Appendix B

927 & 931 N. Palm Avenue Rehabilitation Plan and Peer Review

Rincon Consultants, Inc.
449 15th Street, Suite 303
Oakland, California 94612
510 834 4455 OFFICE AND FAX
info@rinconconsultants.com
www.rinconconsultants.com

Date January 10, 2017
Project No: 16-03450

Antonio Castillo
Associate Planner
Community Development Department
City of West Hollywood
8300 Santa Monica Boulevard
West Hollywood, CA 90069

Subject: **Peer Review of a Rehabilitation Plan for 927 and 931 Palm Avenue, West Hollywood, Los Angeles, California**

Dear: Mr. Castillo:

This letter summarizes the results of a peer review of a rehabilitation plan for the two properties located at 927 and 931 Palm Avenue West Hollywood, California (subject properties).[1] Constructed in 1902, the subject properties are both significant for their association with the town of Sherman and as a representation of West Hollywood's early beginnings. The exteriors of both were locally designated under Resolution No. 13-4478 and the subject properties are therefore considered historical resources for the purposes of CEQA. The rehabilitation plan was prepared to ensure that any proposed alterations to the subject properties would not affect their continued eligibility as historical resources and includes recommendations guided by the Secretary of the Interior's Standards for Rehabilitation (Standards).[2]

This peer review was conducted as part of the environmental analysis of the project being conducted in conformance with the California Environmental Quality Act (CEQA). The purpose of the review is to determine whether the rehabilitation plan provides adequate guidance to successfully avoid adverse impacts to historical resources.

Senior Architectural Historian Steven Treffers, M.H.P., conducted the peer review. Mr. Treffers meets the Secretary of the Interior's *Professional Qualification Standards* (PQS) for architectural history and history. With nearly eight years of experience in historic preservation planning within California, Mr. Treffers has extensive experience applying the Standards.

Methods

The current analysis entailed a review of the rehabilitation plan with regard to methods, findings, and the potential for the project to impact significant historical resources as defined in CEQA and the *State CEQA*

[1] Historic Resources Group, *927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan*, prepared for Dylan Investments, Los Angeles, CA. July 25, 2016.
[2] Kay D. Weeks and Anne E. Grimmer, *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving Rehabilitating, Restoring, & Reconstructing Historic Buildings,* National Park Service, Washington D.C. 1995.

Guidelines. Rincon cultural resources staff did not conduct a site visit, nor was any supplemental archival research, Native American or historical group coordination or California Historical Resources Inventory records search conducted. This review was limited to historical resources as addressed in the rehabilitation plan and does not address any project-related impacts to archaeological, paleontological, or tribal cultural resources.

Peer Review

The rehabilitation plan was prepared by individuals at Historic Resources Group who meet the PQS and have extensive experience applying the Standards. The document adequately summarizes the historic significance of the subject properties, and details the construction history and existing conditions of both buildings. Features that define the historic character of the buildings are clearly identified and recommendations are made for retaining, repairing, and replacing deteriorated building elements as applicable. Recommendations are consistent with best practices for historic preservation and supported by appropriate guidance from the National Park Service, which is included as appendices to the rehabilitation plan. In addition, the document identifies alternative standards, specifically the California Historical Building Code, which is available for qualified historical properties such as the subject properties and would potentially assist in retaining historic character while meeting building codes.

Conclusions

Rincon finds that the rehabilitation plan is adequate and recommends no changes to the document. If the recommendations are followed as prescribed, the rehabilitation of the subject properties would be consistent with the Standards and would not result in an adverse impact to historical resources.

Should you have any questions or comments regarding this report, please do not hesitate to contact me at 415-569-3997, or streffers@rinconconsultants.com

Sincerely,

Steven Treffers, M.H.P.
Senior Architectural Historian
Rincon Consultants, Inc.

REPORT

927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan

July 25, 2016

HISTORIC RESOURCES GROUP
12 S. Fair Oaks Avenue, Suite 200, Pasadena, CA 91105-1915
Telephone 626 793 2400, Facsimile 626 793 2401
www.historicresourcesgroup.com

927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan

HISTORIC RESOURCES GROUP

Dylan Investments
10585 Santa Monica Blvd.
Los Angeles, CA 90025
Attn.: Mr. Jeff Damavandi
Tel: (310) 395-9030
Email: jeff@dylaninvestments.com

927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan

HISTORIC RESOURCES GROUP

This plan was prepared for the purpose of providing recommendations for rehabilitation of two preserved single family buildings. It is the intent of this plan to provide the owner, architects, engineers, and builders with recommendations that retain the historic character the two buildings. The recommendations are guided by the Secretary of the Interior's Standards for Rehabilitation (hereafter, the "Standards").[1] Substantially conforming to the recommendations will assure the historic integrity of buildings and therefore their continued eligibility as historic resources.

The plan outlines specific recommendations for the exteriors and interiors of the buildings. The appendices add substantial and directly applicable reference material for implementing the recommendations, including general guidelines for treating different types of materials, the Preservation Briefs published by the National Park Service to support implementation of the Standards, and model construction specifications for topics that are relevant to the existing materials, finishes, and systems.

The authors of this Plan meet the Secretary of the Interior's Professional Qualifications Standards (36 CFR 61) for history, architectural history, architecture, and historic architecture. We have extensive project experience in identifying, evaluating, and making recommendations for the treatment of historic spaces and features, and in collaborating with owners and builders to meet historic preservation criteria.

Our observations and recommendations are based on knowledge of architectural materials and features in the context of historic resources. Engineering and life safety issues are not evaluated. We did not observe the interiors of the buildings. It is not within our purview to identify or make recommendations with respect to the identification, management, abatement, or handling of hazardous materials.

SIGNIFICANCE OF EXISTING BUILDINGS

Resolution No. 13-4478 of the City of West Hollywood designates the exteriors of the buildings at 927 and 931 Palm Avenue. The buildings located were constructed in 1902. They are located on multi-family zoned parcels on the west side of Palm Avenue. The Assessor Identification Numbers (AIN) for 927 and 931 Palm Avenue are 4339-014-012, and 4339-014-013, respectively.

[1] 36 CFR 68; also found in Kay D. Weeks and Anne E. Grimmer, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (Washington D.C., National Park Service, 1995), p. 61-115.

The building exteriors have experienced minor alterations but retain architectural integrity. The buildings are significant for their association with the town of Sherman, and reflect West Hollywood's modest roots. They meet the following criteria for designation as part of the Old Sherman Thematic Grouping, pursuant to Chapter 19.58.050 of the West Hollywood Municipal Code:

1. Both properties contribute to the significance of Old Sherman, a geographically definable area possessing a concentration of historic properties (Criterion A.2.a);
2. Both properties are part of a thematically related grouping of properties associated with Old Sherman which contribute to each other and are unified aesthetically by plan and physical development (Criterion A.2.b); and
3. Both properties reflect significant geographical patterns associated with different eras of growth and settlement and transportation modes because of their association with the early development of Sherman (Criterion A.3).

Based on the designations, and confirmed by observation, the significant date of these properties is 1902, which is the date of original construction. This provides a fundamental criterion for treatment of existing conditions. Those features that can be identified by documentation or field observation by qualified professionals as original, constructed in 1902, are significant, character-defining features. In general, character-defining features shall be retained, and repaired rather than replaced. If it is the case that a character-defining feature has been previously replaced in-kind, then that feature may continue to be retained, maintained, and repaired if appropriate in lieu of the previously replaced original feature.

GENERAL CONDITION OF BUILDINGS

The following general categories of condition, where used, are defined as follows.

The term “good,” means that the feature appears sound and well maintained; may need minor rehabilitation.

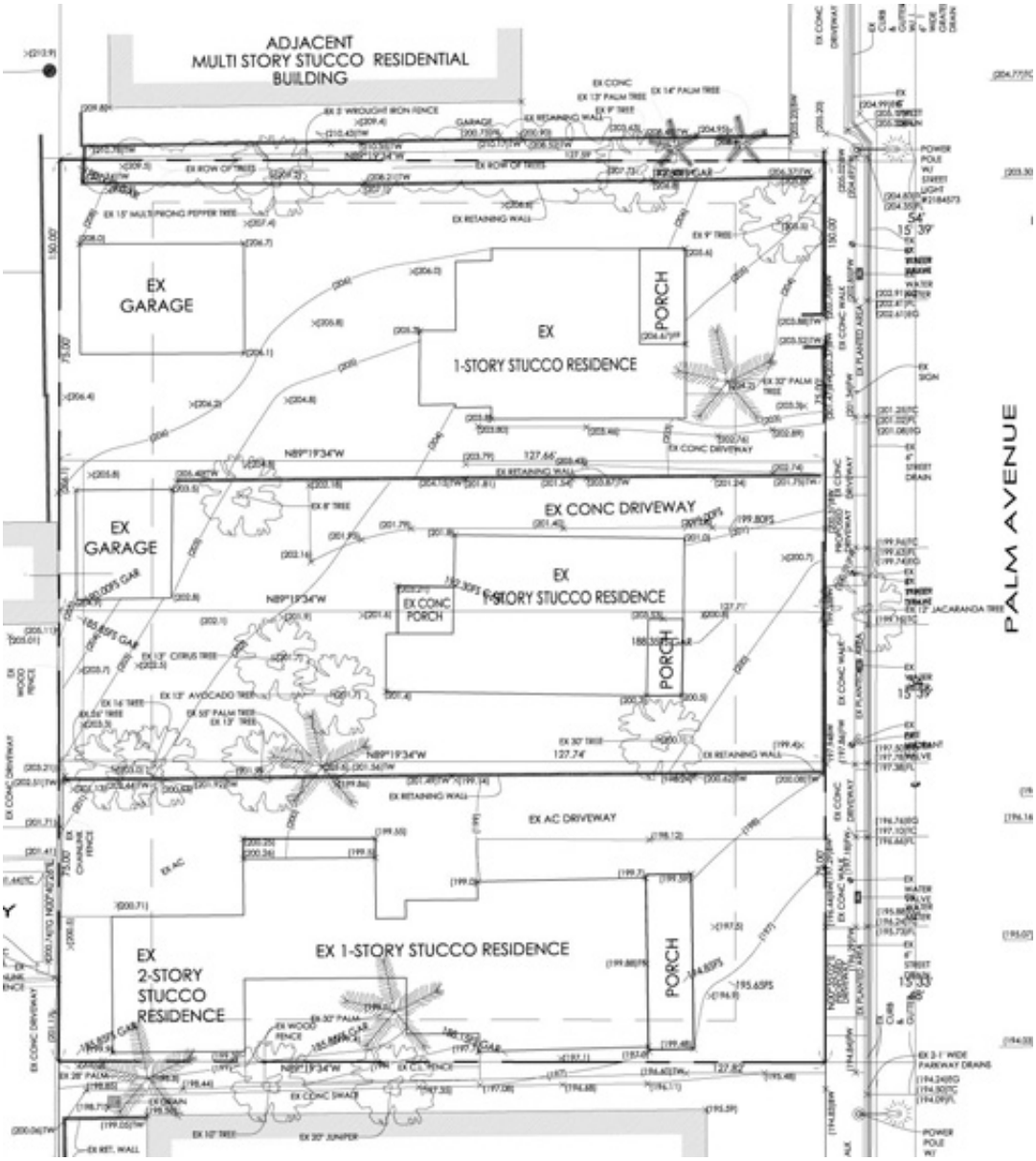
The tem “fair” as used in this report, means that the feature shows a degree of disrepair and neglect; needs rehabilitation.

The term “poor,” as used in this report, means that the feature is deteriorated; needs substantial rehabilitation, and, if proven not technically feasible to repair, may need partial component or whole feature replacement in kind.

