205  
904/693-1200

## 2-2 MATERIALS

- A. Epoxy consolidant and epoxy filler, both are multiple part compounds. Purchase by the gallon unless a large amount of epoxying needs to be done. Use one of the following, or approved equal:
  1. "Con Serv (T) Flexible Consolidant 100" (Conservation Services): Cures slowly with a 5 to 7 hour application time to allow deep penetration. Complete hardness is achieved in 3 to 6 days.
  2. "Con Serv (T) Flexible Patch 200" (Conservation Services): A four part putty-like filler; Is not easy to mix in small amounts; Consistency and hardness are easily controlled with this material.

NOTE: The products of Conservation Services are recommended for treatment of thicker wood such as window sills. Because of its slower curing time, it allows for deeper penetration into members.

3. "Liquidwood-1" Consolidant (Abatron): Solidifies in a short period of time.
4. "Woodepox-2" Adhesive Paste (Abatron): A two-part paste mix; final hardness is determined by varying the ratio of the two parts. The LiquidWood can be used as a thinner, but this reduces the flexibility of the filler.

NOTE: These Abatron products are recommended for use on smaller members such as window sashes where deep penetration of consolidant is not required. The quick drying feature is an advantage for small, but repetitive jobs. Abatron carries twenty different types of wood consolidants with varying degrees of penetration.

- B. Oil clay that can be purchased from a hobby store – used to keep consolidant from leaking through cracks.
- C. Nitril Rubber Gloves (Abatron)

- D. Disposable vinyl gloves: Available from drug store or pharmaceutical supply distributor in 50 count or larger boxes.

## 2-3 EQUIPMENT

- A. Plastic bottles, like those used for hair dye, to apply the consolidant; having many on hand is recommended. Cleaning of the bottles for reuse is possible.
- B. Applicator bottles: Available from drug store and sold for hair dye application usually in 8 fl. oz. size; Also available in bulk from Roux Laboratories. Roux Color Applicators lend themselves more easily to cleaning and reuse.
- C. Rags of different sizes to wipe up spills before epoxy has a chance to harden, small rags are recommended for quick one time uses such as wiping off spouts and caps.
- D. Thin wooden sticks, approximately 8" long for scooping out paste and mixing consolidant.
- E. Goggles and a respirator for protection from fumes.
- F. Putty knives for application of filler
- G. Channel lock pliers for opening stuck caps
- H. Allen wrench to clean out cap holes
- I. Needle nose pliers to pull out hardened epoxy
- J. 1/8"x8"x12" Masonite boards for mixing paste filler
- K. Carbon dioxide fire extinguisher: Curing epoxy creates heat that may cause fire
- L. Rotary saw
- M. Air compressor
- N. Drill
- O. Stiff bristle brushes

## PART 3---EXECUTION

### 3-1 EXAMINATION

- A. Detect rot using the "Pick Test":
  - 1. Insert an ice pick into the wood at a slight angle.
  - 2. Lift the pick out. If the wood splinters in long pieces, the wood is not decayed. If the wood snaps where the pick is being lifted, the wood is decayed.
- B. When rot is discovered:
  - 1. Determine the source of moisture infiltration and eliminate it.
    - a. If rot is only present on the surface, drying is all that is necessary to stop the spread of decay and kill off any growth.
  - 2. If source of moisture is unknown, treat the wood with a preservative.
    - a. Preservatives are caustic chemicals and should be handled with care.
    - b. A particularly dangerous wood preserving chemical is pentachlorophenol (a.k.a. penta).  
  
**CAUTION: THIS CHEMICAL IS CARCINOGENIC AND ITS USE IS BANNED IN MANY STATES.**
  - 3. Preservatives will eliminate fungal growth, but generally do not restore strength to the deteriorated wood material.

### 3-2 PREPARATION

- A. Surface Preparation:
  - 1. Dry affected wood member completely to arrest further decay. Dry in place if possible -or- remove the member and keep in a cool dry place until dry.

**CAUTION: IF THIS PRECAUTION IS NOT TAKEN, THE EPOXY CAN ACTUALLY TRAP MOISTURE IN WOOD FIBERS AND ACCELERATE THE DECAY PROCESS.**

- 2. Have all materials at hand before the mixing process begins.

3. Label all caps and lids so that a cap or lid is not placed on the wrong container or it may remain there permanently.

### 3.3 ERECTION, INSTALLATION, APPLICATION

CAUTION: AS EPOXIES CURE, HEAT IS PRODUCED. FOR THIS REASON, EPOXIES SHOULD BE USED IN SMALL QUANTITIES TO DETER EXTENSIVE HEAT BUILD-UP. CARE SHOULD BE TAKEN WHEN USING EPOXY ON A HOT DAY.

A. Repair decayed wood using epoxy wood consolidant:

1. Drill 1/4" or 3/16" holes in affected wood to receive epoxy consolidant:
  - a. Drill holes at an angle and spaced approximately 2" on center in staggered rows. The top of one hole should line up with the bottom of the next hole.

CAUTION: BE SURE NOT TO DRILL THROUGH THE ENTIRE SURFACE FOR CONSOLIDANT WILL LEAK OUT FROM BEHIND.

- b. Dam any surface cracks with oil clay so that epoxy will not leak.
2. Remove sawdust and dirt from drilled holes using compressed air or stiff bristle brushes.
  3. Following manufacturer's instructions, mix a small amount of the consolidant components (resin and hardener) together in an applicator bottle. Stir the mixture thoroughly by hand with a thin stick for 4 minutes or with a bent coat hanger chucked into a drill for 2 minutes.
  4. Using a large plastic syringe or squeeze bottle and tube spout, carefully squirt the consolidant into the pre-drilled holes. Completely saturate the wood, moving from hole to hole refilling until the wood can hold no more. More than one application may be needed.
  5. Wipe off any excess consolidant or spills and cover the treated area to protect until cured as directed by epoxy manufacturer.
  6. If severed pieces need to be re-attached, glue them in place with a mixture of consolidant and filler.
- B. When the consolidant has cured, fill the voids in the surface with epoxy filler (wood-epoxy putty):

1. Mix the two part epoxy filler following the same procedures for mixing consolidant in Section 3.03 - A.3. above. Mix filler to achieve the consistency of a glazing compound that can be worked with a putty knife.
2. Apply the filler to the surface:
  - a. For large voids, apply filler in 1" thick layers. This reduces the possibility of problems associated with heat build-up.
  - b. Build up filler layers slightly above the wood surface to allow for planing and sanding smooth after it has cured.
3. When the filler has cured, sand or plane the surface smooth.
4. Apply a wood preservative to surrounding wood surfaces and prime and paint the entire surface.

**END OF SECTION**

## REPAIRING CRACKS AND CHECKS IN WOOD WALL ORNAMENT

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on repairing cracks and checks in wood either filling, regluing or using a dutchman.
- B. Cracks and checks in interior wood wall ornament are usually caused by uneven shrinkage, impact damage, or improperly placed fasteners.

#### 1-2 DEFINITIONS

- A. Interior wood wall ornament may include, but not be limited to, crown moulding, chair rail, wainscoting, base, door and window casings and trim, columns and posts, carved relief pieces, and built-in cabinets and bookcases.

### PART 2---PRODUCTS

#### 2-1 MATERIALS

- A. Wood filler: Available from hardware store; Tint to match existing woodwork.
- B. Paint and debris remover (paint or chemical): Available from hardware store.
- C. Wood glue: Available from hardware store.
- D. Replacement stock for dutchman: Available from builder's supply store or lumber yard.
- E. Sandpaper: No. 3/0 or No. 5/0 garnet paper.

#### 2-2 EQUIPMENT

- A. Heat gun or plate
- B. Clamps
- C. Table saw to cut dutchman shims
- D. Knife to cut excess shim

**PART 3---EXECUTION****3-2 EXAMINATION**

- A. If a check is a result of dried or shrunken end grain, it must be filled.
- B. Checks on the underside of logs with no direct water infiltration generally do NOT need filling.

**3-2 ERECTION, INSTALLATION, APPLICATION**

- A. Filling cracks and checks (for small surface cracks up to 1/2" across):
  - 1. Use a proprietary wood filler, or sawdust mixed with white glue. Work into crack so that no gaps remain.
  - 2. When dry, hand rub filled area with a fine grit sandpaper to match surface characteristics and level of surrounding surfaces.
  - 3. Refinish as required to match remaining ornament.
- B. Regluing cracks and checks (for larger cracks that penetrate into the wood ornament):
  - 1. Strip paint and debris from crack area. Before regluing, make sure joint can be forced back together.
  - 2. Widen joint slightly to get glue in and work joint open and closed to spread glue.
  - 3. Clamp joint closed using blocks of wood under clamps to protect wood. Remove all excess glue before it dries.
  - 4. Let glue dry for 24 hours before removing clamp.
  - 5. Refinish as necessary to match surrounding ornament.
- C. Dutchman replacement (for larger cracks that cannot be filled or glued):
  - 1. Cut long, slender, tapered shims from wood of same age, species and grain orientation as piece being patched.
  - 2. Pre-fit shim into crack. When shim fits, glue both shim and crack surface and remove all excess glue.
  - 3. After glue dries, cut shim flush with face of panel and refinish as necessary to match remaining ornament.

**END OF SECTION**

## REPAIRING SCRATCHES, GOUGES, AND DENTS IN WOOD WALL ORNAMENT

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on repairing scratches, gouges and dents in wood by sanding and filling with putty as required.
- B. Scratches, gouges and dents in wood wall ornament are usually the result of an abrasive object coming into contact with the surface of the wood member in question. This type of damage is usually avoidable if care is taken around wood surfaces.

#### 1-2 DEFINITIONS

- A. Interior wood wall ornament may include crown moulding, picture rail, chair rail, wainscotting, base, and casing.
- B. For the purpose of this procedure, repair of interior wall ornament may also pertain to interior wood wall covering and trim; ceiling covering, trim, and ornament; door trim; window trim; ornamental columns and posts; and built-in cabinets and bookcases.
- C. Scratches are slight marks produced by rubbing, scraping or tearing with something sharp or rough. Gouges are blunt grooves or holes and are generally deeper than scratches. Dents are depressions or hollows made by a blow or by pressure.

### PART 2---PRODUCTS

#### 2-1 MATERIALS

- A. Sandpaper
- B. Wood stain
- C. Linseed oil putty
- D. Wood filler (there are four basic types):
  - 1. Water-mix Wood Putty: Easy to tint and fairly resilient, but has poor moisture resistance.
  - 2. Solvent-based Wood Filler: Not tintable, but has many color choices. A solvent is needed to clean any excess or spills. It is difficult to sand, but has good adhesion and moisture resistance. It also has a problem with shrinkage.

3. Acrylic Latex Wood Filler: Better than water-based in adhesion, moisture resistance, and flexibility. Apply the filler in layers to avoid shrinkage.
4. Two-part Polyester Filler: Similar to auto body filler. It has excellent adherence and moisture resistance with minimal shrinkage. It stains easily, but is time consuming to prepare.

## 2-2 EQUIPMENT

- A. Putty knife to apply filler
- B. Any mixing tools required for filler.
- C. Steam iron and moist cloth

## PART 3---EXECUTION

### 3-1 EXAMINATION

- A. Inspect for paint that is worn, chipped, peeling, blistered, or flaking. If any of these conditions exist there may be moisture entering the feature. Check for possible sources of this moisture and correct as necessary.
- B. Inspect for the signs of decay and/or insect infestation and make repairs as necessary.

### 3-2 ERECTION, INSTALLATION, APPLICATION

- A. Carefully hand rub scratches and minor surface imperfections with a fine grit sandpaper. Match patina of unscratched wood by selective staining. Do not remove more than 1/16" thickness of the material. Maintain levelness of surface over entire width or length of wood piece.
- B. Small gouges and nail holes can be filled using linseed oil putty. Stain the putty to match using the sediment from the bottom of the stain can, or use universal tints.
- C. For large holes, use a sandable filler. Stain to match as above (if needed).
- D. Lift dents with steam iron and moistened cloth. Moisture will raise the grain of the wood surface and it will have to be sanded smooth and refinished.
- E. Touch-up resurfaced area during finishing so that color and other appearance characteristics match the finish of adjacent woodwork.

**END OF SECTION**

## DUTCHMAN REPAIR OF WOOD FLOORBOARDS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on repairing small localized damage to wood floorboards by cutting out a geometric piece of the board slightly larger than the damaged area and replacing it with a piece of wood cut and fit to match. This method of repair - called a dutchman - enables as much of the original material to be retained as possible.
- B. This procedure may also be used for making small repairs to wood trim and may include filling holes left from heating or plumbing pipes.

#### 1-2 DEFINITIONS

- A. A wood floor surface can be either a series of connected planks or parquet (small wood pieces arranged in decorative patterns). The wood used is either plain sawn or quarter sawn. Plank flooring, the more common type, is assembled by joining: butt joint, tongue and groove, shiplap, doweled or spline. Wood floors are usually secured to the under structure by countersinking nails, blind-nailing, or screwing and plugging.

### PART 2---PRODUCTS

#### 2-1 MATERIALS

- A. Wood for dutchman (match existing material to be repaired including species, saw/grain)
- B. Wood glue such as Elmer's or equivalent
- C. Sandpaper

#### 2-2 EQUIPMENT

- A. Hammer
- B. Chisel
- C. Plane

**PART 3---EXECUTION****3-1 ERECTION, INSTALLATION, APPLICATION**

- A. Remove damaged portion with hammer and chisel.
  - 1. Cut an irregular geometrically-shaped cavity in the wood that is slightly larger than the damaged area. Select a geometric shape that is easy to reproduce such as a diamond or trapezoid, but is not obvious to the eye (a plug in the shape of a circle or square is more apparent).
  - 2. Bevel the edges of the cavity.
- B. Fabricate a plug to match the surface cavity bevel from matching wood stock. Make sure that the grain direction also matches. Glue the plug into the cavity.
- C. Allow the glue to dry, then plane or sand if necessary and refinish to match surrounding floor.

**END OF SECTION**

## REMOVING PAINT FROM WOOD FEATURES USING THERMAL METHODS

BEFORE UNDERTAKING ANY PROJECT INVOLVING PAINT REMOVAL, APPLICABLE STATE AND FEDERAL LAWS ON LEAD PAINT ABATEMENT AND DISPOSAL MUST BE TAKEN INTO ACCOUNT AND CAREFULLY FOLLOWED. STATE AND FEDERAL REQUIREMENTS MAY AFFECT OPTIONS AVAILABLE TO OWNERS ON BOTH PAINT REMOVAL AND REPAINTING. THESE LAWS, AS WELL AS ANY REQUIREMENTS PROHIBITING VOLATILE ORGANIC COMPOUNDS (VOCs), SHOULD BE REQUESTED FROM THE STATE HISTORIC PRESERVATION OFFICER IN EACH STATE. REGULATORY INFORMATION MAY ALSO BE REQUESTED FROM THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REGIONAL OFFICE AND/OR THE STATE OFFICE OF ENVIRONMENTAL QUALITY.

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on removing paint from interior and exterior wood features using thermal methods
- B. In general, heat should not be used on windows. If, however, a thermal method is used, the glass should be removed to a safe storage place to be reinstalled, or protected from the sudden temperature change which can cause breakage. An overlay of aluminum foil on gypsum board or asbestos can protect the glass from such rapid temperature change.
- C. Safety Precautions:
  - 1. Use appropriate safety precautions such as gloves, goggles and respirators. Old paint layers will likely contain lead. Avoid breathing paint dust during removal.
  - 2. No food or drink shall be allowed near any work station so as to prevent contamination from paint, paint chips or dust which contain lead and other toxic substances.
  - 3. Protective clothing shall be removed at the end of each day and kept at the site to prevent workers from tracking dust and paint chips to other parts of the site or to their homes.
  - 4. Wash hands and face often, especially before eating and at the end of the day.

## 1-2 REFERENCES

- A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

## 1-3 DEFINITIONS

- A. Thermal Methods: as used herein shall apply to either of the two approved (by the Secretary of the Interior) methods of paint removal using heat. This includes the heat plate and the heat gun.
- B. BLOW TORCHES ARE NOT RECOMMENDED BY THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION PROJECTS AND SHOULD NOT BE USED.

## PART 2---PRODUCTS

### 2-1 MANUFACTURERS

- A. For Heat Plate:
  - 1. Hyde Manufacturing  
54 Eastford Road  
Southbridge, MA 01550  
508/764-4344
  - 2. The Old House Journal  
2 Main Street  
Gloucester, MA 01930  
508/281-8803
- B. For Heat Gun:
  - 1. Master Appliance Corporation  
2420 18th Street  
Racine, WI 53403  
414/633-7791
  - 2. The Old House Journal  
2 Main Street  
Gloucester, MA 01930  
508/281-8803

## 2-2 EQUIPMENT

- A. Electric Heat Plate such as "Hydelectric Heat Plate" (Hyde Tools), the "Warner Heat Plate", or approved equal.
  - 1. Operating temperature between 500o F. and 800o F.
  - 2. Works by means of a red hot coil, much like a burner on an electric stove at operating temperatures high enough to soften the paint layers without vaporizing the lead in any lead paint layers.
- B. Electric Heat Gun such as Master's Model Number 499, Master's HG-501 (Master Appliance Corporation) or approved equal.
  - 1. Heavy duty heat gun with metal case.
  - 2. Operating temperature between 500o and 750o F.
  - 3. The heat gun heats a much smaller area at a time than does the heat plate. The danger in using a heat gun is that the hot air blast can ignite dust, birds' nests, or other debris within a wall cavity or behind a cornice or soffit. The dust can smolder only to ignite hours later after the work crew has gone home so extreme caution must be taken when using this method.
- C. A number of replacement heat elements for heat gun should also be kept on hand.
- D. Power Supply: Both devices draw approximately 15 amps of power. Each work station is to be provided with its own temporary power supply so as not to overload other circuits.
- E. A variety of putty knives and paint scrappers of different shapes and flexibility. Corners should be ground to a rounded shape to prevent gouging the wood surfaces. A glazers 5-in-1 tool also works well.
- F. Extension Cords: Proper, heavy-duty extension cords are required

## PART 3---EXECUTION

### 3-1 EXAMINATION

- A. One of the main reasons for paint failure is excess moisture, both from internal and external sources. Before work is begun on removing the existing paint film or otherwise preparing the surface, all flashing and gutters and downspouts shall be inspected and repaired or replaced as required. Make provisions as required for removing excess moisture from areas of high humidity.

- B. All wood elements shall be carefully inspected for rot and, if deteriorated, marked for later replacement, after the paint has been removed.
- C. If accessible, check cavities behind cornices, soffits, etc. for bird's nests and other debris.

### 3-2 PREPARATION

- A. Protection:
  - 1. Protect adjacent surfaces, including grass, shrubs and trees with paper, drop cloths and other means.
  - 2. Items not painted which are in contact with or adjacent to painted surfaces shall be removed or protected prior to surface preparation and painting operations.
  - 3. All waste material shall be collected at the end of each work day and disposed of in a manner consistent with local environmental regulations. It is considered Hazardous Waste.
  - 4. Work area shall be sealed to prevent the spread of paint dust and debris beyond the work site.
  - 5. After paint removal is complete, all areas around the site shall be cleaned of all paint dust and debris, and such debris shall be properly disposed of in a manner consistent with local environmental regulations. Vacuums used to clean up dust shall be equipped with High Efficiency Particulate Air (HEPA) filters.
  - 6. When using either thermal method, keep a fire extinguisher handy. Work should also be stopped several hours before the day's work is completed and the job site is vacated so that smoldering fires can be detected.

### 3-3 ERECTION, INSTALLATION, APPLICATION

- A. Place thermal device (heat gun or heat plate) over area to be stripped and heat paint until it begins to soften and wrinkle. Do not let paint bubble--at this high temperature the wood may become scorched.
  - 1. Use the heat plate on broad, flat surfaces such as clapboards, doors and window sills.

**CAUTION: NEVER PLACE THE HEAT PLATE DIRECTLY ON THE SURFACE. THE HEAT OF THE PLATE MAY IGNITE THE PAINT OR SCORCH THE WOOD.**

2. Use a heat gun on smaller, narrow or curved surfaces, on more intricate details or moldings, or solid wooden elements. Small parts of window sash such as the sash runs, stops, parting bead, etc. can also be successfully stripped using a heat gun.
- B. Using a scraper whose corners have been rounded, scrape and remove paint. With practice, the heat plate or gun and the scraper can be moved at the same time so that the paint comes off quickly, in long ribbons.
- C. To remove last traces of paint it may be necessary to go over surfaces with a liquid paint remover, see "Chemically Removing Paint from Wood Features".
- D. For guidance on repainting wood features, see "Painting".

### 3-4 ADJUSTING/CLEANING

- A. Upon completion of this work, all floors, walls and other adjacent surfaces that are stained, marred, otherwise damaged by work shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and orderly condition.
- B. All completed work shall be adequately protected from damage by subsequent building operations and effects of weather. Protection shall be by methods recommended by the manufacturer of installed materials and as approved by the Architect.

**END OF SECTION**

## CHEMICALLY REMOVING PAINT FROM WOOD FEATURES

BEFORE UNDERTAKING ANY PROJECT INVOLVING PAINT REMOVAL, APPLICABLE STATE AND FEDERAL LAWS ON LEAD PAINT ABATEMENT AND DISPOSAL MUST BE TAKEN INTO ACCOUNT AND CAREFULLY FOLLOWED. STATE AND FEDERAL REQUIREMENTS MAY AFFECT OPTIONS AVAILABLE TO OWNERS ON BOTH PAINT REMOVAL AND REPAINTING. THESE LAWS, AS WELL AS ANY REQUIREMENTS PROHIBITING VOLATILE ORGANIC COMPOUNDS (VOCs), SHOULD BE REQUESTED FROM THE STATE HISTORIC PRESERVATION OFFICER IN EACH STATE. (From Preservation Brief 28, "Painting Historic Interiors".) REGULATORY INFORMATION MAY ALSO BE REQUESTED FROM THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REGIONAL OFFICE AND/OR THE STATE OFFICE OF ENVIRONMENTAL QUALITY.

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on removing paint from interior and exterior wood features using chemical methods.
- B. Chemical strippers should be used on extremely intricate details that might be scorched by too long of an exposure to the blast from a heat gun. They are also useful as final cleanup after paint removal using one of the thermal methods. Follow manufacturer's instructions.
- C. Safety Precautions:
  - 1. Workers shall wear appropriate clothing to protect themselves against the harmful effects of paint stripping activity. Old paint layers will likely contain lead. Avoid breathing paint dust during removal.
  - 2. No food or drink shall be allowed near any work station so as to prevent contamination from paint chips, dust or chemical removers which contain lead and other toxic substances.
  - 3. Protective clothing shall be removed at the end of each day and kept at the site to prevent workers from tracking dust and paint chips to other parts of the site or to their homes.
  - 4. Wash hands and face often, especially before eating and at the end of the day.

## 1-2 REFERENCES

- A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

## 1-3 DEFINITIONS

- A. Chemical Methods: as used herein shall apply to the use of commercial chemical paint strippers.
1. "Do-it-yourself" chemicals available through local paint stores, hardware stores, building supply centers.
  2. Professional, heavy-duty type used by paint removal contractors, generally only available through the manufacturer and/or qualified contractors. May also be available by special order from local paint stores.
- B. Chemical paint strippers are divided into solvent-based, caustic-based, and alternative-based strippers.
1. Solvent-based: Most use methylene chloride to dissolve and swell varnish and/or paint film for removal. Some are water-rinsable.
    - a. Liquid: fast working; best used on horizontal surfaces, or for clean-up when using thermal methods.
    - b. Semi-paste: good for vertical and overhead surfaces, rounded features, intricate details.
    - c. Will soften oil-based paints, lacquers, varnishes and synthetic baked finishes.
    - d. Can be used on both hardwoods and softwoods without changing the color of the wood so that the feature can be refinished with a clear finish if desired.
    - e. Non-water rinsable products are safe for use on most water-based wood glues.
    - f. Before refinishing, surface must be completely cleaned of stripper residue but neutralization of the surface is not required.
    - g. Benzol is another solvent often used in the past in formulating solvent-based paint and varnish removers. **IT IS HIGHLY FLAMMABLE AND HIGHLY TOXIC AND ITS USE IS NO LONGER RECOMMENDED.**
  2. Caustic-based: Use sodium hydroxide, and to a lesser extent potassium hydroxide,

to decompose the binder in the coating. Proprietary products are mostly for commercial rather than "do-it-yourself" use.

- a. Liquid: used for dip-stripping of shutters, doors, furniture, etc.
  - b. Semi-paste: basis for most professional proprietary products; good on horizontal, vertical and overhead surfaces, also intricate details.
  - c. Will work on most types of coatings from oil-based and latex paints to sophisticated epoxy-ester finishes. Check with manufacturer for appropriate usage.
  - d. Will darken hardwoods so it should not be used on features made from oak, walnut, mahogany, and other hardwoods if a clear finish is to be used.
  - e. Because they are water-rinsable, caustic strippers will likely raise the grain on many woods so extra finish steps, such as sanding, may be required regardless of whether the surface is to be painted or given a clear finish.
  - f. Caustic strippers will dissolve many types of wood glues--a problem when stripping shutters, wood veneers, plywood, etc.
  - g. Surface must be neutralized with mild acid wash before refinishing.
3. Alternative-based: Water-based products which use nonflammable, biodegradable active ingredients to soften the paint. Most are water-rinsable, or removed with common household cleaners. Active ingredients include dibasic acid esters. Semi-paste form.
- a. Separate formulas for clear finish removal versus paint removal.
  - b. Require considerably more time to soften the old finish than either methylene-chloride-based or caustic-based strippers.
  - c. Can be used on both hardwoods and softwoods without discoloring the wood.

#### 1-4 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection: All chemicals shall be stored in metal cabinets. No cans shall be left open or out of the cabinet overnight.

**PART 2---PRODUCTS****2-1 MANUFACTURERS****A. For Chemical Paint Removers:**

1. AFM Enterprises, Inc.  
1140 Stacy Ct.  
Riverside, California 92507  
714/781-6860
2. Bix Manufacturing Co.  
P.O. Box 69  
Ashland City, TN 37015  
615/792-3260
3. Diedrich Technologies, Inc.  
7373 South 6th Street  
Oak Creek (Milwaukee), WI 53154  
800/323-3565 or 414/764-0058

Availability: Through contractors licensed by manufacturer, and authorized paint supply centers.

4. Dumond Chemicals, Inc.  
501 Broadway  
New York, NY 10036  
212/840-2666

Availability: Through contractors licensed by manufacturer, and authorized paint supply centers.

5. Klean-Strip  
P.O. Box 13146  
Memphis, TN 38113  
901/775-0100
6. Master Products, Inc.  
P.O. Box 274  
Orange City, IA  
800/747-3436 or 712/737-3436  
Distributors: Martin Paint or Herb Saltzman,  
Flushing, NY.

7. 3M D-I-Y Division Wood Refinishing Products  
P.O. Box 33053  
St. Paul, MN 55133-3053  
800/364-3577 or 612/737-6501

8. ProSoCo, Inc.  
755 Minnesota Avenue  
P.O. Box 1578  
Kansas City, KS 66117  
800/255-4255 or 913/281-2700

Availability: Through contractors licensed by manufacturer.

9. Red Devil, Inc.  
2400 Vauxhall Road  
Union, NJ 07083  
800/423-3845 or 201/688-6900

10. Reliable Remover & Lacquer Corporation  
62 Woolsey Street  
Irvington, NJ 07111  
201/399-2121

Distributor: Pacoa, 133-36 36 Road, Flushing, NY.

11. Savogran Company  
P.O. Box 130  
Norwood, MA 02062  
800/225-9872 or 617/762-5400

12. Specialty Environmental Technologies, Inc.  
4520 Glenmeade Lane  
Auburn Hills, MI 48326  
810/340-0400

13. Star Bronze Co.  
P.O. Box 2206  
Alliance, OH 44601  
216/823-1550

B. For Fumed Silica:

1. Miller-Stephenson  
P.O. Box 950  
Danbury, CT 06813

203/743-4447  
(distributors of epoxy materials)

2. Samuel Cabot, Inc.  
100 Hale Street  
Newburyport, MA 01950  
508/465-1900  
"Cab-o-sil"

## 2-2 MATERIALS

NOTE: Chemical products are sometimes sold under a common name. This usually means that the substance is not as pure as the same chemical sold under its chemical name. The grade of purity of common name substances, however, is usually adequate for stain removal work, and these products should be purchased when available, as they tend to be less expensive. Common names are indicated below by an asterisk (\*).

A. Solvent-based chemical paint remover such as any of the following, or approved equal:

1. Strypeeze Semi-paste (Savogran Company)
2. Super Strip Non-flammable and Zip Strip (Star Bronze Co.)
3. All Purpose Kwik Paint and Varnish Remover, Non-Flammable Sprayable Paint Remover, KS-3 Semi-Paste Paint Remover, Heavy Bodied Paint Remover (Klean-Strip, Inc.)
4. Peel Away II and III (Dumond Chemicals, Inc.)
5. Rock Miracle
6. Old Master's TM-4 Paint Remover (Master Products, Inc.)
7. Reliable #78 Liquid No-wash Paint Remover (Reliable Remover & Lacquer Corporation)
8. Semi-Paste #77, Liquid #99, Water-soluble #122 (Red Devil)
9. Spray-On Stripper (Bix)
10. 509 Paint Stripper (ProSoCo, Inc.)
11. 505 (Diedrich Chemicals)

-OR-

Caustic-based chemical paint strippers such as any of the following, or approved equal:

1. Peel Away I (Dumond Chemicals, Inc.)
2. 404 Rip Strip, 606/606X (Diedrich Chemicals)

-OR-

Alternative-based such as any of the following, or approved equal:

1. Safest Stripper (3M)
  2. MF, Stripper 66 (AFM Enterprises, Inc.)
- B. Plastic sheeting
- C. Cornstarch or fumed silica such as "Cab-o-sil" (Samuel Cabot, Inc.), or approved equal.
1. Used to thicken chemicals so they will adhere to vertical surfaces and ceilings.
  2. Fumed silica is also used as a filler in epoxy repairs.
  3. Available from grocery store.
- D. Denatured alcohol: (to remove last traces of chemical residue)
1. Other chemical or common names include Methylated spirit\*.
  2. Potential hazards: TOXIC AND FLAMMABLE.
  3. Available from hardware store, paint store or printer's supply distributor.
  4. Denatured alcohol should be a satisfactory substitute for ethyl alcohol for stain removing purposes.
- E. For Caustic-based paint strippers, neutralizer as recommended by paint stripper manufacturer, to return surface to neutral pH prior to refinishing.
- F. Steel wool, cheese cloth, or other cloths for final clean-up.
- G. Phenolphthalein: Used to test pH of a surface after stripping with alkaline chemicals. Available at some drug stores or chemical supply houses

## 2-3 EQUIPMENT

- A. Steel wool, scrapers and small picks to remove sludge
- B. Metal containers such as old coffee cans to dispose of sludge
- C. Putty knives and paint scrapers (of different shapes and flexibility)
- D. Natural bristle brushes or plastic spatulas as recommended by paint stripper manufacturer to apply stripper.
- E. Duct tape
- F. Spray equipment (only if recommended or provided by manufacturer)

## PART 3---EXECUTION

### 3-1 EXAMINATION

- A. One of the main reasons for paint failure is excess moisture, both from internal and external sources. Before work is begun on removing the existing paint film or otherwise preparing the surface, all flashing and gutters and downspouts shall be inspected and repaired or replaced as required. Make provisions as required for removing excess moisture from areas of high humidity.
- B. All wood elements shall be carefully inspected for rot and, if deteriorated, marked for later replacement, after the paint has been removed.

### 3-2 PREPARATION

- A. Protection:
  - 1. General: Comply with recommendations of manufacturers of paint strippers for protecting surrounding building surfaces against damage from exposure to their products.
  - 2. Protect adjacent surfaces, including grass, shrubs and trees with paper, drop cloths and other means. Items not painted which are in contact with or adjacent to painted surfaces shall be removed or protected prior to surface preparation and painting operations.
  - 3. All waste material shall be collected at the end of each work day and disposed of in a manner consistent with local environmental regulations. It is considered Hazardous Waste.

4. Work area shall be sealed to prevent the spread of paint dust and debris beyond the work site.
  5. All rags shall be disposed of nightly and removed from the building.
  6. Adequate ventilation should be provided in each area where solvents and strippers are used.
  7. A fully charged fire extinguisher suitable for solvent fires shall be kept in each area where work is going on.
  8. Contractor shall provide multiple fans with high CFM to move fumes out of the building and away from areas where work is being done.
  9. Compressor motors, heat lamps, etc., must be of explosion proof type.
  10. No spraying of solvents or strippers permitted unless specifically allowed by the manufacturer of the product being used.
  11. Do not operate a building's central heating system while stripping interior wood features using chemicals, or for several days afterwards. Chloride compounds in the vapors of these removers can combine with the combustion air and move into the furnace-burner compartment of the heating system. Chemical reactions occur with the flue gasses which create highly corrosive acids which can condense on the heat exchanger, vent piping, etc. Once started, the corrosion created by this acid, cannot be stopped.
  12. After paint removal is complete, all areas around the site shall be cleaned of all paint dust and debris, and such debris shall be properly disposed of in a manner consistent with local environmental regulations. Vacuums used to clean up dust shall be equipped with High Efficiency Particulate Air (HEPA) filters.
- B. Surface Preparation: Use scrapers of a variety of sizes and shapes, whose edges have been rounded, to remove loose paint before removal using chemicals.

### 3-3 ERECTION, INSTALLATION, APPLICATION

NOTE: WORK IN WELL-VENTILATED AREA TO AVOID INHALATION OF TOXIC FUMES.

- A. Lay the chemicals onto the surface in the manner and amount recommended by the manufacturer.
- B. Allow to sit or "dwell" according to the manufacturer's instructions. If required, cover with plastic wrap.

- C. Remove the sludge using scrappers and steel wool. A second application may be required on those areas where paint is especially thick and/or the detail is intricate.
- D. After removal has been completed, rub all surfaces down with denatured alcohol or water (for water rinsable strippers only) to remove all traces of chemical residue.
  - 1. For solvent-based strippers:
    - a. Most solvent-based chemicals also contain wax to help retard evaporation during the dwell period. Unless completely removed, this wax will inhibit the performance of the new finish.
    - b. Thoroughly rub all surfaces, and especially deep crevices, with denatured alcohol to remove all traces of remover. Mineral spirits will work as well, but it may also leave a somewhat oily residue.
  - 2. For caustic-based strippers:
    - a. Carefully and completely neutralize feature as directed by manufacturer to return surfaces to a neutral pH.
    - b. To test whether all chemicals have been removed dissolve a 2" piece of phenolphthalein in denatured alcohol.
    - c. Brush the solution onto the surface. If it turns a shade from pink to magenta there is still chemical residue.
    - d. Treat the surface with additional neutralizer and continue testing until there is no color change in the phenolphthalein solution. This test will work with any alkaline product.
    - e. Testing the damp surface with litmus paper until a pH level of 7 is achieved will also work if phenolphthalein is not available.
  - 3. For alternative-based strippers:
    - a. These products contain neither waxes nor strong alkalies so clean-up is simplified. Follow manufacturers instructions for removal or residue.
- F. For guidance on repainting wood features, see "Painting".

**3-4 ADJUSTING/CLEANING**

- A. Upon completion of this work, all floors, walls and other adjacent surfaces that are stained, marred, otherwise damaged by work shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and orderly condition.
- B. All completed work shall be adequately protected from damage by subsequent building operations and effects of weather. Protection shall be by methods recommended by the manufacturer of installed materials and as approved by the Architect.

**END OF SECTION**

## REPLACING BROKEN GLASS IN WOOD AND METAL WINDOWS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on replacing cracked, broken or missing panes of glass, replacing cracked or missing window putty and cleaning glazing.
- B. Broken or cracked glass panes and missing or cracked window putty may be the result of weather, neglect, or vandalism. In any case, it is a matter that requires immediate attention.
- C. For temporary repairs to broken glass until permanent replacement can be performed, see "Temporary Patching of Chips and Cracks in Window Glazing".

#### 1-2 SYSTEM DESCRIPTION

- A. A window glass is in proper condition when it is sets securely and tightly into the window frame, is properly caulked, and is not scratched, cracked, or broken.

#### 1-3 SEQUENCING AND SCHEDULING

- A. Coordination of Work: The coordination of glass repairing/replacing with other proposed work on the windows must be considered. For example, if window elements (frame, sash, trim, hardware, lintel, sill, etc.) paint removal, cleaning, or repairing is anticipated, it is generally better to postpone glazing work until after the completion of these activities.

### PART 2---PRODUCTS

#### 2-1 MANUFACTURERS

- A. For Glass:
  - 1. Advanced Coating Technology
  - 2. AFG Industries, Inc.
  - 3. Cardinal IG
  - 4. Environmental Glass Products
  - 5. Falconer Glass Industries

6. Ford Glass Division
7. Guardian Industries Corp.
8. Hordis Brothers, Inc.
9. LOF Glass, Inc.
10. Pilkington Sales (North America) Limited (wire glass)
11. PPG Industries, Inc.
12. Saint-Gobain/Euroglass
13. Spectrum Glass Prod. Div., H. H. Robertson Co.
14. Viracon, Inc.

## 2.2 MATERIALS

- A. Linseed oil putty (for wood windows)
- B. Materials for Removing Glazing Compound:

1. Paint remover

-OR-

Mineral Spirits (for lacquer thinner):

- a. A petroleum distillate that is used especially as a paint or varnish thinner.
- b. Other chemical or common names include Benzine\* (not Benzene); Naphtha\*; Petroleum spirits\*; Solvent naphtha\*.
- c. Potential Hazards: TOXIC AND FLAMMABLE.
- d. Safety Precautions:
  - 1) AVOID REPEATED OR PROLONGED SKIN CONTACT.
  - 2) ALWAYS wear rubber gloves when handling mineral spirits.
  - 3) If any chemical is splashed onto the skin, wash immediately with soap and water.

- e. Available from construction specialties distributor, hardware store, paint store, or printer's supply distributor.

-OR-

Muriatic acid (generally available in 18 degree and 20 degree Baume solutions):

- a. A strong corrosive irritating acid.
- b. Other chemical or common names include Chlorhydric acid; Hydrochloric acid; Hydrogen chloride; Marine acid\*; Spirit of salt\*; Spirit of sea salt\*.
- c. Potential Hazards: TOXIC, CORROSIVE TO FLESH; CORROSIVE TO CONCRETE, STEEL, WOOD OR GLASS, FLAMMABLE.
- d. Available from chemical supply house, drugstore or pharmaceutical supply distributor, or hardware store.