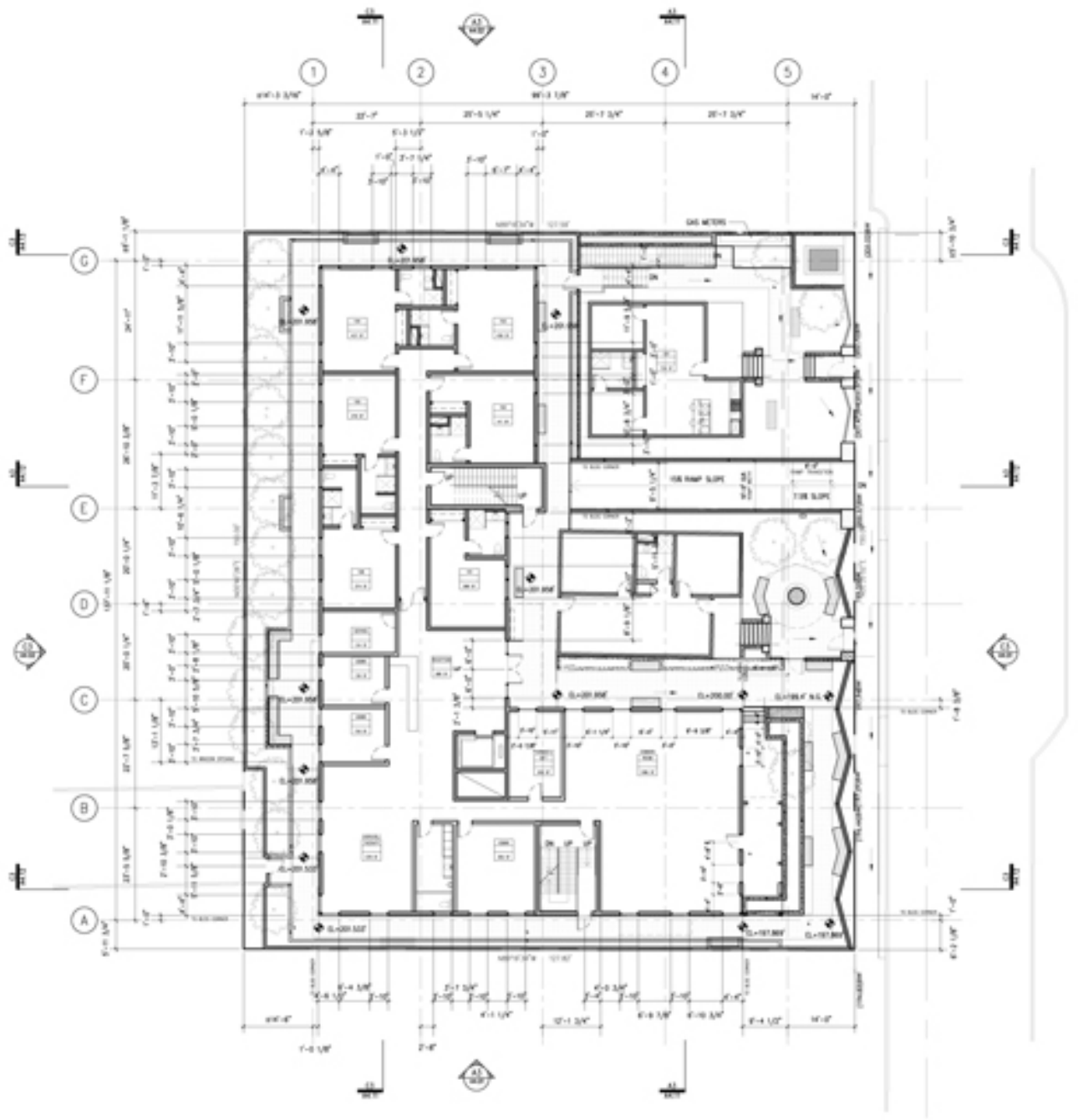
We observed the exterior features of the properties in July 2016, and found them in general to be in fair condition. There is disrepair and neglect; rehabilitation is needed; some individual features may be in poor condition.

ALTERNATIVE STANDARDS FOR QUALIFIED HISTORICAL PROPERTIES

The two buildings are designated local landmarks and qualify for the application of the California Historical Building Code (California Code of Regulations, Title 24, Part 8). Use of the alternative standards by the local building official is mandatory when requested by the applicant. The Code is both an incentive for historic preservation, and sometimes a method of helping to meet regulated historic preservation standards by both retaining historic character and meeting codes.



927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan



927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan

Item #	Feature or space	Recommendations
A	Roofing	Previously deteriorated mineral surfaced asphalt composition roof was recently replaced with a new 3-tab type dark red mineral surfaced asphalt composition roof finish. This an appropriate and compatible replacement roof system because the previous roofing layers included 3-tab type material, and red layers. This is a great benefit because there were multiple layers of roofing that were overload the roof framing, and because the new roof provides sound protection from roof leaks for a new maintenance cycle. This provides a guideline for future roof replacements. A darker color mineral finish, such as red, brown, charcoal, brown & charcoal, or green are compatible with the style and period of the building, reflect older layers that existed on the building, and are more compatible with the style and period than light values of any hue.
B	Flashing at attic vent dormer	De-install roofing and wood shakes at all four sides of the dormer; install sheet metal flashing at all sides to wood before installing base membrane, building paper, and reinstalling roofing and shakes.
C	Sheathing	Do not remove any sheathing, and/or soffits (boxed eaves) that are found on the underside at overhanging eaves. Repair or replace cracked and detached boards; tightly reinstall separating soffit boards.
D	Gutters, scuppers, rain leaders	Remove any residual gutters, and install new painted galvanized sheet-metal gutters and rain leaders terminated at splash blocks or conducted to site drains to carry water away from eaves, soffits, walls, and foundations. Install continuous screen at the top of the gutter. Gutters may be omitted at the rake of the rear sheds only, but should be installed at the eaves.

Item #	Feature or space	Recommendations
E	Wood siding	Retain existing siding; repair. If any area of siding is rotted, termite damaged, or lost to the extent that it cannot be filled and repainted, then replace in kind with matching wood species of similar moisture content (kiln dried if need be), milled to same section. Remove loose paint using a scraper or trowel, taking care to not inscribe any marks in the wood. Non-abrasive, and chemical removal is acceptable provided the chemical does not damage wood and fully neutralized and removed. Abrasive methods of any medium, such as sand, nut shells, or neoprene, including water above 50 psi, including water, will irreversibly damage the wood surface. Abrasive cleaning is not only not recommended, but could cause an irreversible significant negative impact on a local landmark structure.
F	Paint on siding and trim	Applying best practices for standard exterior house painting, fill and level cracks, holes, and divots, prime, and paint all previously painted surfaces utilizing a high quality alkyd-type product. Assure that the existing substrate is compatible with an alkyd product prior to coating. When repainting metal or galvanized metal surfaces, use enamel paint products that are formulated for metal substrates. For preparation and priming of galvanized metal surfaces, use either a traditional "pickling" primer prior to application of the primer coat, or otherwise a contemporary primer product formulated to adhere to a galvanized surface. Non-alkyd exterior paint products may also be used if of high quality and compatible with application to the existing substrate.
G	Paint colors	Exterior painted surfaces shall be repainted to one of the following palettes: i. Hues identified by a qualified professional from sampling of existing painted finishes, documentation of paint seriation using a microscope, and matching of the identified first

Item #	Feature or space	Recommendations
		finish coats to the Munsell color system so that a record of the hue can be retained and referenced for this project or for the future. ii. Match the existing exterior palette, which is in general white with green sash. iii. Select new palettes that are "appropriate," which is the guideline in the support material for the Standards for Rehabilitation. It is not required that an original or significant color be reproduced as a measure of appropriateness. Among the considerations that we use in assessing appropriateness of exterior colors are "period appropriate (colors frequently used in the period of significance)," "style appropriate (colors frequently used regionally for an identified style), "context appropriate (colors observed in the district and neighborhood)," "value relationship appropriate (a palette of lights and darks that are found on the building features and forms, in the period, in the style, and in the context or district)," and "pattern appropriate (surface pattern designs expressed in color rather than form, such as no pattern, geometric pattern, or floriated pattern)."
H	Brick masonry chimneys	We did not observe any masonry chimneys at the property.
I (eye)	Wood-framed porch floors	Remove and reconstruct the framing and deck boards for both houses. Refer to Preservation Brief 45, which is attached, and also available at https://www.nps.gov/tps/how-

Item #	Feature or space	Recommendations
		to-preserve/briefs/45-wooden-porches.htm, is good guidance for appropriate and durable wood construction at a feature that is susceptible to wear, insect damage, and funghal damage.
J	Concrete foundation stem walls	Roughly-formed concrete stem walls are visible under exterior wood siding and trim. These are not visually prominent, but are characteristic, and should be retained. This material should not be trimmed over with wood siding, or veneered with brick or stone.
K	Painted wood door and window frames and sash (double hung and casement).	The retention and repair of historic wood windows is firm recommendation for meeting the Standards for Rehabilitation in historic preservation projects. Refer to Preservation Brief 9, which is attached, and is also available at https://www.nps.gov/tps/how-to-preserve/briefs/9-wooden-windows.htm. In general, retain historic windows, and repair or replace components, such as missing muntins and failing glazing compound, as needed. Energy conservation standards for building envelopes are exempted by CHBC (CCR Title 24, Part 8). Energy conservation is encouraged where it can be achieved while retaining historic character. For example, historic windows can be weather-stripped, and secondary glazing can be added at the interior in order to improve building performance without losing historic windows and glass.
L	Electrical service	Safety and durability of the properties will be improved if the main service is placed underground and turned up to serve a building's main panel, or a subservice for the building.
M	Wood water table, trim, and skirts	Retain existing painted wood features. If any area of siding is rotted, termite damaged, or lost to the extent that it cannot be filled and repainted, then replace in kind with matching wood species of similar moisture content (kiln dried if need be), milled to same section. Remove loose paint using a scraper or

Item #	Feature or space	Recommendations
		trowel, taking care to not inscribe any marks in the wood. Non-abrasive, and chemical removal is acceptable provided the chemical does not damage wood and fully neutralized and removed; abrasive methods are not acceptable.
N	Foundation vents	Retain the location and configuration of foundation vents. The condition and durability of vents is important to both assure ventilation and to prevent intrusion by humans and small animals. Reconstruct the existing deteriorated wood frames and install galvanized welded wire mesh screens with a maximum opening of ½" by ½". Do not paint metal screen material.
O	Concrete sidewalks	The existing sidewalks are in poor condition. For replacement features, use standard gray Portland cement material and finishes, with large brown sand aggregate, and lightly wash the cement paste before a firm set in order to expose the sand aggregate. Utilize the pattern of control joints, and profile of control joints, found at the front walk of 923 Palm Ave., photo 927.03. Alternatives can be considered; note that landscape and hardscape design, materials, and finishes are part of the yards and setting of the historic resource, and therefore should be reviewed for appropriateness and compatibility.
P	Landscaping	Though this rehabilitation report is written for the historic character of the buildings, the yards, hardscape, and landscape contribute to the character of the properties. Where possible, mature trees should be retained, planted, and/or utilized, particularly at the front yards. Foundation (low) perimeter plantings are appropriate. Low fences and low hedges are appropriate and compatible.
Q	Wiring	Remove all exterior wiring and conduit; patch holes. All power and communication distribution should be planned and distributed from new service boxes, and run to new

Item #	Feature or space	Recommendations
		interior or exterior switches, receptacles, or junction boxes, as needed, with appropriate cover plates.
R	Rear sheds	The rear sheds at both buildings are old, and may be original. However, the landmark nomination does not make a distinction between the front and rear portions of the buildings as to contribution to character and integrity, and does not call out additions that may have gained significance over time. In its discussion of this nomination, the Commission explicitly excluded the rear sheds as contributing features that should be designated. We have not provided any recommendations for rehabilitation for the sheds.
S	Accessory buildings	There are secondary buildings standing at the rear, west, yards of both buildings. These buildings are not identified in the landmark nomination. We did not review there conditions nor make recommendations for rehabilitation.

No.	Image	Description & comments
	927 PALM AVENUE	
0		927 and 931 Palm Ave., streetscape at east, front yards, view northwest from Palm Ave.
927.01		East (front) elevation, yard, with picket fence

927.02		East (front) elevation
927.03		Sidewalk from street to porch

927.04		Detail at east (front) elevation, illustrating mitred corner siding, and painted wood paneled door, door grille, and finish hardware configuration.
927.05		Deteriorated wood strip (possibly tongue and groove) floor boards at porch. Boards appear to have been previously replaced due to edge conditions.