-OR-

Linseed oil or thinned primer

- C. Glass to match existing (see 2.01 Manufacturers)
- D. Glazier's points (if old ones are not usable)
- E. Neoprene setting blocks and shims
- F. Clean, potable water
- G. Ammonia
- H. Paper towels or rags

### 2-3 EQUIPMENT

- A. For Replacing a Window Pane:
  - 1. Goggles and gloves for protection when removing broken glass
  - 2. Hammer and chisel
  - 3. Soldering iron wrapped in foil, or a heat plate to remove old glazing compound
  - 4. Pliers and chisels for maneuvering glazier's points

5. Sandpaper
6. Very fine 0000 steel wool
7. Paint brush to apply primer
8. Glass cutter and straight edge
9. Putty knife or glazier's tool for smoothing glazing compound

## **PART 3---EXECUTION**

### **3-1 EXAMINATION**

- A. Check for cracked, broken, chipped, or otherwise damaged glass.
- B. Inspect glazing putty on both sides of pane for cracked, loose, or missing sections which allow water to attack the wood components, especially at the joints.
- C. Examine the condition of the wood window components for corrosion, loose connections, etc.
  1. Does glass rattle or move in the glazing system?
  2. Are glass stops intact?
- D. Inspect all surfaces which are to receive glass and/or glazing sealant for any defects or condition which will interfere with, or prevent a satisfactory installation. Correct all defects prior to installation of new glass.
- E. Verify the glass type in each window type prior to the installation of new glass.

### **3-2 PREPARATION**

- A. Surface Preparation:
  1. Prior to reglazing, remove all oil, dirt, rust and other materials from the glass and the wood framing members using solvents such as toluol or xylol.
  2. Prime and clean all glazing rabbets prior to glazing.
  3. Maintain glass in a reasonably clean condition during construction so that it will not be damaged by corrosive action.

### 3-3 ERECTION, INSTALLATION, APPLICATION

NOTE: BE SURE TO WEAR HEAVY GLOVES AND OTHER PROTECTIVE GEAR WHEN HANDLING GLASS.

- A. Remove existing glazing compound using one of the following four methods:
1. A hammer and chisel (at the risk of adjacent glazing).
  2. A soldering iron wrapped in foil or heat plate (can soften the compound to ease removal).
  3. Chemicals such as a paint remover, mineral spirits or muriatic acid.

CAUTION: THESE ARE POTENTIALLY HARMFUL AND SHOULD BE USED IN WELL VENTILATED AREAS ONLY.

4. Linseed oil (if the putty is linseed oil based - which most are).
- B. Remove glazier's points with pliers and reserve for reinstallation.
- C. Special Procedures For Wood Windows:
1. Thoroughly clean the sash of any remaining compound and sand grooves smooth.
  2. Apply linseed oil or thinned oil based primer to grooves to prevent wood from absorbing oil from new putty. If primer is used it should be applied in two coats, 24 hours apart.
- D. Cut new glass 1/8" smaller in length and width, than the opening.
1. Practice cutting on an unusable piece of glass first.
  2. Make sure the working surface is perfectly clean and do not press too hard with the glass cutter.
    - a. Old window glass is often quite thin, and also contains impurities and irregular internal tensions.
    - b. Pressure from the wheel cutter on even a tiny piece of dirt can cause the pane to split or "run" in all the directions.
  3. Cut straight pieces, use a straight edge as a guide.
    - a. Score the piece with one firm, even stroke of a sharp glass cutter dipped in oil.

- b. Tap along the line to break it off. Plastic glass-cutter's pliers can also be used to break the glass with a quick, downward snap.
4. For curved pieces:
    - a. Make a template out of thick cardboard or masonite board for scoring.
    - b. Score the piece with a sharp glass cutter following the edge of the template. **DO NOT TRY TO SCORE THE PIECE FREEHAND.**
    - c. Starting in the middle and working toward both ends gradually, use the ball end of the cutter and tap along the underside of the score. The score-line should fracture along the curve. Gradual curves may be broken off in one piece, but extreme curves must be cut by removing one small section of glass at a time.
  5. For pieces with complex cuts, employ a stained glass craftsman.
- F. Apply a small bead of glazing compound around the groove to cushion the new glass and then install glass spaced evenly on all sides.
  - G. Replace glazier's points 4" to 6" apart around perimeter, tap them halfway in.
  - H. Form glazing compound into a 3/8" diameter rope and press around perimeter of new glass. Using a putty knife, triangulate the surface of the compound. Hold the knife at a 45 degree angle and align compound with the muntin on the interior.
  - I. Allow the compound to dry for a week, then paint accordingly with a 1/16" moisture seal extending onto the surface of the glass.

### 3-4 ADJUSTING/CLEANING

- A. After the installation of each light, remove all markings and labels from the glass.
- B. Wash the glass on both sides with a mild solution of soapy water.

**NOTE: IN NO CASE SHALL ALKALINE OR ABRASIVE AGENTS BE USED TO CLEAN GLASS. CARE SHALL BE TAKEN DURING CLEANING TO AVOID SCRATCHING OF GLASS SURFACES BY USING GRITTY MATERIALS OR DRY CLOTHS.**

- C. Rinse thoroughly with clean, clear water or as recommended by the glass manufacturer.
- D. Dry both sides of glass with a soft cotton dry cloth.

- E. Clean and trim excess glazing compound from glass, frames and sash promptly after installation.
- F. Clean adjacent surfaces if spills have occurred.

**END OF SECTION**

## REPAIRING DOUBLE-HUNG WINDOW SASH WEIGHTS AND CORDS/CHAINS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on inspecting and correcting a faulty counterbalancing system. This problem may be caused by a missing sash cord/chain, an unattached or missing sash weight, or a pulley in poor condition.
- B. When a window sash will not stay open and slides back down to the closed position or when a window is difficult to slide, a faulty counterbalance system is often to blame.

#### 1-2 DEFINITIONS

- A. The counterbalance system in a double hung window is usually divided for the upper and lower sash. Each system contains sash weights, sash weight pulleys, sash cord/chain, sash cord slot located in the stiles of both of the sashes, and the weight access pocket in the jamb (Not in all double hung windows).

#### 1-3 SYSTEM DESCRIPTION

- A. A window sash in proper working order is freely sliding, has balancing and moving apparatus in working order, and has operable sash lock(s) to deter air infiltration.

### PART 2---PRODUCTS

#### 2-1 MANUFACTURERS

- A. Architectural Iron Co.  
Box 126, Schocopee Rd.  
Milford, PA 18337  
717/296-7722  
sash weights
- B. Barry Supply Company  
36 West 17th ST.  
New York, NY 10011  
212/242-5200  
pulleys, sash weights, old hardware
- C. Blaine Window Hardware, Inc.  
1919 Blaine Drive, R.D. 4

Hagerstown, MD 21740  
800/678-1919 or 301/797-6500  
pulleys

- D. Casting Unlimited  
P.O.Box 400  
Morris, NY 13808  
607/263-5194  
manufactures sash weights with your pattern or sample
- E. Hern Iron Works  
1900 Millview  
Couer D'Alene, ID 83814  
208/765-3115  
sash weights; has patterns for most sizes, requires  
minimum order
- F. The Woodstone Company  
P.O.Box 223, Patch Road  
Westminster, VT 05158  
802/722-3544  
sash manufacturer; will sell pulleys

## 2-2 MATERIALS

- A. Sash cord/chain to replace existing cord/chain
- B. Salvage sash weights if original ones are missing
- C. 1«" PVC pipe and sand or leadshot to fabricate replacement sash weight if necessary
- D. Pulley
- E. Oil, motorcycle-chain lube or powdered graphite to lubricate pulley
- F. Lye solution, or TSP is needed to remove paint from pulley
1. Trisodium Phosphate:

NOTE: THIS CHEMICAL IS BANNED IN SOME STATES SUCH AS CALIFORNIA. REGULATORY INFORMATION AS WELL AS ALTERNATIVE OR EQUIVALENT CHEMICALS MAY BE REQUESTED FROM THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REGIONAL OFFICE AND/OR THE STATE OFFICE OF ENVIRONMENTAL QUALITY.

- a. Strong base-type powdered cleaning material sold under brand names.
- b. Other chemical or common names include Sodium Orthophosphate; Tribasic sodium phosphate; Trisodium orthophosphate; TSP\*; phosphate of soda\*; (also sold under brand names such as).
- c. Potential Hazards: CORROSIVE TO FLESH.
- d. Available from chemical supply house, grocery store or supermarket or hardware store.

### 2-3 EQUIPMENT

- A. Stiff putty knife
- B. Small pry bar
- C. Wide chisel
- D. Wood screws
- E. A "Pinpoint Oiler" which could be an aerosol can with an extension tube or a disposable glue syringe
- F. A buffing machine

## PART 3---EXECUTION

### 3-1 EXAMINATION

- A. Check for the presence of a sash cord or chain. If it is present and in proper working order, proceed to Section 3-2 B. If the old sash cord is missing, replace it. Replace sash cord with cord; sash chain with chain. In many cases, the hardware/pulleys may not be compatible with a change from chord to chain, or vice versa.

### 3-2 ERECTION, INSTALLATION, APPLICATION

- A. To replace a sash cord/chain:
  1. Remove the sash
  2. Remove cord from slot in sash and ease the knot of the cord up towards the pulley, located in the jamb, until it stops and is held in place by the pulley.

3. Locate weight access door in the jamb and carefully remove it. Remove weight from pocket and untie it. Reserve weight. If jamb does not have access door, or if access door has been covered with weatherstripping, the window trim will have to be removed to access weight pocket.
  4. Remove old sash cord/chain and cut a new cord/chain to match its length.
  5. Secure one end of new sash cord/chain to window and thread other end over pulley into weight pocket. Attach cord/chain to weight and replace in pocket. Replace access door or trim.
  6. Pull cord/chain from other end until weight just touches pulley and temporarily secure the cord/chain and pulley in place with a nail threaded through a link across the pulley hole.
  7. Secure other end of cord/chain to slot in sash with 2 wood screws. Remove nail which is temporarily holding weight in up position.
  8. Repeat procedure on other side of sash. Reinstall sash and stops.
  9. If sash cord/chain is missing altogether, pull weight up to pulley and temporarily secure it as in (6) above. With the window in the closed position measure enough cord/chain so that the end can be screwed into the sash slot. Cut cord/chain and continue as in (7) and (8) above.
- B. Check if sash weight is unattached or missing:
1. Secure the sash in an open position.
  2. Locate and remove the weight access panel in the jamb.
  3. If weight is present but unattached, retrieve it and the end of the sash cord out of pocket and reattach. Return them to pocket and replace access door.
  4. If weight is missing or not retrievable, it must be replaced. Salvage is the first choice for replacement. If a salvage weight is unavailable or new sash weights cannot be easily purchased, a sash weight can be fashioned out of a 1-1/2" diameter PVC pipe with the end sealed and filled with sand or lead shot to the proper weight.
  5. To determine size of sash weights:
    - a. Weigh the sash and divide by two

-OR-

- b. Use the following formula:  $[(1\#/sq.ft. \text{ glass}) + (\text{height}\{ft.\} \times \text{width}\{ft\} \times \text{depth}\{in\})]$
- C. Check condition of pulley. Paint and dust build-up may be causing the pulley not to function properly.
  1. If pulley appears to be free from paint or dust build-up, re-lubricate the pulley using a pinpoint oiler to lubricate the wheel-and-axle surface.

-OR-

Recondition the pulley:

- a. Remove pulley from window frame. It may be attached in one of two ways: two obvious countersunk wood screws or friction fit. Care must be exercised when removing a friction fit pulley because it is anchored in place with hidden spurs. Wedging a screwdriver between the wheel and case will damage the pulley.
- b. Paint can be removed from pulley by machine buffing, soaking in a lye solution such as oven cleaner or drain opener or trisodium phosphate (TSP).
- c. When paint and dirt are removed, re-lubricate the wheel-and-axle surface as above and reinstall.

**END OF SECTION**

## INSTALLING WEATHERSTRIPPING ON METAL DOUBLE-HUNG WINDOWS

### PART 1---GENERAL

#### 1-1 SUMMARY

- A. This procedure includes guidance on installing various types of weatherstripping on metal double-hung windows.
- B. It is best to use the thinnest material available to fill the space where air is entering. Weatherstripping that is too thick can spring hinges and can create additional gaps.

### PART 2---PRODUCTS

#### 2-1 MANUFACTURERS

- A. Accurate Metal Weatherstripping  
725 South Fulton Ave.  
Mount Vernon, NY 10550  
914/668-6042
- B. Pemko Company  
Box 3780  
Ventura, CA 93006  
805/642-2600

#### 2-2 MATERIALS

- A. Metal Integral Weatherstripping (Accurate Metal Weatherstripping, Pemko Company), or approved equal.
  - 1. Most effective and durable type of weatherstripping
  - 2. Most difficult to install, requiring some degree of carpentry skill to accomplish.

-OR-

Spring Metal Weatherstripping (Accurate Metal Weatherstripping, Pemko Company), or approved equal.

- 1. Available in bronze, brass or stainless steel. Also available in spring plastic.
- 2. Designed with an integral friction-fit mounting clip.

3. Attached by nails to the side channels of the window frame.
4. No applied glue necessary.
5. Tight closure insured by thin metal.
6. Window must be painted first to prevent galvanic corrosion.
7. Usually applied around entire perimeter of window; On casements, all but hinge side.

-OR-

Adhesive-Backed Plastic Spring or Plastic 'V' stock or Vinyl Strips is a plastic version of spring metal weatherstripping. It is attached by adhesive. Channels must be thoroughly cleaned before installation because the adhesive will not stick to dirty surfaces. The plastic does not last as long as metal.

1. Applied after painting.
2. in "V" configuration.
3. Usually glued to frame; Some have adhesive backing.
4. Increased thickness due to adhesive; therefore, not always appropriate.

-OR-

Compressible Foam Tape:

NOTE: ADHESIVE-BACKED FOAM STRIP SHOULD NOT BE USED AT ALL.

1. Best for large windows where there is a slight bending or distortion of the sash.
2. Adhesive or plain (to be applied with glue) back.
3. Useful for gaps up to 1/4" wide.
4. More frequent replacement required than for spring metal or vinyl strips.

-OR-

Caulking or Sealant Bead and Polyethylene Bond-breaker Tape.

-OR-

Tubular Gasket Weatherstripping:

NOTE: TUBULAR GASKET WEATHERSTRIPPING IS AN EFFECTIVE OPTION; BUT, IT IS UNSIGHTLY. THIS TYPE OF WEATHERSTRIPPING SHOULD NOT BE USED.

## 2-3 EQUIPMENT

- A. Carpenter's tools needed to remove sash
- B. Tin snips or radial arm saw
- C. Table saw or router
- D. Putty knife

## PART 3---EXECUTION

### 3-1 PREPARATION

- A. Surface Preparation:
  - 1. Using a heat gun and thin putty knife, break existing paint film and remove sashes.
  - 2. Strip paint from sash jambs, sill and parting bead.
  - 3. Caulk and fill cracks that could trap moisture.
  - 4. Replace sash cord if needed.

### 3-2 ERECTION, INSTALLATION, APPLICATION

- A. For Metal Integral Weatherstripping: (follow manufacturer's instructions)
  - 1. Measure and cut metal for top and upper sides of sash. The metal can be cut with tin snips or a radial arm saw with metal cutting blade. Miter corners.
  - 2. With a table saw or router, cut slots in sashes to accept weatherstripping.
  - 3. Fit metal into upper jambs and head of window frame leaving space at sash pulley location and reinstall upper sash.

4. Install weatherstripping to the lower window frame, installing it at the jambs before the sill. Slip lower sash into position from above.
  5. Check for binding in both sashes; reinstall stops.
- B. For Spring Metal Weatherstripping: (follow manufacturer's instructions)
1. Nail strips to sash channels being careful not to cover pulleys in upper channel.
  2. Nail full width strip to underside of bottom sash.
  3. Slightly nail strip to inside edge of upper sash.
- C. For Caulking or Sealant Bead and Polyethylene Bond-breaker Tape: (follow manufacturer's instructions)

NOTE: THIS PROCEDURE IS EFFECTIVE FOR ALL TYPE OF METAL WINDOWS WITH VARYING DEGREES OF AIR INFILTRATION.

1. Clean window frame thoroughly using a solvent.
2. Allow to dry and prime.
3. Apply a bead of silicone caulk.
4. Apply bond breaker tape to operable sash covering metal section where contact will occur.
5. Close window and allow sealant to set (2-7 days depending on the temperature and humidity).
6. Open window and remove bond breaker tape; The bead should have taken the shape of the gap.

-OR-

If the window is never opened, it may be sealed shut with acrylic latex caulk. If the window is seldom opened, a roll- type temporary caulk may be used.

**END OF SECTION**



## ORIGINAL AND EARLY INTERIOR DOORS

This appendix enumerates the original and early interior doors in Buildings 1, 3, 4, 5, 6 and 7 as they were noted during the survey undertaken in the summer of 1994. The door numbers were accurate at the time of the survey although, room numbers have changed since that time. It is advisable, when using this list to refer to the floor plan drawings located in Chapter 4, which indicate the room numbers in use at the time of the survey. It is also important to refer to the appropriate section of Chapter 4 for more detailed descriptions of the interior doors and their context. This appendix does not enumerate any doors which are obvious later intrusions such as flush metal or flush wood doors.

Buildings 1, 3, 4, 5, 6, 7 were all constructed between 1904-1911. Although Buildings 3 and 4 were designed by Ernest Flagg, and the others were designed by Navy personnel in the Bureau of Yards and Docks, all the buildings share a similarity of scale, design, detail and finish. There are several door-types existing throughout the site, which are consistent with the original architectural drawings.

The most frequently noted door configuration is a five-panel wood door hung by two hinges and fitted with brass hardware. This door type is most numerous on site and it appears most frequently in the original drawings. Based on visual inspection, it appears that there may be three installation campaigns of five-panel doors. The first campaign is related to original construction dates; the second dates to 1926, in the case of Building 1, or perhaps later, in other cases; the third campaign is recent and includes replication of historic doors in a number of locations. These replicated doors are included in the count.

Other door types are distributed throughout the site, and there are some instances where it appears that doors from one location were salvaged from elsewhere. Some doors are clearly original, as they follow the pattern set in the original drawings others are most likely later additions.

**BUILDING 1****Five-panel:**

Basement	First floor		Second Floor		Third Floor
1006A	1100C	1109B	1200A	1209B	1305B
1009A	1102A	1109C	1201A	1209C	1306C
1010A	1102B	1109D	1202B	1209D	1308A
1011A	1105B	1111A	1204B	1210B	1310B
2 double-leaf corridor	1106A	1111B	1205A	1212A	
doors	1106B	1113A	1205B	1218C	
	1107A	1113B	1206B	1219	
1 single-leaf corridor	1108A	1115	1208A	1221A	
door	1108B	1118C	1208B		
	1108C	1118D	1209A		
	1109A				

**Four-panel:**

Basement	First Floor	Second Floor	Third Floor
1 single-leaf corridor door		1211A 1214A 1216A 1218A 1220 1223	

**Three-panel:**

Basement	First Floor	Second Floor	Third Floor	
1007A		1202A	1301	1306B
1005A		1210A	1302A	1307A
1014B			1303	1307B
			1304	1310A
			1305A	

**Two-panel:**

Basement	First Floor	Second Floor	Third Floor
1 single-leaf corridor door	1101B 1103	1204A 1213A 1217A 1218B	1302B 1309A 1311 1312B 1314A
1009B			
1009C.1			

**French doors (wood and glass):**

Basement	First Floor	Second Floor	Third Floor
1020A (single leaf)	1122 (three double-leaf doors modified by the lamination of flush wood panels)	1222 (single leaf)	
1020B (double leaf)			

**BUILDING 3 (INCLUDING WARD PAVILLIONS)**  
 (None of the interior doors in the solarium corridors is original.)

**Five-panel:**

Basement	First Floor	Second Floor	Third Floor
	3119A 3117	2 at restrooms 3207A 3207B	

**Four-panel:**

Basement	First Floor	Second Floor	Third Floor
	6 doors		

**Flat-panel :**

Basement	First Floor	Second Floor	Third Floor
			3302 3303 3304 3307

**Double-leaf:**

Basement	First Floor	Second Floor	Third Floor
3013-A 3013-B 3013-C 3018-B 3022-A 3022-B			

**BUILDING 4 (INCLUDING WARD PAVILLIONS)**

(None of the interior doors in the solarium corridors is original.)