927.06		Foundation vent detail; porch color scupper, at low porch wall.
927.07		Irregular sheet metal flashing added over window openings; wood soffit paneling separated near eaves at north elevation.

927.08		Deteriorated wood finishes at wood siding below bay window.
927.09		East (front) and north (side) elevation at driveway

927.10		North (side) elevation, view west southwest (from front to rear)
927.11		North elevation (side), at rear lean-to.

927.12		West (rear) elevation, including lean-to.
927.13		West (rear) elevation, north corner

927.14		Typical painted concrete[21] continuous concrete footing stem wall.
927.15		Deteriorated, incompatible wood steps

931 PALM AVENUE		
931.01		East (front) elevation
931.02		Damaged eaves flashing; open wood joints at eaves soffit

931.03		Damaged wood shakes and flashing at roof vent dormer
931.04		Painted plywood porch deck finish

931.05		Pair of painted wood casement windows; missing muntins; deteriorated muntins and glazing compound.
931.06		East (front) and south (side) elevation, with hedge and yard

931.06		North (side) elevation, view east south east (from rear forward)
931.07		Typical double-hung painted wood sash with single glazing.

931.08		West (rear) elevation; overgrowth of plants.
931.09		Rear lean-to with vertical wood siding; north (side) elevation, view south

931.10		Insect damage at vertical[27] wood siding on west (rear) lean-to
931.10		Typical painted wood water table, vertical paneled skirt, and wood-framed screened foundation vent.

931.11		Damaged door at utility closet addition to lean-to
931.11		Typical painted wood water table, vertical paneled skirt, and wood-framed screened foundation vent, illustrating continuity of trims at corners.

931.12		Typical water table and corner trim at wall base, illustrating plain concrete foundation wall below wall framing.
931.13		Security screen door added at south (side) door.

927 & 931 Palm Avenue, West Hollywood, CA: Rehabilitation Plan

HISTORIC RESOURCES GROUP

a. General Recommendations

General Guidelines for Material Conservation

This section provides general guidelines for the conservation and rehabilitation of primary historic materials.

Concrete and Masonry

Exterior features as well as exterior surfaces and their treatment (modeling, tooling, bonding patterns, joint size, and color) are important in defining the historic character of a building. Buildings that have concrete exteriors or masonry detailing may exhibit the following conditions and, therefore, require maintenance and rehabilitation: impact damage at building corners; cracks; damage due to spalling; damaged ornamentation on friezes and columns; peeling paint; inappropriate patching methods; inappropriate treatments such as sandblasting which exposes softer inner materials; and repointing of brick with non-matching tooling.

Guidelines for Concrete and Masonry:

1. Repair walls and other features where there is evidence of deterioration such as spalling, damp walls, or damaged concrete or masonry.

2. Sandblasting shall not be used to prepare or clean exterior concrete or masonry. Blasting by any media, including liquids, shall not be used unless it can be demonstrated that no surface material is removed by application. Application of any liquid media shall not exceed a pressure of 150 pounds per square inch measured where the liquid leaves the application nozzle. Use non-abrasive tools, such as natural bristle brushes; do not use abrasive or gouging tools, such as wire brushes and scrapers.

3. Repair concrete or masonry features by patching, piecing-in, or consolidating the concrete or masonry. Repair may also include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of concrete or masonry features when there are surviving prototypes, such as brackets, pilasters or chimneys.

4. Install a new concrete or masonry feature such as steps, door pediments, detailing, or chimneys when the historic feature is completely missing. This should be an accurate reconstruction using historical, pictorial, and physical documentation when available. If documentation is not available, this may be a new design that is compatible with the size, scale, material, and color of the historic building.

5. It is recommended, but not required, that the building be repainted with colors that are identified through examination of strata by a qualified architect or conservator, or which are historically appropriate to the building.

6. Testing and application of treatments to stabilize historic concrete, stone and masonry materials is encouraged, provided that any consolidants or coatings can be demonstrated to have a minimum permeability rating of 12 perms, and to have no long term detrimental effects on the historic materials.

7. Repointing of historic masonry mortar joints shall utilize mortar mixes formulated to match the composition and color of historic mortar based on laboratory analysis and reporting of the composition and color of the matrix and aggregate in the historic mortar. Tooling of mortar

repairs and restorations shall match historic mortar tooling. Removal of deteriorated or inappropriate mortars prior to repair shall be accomplished with the utmost care, preferably using hand tools, and shall cause no damage or change to the historic masonry.

8. Do not permit plants or weeds to grow on the building. Uproot all weeds as soon as possible. Remove climbing plants from walls.

9. Provide sound roofs and flashing, and proper drainage so that water does not infiltrate, wash down, stand or accumulate. Provide inconspicuous site drainage.

Wood

Buildings with wood features exhibit the following conditions which may require maintenance and rehabilitation: repair of deteriorating material; sealing or painting eaves or trim due to weathering, water damage, fungal or insect damage.

Guidelines for Wood

1. Evaluate the overall condition of the wood to determine the extent of protection and maintenance required.

2. Repair wood features by patching, piecing-in, consolidating, or otherwise reinforcing the wood using recognized preservation methods. Repair may also include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of features where there are surviving prototypes such as brackets, moldings, or sections of siding.

3. Use matching species wherever feasible when replacing irreparable historic painted elements. Utilize wherever possible wood which is naturally resistant or treated to be resistant to water, fungus and insect damage. Utilize wood which is naturally dried or kiln dried and relatively free of knots and checks in order to assure a longer life for replacement materials.

4. Design and install a new wood feature such as a cornice or doorway when the historic feature is completely missing. This should be an accurate restoration using historical, pictorial, and physical documentation. Where documentation does not exist, a new design that is compatible with the size, scale, material, and color of the historic building may be used.

5. Apply compatible paint coating systems following proper surface preparation. Sandblasting shall not be used to prepare or clean historic wood exterior elements. Blasting by any media, including liquids, shall not be used unless it can be demonstrated that no surface material is removed by application. Application of any liquid media shall not exceed a pressure of 150 pounds per square inch measured where the liquid leaves the application nozzle. Paint shall match existing surface coating thickness. Use non-abrasive tools, such as natural bristle brushes; do not use abrasive or gouging tools, such as wire brushes and scrapers.

6. It is recommended, but not required, that the building be refinished with colors that are identified through examination of strata by a qualified architect or conservator, or which are historically appropriate to the building.

Architectural Metals

Architectural metal features may require rehabilitation and maintenance due to weathering and corrosion.

Guidelines for Architectural Metals

1. Identify, retain, and preserve architectural metal features such as columns, capitals, window hoods, canopy cladding or fascia, stairways, light fixtures, or gates that are important in defining the overall historic character of the building. Also identify and preserve their finishes and colors. If originally painted, it is recommended, but not required, that the architectural metals be repainted with colors that are historically appropriate to the building.

2. Clean architectural metal, when necessary, with gentle non-abrasive cleaning methods to remove corrosion. Sandblasting shall not be used to clean historic metal surfaces.

3. Apply appropriate paint or other coating systems after cleaning in order to decrease the corrosion rate of metals or alloys.

4. Repair architectural metal features by patching, splicing, or otherwise reinforcing the metal. Repairs may also include the limited replacement in kind, or with a compatible substitute material, of those extensively deteriorated or missing parts of features when there are surviving prototypes such as porch balusters, column capitals or bases, or roof ornaments.

5. Design and install a new architectural metal feature such as an entry door or sheet metal cornice when the historic feature is completely missing. It may be an accurate reconstruction using historical, pictorial, and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the building.

Doors and Entrances

Doors and entrances are often the principal features of historic buildings, particularly when they occur on primary elevations. Their functional and decorative features, such as the type of door, steps, balustrades, and entrances are extremely important in defining the overall historic character of a building. Their retention, protection, and repair should always be carefully considered when planning rehabilitation work.

Doors are subject to weathering and deterioration and may require maintenance and rehabilitation, which could include cleaning and repair of attachments, flashing and hardware.

Guidelines for Doors, Entrances and Porches

1. Identify, retain, and preserve entrances, and their functional and decorative features that are important in defining the overall historic character of the building such as doors, transoms, sidelights, columns, balustrades, and stairs.

2. Protect and maintain the masonry and architectural metal that comprise entrances through appropriated surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems, replacement of broken glass, and replacement of deteriorated sealants or glazing compounds.

3. Repair entrances by reinforcing the historic materials. Repair will also generally include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of repeated features where there are surviving prototypes such as balustrades, columns, sidelights, and stairs.

4. Design and construct a new entrance if the historic entrance is completely missing. It may be a reconstruction based on historical, pictorial, and physical documentation; or be, a new design that is compatible with the historic character of the building.

5. Design and install additional entrances when required for the new uses in a manner that preserves the historic character of the building. In general, such alterations should be limited to non-character defining elevations. New entrances shall be compatible and may be of contemporary design provided they do not destroy character-defining features. To the extent visible, new entrances shall be reversible.

Windows

The type and size of window openings are extremely important in defining the overall historic character of a building. Their retention, protection, and repair should always be carefully considered when planning rehabilitation work. Wood windows may deteriorate from hard use, warping, or settling, and metal windows are susceptible to water damage. Glazed openings may shatter.

Guidelines for Windows

1. Identify, retain, and preserve historic window features that are important in defining the overall historic character of the building. Such features include frames, sash, muntins, glazing, sills, heads, and hood molds.

2. Protect and maintain the wood and architectural metal, which comprise the window frame, sash, muntins, and surrounds through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

3. Make windows weather tight and improve thermal efficiency by re-caulking and replacing or installing weather stripping.

4. Construct and install new windows if the historic windows (frame, sash and glazing) are completely missing, have been replaced with non-original materials, or are too deteriorated to repair. The replacement windows shall be an accurate reconstruction using historical, pictorial, and physical documentation.

5. Replace broken clear glass with clear non-reflective glass to match historic materials and configuration.

Roofs

The roof is a contributing factor in defining the building's overall historic character. In addition to the design role it plays, a weather tight roof is essential to the preservation of the entire structure. Thus, protecting and repairing the roof as a "cover" is a critical aspect of a rehabilitation project.

Guidelines for Roofs

1. Protect and maintain a roof by cleaning and refinishing coping, cleaning the gutters and downspouts, and replacing deteriorated flashing. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration; and to insure that materials are free from insect infestation.

2. Provide adequate anchorage for roofing material to guard against wind damage and moisture penetration.

3. Repair a roof by reinforcing the historic materials which comprise roof features. Replacement or repairs should use replacement in kind, or with compatible substitute material. When replacing the roof, remove existing membrane down to wood decking. Inspect exposed decking and replace deteriorated wood members; retain historic sheathing materials such as board sheathing.

4. Install mechanical and service equipment on the roof so that they are inconspicuous from the public right-of-way and do not damage or obscure character-defining features.

5. Repair broken gutters and downspouts. If repair is not possible, replace in kind to match existing. Re-solder broken joints. Where missing, replicate historic gutters and downspouts or provide compatible new gutters and downspouts.

Structural and Mechanical Systems

Structural systems of historic buildings may need repair due to deterioration, fire, or seismic activity.

Guidelines for Structural and Mechanical Systems

1. Protect and maintain the structural system by cleaning the roof gutters and downspouts; replacing roof flashing; keeping masonry, wood, and architectural metals in a sound condition; and assuring that structural members are free from insect infestation.

2. Repair the structural system by augmenting or upgrading individual parts or features. For example, weakened structural members such as floor framing can be spliced, braced, or otherwise supplemented and reinforced.

3. Install new work as a requirement of current seismic or code requirements so as not to adversely impact exterior facades. Provide seismic reinforcements as required to an historic building in a manner that avoids damaging the structural system and character-defining features, including window and door openings.

4. Design and install new mechanical or electrical systems which minimize the number of cutouts or holes in structural members.

Site Characteristics

The relationship between historic buildings and landscape features helps to define historic character and should be considered an integral part of planning for rehabilitation project work.

Guidelines for Site Characteristics

1. Identify and evaluate building site features important in defining its historic character. Site features can include walkways, lighting, fencing, signage, fountains, plants, trees, paving, sidewalks, and curbs.

2. Retain the historic relationship between buildings, landscape features, and open space to the extent feasible.

3. New plantings shall be compatible with the historic landscape character of the site and may be of contemporary design provided such alterations and additions do not destroy character-defining features. Important resources, such as healthy large specimen trees, shall be retained if feasible. All planted areas shall reflect the need for water conservation.

4. In general, the existing streets and their elements (curbs, sidewalks, and street paving) should be retained where possible. Where changes are made, the new design shall reflect the traditional elements of the existing streets by referencing elements of street, curb, and sidewalk. These references may be made by delineating materials, colors, or texture of paving.

5. New paving, if any, should not overwhelm or detract from the colors and architectural features of the building. Use of street furniture and movable landscaping are appropriate for enhancing the setting and pedestrian use of the site.

Health and Safety Code Compliance

It is often necessary to make modifications to an historic building so that it can comply with current health, safety, and code requirements. Such work needs to be carefully planned and undertaken so that it does not result in a loss of interior or exterior character-defining spaces, features, and finishes.

The *Americans with Disabilities Act* (ADA) applies to employment, as well as access to public structures and services or public accommodations owned or operated by private entities. In general, there are special rules and minimum access requirements where an alteration would threaten or destroy the historic significance of an historic building. To use the minimum requirements, consultation is required with the State Office of Historic Preservation. The California Historical Building Code offers alternative measures for application to qualified historical structures that help avoid the loss of historic character. It is mandatory that local and state building and fire safety officials recognize the code where applicants utilize relevant provisions.

Guidelines for Code Compliance

1. Identify the historic building's character-defining spaces, features, and finishes so that code-required work will not result in their damage or loss.

2. Comply with health and safety codes, including seismic codes and barrier-free access requirements, in such a manner that character-defining spaces, features, and finishes are preserved.

3. If alterations for code compliance result in the loss of historic character due to the substantial alteration of character-defining features and spaces, study alternatives to demonstrate whether or not there are other designs that would provide both code compliance and retention of historic character.

4. If there are not alternatives under general application codes allowing historic character to be retained, use of the California Historical Building Code shall govern code requirements. Study alternatives to demonstrate whether or not there are other designs which would provide both compliance and retention of historic character using this code.

5. New structural or seismic reinforcement members, including anchor bolts, shall be hidden from view whenever possible.

b. Model Specifications

SECTION 01 35 28 - SPECIAL PROCEDURES FOR HISTORIC TREATMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes special procedures for historic treatment on Project including, but not limited to, the following:

1. Storage and protection of existing historic materials.
2. Temporary protection of historic materials during construction.
3. Protection during application of chemicals.
4. Protection during use of heat-generating equipment.
5. Historic treatment procedures.

B. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for preconstruction photographs taken before historic treatment.
2. Division 1 Section "Photographic Documentation" for preconstruction photographs taken before historic treatment.

1.3 DEFINITIONS

A. "Preservation": To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

B. "Rehabilitation": To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

C. "Restoration": To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other

periods in its history and the reconstruction of missing features from the restoration period.

D. "Reconstruction": To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

E. "Stabilize": To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.

F. "Protect and Maintain": To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

G. "Repair": To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

H. "Replace": To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:

1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

I. "Remove": To detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

J. "Remove and Salvage": To detach items from existing construction and deliver them to Owner.

K. "Remove and Reinstall": To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

L. "Existing to Remain" or "Retain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

M. "Material in Kind": Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.

1.4 SUBMITTALS

A. Historic Treatment Program: Submit a written plan for each phase or process including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.

C. Qualification Data: For historic treatment specialists and supervisory personnel. Include list of completed projects with the scope of work and budget for each.

D. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by historic treatment operations. Submit before work begins.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.5 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications: A firm that employs personnel, including supervisory personnel, experienced and skilled in the processes and operations indicated.

B. Historic Treatment Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

    a. Record procedures established as a result of the review and distribute to affected parties.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Removed and Salvaged Historic Materials:

1. Clean salvaged historic items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.
6. Do not dispose of items removed from existing construction without prior written consent of Owner.

B. Removed and Reinstalled Historic Materials:

1. Clean and repair historic items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Architect, items may be removed to a suitable, protected storage location during historic treatment and cleaned and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature and humidity ranges that are appropriate for the items stored. Secure stored materials to prevent theft. Historic materials are irreplaceable; therefore, protective custody is essential. Damage and loss shall be prevented, since repair and replacement may not be possible. These requirements apply to any subcontractors or others given custody of the items.

1. Identify removed items with an inconspicuous or reversible mark indicating their original location.

1.7 PROJECT-SITE CONDITIONS

A. Exterior Cleaning and Repairing:

1. Proceed with the work only when forecasted weather conditions are favorable.

a. Wet Weather: Do not attempt repairs during rainy or foggy weather. Do not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Do not remove exterior elements of structures when rain is forecast or in progress.
b. Do not perform exterior wet work when the air temperature is below 40 deg F (5 deg C).
c. Do not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing.
d. Do not begin cleaning when either the air or the surface temperature is below 45 deg F (7 deg C) unless approved means are provided for maintaining a 45 deg F (7 deg C) temperature of the air and materials during, and for 48 hours subsequent to, cleaning.

2. Perform cleaning and rinsing of the exterior only during daylight hours.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION, GENERAL

A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
2. Attachments of temporary protection to existing construction shall be approved by Architect prior to installation.

D. Review and coordinate with Architect and Landscape Architect to protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.
2. Bind spreading shrubs.
3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify Architect immediately of drains or systems that are stopped or blocked. Do not begin Work of this Section until the drains are in working order.

1. Provide a method to prevent solids including stone or mortar residue from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed under this Contract.
2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT

A. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Owner's approval for operations involving use of open-flame or welding equipment.

    a. Notification shall be given for each occurrence and location of work with heat-generating equipment.

2. As far as practical, use heat-generating equipment in shop areas or outside the building.
3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.
4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
5. Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.

    a. If combustible material cannot be removed, provide fireproof blankets to cover such materials.

6. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.
7. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
8. Do not use heat for paint removal.
9. Do not use heat for surface operations where there is flammable material hidden below the surface.

10. Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

3.3 HISTORIC TREATMENT PROCEDURES

A. The principal aim of preservation work is to halt the process of deterioration and stabilize the item's condition, unless otherwise indicated. Repair is required where specifically indicated. The following procedures shall be followed:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use traditional replacement materials and techniques. New work shall be distinguishable to the trained eye, on close inspection, from old work.
5. Record the work before the procedure with preconstruction photos and during the work with periodic construction photos. Photographic documentation is specified in Division 1 Section "Construction Progress Documentation."

B. Prohibit smoking by personnel performing work on or near historic structures.

C. Obtain Architect's review and written approval in the form of a Constructive Change Directive or Supplemental Instruction before making changes or additions to construction or removing historic materials.

D. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

E. Where Work requires existing features to be removed, cleaned, and reused, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

F. Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings.

G. When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid over cleaning to prevent damage to existing materials during cleaning.

END OF SECTION 01 35 28

SECTION 01 45 01 – GENERAL GUIDELINES FOR CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general guidelines to follow when performing cutting and patching original work.

1.2 DEFINITIONS

A. "Cutting and patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.

2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be “cutting and patching” under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be “cutting and patching.”

3. “Selective demolition” is recognized as a related-but-separate category of work, which may or may not require cutting and patching as defined in this procedure.

1.3 SUBMITTALS

A. Procedural Proposal for Cutting and Patching: Where prior approval of cutting and patching is required, submit proposed procedures for this work well in advance of the time work will be performed and request approval to proceed. Include the following information, as applicable, in the submittal:

1. Describe nature of the work and how it is to be performed, indicating why cutting and patching cannot be avoided. Describe anticipated results of the work in terms of changes to existing work, including structural, operational and visual changes as well as other significant elements.

2. List products to be used and firms including their qualifications, that will perform work.

3. Give dates when work is expected to be performed.

4. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that will be out of service temporarily. Indicate how long utility service will be disrupted.

5. When cutting and patching of structural work involves the addition of reinforcement, submit details and engineering calculations to show how that reinforcement is integrated with original structure to satisfy requirements.

6. Indicate changes to designated landmark areas or highly rated HBPP zones.

7. All welding and/or hot work requires formal notification to the Building Manager no later than the first thing in the morning of each day such work is to be done. No welding or hot work is permitted without such prior notification.

1.4 QUALITY ASSURANCE

A. General Contractor shall do all cutting and patching of wall and ceiling surface for the removal, relocation of, or new piping, conduit, electrical boxes, asbestos abatement, PCB removal, and where pipes have been removed or abandoned.

1. Cutting which will disturb the asbestos material shall be done under the direction of the Asbestos Abatement subcontractor.

B. Cutting and patching of all nonstructural concrete floors for Mechanical and Electrical work shall be done by the respective subcontractors in accordance with the provision of this section.

C. Cutting and patching of all walls for ducts shall be done by the Mechanical subcontractor in accordance with the provisions of this section.

D. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio. Prior to such work, obtain approval of project's Structural Engineer.

E. Before cutting and patching the following categories of work, obtain the Architect's approval to proceed:

1. Structural steel.
2. Miscellaneous structural metals, including lintels, equipment supports, stair systems and similar categories of work.
3. Structural concrete.

4. Foundation construction.
5. Timber and primary wood framing.
6. Structural decking.
7. Bearing and retaining walls.
8. Piping, ductwork, vessels and equipment.
9. Shoring, bracing, and sheeting.
10. Primary operational systems and equipment.
11. Water/moisture/vapor/air/smoke barriers, membranes and flashings.
12. Noise and vibration control elements and systems.
13. Control, communication, conveying, and electrical wiring systems.

F. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

G. Retain a recognized experienced and specialized firm to cut and patch the following categories of exposed work:

1. Processed concrete finishes.
2. Stonework and stone masonry.
3. Ornamental metal.
4. Matched-veneer woodwork.
5. Roofing.
6. Stucco and ornamental plaster.
7. Terrazzo.
8. Finished wood flooring.
9. Carpeting.
10. Wall covering.
11. HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Except as otherwise indicated, or as directed by the Architect, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

1. The use of a trade name and supplier's name and address is to indicate a possible source of the product. Products of the same type from other sources

shall not be excluded provided they possess like physical and functional characteristics.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

1. Before the start of cutting work, meet at the work site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

3.2 PREPARATION

A. Temporary Support: To prevent failure provide temporary support of work to be cut. Do not endanger other work. Provide adequate protection of other work during cutting and patching, to prevent damage; and provide protection of the work from adverse weather exposure.

B. Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions of that part of the project that may be exposed during cutting and patching operations.

1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 ERECTION, INSTALLATION, APPLICATION

A. General: Employ skilled workers to perform cutting and patching work. Except as otherwise indicated or as approved by the Architect, proceed with cutting and patching at the earliest feasible time and complete work without delay.

B. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or core drill to ensure a neat hole.

2. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
3. Comply with other applicable requirements where cutting and patching requires excavating and backfilling.
4. Bypass utility services such as pipe and conduit, before cutting, where such utility services are shown or required to be removed, relocated or abandoned. Cut off conduit and pipe in walls or partitions to be removed. After bypass and cutting, cap , valve or plug and seal tight remaining portion of pipe and conduit to prevent entrance of moisture or other foreign matter.

C. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

1. Where feasible, inspect and test patched areas to demonstrate integrity of work.
2. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coats.
3. Where removal of walls or partitions extends one finished area into another finished area, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. If necessary to achieve uniform color and appearance, remove existing floor and wall coverings and replace with new materials
    a. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coat.
4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.4 ADJUSTING/CLEANING

A. Thoroughly clean areas and adjacent spaces soiled due to the work performed or used as access to work. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01 45 01

FOR REVIEW AND COORDINATION BY STRUCTURAL ENGINEER AND ARCHITECT PRIOR TO USE

SECTION 03 73 20- REPAIRING CRACKS IN CONCRETE BY INJECTING EPOXY RESIN

PART 1- GENERAL

1.1 SUMMARY

A. This procedure includes guidance on patching cracks in concrete by injecting an epoxy adhesive.

B. Epoxy Injection should be used for DORMANT CRACKS - cracks that remain unchanged. Dormant cracks generally pose little danger. However, if left unrepaired, they will provide channels for moisture penetration.