**Five-panel:**

Basement	First Floor	Second Floor	Third Floor
4001	4101 (closet)		
4007-A	4108 (closet)		
4007-D	4109		
4008-A	4113		
4010A	4116		
4013-A	(probably salvaged)		
4016			
4015-A	4117 (closet)		
4020	4117-A		

Some of these doors, particularly those in the basement, appear to be new five-panel doors.

**Two-panel:**

Basement	First Floor	Second Floor	Third Floor
4002	4111-B		
4006-B	4111-A.1		
4007-C	4112		
	4112-A		
	4115		

**Flush:**

Basement	First Floor	Second Floor	Third Floor
	4110		
	4111-A		
	4111-A.2		
	4111-B		
	4111-C		
	4111-E.1		
	4111-E.2		

**BUILDING 5****Six-panel:**

Basement	First Floor	Second Floor	Third Floor
5008B			

**Five-panel:**

Basement	First floor	Second Floor	Third Floor
5007	5109 5110 5111A 5111B 5103A	5103B 5105A 5105B 5106B 5106C	5204B 5211 5212

**Four panel (top glass):**

Basement	First Floor	Second Floor	Third Floor
		5206	

**Three-panel:**

Basement	First Floor	Second Floor	Third Floor
5003 5004 5005 5008A		5214 Corridor	

**Glass and wood door with fanlight transom:**

Basement	First Floor	Second Floor	Third Floor
	Corridor		

**Two panel:**

Basement	First Floor	Second Floor	Third Floor
5000	5114B 5117 5119 5102B Corridor	5203A	5309A

**BUILDING 5, CONTINUED*****Flush wood with glass panel:***

(These doors appear to be early but may not be original)

Basement	First Floor	Second Floor	Third Floor
			5301 5303 5306 5308 (with louver at bottom)

***Flush:***

(These doors appear to be early but may not be original)

Basement	First Floor	Second Floor	Third Floor
		5209 5210	5301B 5301C 5302 5302 (closet) 5303 (closet)

**BUILDING 6**

There are no original or early doors extant in this building. The historic doors were typically five-panel doors similar to those found throughout the site.

**BUILDING 7*****Five-panel:***

Basement	First floor	Second Floor	Third Floor
7001A	7102C	7205	7303A
7003	7102B	7208B	7301
7004	7107B	7208C	
7006A			
7006B			

***Four-panel:***

Basement	First Floor	Second Floor	Third Floor
	7102B		7302B
	7108B		

***Three-panel:***

Basement	First Floor	Second Floor	Third Floor
		7203A	7302
		7204	7303
		7207B	
		7207C	
		7208A	
		7209	
		7210	

***Two-panel:***

Basement	First Floor	Second Floor	Third Floor
7011	7101C		
	7109		
	7110A		





**Chapter 1**

No illustrations

**Chapter 2 - Illustrations follow page 36**

## Figure 2-1

The New Naval Hospital Adjoining the Medical School  
BUILDINGS 3 & 4  
*BUMED Archives*

## Figure 2-2

HOSPITAL COMPLEX  
"Portion of hospital reservation, viewed from the west", 1912.  
*Bureau of Medicine and Surgery, A.W. Dunbar, "A Description of Recent Hospital*

## Figure 2-3

HOSPITAL (BUILDING 3)  
North and west elevations of administrative building, ca., early 1940's  
*BUMED Archives*

## Figure 2-4

HOSPITAL (BUILDING 3)  
Detail of ambulatory porch of hospital, north elevation (no date).  
*BUMED Archives*

## Figure 2-5

HOSPITAL OR CONTAGIOUS WARD (BUILDINGS 3 & 4, 6)  
Interior "A dressing. Nurse instructor supervising Hospital Corpsmen.", ca. 1920's  
*BUMED Archives*

## Figure 2-6

HOSPITAL (BUILDING 4)  
Interior, Operating Room, 1912.  
*Bureau of Medicine and Surgery, A.W. Dunbar, "A Description of Recent Hospital Construction in the United States Navy", U.S. Naval Medical Bulletin, No. 4 (Oct. 1912)*

## Figure 2-7

SICK OFFICERS' QUARTERS (BUILDING 5)  
North elevation, 1912.  
*Bureau of Medicine and Surgery, A.W. Dunbar, "A Description of Recent Hospital Construction in the United States Navy." U.S. Naval Medical Bulletin, No. 4, (Oct. 1912)*

Figure 2-8  
NURSES' QUARTERS (BUILDING 1)  
East and North elevations, ca. 1929.  
*BUMED Archives*

Figure 2-9  
NURSES' QUARTERS (BUILDING 1)  
East elevation, ca. 1921  
*BUMED Archives*

Figure 2-10  
NURSES' QUARTERS (BUILDING 1)  
Interior, Nurses' Dining Room, ca. 1925.  
*BUMED Archives*

Figure 2-11  
NURSES' QUARTERS (BUILDING 1)  
Interior, Nurse's Room, ca. Late 1920's - early 1930's  
*BUMED Archives*

Figure 2-12  
POTOMAC ANNEX BUILDING 1  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-13  
POTOMAC ANNEX BUILDING 14  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-14  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-15  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-16  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-17  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-18  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-19  
POTOMAC ANNEX BUILDINGS 3 & 4  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-20  
POTOMAC ANNEX BUILDING 5  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-21  
POTOMAC ANNEX BUILDING 6  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-22  
POTOMAC ANNEX BUILDING 7  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-23  
POTOMAC ANNEX BUILDING 7  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-24  
POTOMAC ANNEX BUILDING 2  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

Figure 2-25  
POTOMAC ANNEX BUILDING 2  
ca. Mid-1950's  
*GSA-NCR, Portfolio Management Division Files*

**Chapter 3 - Illustrations follow page 59**

## Figure III-1

Female Nurses' Quarters (BLDG 1)  
East and West Elevations  
*Bureau of Yards and Docks*  
1908

## Figure III-2

Female Nurses' Quarters (BLDG 1)  
South Elevation  
*Bureau of Yards and Docks*  
1908

## Figure III-3

Female Nurses' Quarters (BLDG 1)  
Elevations, Sections, and Details  
*Bureau of Yards and Docks*  
1908

## Figure III-4

Female Nurses' Quarters (BLDG 1)  
Basement Plan  
*Bureau of Yards and Docks*  
1908

## Figure III-5

Female Nurses' Quarters (BLDG 1)  
First Floor Plan  
*Bureau of Yards and Docks*  
1908

## Figure III-6

Female Nurses' Quarters (BLDG 1)  
Second Floor Plan  
*Bureau of Yards and Docks*  
1908

## Figure III-7

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Plot Plan  
*Bureau of Yards and Docks*  
1925

## Figure III-8

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Front Elevation  
*Bureau of Yards and Docks*  
1925

## Figure III-9

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Elev. and Sect.  
*Bureau of Yards and Docks*  
1925

## Figure III-10

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Rear Elev.  
*Bureau of Yards and Docks*  
1925

## Figure III-11

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Cellar Plan  
*Bureau of Yards and Docks*  
1925

## Figure III-12

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, First Floor  
*Bureau of Yards and Docks*  
1925

## Figure III-13

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Second Floor  
*Bureau of Yards and Docks*  
1925

## Figure III-14

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Attic Plan  
*Bureau of Yards and Docks*  
1925

## Figure III-15

Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Interior Details

*Bureau of Yards and Docks*  
1925

Figure III-16  
Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Front Elevation  
*Bureau of Yards and Docks*  
1925

Figure III-17  
Female Nurses' Quarters (BLDG 1)  
Addition and Alterations, Foundation Plan  
*Bureau of Yards and Docks*  
1925

Figure III-18  
Female Nurses' Quarters (BLDG 1)  
First and Second Floor Framing Plan  
*Bureau of Yards and Docks*  
1908

Figure III-19  
Female Nurses' Quarters (BLDG 1)  
Attic and Roof Framing Plans  
*Bureau of Yards and Docks*  
1908

Figure III-20  
Hospital (BLDG 3)  
Administration Building  
Ernest Flagg, Arch.  
1903

Figure III-21  
Hospital (BLDG 3)  
Roof Plan  
Ernest Flagg, Arch.  
1903

Figure III-22  
Hospital (BLDG 3)  
Front and Rear Elevations  
Ernest Flagg, Arch.  
1903

Figure III-23  
Hospital (BLDG 3)  
Sections  
Ernest Flagg, Arch.  
1903

Figure III-24  
Hospital (BLDG 3)  
Operating Pavilion  
Ernest Flagg, Arch.  
1903

Figure III-25  
Hospital (BLDG 3)  
First Floor Plan  
Ernest Flagg, Arch.  
1903

Figure III-26  
Hospital (BLDG 4)  
Elevations  
Wood, Donn & Demmings, Archs.  
1907

Figure III-27  
Hospital (BLDG 4)  
Basement and 1<sup>st</sup> Floor Plans  
Wood, Donn & Demmings, Archs.  
1907

Figure III-28  
Hospital (BLDG 4)  
Repairs to Kitchen, Elev. And Section  
*Bureau of Yards and Docks*  
1917

Figure III-29  
Hospital (BLDG 4)  
Repairs to Kitchen, Basement Floorplan  
*Bureau of Yards and Docks*  
1917

Figure III-30  
Hospital (BLDG 4)  
Repairs to Kitchen, Roof Plan

*Bureau of Yards and Docks*  
1917

Figure III-31  
Hospital (BLDG 4)  
Repairs to Kitchen, Floor and Roof Framing Plans  
*Bureau of Yards and Docks*  
1917

Figure III-32  
Hospital (BLDG 4)  
Repairs to Kitchen, Steel Details  
*Bureau of Yards and Docks*  
1917

Figure III-33  
Sick Officers' Quarters (BLDG 5)  
Elevations  
*Bureau of Yards and Docks*  
1908

Figure III-34  
Sick Officers' Quarters (BLDG 5)  
Section through Front Porch  
*Bureau of Yards and Docks*  
1909

Figure III-35  
Sick Officers' Quarters (BLDG 5)  
Basement Plan  
*Bureau of Yards and Docks*  
1908

Figure III-36  
Sick Officers' Quarters (BLDG 5)  
First Floor Plan  
*Bureau of Yards and Docks*  
1908

Figure III-37  
Sick Officers' Quarters (BLDG 5)  
Second Floor Plan  
*Bureau of Yards and Docks*  
1908

Figure III-38  
Sick Officers' Quarters (BLDG 5)  
Roof Plan  
*Bureau of Yards and Docks*  
1908

Figure III-39  
Sick Officers' Quarters (BLDG 5)  
Foundation (Basement Plan)  
*Bureau of Yards and Docks*  
1908

Figure III-40  
Sick Officers' Quarters (BLDG 5)  
First Floor Plan, Scheme 1  
*Bureau of Yards and Docks*  
1909

Figure III-41  
Sick Officers' Quarters (BLDG 5)  
First Floor Plan, Scheme 2  
*Bureau of Yards and Docks*  
1909

Figure III-42  
Sick Officers' Quarters (BLDG 5)  
First Floor Plan, Scheme 3  
*Bureau of Yards and Docks*  
1909

Figure III-43  
Sick Officers' Quarters (BLDG 5)  
1<sup>st</sup>, 2<sup>nd</sup>, & 3<sup>rd</sup> Floor Plan, Scheme 4  
*Bureau of Yards and Docks*  
1909

Figure III-44  
Sick Officers' Quarters (BLDG 5)  
Roof Framing Plan  
*Bureau of Yards and Docks*  
1909

Figure III-45  
Contagious Ward Building (BLDG 6)  
Front Elevation

*Bureau of Yards and Docks*  
1908

Figure III-46  
Contagious Ward Building (BLDG 6)  
Long Section, Looking West  
*Bureau of Yards and Docks*  
1908

Figure III-47  
Contagious Ward Building (BLDG 6)  
Long Section, Looking East  
*Bureau of Yards and Docks*  
1908

Figure III-48  
Contagious Ward Building (BLDG 6)  
Rear Elevation  
*Bureau of Yards and Docks*  
1908

Figure III-49  
Contagious Ward Building (BLDG 6)  
First Floor Plan  
*Bureau of Yards and Docks*  
1908

Figure III-50  
Contagious Ward Building (BLDG 6)  
Second Floor Plan  
*Bureau of Yards and Docks*  
1908

Figure III-51  
Contagious Ward Building (BLDG 6)  
Foundation Plan  
*Bureau of Yards and Docks*  
1909

Figure III-52  
Contagious Ward Building (BLDG 6)  
1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> Floor and Roof Framing Plans, Hy-rib system  
*Bureau of Yards and Docks*  
1909

Figure III-53  
Contagious Ward Building (BLDG 6)  
1<sup>st</sup>, 2<sup>nd</sup> Floor and Roof Framing Plans  
Reinforced Concrete System  
*Bureau of Yards and Docks*  
1909

Figure III-54  
Contagious Ward Building (BLDG 6)  
Roof Framing Plan  
*Bureau of Yards and Docks*  
1909

Figure III-55  
Hospital Corp's Quarters (BLDG 7)  
East and West Elevations  
*Bureau of Yards and Docks*  
1909

Figure III-56  
Hospital Corp's Quarters (BLDG 7)  
North and South Elevations  
*Bureau of Yards and Docks*  
1909

Figure III-57  
Hospital Corp's Quarters (BLDG 7)  
Basement and Foundation  
*Bureau of Yards and Docks*  
1909

Figure III-58  
Hospital Corp's Quarters (BLDG 7)  
First Floor Plan  
*Bureau of Yards and Docks*  
1909

Figure III-59  
Hospital Corp's Quarters (BLDG 7)  
Second Floor Plan  
*Bureau of Yards and Docks*  
1909

## Figure III-60

Hospital Corp's Quarters (BLDG 7)

Roof and Roof Framing

*Bureau of Yards and Docks*

1909

## Figure III-61

Hospital Corp's Quarters (BLDG 7)

1<sup>st</sup> Floor Framing Plan*Bureau of Yards and Docks*

1909

## Figure III-62

Hospital Corp's Quarters (BLDG 7)

2<sup>nd</sup> Floor Framing Plan*Bureau of Yards and Docks*

1909

## Figure III-63

Hospital Corp's Quarters (BLDG 7)

3<sup>rd</sup> Floor Framing Plan*Bureau of Yards and Docks*

1909

## Figure III-64

Hospital Corp's Quarters (BLDG 7)

Roof Framing Plan

*Bureau of Yards and Docks*

1909

## Figure III-65

Site Plan (1844), Landscape Plan

William Strickland, National Archives

## Figure III-66

Site Plan (1844), Landscape Plan

William Strickland

National Archives

## Figure III-67

Site Plan (after 1873)

"Map of the U.S. Naval-Observatory Grounds at Washington, D.C.

BUMED Archive

Figure III-68  
Site Plan (1911)  
"U.S. Naval Hospital Reservation"  
National Archives

Figure III-69  
Site Plan (after 1918)  
Detail of Topographical Map  
National Archives

Figure III-70  
Site Plan (1925)  
"Map of the U.S. Naval Hospital"  
National Archives

Figure III-71  
Site Plan (1927)  
Site plan showing proposed extension of New York Avenue  
National Archives

Figure III-72  
Site Plan (1946)  
"Map of Navy Department Potomac Annex"  
National Archives

Figure III-73  
Site Plan (1964)  
Bureau of Medicine and Surgery

#### **Chapter 4 - Illustrations follow page 160**

Figure 1-1.  
Building 1. East elevation. This building originally functioned as a nurses' dormitory. The north section of the building (to the right) was constructed between 1908-1911; the building section to the south was added in 1926.

Figure 1-2.  
Building . East elevation, entry portico. The aluminum framed glass doors infill what was originally a recessed entry. Presumably at that time, the original wood and glass doors, fanlight and sidelights were also replaced, creating an interior vestibule. The new infill detracts from the architectural character of the portico and the building. The balustrade on the roof of the portico was replaced, and the columns repaired during the summer of 1994.

## Figure 1-3.

Building 1. East elevation, south end. This entry to the Surgeon General's office was created from an original window opening. The brick infill in the window opening to the right, indicates that this is the original opening.

## Figure 1-4.

Building 1. South elevation, sun porch. This sun porch was constructed as part of the 1926 addition. The structure, configuration and windows all probably date to that time. Paint failure is evident on the columns and spandrel panels under the windows.

## Figure 1-5.

Building 1. West elevation. The retaining wall and iron fence, represents the property line. Note electric cables running across and into building.

## Figure 1-6.

Building 1. North elevation. This entry was created from an original window opening; ghosts of former railings and stoop are evident in the masonry. The opening is a sensitive addition; however, the existing stoop and railing are of poor quality and condition.

## Figure 1-7.

Building 1. Cornice, roof and dormers. The painted wood cornice is generally in good condition. The dormers and roof are clad with slate, which is mismatched and in varying degrees of condition.

## Figure 1-8.

Building 1. Brick and granite detail on east elevation. Note the fine grain of the granite sill and compare to Figure 1-9, which shows a cast stone sill on the rear of the building. Also note fine, small mortar joints.

## Figure 1-9.

Building 1. Brick and cast stone detail on west elevation. Note the course aggregate of the cast stone and compare to Figure 1-8, which shows a granite sill on the front of the building. Also note wider mortar joints, and uniformity of the brick.

## Figure 1-10.

Building 1. West elevation. The joint between the bricks in the original 1908 section and the 1925-26 addition on the rear is open. This occurs at the basement level only, no joint is evident above the belt course, or on the front of the building.

## Figure 1-11.

Building 1. This light fixture is located over a basement entry in the 1926 addition. It may be original. No other similar fixture was found on the site; so this may be a salvaged item.

## Figure 1-12.

Building 1. Concrete stairs leading to the areaway on the east side of building. Note cracks in the concrete curb in the foreground, and misalignment of the rear sections. Also note displacement of bricks at the rear.

## Figure 1-13.

Building 1. View of the south elevation of Building 1 and the west elevation of the northeast pavilion of Building 3. Note the covered walk between the two buildings, and wide expanse of parking. Asphalt parking covers a large percentage of the site and detracts from the overall appearance of the setting. Parking immediately adjacent to the buildings leads to impact damage.

## Figure 1-14.

Building 1. View of lobby looking toward main entry. Note how non-original materials and treatments have compromised the space. The suspended ceilings, flush varnished wood interior doors and aluminum entry doors, and stair banister infill, all obscure or replaced original materials and finishes.

## Figure 1-15.

Building 1. View of the north stair, looking up to the landing between the first and second floors. Note vinyl flooring on risers and treads and gypsum board infill of stair banister.

## Figure 1-16

Building 1. View of the north stair from the landing between the second and third floors. Note how non-original partitions compromise the third-floor landing, and how non-original varnished wood doors impact the spaces.

## Figure 1-17

Building 1. View of the south stair from the first floor. Vinyl anti-skid flooring is a minor detraction, but the stair is generally intact and in good condition.

## Figure 1-18

Building 1. Surgeon General's office (Rooms 1119, 1120, 1121) looking east. This room is the most intact and, therefore, most significant historic space in the building. The dropped beam ceiling is unique in the building. Fitting the original wood doors with flush panels (example at right) detracts from the quality of the space as do the fluorescent ceiling fixtures.

## Figure 1-19

Building 1. Surgeon General's office looking west. The closet enclosures flanking the fireplace are recent additions. They are designed and detailed in such a way as to minimize the impact on the character of the space.

## Figure 1-20

Building 1. Sun porch (Room 1122). The spatial configuration, the interior surface of the Tuscan columns and the casement windows are the remaining visible historic fabric in this space. Non-original thin wood veneer paneling covers most of the walls; the floor is covered with

carpet; and the ceiling is covered by 1' x 1' fiberboard tile. Access is gained from the Surgeon General's office.

Figure 1-21

Building 1. First-floor corridor looking north. Generally, this reflects the 1926 configuration. The partition at the end of the hall with flush varnished wood doors are later additions to enclose the north stair. Fluorescent ceiling fixtures and acoustic tile ceiling detract from the space.

Figure 1-22

Building 1. Wide door frame on the first floor with non-original infill and flush varnished wood door. This wide door frame lines up with the former exterior door near the Surgeon General's private entrance.

Figure 1-23

Building 1. Room 1202. The five-panel closet door, door frame, window s and window frame and base board are original. These details are typical throughout the building. The chair rail may be original. Note how suspended ceiling interferes with the top of the window frames and compromises the architectural character of the space.

Figure 1-24

Building 1. Third-floor corridor looking north. The infill on the right side (see different baseboard height) was installed to enclose the north stair at this level.

Figure 1-25

Building 1. Room 1318. This room was created by removing partitions from several smaller rooms. The space is negatively impacted by the fluorescent lights and the acoustic tile wall and ceiling treatment.

Figure 1-26

Building 1. First floor. Typical original five-panel wood door with transom and brass hardware. The 1908 doors have rounded panel moldings; the 1926 doors have panel moldings with a molded profile.

Figure 1-27

Building 1. Second floor. Two-panel wood door with chamfered panel moldings. This is an early replacement door; similar ones are found in other buildings on the site.

Figure 1-28

Building 1. Third floor. Typical original three-panel wood doors with transoms and brass hardware. These doors are located in the 1908 section and the panel moldings have rounded profiles.

## Figure 1-29

Building 1. Second floor toilet. Note original wood toilet enclosures and louvered doors and original 1" x 1" ceramic tile floor.

## Figure 1-30

Building 1. Floor plans; Basement and First Floors. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 1-31

Building 1. Floor plans; Second and Third Floors. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 1-32

Building 1. East, West, North and South Elevations. These elevations represent the conditions of the building as they existed in 1994.

## Figure 3-1.

Building 3. View of north elevation. The original roof slates were replaced with asphalt. The cupola is an important architectural feature of exterior. It also houses a fan, part of the original ventilating system for the hospital. Note that paint was removed from most of the porte cochere with an acetylene torch in the Summer of 1994.

## Figure 3-2.

Building 3. Detail of entry. Note scorch marks in the wood surface from the paint removal process. The aluminum and glass entry infill detracts from the architectural character of the porch and intrudes on the interior space. The lighting fixture above, is typical of those found on other buildings on the site. They are flimsy and do not maintain the scale of decorative elements on the buildings.

## Figure 3-3.

Building 3. Detail of north entry stair. Note chiseled surface of center treads. This is probably an original treatment. The square-sectioned hand rail is not original.

## Figure 3-4.

Building 3. Porte cochere, column base detail. Note missing sections of torus and the crack in the brick base.

## Figure 3-5.

Building 3. View of the south elevation from the west. Note the non-original casement window in the first-floor, first-bay opening, and the vent at grade in the second bay. The doors in the solarium corridor (at right) match historic doors, but have been fitted with automatic openers. The spaces between building sections are all paved and used for parking.

Figure 3-6.

Building 3. View of the south elevation from the east. Note the fire escapes over the solarium corridor. Cross bracing supports the fire escape leading from the second to the third floor.

Figure 3-7.

Building 3. View of the west elevation of the northwest pavilion. Note the small brick structure at the center of the pavilion. This feature is typical of each of the pavilions and appears to have been part of the air-intake for the heating system. The roofs on the air-intakes are all metal, but the original roofing material is not known. The small brick building in the foreground houses electric transformers.

Figure 3-8.

Building 3. View from the east. The electric transformer is obtrusive. Parking takes up the remaining space between the building sections. Note that the skylight in the roof of the main building is an original feature, the ventilator is a later alteration.

Figure 3-9.

Building 3. The junctures of the corridor to the hospital building and the pavilion at each end are recessed from the plane of the corridor facade. This condition exists on both the north and south facades of the north corridors only. The transom area over the recessed section adjacent to the main building is open and appears to have served as a plenum for the original ventilating system.

Figure 3-10.

Building 3. East side of solarium corridor connecting Buildings 3 and 4. Note peeling paint on wood elements. The entry doors in the solarium corridors match the historic condition, and they have been fitted with panic hardware.

Figure 3-11.

Building 3. Most of the windows are the original six-over-six double hung sash and frames. Note failing paint and glazing putty. Note also heavily soiled brick and mortar loss under window. Copper vent (above keystone) is a typical facade feature having to do with the original ventilating system.

Figure 3-12.

Building 3. Detail of copper vent. These vents are related to the original ventilating system. They are significant elements of the facade reflecting the original hospital use of the building.

Figure 3-13.

Building 3. View of the entry lobby. A reconfiguration of the ceiling molding on the west side indicates that this partition has been altered. Note how the glass and aluminum entry vestibule protrudes into the space. Conduit and fluorescent lights detract from the quality of the space. Brackets at the ceiling level are original features. This space was originally painted a terra cotta color with white ceiling trim.

Figure 3-13a  
Building 3. Plaster bracket detail.

Figure 3-14.  
Building 3. View of iron stair. The stair is intact and in good condition. It is an important, character-defining feature of the building. Its original finish was a glossy black paint with a varnish finish on the oak handrail. The window and frame were also varnished.

Figure 3-14a  
Building 3. Elevator detail. The original iron doors were replaced. The new stock doors do not fill the opening defined by the pilasters; this detracts from the architectural quality of this feature and of the stair hall. The iron pilasters and entablature were originally painted a glossy black.

Figure 3-15.  
Building 3. View of solarium corridor connecting Building 3 to Building 4. The flush wood doors are not original. They detract from the architectural character of the space. The heavy use of all of the solarium corridors for storage detracts from the appearance and poses a hazard for the occupants.

Figure 3-16.  
Building 3. View of first-floor east corridor looking west. Doors and door frames are original on this side of the corridor. They were originally varnished. The west corridor has a combination of original and non-original openings and doors.

Figure 3-17.  
Building 3. View of Room 3207. The condition of this office space is typical of spaces throughout the building. This room was created by combining two smaller room. The doors are five-panel doors, similar to those found throughout the site. They are original, or early replacement doors. Door and window frames are flat with no moldings.

Figure 3-18.  
Building 3. View of Room 3304. Flush-panel wood doors on this floor are original, or are early replacements. They are similar to doors in the Operating Room in Building 4.

Figure 3-19.  
Building 3. Third-floor corridor looking east. The third-floor plan has been altered by the rehabilitation of original baths to create toilets and to create the fire escape exit. The toilets are an early change (probably while the hospital was still in operation); the exit is a recent alteration.

Figure 3-20.  
Building 3. Third-floor ceiling showing the frame of the original skylight. Infill and ventilator are later installations (See also Figure 3-39). The acoustic tile ceiling is a later alteration.

Figure 3-21.

Building 3. Basement. View of solarium corridor looking into the tunnel connecting Building 3 to Building 5. Note ghost of former door in brick wall.

Figure 3-22.

Building 3. View of basement looking east from central section into corridor under solarium

Figure 3-23.

Building 3. Northwest pavilion. Fire place detail. All of the ward pavilions were fitted with fireplaces originally. This is the only one remaining in its original configuration. Others have been covered partially or completely with gypsum board. This pavilion is an open space, which has been subdivided by partial-height office partitions. The suspended ceilings are highly obtrusive, cutting the space nearly in half. (See Figures 4-16 and 4-17 for the similar treatment in the southwest pavilion.) Soffits are less than two feet from the windows.

Figure 3-24.

Building 3. Bathroom in northwest pavilion. This rehabilitation was being undertaken in the Autumn of 1995.

Figure 3-25.

Building 3. Detail of bathroom floor showing original mosaic tile under non-original ceramic tile.

Figure 3-26.

Building 3. Detail of bathroom wall showing original wall construction with plaster and metal lath with original white ceramic tiles under non-original square tiles.

Figure 3-27.

Building 3. Northeast pavilion. Like the other pavilions, this room and its windows are severely impacted by the suspended ceilings. They provide virtually no setback from the windows, and cut the space in half. The fire place is blocked in and covered by furniture. It's original appearance was likely to have been identical to that of the other pavilions (See Figure 3-23).

Figure 3-28.

Building 3. Structural system and ventilation system. The entire roof structure is reinforced concrete. Beaded board box at left encloses the ventilator fan in the cupola.

Figure 3-29.

Building 3. Electrical switches for the operation of the ventilator fan above.

Figure 3-30.

Building 3. Ventilator fan in the roof cupola.

## Figure 3-31.

Building 3. Original opening and early door in the east corridor. Unlike the door and window frames in other parts of the building, those on the first floor have raised moldings. The doors and frames in the first-floor corridor were originally varnished.

## Figure 3-32.

Building 3. This door is located in the west corridor on the first floor. It is a five-panel door with a flat frame, similar to other early doors in the building and on the site. However, this is likely to be an early alteration. Most of the door frames on the first-floor corridor have transoms and a more articulated door frame. The doors also have a different panel configuration. The door has been altered by the installation of a glass panel.

## Figure 3-33.

Building 3. Typical doors on the second floor. Note that the door on the left is an original or early five-panel wood door; the one on the right is a recent replication.

## Figure 3-34.

Building 3. Typical flush-panel wood door on the third floor. These doors are either original or are early additions, they are similar to doors found in the Operating Room in Building 4.

## Figure 3-35.

Building 3. Basement door on east corridor. Note that both sections are hinged. The doors are either original or early alterations.

## Figure 3-36.

Building 3. Typical cast-iron radiator, which is part of the original heating system.

## Figure 3-37.

Building 3. Room 3210. This toilet is in an original bathroom location. It has been reconfigured, and the tub removed. The sink is original or an early addition. The finishes are not original.

## Figure 3-38

Building 3. Structure. Reinforced concrete roof framing in the attic of Building 3. View from near the center of the attic looking north. Beaded board structure to the left is the enclosure for the cupola fan.

## Figure 3-39

Building 3. Structure. Reinforced concrete roof framing in the attic of Building 3. View of the roof hip. Note the concrete shaft at the lower left, which frames the opening for the skylight in the roof and attic floor. (See Figure 3-20 for third-floor ceiling).

## Figure 4-1.

Building 4. View from the south. Building 4 (with the columned porch left of center) was the original Operating Pavilion of the hospital.

Figure 4-2.

Building 4. View of the south porch. This section of the building was added in 1917 to accommodate a mess hall. Wood elements exhibit paint failure. The capital on the second column from the right is missing. The brick and stone have suffered impact and water damage and have been repaired inappropriately and ineffectively with mismatched bricks and mortar.

Figure 4-3.

Building 4. South porch detail. The original door was a single leaf wood and glass door set within a frame of transom and sidelights. The current glass and aluminum vestibule detracts from the architectural character of the building. The center light fixture appears to be original or an early alteration; those flanking it are poor substitutes. Note paint failure on the ceiling.

Figure 4-4.

Building 4. View from the west. The one-story section to the right was constructed in 1917 to accommodate a mess hall. The sloped section at the second-story level is the original Operating Room skylight, which has been covered with metal panels.

Figure 4-5.

Building 4. Detail of Operating Room skylight. Note that the skylight has been covered with metal panels.

Figure 4-6.

Building 4. View of southeast side showing loading dock. This is part of the 1917 construction, although it has been altered. The double-leaf wood and glass door entering the loading dock is probably original.

Figure 4-7

Building 4. Southeast pavilion. The garage is a later addition. Note insertion of doors in original window openings were done crudely; brick infill is red.

Figure 4-8.

Building 4. Southwest pavilion from the west. The small projection, typical on all of the pavilion structures provided air intake for the original ventilating system. Parking fills every space between and adjacent to the building sections. Metal corner guards were attached as a means of protecting the building from impact. The small brick building to the left houses an electric transformer.

Figure 4-9.

Building 4. Window detail the southwest pavilion. The windows in the pavilions are the original nine-over-nine wood sash set under six-light transoms. Most windows exhibit paint and glazing putty failure. This example is particularly bad. Note rot and material loss at the top of the frame.

## Figure 4-10.

Building 4. Solarium corridors connecting Buildings 3 and 4. The solarium corridors are remarkably intact. The windows are original. The doors may be later additions, but they reflect the historic configuration.

## Figure 4-11.

Building 4. First floor. Operating Room ante room. Scuttle in the ceiling leads to the fan chamber above. Double entry was crudely infilled. Note remnants of original ceramic tile on either side of the door frame.

## Figure 4-12.

Building 4. First floor. Operating Room ante room. Note ceramic tile wainscot. The door is similar to other 5-panel doors found throughout the site. However, the infill of the opening indicates that this door may have been salvaged from elsewhere.

## Figure 4-13.

Building 4. First floor. Original Operating Room. Note sloped wall at right; this is the original skylight, which has been covered with gypsum board. Metal ceiling is probably original.

## Figure 4-14.

Building 4. First floor. Operating Room ante room. View into original etherizing room. Note remnants of ceramic tile on the wall to the left of the door. Wood flush-panel door is similar to those found on the third floor of Building 3. It is probably original, or an early addition.

## Figure 4-15.

Building 4. Solarium corridor looking west. Building 4 is to the immediate left, and Building 3 is to the immediate right. Straight ahead and to the left is the southwest pavilion. Originally, the woodwork in these spaces including window sash and frames, and baseboards were dark stained and varnished. It is likely that the walls were a light green, since that color has been found on other walls in the building. The solarium corridors are typically used for storage, which is hazardous and unattractive.

## Figure 4-16.

Building 4. Southwest pavilion. This work was being undertaken in Autumn 1995. Note how the suspended ceiling impacts the space and interferes with the window configuration. The fireplace is original, but it has been blocked in. (See Figure 3-23 for the original appearance).

## Figure 4-17.

Building 4. Southwest pavilion. The four piers in each pavilion are actually ventilating ducts. Note vents at the top and bottom of the shaft (they exist on both sides). The tops of the shafts are visible in the attic space above (See Figure 4-29). This is the only pavilion where the vents are still visible.

Figure 4-18.

Building 4. Southwest pavilion. View toward original Quiet Room and closets. The doors and frames are original or early replacements.

Figure 4-19.

Building 4. Southwest pavilion. The toilet enclosures are original or early alterations. The ceramic tile floor is not original.

Figure 4-20.

Building 4. Southwest pavilion. Early slop sink is similar to another found in Building 1. It is probably original.

Figure 4-21.

Building 4. Southeast pavilion. View toward the fireplace on the east wall. As in all the pavilions, the suspended ceiling has a severe impact on the original height of the space and on the windows. The partition wall dividing the space is not original. Note that the room on the right retains some original ceramic wall tile. This room was originally designated a Quiet Room.

Figure 4-22.

Building 4. Southeast pavilion. Detail of original fireplace. (See Figure 3-23 for probable original appearance.)

Figure 4-23.

Building 4. Southwest pavilion stair, basement level. This stair is original, and identical to the one in the southeast pavilion. Paint analysis shows that the risers and balusters were dark stained and varnished and that the walls were light green.

Figure 4-24.

Building 4. Southeast pavilion stair, first-floor level. This arrangement is similar to the stair opposite.

Figure 4-25.

Building 4. Southeast pavilion stair landing at first-floor level. Note damage from water infiltration.

Figure 4-26.

Building 4. Southwest pavilion. Attic space showing ventilator fan.

Figure 4-27.

Building 4. Structure. Fan Chamber in Building 4, showing the underside of the ribbed concrete roof slab with terra cotta tile infill between the ribs. The crack in the concrete beam is visible to the right of the column.

Figure 4-28.

Building 4. Structure. Detail of crack in reinforced concrete roof beam in the Fan Chamber.

Figure 4-29.

Building 4. Structure. Attic of the southwest pavilion showing the gabled concrete roof frames and hanger rods supporting upturned concrete beam. Note ventilation duct through the floor at right center.

Figure A

Building 3. North and South Elevations. These elevations represent the conditions of the building as they existed in 1994.

Figure B

Building 4. North and South Elevations. These elevations represent the conditions of the building as they existed in 1994.

Figure C

Building 3 and Building 4. East Elevations. These elevations represent the conditions of the building as they existed in 1994. They also show how the glazed solarium corridors connect Buildings 3 and 4 with each other and with the ward pavilions.

Figure D

Building 3 and Building 4. West Elevations. These elevations represent the conditions of the building as they existed in 1994. They also show how the glazed solarium corridors connect Buildings 3 and 4 with each other and with the ward pavilions.

Figure E

Building 3 and Building 4. Sectional Elevations. These elevations represent the conditions of the building as they existed in 1994. They also show how the glazed solarium corridors connect Buildings 3 and 4 with each other and with the ward pavilions.

Figure F

Building 3 and Building 4. Basement Plan. This plan shows how the glazed solarium corridors connect Buildings 3 and 4 with each other and with the ward pavilions.

Figure G

Building 3 and Building 4. First Floor Plan. This plan shows how the glazed solarium corridors connect Buildings 3 and 4 with each other and with the ward pavilions.

Figure H

Building 3. Second and Third Floor Plans. Building 3 and Building 4 are connected to each other at the basement and first floor. Building 3 rises above Building 4 on the second and third floors.

## Figure I

Building 3. Basement plan. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure J

Building 3. First floor plan. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure K

Building 3. Second and Third Floor plans. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure L

Building 4. Basement Plan. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure M

Building 4. First floor plan. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 5-1.

Building 5. West elevation. The building originally functioned as the Sick Officers' Quarters. It was constructed 1908-1910. The building is similar in style and massing to the other buildings on the site. However, it is distinguished by a two-story porte cochere on the north elevation (at left in the photograph).

## Figure 5-2.

Building 5. Oblique view from the southeast. The building's "T" shape accommodates a secondary entry porch on the east side, similar to that on the west. Note also the steep slope of the site down to 23rd Street and parking lot adjacent to the building.

## Figure 5-3.

Building 5. Oblique view from southwest. The building's "T" shape accommodates a secondary entry porch on the west side, similar to that on the east. The elevator bulkhead at the roof crossing is an original feature.

## Figure 5-4.

Building 5. North elevation. Porte cochere, east side. The porte cochere is the most distinguished feature of the building; however, it is also the most compromised due to alterations and severe water damage. The concrete steps and covered swale next to the concrete sidewalk are not original features of this building. The wood fence in the background separates the asphalt driveway from the residence garden to the north.

## Figure 5-5.

Building 5. Porte cochere. Detail of cracked concrete steps. These steps do not appear on the original drawings; they were probably installed when the porte cochere was converted to a loading dock (see Figure 5-8).

## Figure 5-6.

Building 5. Porte cochere. Detail of pilaster and railing at the second floor. The porte cochere is subject to severe water damage due to blocked roof drains above. The east side, as shown here is particularly bad. Wood rot and peeling paint is noted from roof level through the first floor.

## Figure 5-7.

Building 5. Porte cochere. The original door was identical to the one still existing in the south corridor of the building (see Figure 5-30). It was replaced by this aluminum and glass door. The aluminum infill of the arch replaces the original fan-lighted transom. This alteration detracts from the architectural character of this building.

## Figure 5-8.

Building 5. Porte cochere. Detail of west side. The date of the conversion of the porte cochere to a loading dock is not known. However, original drawings show a set of granite steps in this location. Infill brick under the platform is close to the original in color, but noticeably different. The installation of the wood gate and crude attachment of bumpers, corner guards and signs further detract from the architectural character of the building.

## Figure 5-9.

Building 5. Porte cochere. Detail of column base and wood plinth on west side. Water damage is noted throughout the wood elements in the porte cochere. The bases on other columns have replacement steel plinths, which are rusting.