C. The calculated maximum crack width for concrete should not exceed 0.3 mm. Consult a professional to determine the cause for cracking and its source, as superficial repairs can aggravate the problem.

D. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)
100 Barr Drive
West Conshohocken, PA 19428
(610) 832-9585 or FAX (610) 832-9555

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Abatron, Inc.
5501 95th Ave.
Kenosha, WI 53144
800/445-1754 or 414/653-2000

B. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
201/933-8800

2.2 MATERIALS

A. Epoxy Resin (Abatron, Inc., Sika Corp., or approved equal).

1. For Fine Cracks:

a. Epoxy shall be a two-part type, low viscosity epoxy adhesive material containing 100% solids and shall meet or exceed the following characteristics when tested in accordance with the standards specified.

b. Characteristics of Components:
1) Component A - shall be a blend of modified epoxy resins.
2) Component B - shall be a blend of modified amine curing agents.

c. Test Method Requirements:
1) Component A - Brookfield RVT, 700 maximum; Viscosity @ 77 +/- 3 degrees F., cps; Spindle No. 2 @ 20 rpm.
2) Component B - Brookfield RVT, 240 maximum; Viscosity @ 77 +/- 3 degrees F, cps; Spindle No. 2.

d. Properties of Combined Components: When mixed in the ratio of two parts Component A to one part Component B by volume; or 100 parts Component A to 44 parts Component B by weight, shall be:
1) Potlife, 60g @ 77 +/- 3 degrees F., minutes; 25 minutes maximum.

e. Properties of the Cured Adhesive: When cured for seven days @ 77 +/- 3 degrees F., unless otherwise specified, shall be:
1) Ultimate Tensile Strength: ASTM D638; 8000 minimum.
2) Compressive Yield Strength, psi: ASTM D695*; 15,000 minimum.
3) Heat Deflection Temperature: ASTM D648*; 130 F. minimum.

NOTE: *Test specimens must be cured in a manner such that the peak exothermic temperature of the adhesive does not exceed 77 degrees F.

2. For Wide Cracks:

a. Epoxy shall be a two-part gel epoxy adhesive material containing 100% solids and shall meet or exceed the following characteristics when tested in accordance with the standards specified.

b. Properties of Combined Components: When mixed in the ratio of two parts Component A to one part Component B by volume; or 100 parts Component A to 34 parts Component B by weight shall be:
1) Potlife, 200g @ 77 degrees F. +/- 3 degrees F., minutes.

c. Properties of the Cured Adhesive: When cured for seven days @ 77 degrees F. +/- 3 degrees F., unless otherwise specified, shall be:
1) Ultimate Tensile Strength: ASTM D638; 1,500 psi minimum.
2) Compressive Yield Strength: ASTM D695; 6,000 psi minimum.
3) Heat Deflection Temperature: ASTM D648; 105 F. minimum.

B. Surface Seal: (Epoxy Mortar or Oil-free Clay)

1. Description: The surface seal material is that material used to confine the injection adhesive in the joints or cracks during injection and cure.

2. Properties: The surface seal material shall have adequate strength to hold injection fittings firmly in place and to resist injection pressures adequately to prevent leakage during injection. The material shall not leave a residue upon removal.

NOTE: Provide adhesive crack fillers and other related materials that are compatible with one another and with substrates under conditions of severe weather, demonstrated by sealant manufacturer based on testing and field experience.

2.3 EQUIPMENT

A. Equipment for Injection:

1. Type: The equipment used to meter and mix the two injection adhesive components and inject the mixed adhesive into the crack shall be portable, positive displacement type pumps with interlock to provide positive ratio control of exact proportions of the two components at the nozzle. The pumps shall be electric or air powered and shall provide in-line metering and mixing.

2. Discharge Pressure: The injection equipment shall have automatic pressure control capable of discharging the mixed adhesive at any pre-set pressure up to

200 psi + 5 psi and shall be equipped with a manual pressure control override. For injection of the gel epoxy, the equipment shall be equipped with the above features and be able to pump at up to 5,000 psi.

3. Ratio Tolerance: The equipment shall have the capability of maintaining the volume ratio for the injection adhesive prescribed by the manufacturer of the adhesive within a tolerance of + 5% by volume at any discharge pressure up to 200 psi. For gel epoxies, the ratio will be checked by weight at up to 5,000 psi.

4. Automatic Shut-Off Control: The injection equipment shall be equipped with sensors on both the Component A and B reservoirs that will automatically stop the machine when only one component is being pumped to the mixing head.

5. The manufacturer of the injection equipment and the manufacturer of the epoxy resin adhesive for injection shall be one and the same.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the nature and severity of the crack:

1. What direction are the cracks going and where are they the widest?

2. Note sloped floors, bulging walls and doors that do not fit.

B. Determine the probable cause:

1. Foundation erosion

2. Decay of materials

3. Structural failure

4. Change in materials or geometry

5. Thermal and moisture changes

C. Determine possible consequences if left unrepaired.

D. Evaluate alternative methods of repair.

E. For cracks associated with thermal movement look for:

1. Horizontal or diagonal cracks near the ground at piers in long walls: due to horizontal shearing stresses between the upper wall and the wall where it enters the ground.

2. Vertical cracks near the ends of walls.

3. Vertical cracks near the top and ends of the façade.

4. Cracks around stone sills or lintels: due to expansion of the masonry against both ends of the tight fitting stone piece that cannot be compressed.

3.2 PREPARATION

A. Surface Preparation:

1. Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

2. Surfaces adjacent to joints or other areas of application shall be cleaned of dirt, dust, grease, oil or other foreign matter detrimental to bond of epoxy injection surface seal system.

3. Entry ports shall be provided along the crack at intervals of not less than the thickness of the concrete member at that location.

4. Surface seal material shall be applied to the face of the crack or end. For through cracks, surface seal shall be applied to both faces.

5. Enough time for the surface seal material to gain adequate strength shall pass before proceeding with the injection.

3.3 ERECTION, INSTALLATION, APPLICATION

A. If, before repairs are made, the crack is still damp, be sure to use an epoxy appropriate for damp conditions.

B. Seal both sides of cracks with an epoxy mortar or oil-free clay, leaving small holes through which epoxy resin will be injected. 1/8" to 1/4" diameter tubing can be used to form holes. Holes should be 2"-4" long, roughly 8" apart.

C. Inject 2-component epoxy using device as provided by manufacturer.

D. Injection of epoxy adhesive shall begin at lower entry port and continue until there is an appearance of epoxy adhesive at the next entry port adjacent to the entry port being pumped.

E. When epoxy adhesive travel is indicated by appearance at the next adjacent port, injection shall be discontinued on the entry port being pumped, and epoxy injection shall be transferred to next adjacent port where epoxy adhesive has appeared.

F. Perform epoxy adhesive injection continuously until cracks are completely filled.

G. If port to port travel of epoxy adhesive is not indicated, the work shall immediately be stopped and the engineer notified.

H. When cracks or joints are completely filled, epoxy adhesive shall be cured for sufficient time to allow removal of injection or port sealing devices.

I. The outermost quarter inch of the crack shall be filled with a colored epoxy material of the installer's choice subject to prior approval. The colored epoxy filler shall match the existing material which it is filling and shall not be discernible from a distance of 15 feet.

3.4 ADJUSTING/CLEANING

A. Upon completion of work, remove all seal material and other residue from site. Remove and clean exposed surfaces of residue or staining resulting from this work.

END OF SECTION 03 73 20

SECTION 03 73 24 – PATCHING SPALLED CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on patching spalls and holes in concrete with a cementitious patching material

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 QUALITY ASSURANCE

A. Masonry and Concrete Repair: Prepare sample panels of size indicated for each type of masonry material indicated to be patched, rebuilt or replaced.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
(201) 933-8800

B. General Polymers

C. Master Builders

2.2 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Concrete Patching Material:

B. As called out: “Standard patch:” One component, early strength, cementitious patching material “SikeTop 222” or “223” (Sika Corporation); “TPM 723” (General Polymers); “Vertipatch” (Master Builders), or approved equal.

As called out: “Custom matching patch:” Match the composition texture, and color of the original. Assay the original composition, present testing report, submit information for the replacement components, submit mock-ups of the patching mix on a board, not on the building, for Architect’s approval.

C. Water: Clean, free of oils, acids, alkalis and organic matter.

2.3 EQUIPMENT

A. Trowels

B. Chisels

C. Stiff bristle brushes (non-metallic)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection:

1. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.
2. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles which must remain in operation during course of masonry restoration work.
3. Contractor shall test those areaway drains, window well drains, etc., which will be used to assure that drains are functioning properly prior to performing masonry restoration operations in those areas. The Contractor shall report immediately to the Construction Engineer the location of drains which are found to be stopped up or blocked.

4. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.
5. Protect sills, ledges, windows, and projections from patching material droppings.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Remove deteriorated concrete at spalls to sound material. Grind, chisel or saw cut ()" deep undercut around perimeter of patch. Clean with compressed air. Thoroughly remove any concrete showing traces of oils or grease.

B. Thoroughly wet patched area prior to casting concrete patching material. If cement patching material manufacturer recommends a different procedure, such procedure is to be followed and executed in accordance with published instructions and in accordance with approved test patch.

C. Install cement patching material in strict accordance with manufacturer's published instructions.

D. Finish surface to match surface being patched, by grinding, troweling, sacking, or brushing.

3.3 ADJUSTING/CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water, spray applied at low pressure.

B. Use of metal scrapers or brushes will not be permitted.

C. Use of acid or alkali cleaning agents will not be permitted.

END OF SECTION 03 73 24

04 21 14 CHEMICALLY REMOVING PAINT FROM AND REPAINTING BRICK MASONRY

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 RESPONSIBLE AUTHORITIES IN EACH STATE. (From Preservation Brief 28, "Painting Historic Interiors.")

PART 1 – GENERAL

1.01 SUMMARY

A. This procedure includes guidance on chemically removing paint from and repainting brick masonry.

   NOTE: SANDBLASTING IS NOT RECOMMENDED BY THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION AND SHALL NOT BE USED. HIGH-PRESSURE WATER BLASTING IS ALSO NOT RECOMMENDED WITHOUT ADEQUATE TESTING OR EXPERIENCE AS IT MAY ERODE SOFT BRICK AND DRIVE MOISTURE INTO THE WALL.

B. Brick, properly fired, is a durable surface which does not need a sacrificial coating such as paint to protect it. Painting often creates long term maintenance problems. However, brick that has been painted is usually NOT properly fired and needs the protection provided by the application of paint. Furthermore, brick which has been damaged by abrasive cleaning may require painting in order to seal the masonry from excessive water penetration which, if not protected, can lead to further deterioration of the masonry.
C. Safety Precautions:

   CAUTION: CHEMICALS OFTEN USED TO REMOVE PAINT ARE HIGHLY CAUSTIC AND TOXIC.

   1. Both acids and alkalis are used in the cleaning process. The wrong type of acid can burn and/or dissolve both the brick and the mortar. Adjacent and imbedded materials, i.e. glass or iron cramps, can also be damaged.
   2. Failure to properly neutralize the chemicals, or inadequate rinsing can cause salts, stains and other residues which may be impossible to remove.

D. Historic Structure Precautions:
   1. Masonry buildings were sometimes painted from the start. A study of all of the paint layers should be conducted to determine what were the original colors and if any special treatments were used.
   2. For buildings in which all paint is to be removed, retain small representative areas of paint to provide a paint history of the building for future research.

3. An archive of the paint history of the building is to be maintained. This is to include any paint samples, taken during research, samples of the new paint colors and the manufacturer's technical information.