## Figure 5-10.

Building 5. Oblique view of the sun porch from the west. As noted on most of the other buildings on the site, the sun porch has been enclosed to accommodate interior office space. While it would be possible to enclose the sun porches in a sympathetic manner, the design and installation of the current system detracts from the architectural character of the building. The metal ladder on the west side does not detract from the appearance of the building, but its purpose is not clear.

## Figure 5-11.

Building 5. Sun porch detail. The wood and glass door entering the south side of the sun porch probably dates to the construction of the infill.

## Figure 5-12.

Building 5. Sun porch detail. The balustrade at the top of sun porch opens onto the wood fire escape. Peeling paint, checked wood rail and replacement newel indicate water damage and lack of maintenance. Also note cracking in the roofing material (bottom center of the photograph).

Figure 5-13.

Building 5. West elevation from the south. Secondary entry porch. Note the small lawn buffer between the building and the asphalt parking lot. This approach softens the visual effect of the parking and protects the building from impact. The brick curb at the center of the photographs has a concrete paving, which covers the underground passage connecting Building 5 to Building 3.

Figure 5-14.

Building 5. West entry porch detail. This door appears to be original.

Figure 5-15.

Building 5. West entry porch detail. Note that the original granite step at the bottom is in good condition, while the concrete replacement above, and the porch slab, are cracked.

Figure 5-16.

Building 5. Oblique view from the southeast. Note that the asphalt parking abuts the building at grade, exposing it to impact damage. There is no curb on the east side of the parking lot (at right); the pipe railing serves as guard rail. The site slopes sharply to the east toward 23rd Street.

Figure 5-17.

Building 5. East entry porch detail. The french doors in both openings appear to be original.

Figure 5-18.

Building 5. Typical exterior light fixture. This type of fixture is suspended from the ceilings of the porte cochere and the east and west entry porches. It is not original.

Figure 5-19.

Building 5. Most of the windows are the original six-over-six double-hung wood sash set into wood frames. While they have been over-painted, they appear to be in sound condition. Also note the brick and granite detail. The masonry, too, is in good condition.

Figure 5-20.

Building 5. Basement windows on the east side.

Figure 5-21.

Building 5. Main staircase. The first-floor level of the stair remains open and in its original configuration. Its design and detailing is similar, but not a replication of the stair in Building 3.

Figure 5-22.

Building 5. Main staircase, from the landing between the first and second floors. Unlike the treatments seen in other buildings, the fire enclosure of this stair left open the original hand rail. The enclosure does detract from the architectural character of the space, but it does leave the detail exposed. If it is necessary to enclose the stair for fire-rating purposes, this is a reasonable compromise.

Figure 5-23.

Building 5. View of the second floor looking south. This space has been heavily altered. The gypsum board stair enclosure to the right, and the partition with door at the end of the space are not original. The electrical closet enclosure to the left is pulling away from the plaster wall.

Figure 5-24.

Building 5. View of the second floor looking north. The door opening to the left is original, but the door is not. The infill and door to the right of the structural column are not original.

Figure 5-25.

Building 5. View of a typical office space on the second floor (Room 5207). The room configurations have been altered throughout the building.

Figure 5-26.

Building 5. View of Room 5213. Like many rooms in the building, this has been altered by the removal of interior partitions. The suspended ceilings reduce the room height and cover the tops of door and window frames.

Figure 5-27.

Building 5. View of the third-floor corridor. This area is used as circulation and conference space. Floor plan changes have been made on this floor, as on the others.

Figure 5-28.

Building 5. View of the second-floor sun porch. This space is used for storage. The door to the left appears to be original (see Figures 5-27, 5-33), but the window openings have been blocked in.

Figure 5-29.

Building 5. Fireplace in Room 5205. Some of the fireplaces have had minor alterations; but they are all extant and mostly intact.

Figure 5-30.

Building 5. The doors and fan light at the south end of first-floor corridor are in their original location, although they are now enclosed by the sun porch corridor. The original north entry doors and fan light were identical to these.

Figure 5-31.

Building 5. Typical five-panel wood door with original hardware. The panel moldings in these doors all have molded profiles. Rounded profiles on doors in other buildings on the site seem to denote that the doors are original; molded profiles seem to signify early replacements. The fact that there are no rounded moldings on the doors in this building may signify that they are early replacements, as well.

Figure 5-32.

Building 5. Typical two-panel door. These doors are found throughout the site. They are probably early replacements.

Figure 5-33.

Building 5. The entry door to the second-floor sun porch appears to be original.

Figure 5-34.

Building 5. Typical third-floor door. These flush doors with window panels are probably early replacements.

Figure 5-35.

Building 5. Typical toilet door and sign. These are probably early replacements.

Figure 5-36.

Building 5. Typical toilet enclosure (Room 5209). These wood partitions with louvered or paneled doors probably represent early alterations. Most of the toilets were originally smaller bathrooms outfitted with tubs.

Figure 5-37.

Building 5. Typical toilet enclosure (Room 5306). Marble partitions may be original or early alterations.

Figure 5-38.

Building 5. Original pedestal sinks. Several original sinks exist in this building.

Figure 5-39

Building 5. Basement and first floor plans. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

Figure 5-40

Building 5. Second and third floor plans. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

Figure 5-41

Building 5. North, South, East and West Elevations. These elevations represent the conditions of the building as they existed in 1994.

Figure 6-1.

Building 6. Oblique view from northeast. Building 6 was constructed as the Contagious Hospital, and was constructed 1908-1910.

Figure 6-2.

Building 6. North elevation, entry portico. The aluminum and glass entry infill replaces a folding partition arrangement noted on original drawings. A glazed partition could be an appropriate solution to enclosing the building; but the heavy, mill-finish aluminum members of

this system detract from the architectural integrity of the building. The steel stair (to the right of the canopy) and the metal railing along the second-floor balcony replace a wood balustrade; both elements detract from the building's design.

Figure 6-3.

Building 6. North elevation, second-floor balcony. The aluminum and glass entry infill replaces a folding partition arrangement noted on original drawings. A glazed partition could be an appropriate solution to enclosing the building; but the heavy, mill-finish aluminum members of this system detract from the architectural integrity of the building. The hanging light fixture is a later addition; it is similar to others on the site.

Figure 6-4.

Building 6. Oblique view from the southeast. The south elevation of this building, and the HVAC equipment on top of the porte cochere, are highly visible from off-site. Note also that the windows are original 6-over-6 wood sashes. On the north, east and west they are single units with transoms. On the south elevation, the windows are paired in wider masonry openings.

Figure 6-5.

Building 6. South elevation, detail of former porte cochere. The aluminum and glass infill, and the covered walk detract from the building's architectural character. Glazed systems could be an appropriate solution, but the heavy, mill-finished aluminum members of the infill and heavy posts of the walkway do not enhance the quality of this design.

Figure 6-6.

Building 6. North elevation. Six-over-six wood double-hung sash windows set under three-light transoms are typical of north, east and west elevations. The white panels under the windows are vestiges of the ventilating system designed for the original hospital use of this building. Also note obtrusive conduit running across the top of the water table belt course.

Figure 6-7.

Building 6. Typical basement window.

Figure 6-8.

Building 6. Landscape, view looking down the slope toward the southwest. Note the recent retaining walls and plantings; the pressure-treated lumber is not a sympathetic material in the landscape on this site, which is typified by masonry paths and retaining walls.

Figure 6-9.

Building 6. Landscape, view looking down the slope toward the southeast. Note condensers, recent retaining walls and highly obtrusive cables running across the front of the building. Also note the fire pull station in background (in front of white car), which is one of a few early-20th century features remaining.

## Figure 6-10.

Building 6. Landscape, view from second-floor balcony on north facade looking down the steel stair. Note awkward junctures between different paving materials and grade levels. Note also poor condition and inappropriate repairs.

## Figure 6-11.

Building 6. View of the first-floor lobby space. Note elevator shaft in the foreground (behind the flags). The elevator doors open to the area to the right, which is a deviation from the original design intent. The interior of this building has been altered more heavily than any other building on the site. Of particular note are dropped ceilings, new partitions and flush wood doors throughout.

## Figure 6-12.

Building 6. View of stair leading from first-floor lobby to second floor. The gypsum board enclosing the stair is a later alteration.

## Figure 6-13.

Building 6. Room 6113. Note that hung ceilings butt into the window at the transom level. This detracts from the original height of the room and is also visible from the exterior.

## Figure 6-14.

Building 6. View of the basement corridor looking toward the former porte cochere. Note the brick pier and interior wall to the right of the window. This is the last vestige of original finish remaining on this floor.

## Figure 6-15.

Building 6. Basement. View of the former porte cochere looking through the glass and aluminum vestibule toward the covered walkway. A glazed system could be an appropriate solution to this entry, but the heavy mill-finish aluminum members of this system does not enhance the design.

## Figure 6-16.

Building 6. Typical door. There are no original doors remaining in this building. The original doors were typically wood five-panel doors similar to those found in the other buildings on the site. Replacement doors are generally flush wood or metal in metal bucks.

## Figure 6-17

Building 6. Floor plan, Basement. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 6-18

Building 6. Floor plan, First Floor. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 6-19

Building 6. Floor plan, Second Floor. These floor plans represent the conditions of the building as they existed in 1994. They also provide location symbols for the preceding photographs.

## Figure 6-20

Building 6. North, South, East and West Elevations. These elevations represent the conditions of the building as they existed in 1994.

## Figure 7-1.

Building 7. West elevation. The building originally functioned as the Hospital Corps' Quarters. It was constructed 1908-1910.

## Figure 7-2.

Building 7. West elevation, entry portico. The portico is in its original configuration. The fanlight transom and side panels of the original entry remain, but they were damaged by the installation of the aluminum and glass vestibule. The original door no longer exists. In addition to damaging the fabric of the building, the vestibule detracts from the architectural character of the building. Also note paint failure on the columns.

## Figure 7-3.

Building 7. South sun porch. The sun porches on most of the buildings on the site were originally designed to be open. The infill between the columns is a later alteration. Creating interior spaces within the sun porches could be compatibly designed; however, the design and installation of the current system detracts from the architectural character of the building. The roof drainage system and construction details of this porch are particularly bad and there is quite a lot of water damage noted on the interior and rotting wood elements in the balustrade.

## Figure 7-4.

Building 7. East (rear) elevation. The site slopes sharply to the east down to 23rd Street behind this building so that the basement level is above grade on this side.

## Figure 7-5.

Building 7. North elevation. The fire escape dominates and obscures most of the north elevation; it is a highly obtrusive alteration. The third-floor dormer provides access to the escape by a wood platform projecting over the roof cornice (see Figure 7-21). The second-floor access to the fire escape is through the center bay window (see Figure 7-20).

## Figure 7-6.

Building 7. Landscape at northeast corner of site. The areaways are accessed from grade behind a retaining wall at the southwest corner of the building, and by way of concrete steps leading down from grade on the northwest and northeast corners (see Figure 7-7). The areaway retaining walls are bowing and several cracks are evident. Simple iron pipe rails surmount the retaining walls; they appear to be original and in good condition.

## Figure 7-7.

Building 7. Concrete patio at north end of east elevation. Concrete steps, at the edge of the building accommodate the change in grade from the front to the rear of the building. Generally, the concrete paving, steps, retaining walls and coping stones are in poor condition.

## Figure 7-8.

Building 7. Most of the windows are the original wood six-over-six double-hung wood sash set into wood frames. While they have been over-painted, they appear to be in sound condition. Also note the brick and granite detail. The masonry, too, is in good condition.

## Figure 7-9.

Building 7. Basement room 7001A, room under the sun porch. The brick infill in the arches is not original, but it is close to the original in color. The infill also is set back from the plane of the original brick on the interior and the exterior. Unfortunately, the installation of the windows and air conditioning units does not enhance what would otherwise be a sympathetic alteration.

## Figure 7-10.

Building 7. Basement corridor. Note infill and non-original flush door at the end of hall. Original doors are noted in the openings to the right.

## Figure 7-11

Building 7. Basement corridor. Note the original exterior doors. The panic hardware is a later alteration.

## Figure 7-12

Building 7. View of the first-floor lobby space toward the entry. The original transom and sidelight panels are original. However, the original configuration of the glazing was altered by the installation of undivided glazing, and the original doors have been removed. The installation of the aluminum and glass doors and vestibule damaged the original millwork on the exterior. In addition, the design and detailing detract from the architectural character of both the interior and exterior of the building.

## Figure 7-13

Building 7. View of the first-floor lobby space toward the stair. The flush wood doors beyond the stair are not original, but they are set into the original door frame with transom. These doors do not conform to the appearance of the original five-panel wood doors seen in other parts of the building, and they detract from the appearance of this space.

## Figure 7-14

Building 7. Detail of the stairs in first-floor lobby space. The stair surfaces are scuffed and worn, but generally in good condition.

## Figure 7-15

Building 7. Detail of the second-floor landing. The return stair at the landing (in the foreground) was probably added with the stair enclosure, which is a later alteration.

Figure 7-16

Building 7. Second-floor corridor. The double-loaded corridor reflects its original configuration, both in plan and ceiling height.

Figure 7-17

Building 7. Room 7201A, sun porch. View toward Tucson columns, which were part of original sun porch configuration. The infill with windows is not original. While an infill system could be compatibly designed, the design and installation of this system is not sympathetic to the architectural character of the building.

Figure 7-18.

Building 7. Room 7205. The door opening in the foreground appears to be original, although the door has been removed from its hinges. The door and opening to the corridor (on the right) are probably early alterations; they do not correspond to any door opening on the original floor plans. In addition, the door, very similar to other five-panel doors in the building, has molded profiles rather than rounded, which are noted on original doors. Pipes, conduits and lighting detract from the space. Note water damage in the ceiling and wall.

Figure 7-19.

Building 7. Room 7207. French door leading to balcony over entry portico. The door and frame appear to be original. The transom light was designed to be articulated by wood muntins or lead coming as noted in the original drawings. The existing is probably a later alteration.

Figure 7-20.

Building 7. Rooms 7209-7210. View shows window opening onto the wood fire escape on the north side. Note that furniture blocks access to the window.

Figure 7-21.

Building 7. Room 7302. View shows the north dormer with wood steps providing access to the fire escape.

Figure 7-22

Building 7. First-floor lobby. Detail of water damage in plaster over the entry. This is probably due to poor flashing and roof drainage. Other water damage noted on the west wall and ceiling in this room may be due to faulty plumbing above.

Figure 7-23

Building 7. Room 7106. Detail of damaged plaster on north wall. This may be due to water infiltration from the exterior wall, but it is more likely to be associated with prolonged poor performance of the radiator.

## Figure 7-24

Building 7. Room 7201A, sun porch, east corner. Detail of the juncture between the sun porch and the main structure of building. Water penetration has caused wood rot and displacement. Note that original masonry (to left) opening has been infilled with gypsum board, replacing original french doors. This is a typical condition on every floor of the sun porch.

## Figure 7-25

Building 7. Room 7207. Detail of water damage in the ceiling, which is probably related to leaks from the third-floor toilet.

## Figure 7-26

Building 7. Typical original five-panel wood door with original brass knobs and lockset. Note the rounded panel moldings, which differentiate the original doors from the early replacements. The simple, flat frames are typical throughout the building.

## Figure 7-26a

Building 7. Typical early replacement five-panel wood door with original brass knobs and lockset. Note the molded profile of the panel moldings, which differentiate the early replacement doors from the originals.

## Figure 7-27

Building 7. Original double-leaf door leading to large conference room space. Note transom above.

## Figure 7-28

Building 7. Typical original wood door reconfigured to accommodate glazing and ventilator panels. The brass knob and lockset are probably original; the latch above, and the automatic closer are not.

## Figure 7-29

Building 7. This wood paneled door does not match the configuration of original five-panel doors. It is similar to doors found in Building 2, and it may have been salvaged from there.

## Figure 7-30

Building 7. Typical later replacement doors include flush wood doors fit into original door frames. Transom glazing was frequently painted or replaced with wood panels.

## Figure 7-31

Building 7. Typical toilet enclosure.

## Figure 7-32

Building 7. Typical toilet. Note poor condition of vinyl tile floor.

## Figure 7-33

Building 7. Typical non-original fluorescent lighting fixture.

Figure 7-34  
Building 7. Typical steam heat radiator.

Figure 7-35  
Building 7. Basement floor plan. The floor plan represents the conditions of the building as they existed in 1994. It also provides location symbols for the preceding photographs.

Figure 7-36  
Building 7. First floor plan. The floor plan represents the conditions of the building as they existed in 1994. It also provides location symbols for the preceding photographs.

Figure 7-37  
Building 7. Second floor plan. The floor plan represents the conditions of the building as they existed in 1994. It also provides location symbols for the preceding photographs.

Figure 7-38  
Building 7. Third floor plan. The floor plan represents the conditions of the building as they existed in 1994. It also provides location symbols for the preceding photographs.

Figure 7-39  
Building 7. East, West, North and South Elevations. These elevations represent the conditions of the building as they existed in 1994.

## **Chapter 5 - Illustrations follow page 219**

Sample Locator Maps

## **Chapter 6 - Illustrations follow page 267**

Figure 1-1

Location: North Elevation of Building 1 at West End

Problem: Stress crack (and open joints) from granite water table joint to first floor window

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

Figure 1-2

Location: East Elevation of Building 1 at North End

Problem: Stress crack (and open mortar joints) between first and second floor windows

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

Figure 1-3

Location: East Elevation of Building 1 in South Areaway

Problem: Open mortar joints

Cause of Problem: Freezing water in open joints of granite water table.

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

Figure 1-4

Location: East Elevation of Building 1 in Central Areaway

Problem: Open mortar joints and stress cracks in brickwork

Cause of Problem: Freezing water in open joints.

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile. Crack brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

Figure 1-5

Location: East Elevation of Building 1 in South Areaway

Problem: Open and badly repointed joints associated with iron railings

Cause of Problem: Freezing water in open joints, rusting iron railings

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

Figure 1-6

Location: East Elevation of Building 1 at North End

Problem: Open joints between granite keystones and brick voussoirs

Cause of Problem: Freezing water in open joints

Suggested Remedy: Existing mortar should be raked from the joints to a minimum depth of 3/4 inches. Repoint joints with fresh mortar that matches existing pointing mortar in color, texture and profile.

Figure 1-7

Location: South Elevation of Building 1 near South Areaway

Problem: Bulging and efflorescing brick retaining wall

Cause of Problem: Movement and freezing of water in the wall

Suggested Remedy: Earth should be excavated from next to the wall, the waterproofing skin renewed. The opposite side of the wall is cut and repointed.