E. See 01 35 28 for general protection guidelines to be reviewed along with this procedure. These guidelines cover the following sections:
   1. Safety Precautions
   2. Historic Structures Precautions
   3. Submittals
   4. Quality Assurance
   5. Delivery, Storage and Handling
   6. Project/Site Conditions
   7. Sequencing and Scheduling
   8. General Protection (Surface and Surrounding)

1.02 SUBMITTALS

A. Samples:
   1. Under supervision, test panels, using the appropriate cleaning methods, shall be done to determine the best method to remove paint. The "best method" shall be defined as that which successfully removes the paint with no, or minimal, damage to masonry substrate.
   2. Testing shall be done in unobtrusive locations on each building exposure. The methods used, their application, etc. shall be in accordance with manufacturers' instructions and shall duplicate those procedures proposed for the overall paint stripping process. The Architect shall select the test areas and shall conduct a thorough evaluation of each method after paint removal is complete to determine the best method for the overall stripping.
   3. The testing shall include an evaluation of the materials and techniques proposed for the protection of surrounding areas from the chemicals used to strip the paint. Especially important is an evaluation of the method to be used to collect the cleaning effluent.
   4. A representative of the cleaning materials manufacturer(s) (for proprietary cleaning systems) shall be present during the preparation and application of the test areas.

1.03 PROJECT SITE CONDITIONS

A. Environmental Requirements:
   1. To prevent water in the masonry from freezing, no paint stripping shall be done if temperatures are expected to fall below 40 degrees Fahrenheit during the stripping process, or within 24 hours of completing the stripping. If allowed by the chemical manufacturer, heated rinse water may be used if lower temperatures are expected.
   2. No cleaning shall be conducted during periods of strong winds when the chemicals may be spread to adjacent unprotected surfaces.
   3. Unless otherwise recommended by the paint manufacturer, the ambient temperature shall be between 50 degrees Fahrenheit and 95 degrees Fahrenheit. Do not apply paints when the temperature is expected to fall below 50 degrees F during the first 24 hours after application.

4. Do not apply any of the coats of paint in the direct sun. It shall be applied only when the surface to be painted is in the shade and the sun is shining on the opposite façade. The west façade should be painted in the morning when the sun is shining on the east façade; the north façade should be painted around noon when the sun is shining on the south façade; the east façade should be painted in the afternoon when the sun is shining on the west façade; and the south façade should be painted late in the afternoon when it is in full shade.
5. Do not apply paint to damp surfaces, in misty or rainy weather, in the snow or where there is visible ice or frost on the surfaces.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Proprietary Chemicals (one of the following, or approved equal):
   1. ProSoCo, Inc.
      1601 Rock Mountain Blvd.
      66117 Stone Mountain, Georgia 30083
      404-939-9890
      OR
      P.O. Box 1578
      Kansas City, KS
      800-255-4255 or 913-281-2700
   2. Diedrich Chemicals Restoration Technologies, Inc.
      7373 S. 6th Street
      Oak Creek, WI 53154
      800-323-3565 or 414-764-0058
   3. Hydroclean
      P.O. Box 2078
      Hartford, CT 06145
      203-527-6350
   4. Solmica Chemical Manufacturing
      6240 Wiehe Road
      Cincinnati, OH 45237
      513-631-0076
   5. Dumond Chemicals, Inc.
      1501 Broadway
      New York, NY 10036
      212-840-2666

2.02 MATERIALS

A. Off-the-shelf Chemical Paint Removers:
   1. Semi-paste, water rinsing, non-benzol removers such as Strypeeze Semi-paste, or approved equal.
      a. Characteristic orange color
      b. Will work on both latex and oil-based paints, lacquers and varnishes
      c. Cling well to round or vertical surfaces; form an anti-evaporative film as they dry.

2. Non-flammable, heavy bodied, methylene-chloride based removers such as Superstrip Nonflammable, Zip Strip, or approved equal.
    a. Good for interior use because they are non-flammable
    b. Will soften oil-based paints, lacquers, varnish and synthetic baked finishes
    c. Because they are so heavy bodied they will cling to vertical and irregular surfaces.
3. Cornstarch or fumed silica to further thicken chemicals so they will adhere to vertical surfaces.
   OR
4. One of the following proprietary paint strippers, or approved equal:
    a. Sure Klean Heavy Duty Paint Stripper (ProSoCo, Inc.)
    b. Sure Klean 509 Paint Stripper (ProSoCo, Inc.)
    c. Sure Klean 859 Stripper (ProSoCo, Inc.)
    d. Stand-off Graffiti Control (ProSoCo, Inc.)
    e. 404 Rip Strip (Diedrich Chemicals)
    f. 505 Special Coatings Stripper (Diedrich Chemicals)
    g. 606, 606X Caustic Multi-layer Paint Remover (Diedrich Chemicals)
    h. Heavy Soil Paint and Rust Remover (Hydroclean)
    i. Peel Away1.2 (Dumond Chemicals, Inc.)

B. Clean, potable water to remove chemical residue.
C. Phenolphthalein: Used to test pH of a surface after stripping with chemicals or any alkaline product. Available at some drug stores or chemical supply houses.
D. Clean, clear white vinegar or other appropriate neutralizer such as Sure Klean Restoration Cleaner (ProSoCo, Inc.) 101 Masonry Restorer/Cleaner (Diedrich Chemicals), or approved equal.
E. Paint: From the same manufacturer and appropriately suited for the conditions.

   CAUTION: DO NOT USE A VAPOR-IMPERMEABLE PAINT ON SURFACES THAT MIGHT HOLD DAMP FROM GROUND OR THROUGH WALLS SUCH AS BADLY PITTED BRICK CAUSED BY SANDBLASTING.

2.03 EQUIPMENT

A. Paint scrapers
B. Putty knives
C. Stiff bristle brushes to remove loose, flaky paint
D. Natural fiber cleaning brush
E. Synthetic fiber brush
F. Rollers, and/or spray equipment as appropriate and as recommended by paint stripper manufacturers for the application of their various products. Not all types of brushes, etc. are appropriate for all chemicals.
G. Plastic sheeting and duct tape may be necessary to cover the stripper during dwell time as it evaporates quickly.
H. Scrapers and/or pressure rinsing equipment to remove sludge
I. Nylon bristle brushes
J. Garden hose

PART 3 – EXECUTION

3.01 EXAMINATION

A. DETERMINE THE REASON FOR PAINT REMOVAL AND WHY THE BUILDING WAS ORIGINALLY PAINTED.
B. Before work is begun on removing existing paint film or otherwise preparing the surface, all flashing, gutters and downspouts shall be inspected and repaired or replaced as required.

3.02 PREPARATION

A. Surface preparation: Repoint any open mortar joints to prevent water and chemicals from entering the wall structure.

3.03 ERECTION, INSTALLATION, APPLICATION

A. Paint Removal:
    1. Manually scrape all loose paint and efflorescence using paint scrapers, putty knives or stiff bristle brushes. If the mortar and bricks are quite crumbly, use a softer brush.
    2. Apply an off-the-shelf methylene chloride-based paint remover (for small surface areas):
        a. Thicken stripper with cornstarch as necessary.
        b. Apply stripper to the surface by brush.
        c. Cover with plastic wrap or keep misted to prevent chemical from drying out before it has had time to soften paint film.
        d. When paint film is softened, rinse surface completely using a garden hose or pressure washing equipment. Use the lowest pressure which will remove paint and paint remover – usually about 300 to 500 psi, but no higher than 800 psi and only on approval of the Architect. HIGH PRESSURE WATER BLASTING IS NOT RECOMMENDED. Supplement rinsing as necessary with a wood or plastic scraper. Repeat if required to remove all paint.

        OR

        Apply a proprietary chemical paint remover (for large surface areas):

        a. Apply chemical paint remover with a brush, roller or appropriate spray equipment as directed by manufacturer. Pressure application of paint stripping materials shall not be done as it tends to drive the chemicals too far into the brick and mortar making it impossible to remove all residue. Final dilution ratio to be determined by test patches done prior to removal process.
        b. Allow the stripper to stay on the brick as directed by the manufacturer and as determined by test patches.
        c. Rinse completely with clean, fresh water using pressure washing equipment to remove all paint and residue. Maintain water pressure as recommended by chemical manufacturer and Architect.
        d. Apply a second coat of paint stripper if necessary to remove remaining paint, again following manufacturer’s instructions.

e. Rinse completely again and apply afterwash as recommended by chemical manufacturer.

3. After paint has been removed, but before brick dries, apply neutralizer such as white vinegar or a proprietary chemical neutralizer. A neutral pH (7pH) should be achieved before repainting.
4. Allow neutralizer to stand on wall about three minutes before rinsing. DO NOT LET IT DRY!
5. Thoroughly rinse the surface with clean, clear water.
6. Test the pH with litmus paper or phenolphthalein:
   a. Dissolve a 2" piece of phenolphthalein in denatured alcohol.
   b. Brush the solution onto the surface. If it turns a shade from pink to magenta there is still chemical residue.
7. Continue to neutralize the surface and test until there is no color change in the phenolphthalein solution or the litmus paper registers neutral.

B. Repainting:
   1. If walls are to be repainted, allow them to dry completely before priming.
   2. Make sure all mortar joints and brick are sound, making any necessary repairs before priming.
   3. Select an acrylic or vinyl latex masonry primer or undercoat – one that is mildew and alkali resistant and made to be used on brick.
   4. After the primer has dried according to manufacturer's instructions, apply to top coats of finish paint compatible with primer. Allow adequate drying time between coats.
      a. Primer and top coats shall be from the same manufacturer and compatible with one another.
      b. If the brick surface is badly pitted because of previous sandblasting, cement-based paints may be used. Consult paint manufacturers for appropriate use.
   5. Apply paint with a brush to insure complete coverage. A long nap roller for use on brick may also be used for the top coats but great care must be used to ensure adequate coverage.

END OF SECTION

SECTION 04 51 04 – GUIDELINES FOR USING HIGH PRESSURE CLEANING EQUIPMENT ON MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. When used properly, high pressure cleaning equipment can safely and effectively remove dirt from masonry materials. However, when NOT used properly, this type of cleaning equipment can cause severe damage.

CAUTION: HIGH PRESSURE CLEANING IS NOT RECOMMENDED FOR USE ON POROUS SURFACES SUCH AS MASONRY. RATHER, POROUS SURFACES SHOULD BE CLEANED USING LOW PRESSURE TECHNIQUES.

B. There are three important factors to consider when specifying the use of high pressure cleaning equipment. All three factors influence the “impact” of the spray on the masonry surface. They are:

1. Pressure rating of water from the nozzle in pounds per square inch (psi)
2. Flow rate of water from the pump in gallons per minute (gpm)
3. Size and type of nozzle or spray tip

1.2 GUIDELINES

A. Pressure Rating

1. The pressure rating is the rate of intensity that water is supplied to the pump and is measured in pounds per square inch (psi).
2. The pumps most preferred by cleaning contractors are those providing adjustable pressure between 500 and 2,000 psi.
3. Pressures between 1,000 and 2,000 psi are typically used for surface preparation cleaning.
4. For typical masonry cleaning, the pressure rating can range from 500 to 1,000 psi. FOR OLDER AND DELICATE SURFACES, HOWEVER, MUCH LOWER PRESSURES MUST BE USED.

    a. A low-pressure wash generally measures between 100 psi and 400 psi.
    b. A medium-pressure wash generally measures between 400 psi and 800 psi.
    c. A high-pressure wash generally measures between 800 psi and 1200 psi.

B. Flow Rate

1. Flow rate is the volume of water supplied by the pump and is measured in gallons per minute (gpm).
2. Higher volume pumps are preferable for masonry cleaning. They allow flexibility in adjusting the water pressure as necessary while providing a strong enough flow of water to thoroughly rinse dirt and cleaner residue from the masonry.

C. Nozzle Type and Size

1. A fan type nozzle providing a 15-40 degree fan is preferred.
2. Laser tips, O-tips, or any fan spray narrower than 15 degrees should NOT be used on masonry. These types of tips generate a concentrated stream of water which can be damaging to the surface.
3. Nozzles should be held perpendicular to the surface at a distance between 18 and 30 inches from the surface.

D. HIGH PRESSURE SHOULD NOT BE USED FOR APPLYING CLEANING COMPOUNDS TO MASONRY.

1. Complete rinsing and removal of cleaning compounds from masonry is difficult when they are applied under pressure. Therefore, low pressure spray equipment (50 psi maximum) should be used.
2. Traces of cleaning compounds left in the masonry surface can result in severe remedial problems and staining, such as efflorescence, vanadium staining, acid burn, rust and other metallic oxidation stains.