## Figure 1-8

Location: North Elevation of Building 1 at Central Steps

Problem: Shifting of brick piers for steps

Cause of Problem: Rear piers not anchored to walls

Suggested Remedy: Rebuild piers anchoring rear ones to the wall

## Figure 1-9

Location: Northeast Corner of Building 1

Problem: Damaged brick

Cause of Problem: Impact from vehicles

Suggested Remedy: Brick should be removed and replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 1-10

Location: East Elevation of Building 1 in Central Area

Problem: Spalled brick

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 1-11

Location: East Elevation of Building 1 at North End

Problem: Movement of concrete window wells

Cause of Problem: Freezing water in joints between brick wall and window well

Suggested Remedy: Demolish and rebuild

## Figure 1-12

Location: East Elevation of Building 1 in Central Area

Problem: Failure of joint between brick walls and concrete window wells

Cause of Problem: Freezing water in joints between brick wall and window well

Suggested Remedy: Demolish and rebuild

## Figure 1-13

Location: East Elevation of Building 1 at North End

Problem: Damaged tops of concrete window wells

Cause of Problem: Freezing water and movement of window wells

Suggested Remedy: Demolish and rebuild

## Figure 1-14

Location: East Elevation of Building 1 in Central Areaway

Problem: Damaged concrete capstones

Cause of Problem: Rusting iron railings

Suggested Remedy: Demolish and rebuild in concrete

Figure 1-15

Location: East Elevation of Building 1 in South Areaway

Problem: Bitumen repairs to concrete capstone joints

Cause of Problem: Improper maintenance procedures

Suggested Remedy: Remove bitumen; cut and repoint joint (if capstones are replaced this remedy is unnecessary)

Figure 1-16

Location: East Elevation of Building 1 at South Entryway

Problem: Cementitious coating on concrete steps

Cause of Problem: Improper maintenance procedures

Suggested Remedy: Demolish and repour concrete slab

Figure 1-17

Location: South Elevation of Building 1 at South Areaway

Problem: Cracked concrete arches

Cause of Problem: Water penetration due to damage concrete slab

Suggested Remedy: Demolish and repour concrete slab and arches

Figure 1-18

Location: South Elevation of Building 1 near Southwest Corner

Problem: Cracked concrete window "lintel"

Cause of Problem: Water penetration and rusting rebar

Suggested Remedy: Rebar should be cleaned and painted and a cement patch installed

Figure 1-19

Location: East Elevation of Building 1 at North End

Problem: Damage woodwork and paint

Cause of Problem: Water penetration due to blocked gutter and leader

Suggested Remedy: Clear and maintain gutters and leaders.

Figure 1-20

Location: North Elevation of Building 1 at near East End

Problem: Open mortar joints

Cause of Problem: Susceptibility of vertical joints to water run-off

Suggested Remedy: Cut and point (see Chapter VIII. Mortar Analysis for mortar suggestions)

Figure 1-21

Location: East Elevation of Building 1 at near North Entrance

Problem: Rust stains on granite water table

Cause of Problem: Run-off from window air conditioners

Suggested Remedy: Poultice with iron-chelating agent

## Figure 3-1

Location: West Elevation of Building 3 on West Pavilion

Problem: Mottled soiling of buff brick and light soiling of white brick

Cause of Problem: Atmospheric pollution

Suggested Remedy: The buff brick will not clean by conventional or unconventional methods (see also Chapter VIII. *Materials Cleaning Analysis*)

## Figure 3-2

Location: North Elevation of Building 3 near West Pavilion

Problem: Damage brick

Cause of Problem: Unknown but may be poorly fabricated brick

Suggested Remedy: There is no remedy other than replacement of all buff brick

## Figure 3-3

Location: North Elevation of Building 3 near West Pavilion

Problem: Bitumen deposits on brick

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII. *Materials Cleaning Analysis*)

## Figure 3-4

Location: South Elevation of Building 3 on East Pavilion

Problem: Damaged brick

Cause of Problem: Installation of window grates

Suggested Remedy: Remove inserts and fill all holes

## Figure 3-5

Location: East Elevation of Building 3 on West Pavilion

Problem: Damaged brick

Cause of Problem: Unknown but may be freezing water or impact damage

Suggested Remedy: Replace with matching brick and mortar

## Figure 3-6

Location: East Elevation of Building 3 on East Pavilion

Problem: Open joints and stress cracks

Cause of Problem: Freezing water in open joints and/or rusting of iron anchors

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 3-7

Location: South Elevation of Building 3 at West Corner

Problem: Stress crack in brick (caulked)

Cause of Problem: Unknown but possibly differential heat stress

Suggested Remedy: Remove brickwork and replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

Figure 3-8

Location: East Elevation West Pavilion on North Side of Building 3

Problem: Caulked open joints

Cause of Problem: Improper maintenance

Suggested Remedy: Remove caulk and repoint with mortar

Figure 3-9

Location: South Elevation of Building on East Pavilion

Problem: Gypsum and flyash under limestone sills

Cause of Problem: Atmospheric pollution

Suggested Remedy: Water misting cleaning (for details see Chapter VIII. *Materials Cleaning Analysis*)

Figure 3-10

Location: South Elevation of Building 3 on West Pavilion

Problem: Open mortar joints

Cause of Problem: Freezing water in open joints and/or rusting iron anchors in window sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

Figure 3-11

Location: North Elevation of Building 3 on West Pavilion

Problem: Stains on limestone

Cause of Problem: Rusting iron attachments

Suggested Remedy: Remove stain with iron poultice (scrape and paint iron elements)

Figure 3-12

Location: West Elevation of Breezeway between Buildings 3 & 4

Problem: Damaged limestone

Cause of Problem: Impact from vehicles

Suggested Remedy: Repair with patching mortar

Figure 3-13

Location: East Elevation of Building 3 on South Corner of East Pavilion

Problem: Damaged limestone

Cause of Problem: Impact from vehicles

Suggested Remedy: Repair with patching mortar

## Figure 3-14

Location: North Elevation of Building 3 in Central Areaway

Problem: Bulging, cracked, efflorescing retaining wall

Cause of Problem: Water infiltration

Suggested Remedy: Excavate, waterproof, cut and point

## Figure 3-15

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete capstones

Cause of Problem: Water infiltration and corroding iron railings

Suggested Remedy: Remove and replace with new concrete

## Figure 3-16

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete capstones with repairs

Cause of Problem: Improper and unsightly maintenance procedures

Suggested Remedy: Remove and replace with new concrete

## Figure 3-17

Location: North Elevation of Building 3 in Central Areaway

Problem: Damaged concrete and corroding rebar

Cause of Problem: Water infiltration

Suggested Remedy: Demolish and rebuild

## Figure 3-18

Location: East Elevation of Building 3 on East Pavilion

Problem: Failing paint

Cause of Problem: Inadequate maintenance

Suggested Remedy: Scrape, prime and paint

## Figure 4-1

Location: East Elevation of East Pavilion on Building 4

Problem: Mottled soiling of buff brick and light soiling of white brick

Cause of Problem: Atmospheric pollution

Suggested Remedy: The buff brick will not clean by conventional or unconventional methods (see also Chapter VIII).

## Figure 4-2

Location: North Elevation of Building 4 on West Pavilion

Problem: Bitumen deposits on brick

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII. *Materials Cleaning Analysis*)

## Figure 4-3

Location: South Elevation of Building 4 on East Pavilion

Problem: Bitumen deposits on brick and limestone

Cause of Problem: Poorly executed maintenance procedures

Suggested Remedy: Remove with solvent poultice (details are discussed in Chapter VIII.

*Materials Cleaning Analysis*)

## Figure 4-4

Location: North Elevation of Building 4 on West Pavilion

Problem: Damaged brick

Cause of Problem: Unknown but possibly freezing water or impact damage

Suggested Remedy: Replace with matching brick and mortar

## Figure 4-5

Location: East Elevation of East Pavilion on Building 4

Problem: Open joints and stress cracks

Cause of Problem: Freezing water in open joints and/or rusting of iron anchors

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 4-6

Location: East Elevation of Building 3 on East Pavilion

Problem: Open joints and damaged and missing brick

Cause of Problem: Vehicular impact

Suggested Remedy: Remove damaged; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

## Figure 4-7

Location: North Elevation of Building 4 on West Pavilion

Problem: Gypsum and flyash under limestone sills

Cause of Problem: Atmospheric pollution

Suggested Remedy: Water misting cleaning (for details see Chapter VIII. *Materials Cleaning Analysis*)

## Figure 4-8

Location: West Elevation of Building 4

Problem: Biological soiling

Cause of Problem: Slow drying and overhanging trees

Suggested Remedy: Clean with power wash and detergent (for details see Chapter VIII. *Materials Cleaning Analysis*)

## Figure 4-9

Location: West Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Impact damage or corrosion of iron anchors

Suggested Remedy: Remove damaged limestone and assess anchors; replace with stainless steel if corroded and replace limestone with dutchman

Figure 4-10

Location: South Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Corrosion of iron anchors

Suggested Remedy: Replace anchors with stainless steel and replace limestone with dutchman

Figure 4-11

Location: South Elevation of Building 4 on South Portico

Problem: Damaged limestone

Cause of Problem: Vehicular impact

Suggested Remedy: Replace limestone with dutchman

Figure 4-12

Location: South Elevation of Building 4 on South Portico

Problem: Displaced granite

Cause of Problem: Vehicular impact

Suggested Remedy: Reset and re-anchor granite

Figure 4-13

Location: West Elevation of Breezeway between Buildings 3 and 4

Problem: Damaged and repaired limestone

Cause of Problem: Improper choice of materials

Suggested Remedy: Remove and replace with better matching patching mortar

Figure 4-14

Location: South Elevation of Building 4 on Garage of East Pavilion

Problem: Open joints and displaced brick

Cause of Problem: Water infiltration from poorly functioning gutter and leader

Suggested Remedy: Clear gutters and leaders; reset brick with proper mortar

Figure 4-15

Location: South Elevation of Building 4 on South Portico

Problem: Damaged brick

Cause of Problem: Water infiltration from poorly functioning leader

Suggested Remedy: Clear leader

Figure 5-1

Location: North Elevation of Building 5 near West End

Problem: Stress cracks in brick and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

Figure 5-2

Location: East Elevation of Building 5 near South End

Problem: Open mortar joints at articulate brick

Cause of Problem: Freezing water in joints

Suggested Remedy: cut and point joints

Figure 5-3

Location: North Elevation of Building 5 at West End of Porch

Problem: Open mortar joints and stress cracks in brick

Cause of Problem: Freezing water in joints; impact damage

Suggested Remedy: Brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

Figure 5-4

Location: Northwest Corner of Building 5

Problem: Damage brick

Cause of Problem: Unknown but perhaps impact damage

Suggested Remedy: Brick should be removed and then replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

Figure 5-5

Location: West Elevation of Building 5 at Central Entryway

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild

Figure 5-6

Location: West Elevation of Building 5 at Steps to Areaway

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing; rusting of iron railings

Suggested Remedy: Demolish and rebuild

Figure 5-7

Location: North Elevation of Building 5 at Westernmost Column of Portico

Problem: Damaged wooden base

Cause of Problem: Water penetration and poor maintenance

Suggested Remedy: Remove rotted wood and replace with new elements

## Figure 5-8

Location: North Elevation of Building 5 at Easternmost Column of Portico

Problem: Rusting of column leading to staining of granite

Cause of Problem: Water penetration of paint film and poor maintenance of paint

Suggested Remedy: Scrape and repaint column; poultice iron stain with chelating agent

## Figure 5-9

Location: North Elevation of Building 5 at Portico Balustrade

Problem: Soiling of granite

Cause of Problem: Atmospheric pollution

Suggested Remedy: Chemical cleaning (see Chapter VIII. Materials Cleaning Analysis for details)

## Figure 5-10

Location: North Elevation of Building 5 at West End

Problem: Open or caulked joints in granite water table

Cause of Problem: Susceptibility of vertical joints to water run-off; improper maintenance procedures

Suggested Remedy: Cut and point (see Chapter VII. Mortar Analysis for a discussion of replacement mortar)

## Figure 5-11

Location: West Elevation of Building 5 at North End

Problem: Open joints in granite window well

Cause of Problem: Susceptibility of vertical joints to water run-off; improper maintenance procedures

Suggested Remedy: Cut and point (see Chapter VII. Mortar Analysis for a discussion of replacement mortar)

## Figure 5-12

Location: West Elevation of Building 5 at North End

Problem: Bitumen on granite

Cause of Problem: Sloppy application of waterproofing material for drain

Suggested Remedy: Poultice cleaning with solvent (see Chapter VIII. Materials Cleaning Analysis for details of treatment)

## Figure 6-1

Location: North Elevation of Building 6 at West End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile

## Figure 6-2

Location: North Elevation of Building 6 at West End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 6-3

Location: East Elevation of Building 6 at North End

Problem: Stress cracks and open mortar joints

Cause of Problem: Freezing water in open joints of water table and/or rusting iron anchors in window lintels and sills.

Suggested Remedy: Remove brickwork and assess for rusting iron anchors. If anchors are rusted they should be replaced with stainless steel anchors; brick should then be replaced to match existing texture, color and size and reset in mortar to match surrounding pointing in color, texture, and profile.

## Figure 6-4

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Open mortar joints and efflorescence in brick

Cause of Problem: Water penetration through concrete slab

Suggested Remedy: Cut and point; waterproof concrete slab or replace concrete slab

## Figure 6-5

Location: South Elevation of Building 6 at East End

Problem: Damaged brick

Cause of Problem: Water penetration and freezing near metal anchors

Suggested Remedy: Remove anchors and fill with pointing mortar

## Figure 6-6

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Damaged concrete capstones

Cause of Problem: Water penetration and freezing; rusting of iron railings

Suggested Remedy: Demolish and rebuild

## Figure 6-7

Location: West Side of Entryway on North Elevation of Building 6

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild

## Figure 6-8

Location: West Wall of Entryway on North Elevation of Building 6

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Demolish and rebuild

## Figure 7-1

Problem: Bitumen waterproofing (and/or paint) on brick

Cause of Problem: Poor maintenance procedures

Suggested Remedy: Poultice with solvents

## Figure 7-2

Location: South Elevation of Building 7 at West End

Problem: Open mortar joints in brick

Cause of Problem: Water penetration and freezing

Suggested Remedy: Cut and point

## Figure 7-3

Location: North Side of Entryway on West Elevation of Building 7

Problem: Open mortar joints in brick

Cause of Problem: Water penetration and freezing; rusting of door lintel

Suggested Remedy: Remove brick and assess condition of lintel; replace if necessary and reset brick with mortar to match existing in color, texture and profile

## Figure 7-4

Location: North Elevation of Building 7 in Central Area

Problem: Open mortar joints

Cause of Problem: Water penetration and freezing

Suggested Remedy: Cut and point

## Figure 7-5

Location: East Elevation of Building 7 at North End (patio wall)

Problem: Damaged concrete

Cause of Problem: Water penetration and freezing

Suggested Remedy: Repair with concrete patching material

## Figure 7-6

Location: South Elevation of Building 7 at West End

Problem: Damaged and failing stucco

Cause of Problem: Water penetration and freezing

Suggested Remedy: Repair with new stucco

## Figure 7-7

Location: West Elevation of Building 7 along North Areaway

Problem: Bulging and efflorescing concrete retaining wall

Cause of Problem: Water penetration and freezing; pressure from soil

Suggested Remedy: Demolish and rebuild

Figure 7-8

Location: West Elevation of Building 7 at Central Entryway

Problem: Damaged and deteriorating concrete piers

Cause of Problem: Water penetration and freezing Suggested Remedy: Repair with concrete patching

Figure 7-9

Location: North Elevation of Building 7 at West End (Walkway Wall)

Problem: Damaged and deteriorating concrete capstone

Cause of Problem: Water penetration and freezing

Figure 7-10

Location: West Elevation of Building 7 at Central Entryway

Problem: Open or caulked joints

Cause of Problem: Water penetration and freezing; improper maintenance procedures

Suggested Remedy: Remove, cut and point

## **Chapter 7 - Illustrations follow page 282**

Figure 7-1

Building 1 - Brick Pointing Mortar

Figure 7-2

Building 1 - Granite Pointing Mortar

Figure 7-3

Building 3 - Brick Pointing Mortar

Figure 7-4

Building 3 - Limestone Pointing Mortar

Figure 7-5

Building 4 - Brick Pointing Mortar

Figure 7-6

Building 4 - Limestone Pointing Mortar

Figure 7-7

Building 5 - Brick Pointing Mortar

Figure 7-8

Building 5 - Granite Pointing Mortar

Figure 7-9  
Building 6 - Brick Pointing Mortar

Figure 7-10  
Building 6 - Granite Pointing Mortar

Figure 7-11  
Building 7 - Brick Pointing Mortar

Figure 7-12  
Building 7 - Granite Pointing Mortar

Sample Locator Maps

### **Chapter 8 - Illustrations follow page 291**

Figure 8-1  
The brick and granite on Buildings 1, 5, 6 and 7 is only lightly soiled as seen here on the elevation of Building 1.

Figure 8-2  
Gypsum and flyash have deposited on the undersides of window lintels and sills as seen here on the elevation of Building 3.

Figure 8-3  
Bitumen-based materials have been accidentally splashed onto the brick and granite as seen here on the elevation of Building 7.

Figure 8-4  
Condition of the lightly soiled brick on the east elevation of Building 5 before commencing cleaning tests.

Figure 8-5  
Condition of lightly soiled brick on the east elevation of Building 5 after cleaning with detergent (10 minute dwell time) and power wash (approximately 400 psi). Good results are obtained with little risk of damaging the brick.

Figure 8-6  
The light soiling of the brick on the east elevation of Building 5 was also cleaned by an alkaline pre-wash/acid after-wash system. The results of the cleaning are good but this system is more aggressive than the detergent cleaning which also achieved good results as seen in Figure 5. Therefore, the detergent cleaning is the recommended method for cleaning the lightly soiled brick on Buildings 1, 5, 6 and 7.

## Figure 8-7

The granite water tables (as well as other granite elements) on Buildings 1, 5, 6 and 7 are lightly soiled as seen here on the east elevation of Building 5 before cleaning tests commenced.

## Figure 8-8

The detergent cleaning of the granite water table on the east elevation of Building 5 was unsuccessful.

## Figure 8-9

The lightly soiled granite was cleaned well by the alkaline pre-wash/acid after-wash system as seen here on the east elevation of Building 5. This method is recommended for the cleaning of all granite elements on Buildings 1, 5, 6 and 7.

## Figure 8-10

The water misting method was used to remove gypsum and flyash from the undersides of window lintels as shown here on the east elevation of Building 5. Good results were obtained after 6 hours (before cleaning condition can be seen on the right). This is a safe and effective method for removing this soiling and is the recommended techniques for this condition.

## Figure 8-11

Bitumen-based deposits as shown here on the elevation of Building 5 were cleaned with PROSOCO'S Asphalt and Tar Remover - a solvent-based cleaner. The applied as a paste in attapulgite for 4 hours the deposit was then dislodged with paint scrapers taking care not to scrape the brick. The results shown here (uncleaned area on the left and cleaned area on the right) are good and this is the recommended method for removing these deposits.

## Figure 8-12

The soiling of the brick on Building 3 and 4 is more severe than on Buildings 1, 5, 6 and 7 as seen here on the elevation of Building 3. The brick on Buildings 3 and 4 is also different from the brick on Building 1, 5, 6 and 7.

## Figure 8-13

The water tables (and other decorative elements) on Buildings 3 and 4 are limestone. This limestone is moderately soiled as seen here on the elevation of Building 3.

## Figure 8-14

A cleaning test was executed with PROSOCO'S 1026 detergent on the brick of the south elevation of Building 3. No cleaning was achieved by this method (the left side of Figure 12 shows this area before cleaning).

## Figure 8-15

Cleaning tests on the brick of Building 3 were also executed with an alkaline pre-wash/acid after-wash system. The results shown here on the south elevation of Building 3 indicate that no cleaning was achieved by this method.

**Figure 8-16**

Cleaning tests were executed on the brick of Building 3 using increased concentrations in the alkaline pre-wash/acid after-wash system. Again, no cleaning was achieved as shown here on the south elevation of Building 3.

**Figure 8-17**

A section of the brickwork on the east elevation of Building 4 was cleaned with the water misting method. On the lower left the brick (and the limestone water table) can be seen before cleaning.

**Figure 8-18**

After 24 hours of water mist here on the east elevation of Building 4 the appearance of neither brick nor the limestone water table has altered significantly.

**Figure 19**

Application of ammonium thioglycolate poultice to brick to remove soiling from Buildings 3 & 4. Note the typical soiling conditions immediately adjacent to the poultices at Building 3.

**Figure 20**

Unsuccessful results of the hydrogen peroxide cleaning tests; there was little or no change from "before" and "after" on Building 3.

**Figure 8-21**

A section of the limestone water table on the north elevation of Building 4 was cleaned by several methods. Here can be seen the result when cleaning with a detergent followed by power washing. Good cleaning is achieved with little harm to the substrate. The before cleaning condition can be seen to the left and the to the right of the cleaned area.

**Figure 8-22**

A section of the limestone water table on the north elevation of Building 4 was also cleaned by the alkaline pre-wash/acid after-wash method. Good cleaning is also achieved but the method is more aggressive on the substrate. The before cleaning condition can be seen to the left and the to the right of the cleaned area.

**Figure 8- 23**

A section of the limestone water table on the north elevation of Building 4 was also cleaned using PROSOCO'S 1217 poultice for 6 hours followed by power washing. Good cleaning is also achieved by this method which is intermediate in aggressiveness to the detergent and alkaline pre-wash/acid after-wash methods. The before cleaning condition can be seen to the left and the to the right of the cleaned area.

Cleaning Test Locator Maps

**Chapter 9 - Illustrations follow page 336**

Building Zone Illustrations





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**A**

**Alkali.** A water soluble salt already present in concrete. Alkalies from the concrete or in the ground soil where cement may be placed can react with some aggregates to form the damaging effect of expansion.

**Ammonium Thioglycolate.** A poulticing medium known to remove iron staining from marble and other stones.

**Apron.** A raised panel below a window sill, sometimes shaped and decorated.

**Architrave.** The lintel extending from one column or pier to another: also, the lowest of the 3 main parts of an ENTABLATURE, also, more loosely, the molded frame surrounding a door or window (if this frame turns away at the top at right angles, rises vertically and returns horizontally, forming a shoulder, it is called a shouldered architrave).

**Archway.** A passage through or under an arch.

**Area well.** An open space through one or more floors, as a stair well or an elevator well.

**Areaway.** A sunken space affording access, air and light to a basement.

**Ashlar.** Hewn blocks of masonry wrought to even faces and square edges and laid in horizontal courses with vertical joints, as opposed to rubble or unhewn stone straight from the quarry.

**Attic.** A story built above the wall cornice and under the sloping roof of a house.

**Attapulgate.** A clay like material used for creating poultices that will clean exterior masonry.

**Axial plan.** Of a building planned longitudinally or along an axis, i.e. not centrally planned, e.g. a basilica as opposed to an octagon.

**B**

**Balcony.** A platform projecting from a wall, enclosed by a railing or balustrade, supported on brackets or columns or cantilevered out. A small, decorative balcony projecting from a window-sill, sometimes to hold flower-pots, is called a BALCONETTE.

**Baluster.** A short post or pillar in a series supporting a rail or coping and thus forming a balustrade.

**Balustrade,** see BALUSTER.

**Base course.** In masonry, the lowest course, or footing, of a wall or pier.

**Baseboard.** A molding covering a joint of a wall and the adjoining floor.

**Basement.** The lowest story of a building, usually below or partly below ground level or, if beginning at ground level, of less height than the story above. It is a living space, as distinct from a cellar.

**Bead molding.** A small cylindrical molding enriched with ornament resembling a string of beads; used in the Romanesque period.

**Beaded-Board.** A wood board that has been carved so that it has the appearance of being covered with rows of small spherical beads.

**Beam.** A term applied to a transverse, horizontal piece of timber (or sometimes metal) in roof construction. In the body of a building a main horizontal timber supporting floor or ceiling joists. A dragon beam is set diagonally and projecting at the corner of a building to support the joists of a jetty on two adjacent sides.

**Bearing wall.** A wall supporting a vertical load in addition to its own weight.

**Bedding planes.** A bottom layer of the foundation.

**Belt course.** A continuous horizontal band of masonry, marking a division in the wall plane.

**Bracket.** A small supporting piece of stone or other material, often formed of scrolls or volutes, to carry a projecting weight.

**Bull Nose.** An exterior angle which is rounded to eliminate a sharp or square corner. In masonry, a brick having one rounded corner.

**Butt hinges.** Those employed in the hanging of doors, shutters, casements, etc. They are placed on the edges with the knuckle projecting on the side to which the unit swings. Workmen generally sink the thickness of the hinges flush with the surface of the edge of the closure, and the tail part one half into the jamb. There are several kinds of butt hinges; such as top butt-hinges, which permit the closure to open only to a right angle, or perhaps a little more, without breaking the hinges; rising butt-hinges, which are those that turn upon a screw; these are most employed in doors, and cause the door to rise as it opens, so as to clear the carpet in the apartment; slip-off butt-hinges, which are those employed where a door or window blind is required to be taken off occasionally.

## C

**Casement.** (1) The hinged part of a window, attached to the upright side of the window-frame. (2) The wide concave molding in door and window jambs and between compound columns or piers, found in late Gothic architecture.

**Cementitious.** Having the properties of cement.

**Chair rail or dado-rail.** A molding round a room to prevent chairs, when pushed back against the walls from damaging their surface.

**Chelate.** Of, relating to, or having a ring structure that usually contains a metal ion held by coordination bonds.

**Coffer.** A recessed panel in a vault, ceiling, or soffit.

**Composite Order.** One of the five classical orders. A Roman elaboration of the Corinthian order, having the acanthus leaves of its capital combined with the large volutes of the Ionic order, and other details also elaborated.

**Concrete.** Concrete is 'mortar mixed with small stones to produce a hard monolithic mass' (P. Collins, Concrete, 1959). The use of concrete dated back to the ancient Roman times. Somehow the technology of making concrete was lost after the Romans, but was revived in the 18th century. It has become one of the most popular building material in the 20th century. *See also Reinforced concrete.*

**Coping.** A capping or covering to a wall, either flat or sloping to throw off water

**Cornice.** In classical architecture, the top, projecting section of an entablature; also any projecting ornamental molding along the top of a building, wall, arch, etc., finishing or crowning it. That along the sloping sides of a pediment is called a ranking cornice.

**Cyma recta.** A double-curved molding, concave above and convex below; also called an ogee molding.

**Cyma reversa.** A double-curved molding, convex above and concave below.

## D

**Dado.** The middle part (sometimes all parts) of a protective, ornamental paneling applied to the lower walls of a room above the baseboard.

**Deadbolt.** A lock bolt without a spring that is not automatically activated, but must be engaged by physically turning or sliding the bolt.

**Dentil.** A small square block used in series in Ionic, Corinthian, Composite, and more rarely Doric cornices.

**Diffractionmeter.** An apparatus which produces and quantifies the diffraction of light with respect to various substances.

**Dome.** Vault of even curvature on a circular base. The section can be segmental, semicircular, pointed, or bulbous.

**Dormer.** A vertical structure, usually housing a window, that projects from a sloping roof and is covered by a separate roof structure.

**Downspout.** A rain leader or vertical pipe to conduct water from the eaves gutter.

**Dutchman.** A device for hiding or counteracting structural defects.

## E

**Efflorescence.** To form or to become covered with a powdery crust.

**Egg and Dart or egg and tongue.** An ovolo molding decorated with a pattern based on alternate eggs and arrow-heads.

**Elastomeric.** Any of various polymers having the elastic properties of natural rubber.

**Elevation.** The external faces of a building; also a drawing made in projection on a vertical plane to show any one face (or elevation) of a building.

**Erlenmeyer flask.** A flat-bottomed conical laboratory flask.

**Escutcheon.** A protective plate surrounding the keyhole on a door.

## F

**Fascia.** A plain horizontal band, usually in an architrave, which may consist of two or three fasciae over-sailing each other and sometimes separated by a narrow molding.

**Fenestration.** The arrangement and design of windows in a building.

**Finish.** The final treatment or coating of a surface.

**Flemish Bond.** In brickwork, a bond in which each course consists of headers and stretchers laid alternately; each header is centered with respect to the stretcher above and the stretcher below it.

**Flue.** A separate incombustible and heat-resistant enclosed passage within a chimney to control and carry away products of combustion from a fireplace, furnace, or boiler to the outside air. In some cases the brick of the chimney itself encloses the passage.

**Flyash.** Fine, solid pieces of ashes, dust, and soot carried out from burning fuels (as coal or oil) by a draft.

**Footing.** An enlargement at the lower end of a foundation wall, pier, or column to distribute the load.

**Foundation.** An underlying base or support for a wall.

**Framing.** A structure whose weight is carried by the framework instead of by load-bearing walls. The term includes modern metal and reinforced concrete structures, as well as timber-framed (half-timbered) buildings.

## G

**Gable roof or pitched roof.** It is the most common type of roof with gables at both ends.

**Girder.** A large or principal beam used to support concentrated loads, usually from other beams, at isolated points along its length.

**Glazed bricks.** Polychrome glazed bricks were developed in the ancient Near East in the late 2nd millennium BC and were used for wall decoration on a large scale at Khorsabad (c.8 BC) and Babylon (c.575 BC).

**Grade.** The existing or established level of the ground about a building.

**Greek Revival.** Greek as against Roman architecture became known to the West only about 1750-60. It was at first regarded as primitive and imitated by only a few architects. The earliest example is a garden temple at Hagley by 'Athenian' STUART (1758). A Grecian fashion began only in the 1780s. Among the earliest believers in the positive value of the simplicity and gravity of the Greek C5 were LEDOUX and SOANE. The Greek Revival culminated in all countries in the 1820s and 1830s

**Grille.** A grating or openwork barrier, usually of metal but sometimes of wood or stone. It is used to cover, conceal, decorate, or protect an opening, as in a wall, floor or outdoor paving.

## H

**Hipped roof.** A hipped roof has sloped instead of vertical ends.

**Hearth.** That part of a fireplace on which the fire is laid, including the horizontal projection of this surface beyond the fire chamber.

**Hood.** 1. A cover placed above an opening or an object to shelter it. 2. A cover placed over a fire or chimney to create a draft and to direct the smoke, odors, or noxious vapors into a flue; may be supported or hung in space, or attached to a wall.

**J**

**Jamb.** The vertical face of an archway, doorway, or window; the part of the jamb which lies between the glass or door and the outer wall-surface is called a reveal.

**Jointing.** Finishing the surface of mortar joints in brickwork or masonry while the mortar is fresh, instead of raking it out and pointing.

**Joists.** Horizontal parallel timbers laid between the walls or the beams of a building to carry the floorboards. The undersides are either exposed to the room below and then often molded, or have ceiling laths nailed to them for a plaster ceiling.

**K**

**Keystone.** The central stone of an arch or a rib vault; sometimes carved.

**Knuckle.** One of the jointing parts of a hinge through which a pin or rivet passes.

**L**

**Laitance.** An accumulation of fine particles on the surface of freshly poured concrete caused by an upward movement of water through the concrete. This can be caused by too much mixing water, by excessive tamping, or by vibration of the concrete.

**Lath.** Rib-like support of wood or metal upon which plaster is spread.

**Leader.** A vertical pipe that conducts water from a gutter down the face of a building to an outlet at or below grade.

**Leaf.** One part of a double or multiple door.

**Limestone.** In commercial terms, a sedimentary rock consisting chiefly of calcium carbonate ( $\text{CaCO}_3$ ), often containing an accumulation of organic remains such as shells and fossils. Usually unpolished, relatively uniform in texture, and very light in color.

**Lintel.** A horizontal beam or stone bridging an opening.

**M**

**Mantelpiece.** The wood, brick, stone or marble frame surrounding a fireplace, frequently including an over-mantel or mirror above; sometimes called chimney-piece.

**Masonry.** Work by a mason, for example brickwork, stonework.

**Molding.** A deviation from a plane surface, involving rectangular or curved profiles, or both, with the purpose of effecting a transition or of obtaining a decorative play of light and shade.

**Mortar.** A mixture of cement (of lime), sand and water, laid between courses of bricks or masonry to even out irregularities and gain greater adhesion; more loosely, any material for and jointing brickwork or stonework.

**Mortise and tenon joint.** A joint formed by a projecting piece (or tenon) fitting into a socket (or mortise).

**Muntin.** The vertical part in the framing of a door, screen, panelling, etc., butting into, or stopped by, the horizontal rails.

## N

**Newel.** A post terminating the handrail of a stairway at top, bottom or on a landing. Originally the central pillar of a spiral staircase.

**Nosing.** The rounded front edge of a stair.

## O

**Oculus:** A round or oval aperture, open, louvered or glazed. A bull's eye.

**Off-set.** The part of a wall exposed horizontally when the portion above it is reduced in thickness; often sloping, with a projecting drip mould on the lower edge to stop water running down the walls, e.g. in Gothic buttresses. Also called water-table.

**Open-string.** Descriptive of a stairway in which the ends of risers and treads are uncovered on the outside.

**Overhang.** Projection of the upper story of a house.

## P

**Panel.** Strictly any flat surface sunk or raised within a framework.

**Panic hardware** (panic bolt). A door latch operated from one side by pressure against a horizontal bar running across the full width of the door.

**Parapet.** A low wall, sometimes battlemented, placed to protect any spot where there is a sudden drop, for example, at the edge of a bridge, quay, or house-top.

**Parquet.** Flooring of thin hardwood (about 1/4" thick) laid in patterns on a wood sub-floor and highly polished. Inlaid or plated parquet consists of a veneer of decorative hardwood glued in patterns to squares of softwood backing and then laid on a wood sub-floor.

**Pavilion.** On a facade, a prominent portion usually central or terminal, identified by projection, height, and special roof forms.

**Paving.** Durable floor, walk, or road surfacing.

**Pediment.** Not a Greek or Roman term but signifying in classical architecture a low-pitched gable above a portico, formed by running the top member of the entablature along the sides of a gable; also a similar feature above doors, windows etc. It may be straight-sided or curved segmentally.

**Petrographic.** Relating to the description and classification of rocks.

**Picture mould.** A molding at the upper part of a wall, or forming the lower edge of an interior cornice, rounded at its top to support picture hooks.

**Pier.** (1) A solid masonry support, as distinct from a column. (2) The solid mass between doors, windows, and other openings in buildings. (3) A name frequently given to Romanesque and Gothic pillars varying from a square to a composite section.

**Pilaster.** A shallow pier or rectangular column projecting only slightly from a wall and, in classical architecture, conforming with one of the orders.

**Pillar.** A free-standing upright member which, unlike a column, need not be cylindrical or conform with any of the

**Plan.** The horizontal arrangement of the parts of a building or a drawing or diagram showing such arrangement as horizontal section.

**Plaster,** see STUCCO.

**Plasterboard.** A compositional sheet in various thicknesses used as a base for a thin finish coat of plaster, also known as "drywall".

**Plenum.** An air compartment maintained under pressure and connected to one or more distributing ducts.

**Pocket doors.** Doors, which are set on tracks near their top and base, allowing them to be pushed into narrow recesses within adjacent walls.

**Pointing.** The exposed mortar finishing to brick or masonry joints raked out to receive it. Jointing is more durable. Old brickwork has to be repointed by renewing decayed mortar. Pointing is usually flushed at the edges (flush pointing) or slightly recessed (recessed pointing).

**Porch.** The covered entrance to a building; called a portico if columned and pedimented like a temple front.

**Porte-cochere.** A porch large enough for wheeled vehicles to pass through.

**Portico.** A roofed space, open or partly enclosed forming the entrance and center-piece of the facade of a building, often with detached or attached columns and a pediment.

**Posts.** In timber framed buildings the main vertical timbers of the walls. In roof construction vertical timbers which carry longitudinal ones.

**Precast concrete.** Concrete components cast in a factory or on the site before being placed in position.

**Primer.** A ground coat in painting.

**Psi.** Pounds per square inch; the compressive strength of concrete is measured in psi's.

## Q

**Quoins.** The dressed stones at the corners of buildings, usually laid so that their faces are alternately large and small. From the French "coin."

**R**

**Rail.** A horizontal member in the frame of a door, window, panel, etc.

**Rainwater head.** A box-shape structure of metal, usually cast-iron or lead, and sometimes elaborately decorated, in which water from a gutter or parapet is collected and discharged into a down-pipe.

**Ramp.** (1) A slope joining two different levels. (2) Part of a staircase handrail which rises at a steeper angle than normal, usually where windows are used.

**Reinforced concrete.** Concrete in which steel rods are placed to enhance the tensile strength.

**Rear arch.** The arch on the inside of a wall spanning a doorway or window opening.

**Reinforced concrete.** Since concrete is strong in compression and weak in tension, steel mesh or rods are inserted to take the tensile stresses which, in a simple beam, occur in the lower part; the concrete is thus reinforced. Also called ferro-concrete.

**Retaining wall.** A wall, usually battered, which supports or retains a weight of earth or water; also called a revetment.

**Risers.** A vertical member between treads of a stair.

**Roll molding.** Molding of semi-circular or more than semi-circular section.

**Rotunda.** A building (often surrounded by a colonnade) or room circular in plan and usually domed, e.g. the Pantheon.

**S**

**Sandstone.** A sedimentary rock made up of grains of sand or other minerals held together by natural cementing agents and formed with a distinct layered structure.

**Sash.** A substantial frame which holds the glass pane or panes of a window.

**Sash fasts.** Hardware mounted on meeting rails of double hung windows, or meeting stiles of casement windows, used to hold the sash in a closed position. -

**Screed.** In cement masonry flamework, the wood or metal straightedge used to strike off or level newly placed concrete.

**Seriation.** The arrangement of a series of objects, as in the layers of paint found on historic walls.

**Shaft.** The trunk of a column between the base and capital. Also, in medieval architecture, one of several slender columns attached (in a cluster) to a pillar or pier, door jamb or window surround.

**Side light.** 1. A source of artificial illumination located on an interior wall or partition. 2. One of a pair of narrow windows flanking a door.

**Sill.** The horizontal member at the base timber-framed wall into which the posts and studs are normally tenoned. Also the horizontal member at the bottom of a window-opening or door frame.

**Skylight.** A window set into a roof or ceiling to provide top-lighting.

**Soffits.** The underside of an architectural element, e.g. an intrados.

**Spandrel.** The triangular space between the side of an arch, the horizontal drawn from the level of its apex, and the vertical of its springing, also applied to the surface between two arches in an arcade, and the surface of a vault between adjacent ribs.

**Spall.** A fragment or chip of stone or brick, especially bad or broken brick.

**Stile.** The vertical member to which the rails of a door, window or other frames are joined.

**Stratigraphy.** The arrangement of strata, as in the numerous layers of paint found on historic walls.

**Stoop.** A platform or small porch, usually up several steps, at the entrance to a house.

**Stratigraphy.** The arrangement of layers, a tool used to indicate the paint layers in a paint analysis.

**Stucco.** A slow-setting plaster composed basically of gypsum, sand and slaked lime with other substances to facilitate modeling and ensure durability.

**Swale.** A drainage canal formed by the convergence of intersecting slopes.

**Subflorescence.** Powdery deposits of crystals of various salts occurring from below the surface.

## T

**Terne.** An alloy of lead and tin typically in a ratio of 4 to 1 that is used as a coating in producing terne-plate.

**Threshold.** A strip fastened to the floor beneath a door, usually required to cover the joint where two types of floor material meet; may provide weather protection at exterior doors.

**Transom.** A horizontal bar of stone or wood across the opening of a window or across a panel.

**Tread.** The horizontal surface of a step.

**Trim.** The framing or edging of openings and other features on a facade or indoors. It is usually of a color and vertical (wood, stucco, or stone) different from that of the adjacent wall surface.

**Tuscan order.** It is the simplest of all orders. It is supposedly derived from the Etruscan-type temple.

## U

**Underpinning.** (1) A foundation replacing a former one or reinforcing it (from below). (2) Support for a structure by propping it up from below, usually temporary.

**V**

**Vestibule.** A small room between an outside door and an inside one, the later frequently opened into a hall.

**Vousoir.** A brick or wedge-shaped stone forming one of the units of an arch.

**W**

**Wainscot.** The timber lining to walls. The term is also applied to the wooden panelling of pews.

**Watertable.** A projecting course of molded masonry near ground level which may be combined with a damp-proofing system. Designed to shed water.

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