E. Pressure Washing With Hot Water

1. Useful for cleaning when outside temperatures are too cold to clean with cold water.
2. Water temperatures should not exceed 160 degrees. Higher temperatures may adversely react with some chemical cleaners, resulting in surface discolorations or streaking.
3. Hot water is most effective when used in conjunction with alkaline cleaning compounds. It is best used in applications for removing paint, grease and oil.
4. Hot water is NOT effective when used in conjunction with acidic masonry cleaners.

END OF SECTION 04 51 04

SECTION 04 51 07 – TYPES OF CLEANING DETERGENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This standard includes general information on the different types of cleaning detergents, their typical uses, and their advantages and limitations. Sample products are listed when known.

PART 2 - PRODUCTS

2.1 SOAP

A. Uses

1. A surfactant (Surface Active Agent).
2. Soaps are produced from naturally occurring fats and oils. Soapless or synthetic detergents are manufactured from organic chemicals usually derived from petroleum.

B. Advantages

1. Very effective as a bactericide
2. It will form gels, emulsify oil and lower the surface tension of water. A lower surface tension allows the soap to come in contact with greater surface area than with water alone.

C. Disadvantages

1. When used in hard water, soap can produce a scum – calcium and magnesium salts present in hard water react with the soap to cause this to happen. Soapless or synthetic detergents do not leave a residual film behind.
2. Considerable rinsing is required to remove soap scum.
3. Soap may produce a greasy build-up on the surface which can be slippery.
4. More expensive than synthetic detergents.

D. Sample Products

1. “Joy,” “Ivory” (Proctor & Gamble Co.)

2.2 ANIONIC DETERGENTS

A. Uses

1. Commonly known as “neutral” detergent.
2. The most widely used soapless detergent.
3. Available in both liquid and powder.
4. Manufactured from strong alkalis and weak acids.
5. Effectiveness is even greater when combined with a non-ionic detergent.
6. These detergents produce foam when used in excess quantities and, therefore, should only be used in the recommended amounts.

B. Advantages

1. Safe for use on all floors and should not affect any pigment present in the floor covering.
2. Can safely be used on waxed or unwaxed floors or floors treated with a water emulsion floor wax or solvent-based wax.
3. Can be used in conjunction with mopping equipment or a polishing/scrubbing machine.
4. More effective than non-ionic detergents in the wetting of metal surfaces.
5. Very effective in removing inorganic dirt and soil.
6. Greater dirt carrying capacity than non-ionic detergents.
7. Fairly inexpensive.

C. Disadvantages

1. Not very effective in hard water.
2. More difficult to rinse than non-ionic detergents.
3. Produces considerable foam.

D. Sample Products

1. Natural soaps

2.3 NON-IONIC DETERGENTS

A. Uses:

1. These detergents do not ionize or carry a charge when dissolved in water.
2. They are manufactured from alkalis and acids of equal strengths and are, therefore, neither alkaline nor acid. They have a pH value of 7.
3. Compatible with many ingredients and can therefore be included in a wide variety of formulations.

4. Acts as a foam booster when combined with other detergents such as anionic detergents.

B. Advantages:

1. Safe for use on all surfaces.
2. Produce less foam than anionic detergents.
3. Because of their low foam characteristics, they may be effectively used in conjunction with scrubbing machines or other cleaning equipment.
4. Easier to rinse.
5. More effective for use in hard water than anionic detergents.
6. Very effective for removing oils and grease.

C. Disadvantages

1. Less effective than anionic detergents in the wetting of metal surfaces.
2. Generally more expensive than anionic detergents.
3. Mostly available in liquid form.

D. Sample Products

1. “Orvus” (Proctor & Gamble Co.)
2. “Joy” or “Ivory Liquid” (Proctor & Gamble Co.)
3. “Zyfo” (Industrial Soap Co.) cleaner concentrate, a controlled suds, silicate buffered, non-ionic, rinseless-type synthetic detergent, containing no soap, free of alkali, solvents, abrasives, acids, caustics or the like.
4. “Igepal 630” (GAF Corporation)

2.4 CATIONIC DETERGENTS

A. Uses:

1. These detergents carry a positive charge when dissolved in water.
2. Manufactured from weak alkalis and strong acids. They are acidic in nature with a pH value less than 7.

B. Advantages:

1. Have low-foam characteristics.
2. These detergents carry anti-static properties and are effective in repelling dust. The positive charge in a cationic solution repels the positive charge carried by dust in the atmosphere.
3. Very effective as a bactericide, disinfectant and deodorizer.

C. Disadvantages:

1. More expensive than anionic and no-ionic detergents.
2. Used alone, these detergents are very ineffective. They are usually combined with non-ionic detergents for better cleaning effectiveness.
3. These detergents CANNOT be blended with anionic detergents, as each will cancel out the other, rendering the detergent completely ineffective.

D. Sample Products:

1. Dish- and hand-washing soaps.

2.5 AMPHOTERIC DETERGENTS

A. Uses:

1. Also called ampholitic detergents.
2. These detergents have both acidic and alkaline properties.
3. Mainly used in specialty formulations.
4. Limited quantities are used in shampoos, medicated liquid soaps and aerosol shampoos.

B. Advantages:

1. These are greatly affected by changes in pH. They behave like anionic detergents at pH values greater than or equal to 8. They behave like non-ionic detergents at pH values between 8 and 6. They behave like cationic detergents at pH below 4.
   NOTE: AT A HIGH pH, DETERGENCY POWERS ARE INCREASED; AT A LOW pH, DETERGENCY POWERS ARE REDUCED.
2. Non-toxic, non-irritating, germicidal and compatible with anionic, non-ionic and cationic detergents.

C. Disadvantages:

1. Fairly expensive.

2.6 ALKALINE DETERGENTS

A. Uses:

1. Alkaline detergents are water-soluble alkalis having detergent properties, but containing no soap.
2. Usually range in pH from 9 to 12.5.
3. Used in applications where a strong detergent is required such as removing water emulsion waxes, scuff marks and heavy accumulations of dirt.

4. Generally used for “hard surface” cleaning.
5. High alkalinity is important in saponifying fats and neutralizing acids found in many types of dirt.
6. They are the most used of all cleaning materials.
7. Some materials used in formulating alkaline detergents include sodium carbonate, trisodium phosphate, sodium silicate, sodium tripolyphosphate, and to a lesser extent, sodium bicarbonate, sodium sulphate and certain silicates.

   CAUTION: TAKE PRECAUTIONS WHEN USING ALKALINE DETERGENTS ON LINOLEUM. THESE DETERGENTS CAN REMOVE THE LINSEED OIL COMPONENT IN LINOLEUM AND ADVERSELY AFFECT THE WOOD FLOUR COMPONENT.

B. Advantages:

1. They remove a wider range of dirt and soil than any other type of detergent.
2. Economical.
3. Can be used with a wide variety of cleaning equipment.
4. Low foam properties in the better alkaline detergents.

C. Disadvantages:

1. DO NOT ALLOW to remain in contact with the skin for any length of time. Wear rubber gloves.
2. Alkaline detergents may remove water emulsion floor waxes.
3. Alkaline detergents may also affect pigment by causing it to fade or yellow.
4. Some alkaline cleaners (especially those containing sodium hydroxide) may tend to form soluble salts which crystallize as efflorescence on the surface.
5. Alkaline detergents must be rinsed thoroughly in order to prevent a white powdery residue from remaining on the surface.
6. Multiple applications may cause damage to the surface.
7. Contact of bronze or copper with alkaline cleaners will cause the metals to corrode.

D. Sample Products:
1. Sodium Hydroxide (NaOH):
   a. A white, brittle solid that is a strong caustic base used especially in making soap, rayon, and paper.
   b. Other chemical or common names include Caustic soda*; Hydrate of soda*; Hydrated oxide of sodium*; Lye*; Mineral alkali*; Soda lye*; Sodic hydrate*; Sodium hydrate*.
   c. Potential Hazards: CORROSIVE TO FLESH AND FLAMMABLE (WHEN IN CONTACT WITH ORGANIC SOLVENTS).
   d. Available from chemical supply house, drugstore or pharmaceutical supply distributor, hardware store, or paint store.
2. Potassium Hydroxide (KOH):

a. A white deliquescent solid that dissolves in water with much heat to form a strongly alkaline and caustic liquid; used chiefly in making soap and as a reagent.
b. Other chemical or common names include Potassium hydrate; Caustic potash*; Caustic potassa*; Hydrate of potassa*; Potassa*.
c. Potential Hazards: TOXIC AND CORROSIVE TO FLESH.
d. Available from chemical supply house, drugstore or pharmaceutical supply distributor, hardware store, or garden and lawn supply center.

3. Ammonium Hydroxide or Ammonia (NH4OH): CAUTION: DO NOT MIX AMMONIA WITH CHLORINE BLEACHES. A POISONOUS GAS WILL RESULT! DO NOT USE BLEACH ON BIRD DROPPINGS.
   a. A weakly basic compound that is formed when ammonia dissolves in water and that exists only in solution.
   b. Other chemical or common names include Ammonia water*; Aqua ammonia*; Household ammonia*.
   c. Potential Hazards: TOXIC; MAY IRRITATE THE EYES.
   d. Available from chemical supply house, grocery store or pharmaceutical supply distributor, or hardware store.
4. Spic ‘n’ Span (Proctor & Gamble Co.)

2.7 CAUSTIC MATERIALS

A. Uses:

1. Caustic materials are based on caustic soda, sodium hydroxide, caustic potash or potassium hydroxide.
2. EXTREMELY strong materials with a high pH value.
3. Used where VERY STRONG alkaline solutions are required such as in clearing blocked drains.
4. Available in solid or concentrated liquid forms.
5. Caustic potash is hygroscopic (absorbs water from the air) and is NOT recommended for use in powdered formulations that are to remain moisture-free. CAUTION: NEVER USE CAUSTIC MATERIALS ON FLOOR COVERINGS. THE STRONG ALKALINITY WILL PRODUCE IRREVERSIBLE DAMAGE.

B. Disadvantages:

1. Can produce irreversible discoloration.
2. Safety hazard to user: Corrosive to flesh and flammable when in contact with organic solvents.
3. Produces a significant increase in temperature when dissolved in water at high levels.
4. Difficult to rinse from surfaces. However, caustic potash is more soluble than caustic soda.

5. Lack the ability to absorb liquid ingredients in powdered formulations.
6. Extremely corrosive to soft metals such as aluminum and zinc, and ceramic or glazed surfaces.
7. Avoid contact between caustic soda and liquid surfactants – contact may result in a decrease in its effectiveness and discoloration in the product.

C. Sample Products:

1. Liquid Plumber (The Clorox Company)
2. Oven cleaners

2.8 ACID CLEANERS

A. Uses:

1. Composed primarily of compounds based on phosphoric acid, sodium bisulphate, oxalic acid, gluconic acid and hydrochloric acid.
2. Acid cleaners are usually formulated as aqueous solutions.
3. DO NOT ALLOW acids to come in contact wit skin or clothing. Protect hands by wearing rubber gloves. Wash with soapy water immediately if skin comes in contact with an acid cleaner.
4. Hydrofluoric acid (HF) is the most commonly used acid cleaner and the only cleaner known not to leave soluble salts in masonry; usually applied in a 2-5% dilute water solution.

   CAUTION: ACID CLEANERS CAN BE DETRIMENTAL TO MANY TYPES OF SURFACES SUCH AS PAINT, STAINLESS STEEL, ALUMINUM AND ALMOST ALL FLOOR TYPES.

   NOT RECOMMENDED FOR USE ON LIMESTONE, MARBLE OR LIGHT-COLORED BRICK, UNLESS APPLIED IN VERY LOW CONCENTRATIONS (3%) AND RINSED IMMEDIATELY WITH COPIOUS AMOUNTS OF WATER.

   NEVER USE ACID CLEANERS IN COMBINATION WITH BLEACH OR HYPOCHLORITE SOLUTIONS. THIS COMBINATION WILL PRODUCE A TOXIC CHLORINE GAS.

B. Advantages:

1. Effective in removing cement, plaster or concrete spill because acids will attack alkaline materials.
2. Suitable for use on sandstone and granite.

C. Disadvantages:

1. Acids may damage surrounding materials such as glass, bronze, painted surfaces, wood, limestone and marble, vegetation and humans.
2. Disposal of run-off must be carefully controlled.
3. Drainage of toxic chemicals may not be permissible in some cities.

D. Sample Products:

1. Weak acids include white vinegar (acetic acid) and lemon juice (citric acid).
2. Rust removers – usually contain oxalic acid; “Zud”.
3. Cleaning products for removing hard water deposits – usually contain phosphoric acid.
4. Toilet bowl cleaners – usually contain diluted concentrations of hydrochloric and sulfuric acids.

2.9 DETERGENT CRYSTALS

A. Uses:

1. Also called alkaline degreasers.
2. Used primarily in industrial applications.
3. Detergent crystals contain few ingredients – one being sodium metasilicate which is soluble in hot or cold water.
4. Detergent crystals, when mixed with water, create a strong alkaline solution that is effective in removing oil, grease and wax.
5. See also Alkaline Detergents above.

B. Advantages:

1. Less expensive than solvent-based emulsions.
2. They can be used on any type of floor because they are water-based and solvent-free.

2.10 SOLVENT-BASED DETERGENT WAX REMOVERS

A. Uses:

1. Composed of hydrocarbon solvents such as white spirit and water. NOTE: THESE WAX REMOVERS CAN ONLY BE USED ON FLOORS NOT ADVERSELY AFFECTED BY WHITE SPIRIT OR SIMILAR SOLVENTS.
2. Manufactured in many different strengths. The two most common include 1) those containing almost all solvent and a little water (usually clear, transparent liquids), and 2) those with equal proportions of solvent and water (usually white, opaque liquids).

3. Solvent-based detergents are used primarily for removing solvent-based waxes, oil and grease.
4. Widely used for removing paste and liquid types of solvent wax from floors.
5. The solvent component of the remover penetrates and softens the wax. The emulsifying and wetting agents hold the wax in suspension for removal by mopping with warm water.

B. Advantages:

1. Safe and effective for use on wood, wood composition, cork, magnesite, linoleum, concrete and stone floors.
2. Non-flammable.
3. Better than paraffin and white spirit in removing wax, oil and grease because of the presence of an emulsifying agent in the solvent-based remover, which suspends the dirt for removal.
4. Less material is required to soften the wax than with paraffin or white spirit. Paraffin and white spirit tend to evaporate quickly leaving loosened dirt behind to harden again on the surface.

C. Disadvantages:

1. DO NOT USE on asphalt, thermoplastic tiles, PVC (vinyl), asbestos or rubber floors. Solvents will damage these types of floors.

END OF SECTION 04 51 07

O4 52 02 REPOINTING MASONRY USING LIME MORTAR

PART 1 – GENERAL

1.01 SUMMARY

A. This procedure includes guidance on repointing stone masonry using lime mortar.
B. Repointing is the process of removing deteriorated mortar from a masonry joint and replacing old mortar with new, sound mortar.
C. This process is sometimes referred to as “tuck pointing,” though “tuck pointing” is actually a decorative treatment rather than a method of repair. True tuck pointing is the process of adding a finish layer of mortar, occasionally tinted, to the outer portion of a newly laid joint.
D. Major reasons for mortar joint failure include:
    1. Weathering action
    2. Settling
    3. Temperature cycles
    4. Poor original design and materials, and
    5. Lack of exterior maintenance
E. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines follow the following sections:
    1. Safety Precautions
    2. Historic Structures Precautions
    3. Submittals
    4. Quality Assurance
    5. Delivery, Storage and Handling
    6. Project/Site Conditions
    7. Sequencing and Scheduling
    8. General Protection (Surface and Surrounding)

    These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

F. For guidance on preparing lime mortar, see 04 10 03.

1.02 SUBMITTALS

A. Manufacturers’ literature describing packaged items.
B. Source and screen analysis of bulk aggregate
C. Mortar sample: Submit, for verification and approval, a sample of each type of mortar used, in form of 6 inch long by ½ inch wide sample strips of mortar set in aluminum or plastic channels.
    1. Provide record of mortar mix, composition and field procedures to be followed.

1.03 QUALITY ASSURANCE

A. Mock-ups: Raking and Repointing Sample Work:
    1. Test/Sample Area and Architect’s Approval
        a. Initially perform sample joint raking and repointing on each of a 100 square foot test of stone, brick, and terra cotta areas as approved by Architect.
        b. Demonstrate proficiency with joint raking tools and ability to not damage masonry units with either hand or power tools.

c. Mix and cure test batch of repointing mortar and place in joints; repeat test until mortar color is approved. Test mortar should be matched, dried, and approved before placing in joints.
d. Demonstrate workmanship of repointing procedures and joint finishing.
e. Gain written approval from Architect for test area before proceeding with remaining work.

2. Joint Raking Method: Rake joints by hand ONLY using special joint cleaning chisels and hammer.
3. Repointing Method: Repoint joints by hand ONLY using approved pointing trowels. NO "BAGGING" OR CAULKING GUN POINTING METHODS APPROVED.

1.04 PROJECT/SITE CONDITIONS

A. Environmental Conditions: Perform repointing only when the temperature is between 40 degrees Fahrenheit and 80 degrees Fahrenheit. If the temperature is below 40 degrees the mortar sets too slowly and there is a good chance of freezing before it fully sets. If the temperature is above 80 degrees the mortar will set too quickly, and there is a strong chance of excessive loss of water prior to adequate setting.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Repointing Tools: Available from good hardware stores, building material suppliers or mail-order catalogues and online sources.
1. The Stanley Goldblatt Tool Co.
511 Osage Ave.
Kansas City, KS 66105-2198
913-621-3010

2. Marshalltown Trowel Co.
P.O. Box 738
Marshalltown, IA 50158
515-753-5999

3. Masonry Specialty Co.
4430 Gibsonia Rd.
Gibsonia, PA 15044
412-443-7080

2.02 MATERIALS

A. Lime mortar (see 04 10 03 for materials and procedures in preparing lime mortar)
B. Clean, potable water

2.03 EQUIPMENT

A. Trowels: range in length from 10 to 12 inches
B. Chisels:
1. Joint chisels or a standard mason's chisel with a 1 ½ in. blade and along narrow handle
2. Floor chisels

C. Hammers:
    1. 5# stone dressing hammer
    2. 2# striking hammer
    3. “No-Bounce” hammer
    4. Full size and one-half size brick hammers
D. Joint Tools: (see 2.01 MANUFACTURERS above)
    1. 3/8”- ¼” raised beaded tool
    2. 3/8”- ¼” beaded striking tool
    3. ½” raised beaded tool with offset handle
    4. ½” flat joint iron
    5. Pointing tool should be about 1/16” narrower than the joint being filled to achieve good compaction
E. Hawks: Plywood or steel hawk (mortar board)
F. Brushes:
    1. Natural bristle brushes
    2. Stiff bristle brushes (no wire)
G. Spray bottle

2.04 MIXES

A. See 04 10 03 for lime mortar mixes

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine all existing exterior mortar joints. If the answer to any of the following questions is yes, then the building’s joints are deteriorated and need repointing:
    1. Are mortar joints eroded back more than ¼” from the masonry face?
    2. Are there cracks running vertically or horizontally through the mortar?
    3. Are mortar bonds broken or pulled away from the masonry?
    4. Has mortar fallen out of joints?
    5. Is mortar excessively soft, powdery or crumbling?
    6. Is pointing badly stained?
B. Typical exterior damage due to mortar deterioration includes open joints, efflorescence, spalling and loosened masonry units.
C. Typical interior damage due to mortar deterioration includes falling plaster and stained wall paper.
D. A profession pointer experienced in old masonry is required for any of the following areas or conditions:
    1. Chimneys need repointing
    2. Window lintels must be rebuilt
    3. Masonry is loose or missing
    4. Work must be done from scaffolds or extension ladders
    5. The original mortar joints were “beaded”-tooled with a raised, round-profiled joint that projects out from the wall

3.02 PREPARATION

A. Preparing the Joints:

1. Clean area of loose dirt and debris using a stiff bristle brush and remove all extraneous fastenings and devices.
2. Install necessary protection of adjacent building materials, property and persons from joint cleaning work and dust.
3. Control dust and dirt from raking work; dampen area being worked; and use curtains to limit spread of dust from joint raking and cutting operations.

B. Joint Cutting and Raking:
1. Cut and rake old mortar from existing joints by hand using a hammer and chisel. NOTE: POWER CHISELS AND POWER SAWS SHOULD NOT BE USED.
2. Place the chisel in the center of the joint and pound it with a striking hammer or “No-Bounce” hammer until the mortar disintegrates.
3. Rake out the loose material to a depth of about 1 inch and never to a depth less than the width. Leave a clean, square face at the back of the joint to provide optimum contact with the new mortar.

   CAUTION: AVOID OVERCUTTING ENDS OF VERTICAL JOINTS, WIDENING JOINTS OR CUTTING INTO BEDDING FACES OF MASONRY UNITS.

4. While raking out joints, remove all metal fittings such as nails, brackets and clips on both horizontal and vertical surfaces.
5. Carefully clean out the prepared face with a soft or stiff bristle brush, or blow the joints clean with low-pressure compressed air (40-60 psi).
6. Thoroughly flush out joint with clean, clear water.

3.03 ERECTION, INSTALLATION, APPLICATION

A. Filling Joints:
1. Dampen masonry surfaces and joints to control suction and evaporation before replacing repointing mortars.

   NOTE: THERE SHOULD BE NO FREE WATER PRESENT WHICH MAY CAUSE VOIDS IN THE MORTAR.

2. Using a pointing tool, push the mortar into the joint from a board and iron with the maximum possible pressure. The mortar should be applied in layers, each to a maximum thickness of 3/8”.

   NOTE: THE POINTING TOOL SHOULD BE ABOUT 1/16” NARROWER THAN THE JOINT BEING FILLED TO ACHIEVE GOOD COMPACTION. IN SOME CASES, THE JOINTS WILL BE SO THIN THAT A STANDARDS POINTING TOOL WILL NEED TO BE GROUND DOWN TO FIT THE JOINT.

3. Thoroughly compact each layer of mortar and allow to set until thumb-print hard before applying next layer of mortar.
4. Fill the joints so that they are slightly recessed from the masonry face. Avoid leaving a joint which is visually wider than the actual historic appearance.
5. Continuously keep all excess and spilled mortar brushed off the faces of masonry units, ledges and other surfaces before it sets or stains the work.

B. Joint Finishing:
   1. Begin when mortar attains “thumb print” hardness.
   2. Tool the joint to match the old mortar.

      NOTE: IT IS IMPORTANT TO TOOL THE JOINT AT THE RIGHT STAGE; IF THE JOINT IS TOO SOFT THE COLOR WILL BE LIGHTER THAN EXPECTED AND HAIRLINE SHRINKAGE CRACKS ARE LIKELY TO OCCUR. IF THE JOINT IS TOO HARD WHEN TOOLED DARK STREAKS MAY APPEAR (TOOL BURNING) AND GOOD CLOSURE OF THE MORTAR AGAINST THE MASONRY WILL NOT BE ACHIEVED. EXCESSIVE TOOLING MAY BRING LIME AND FINE AGGREGATES TO THE SURFACE, CREATING A VISUAL CHANGE IN THE TEXTURE AND A SURFACE SUBJECT TO EARLY DETERIORATION.

   3. To produce a roughened texture, lightly spray the mortar with water after the initial set, stipple the mortar with a stiff bristle brush or dab the mortar with coarse sacking.
   4. Protect finished work from direct sun and rain until the face has dried and hardened.

3.04 ADJUSTING/CLEANING

A. Cleaning Up:
   1. Use masking and drop cloths to prevent mortar stains on adjacent work and ledges.
   2. Keep work areas clean and free from mortar drips, spills and residue of waste mortars or wash-offs.
   3. Clean off excess mortar as work proceeds using masonry brushes before mortar sets.
   4. Wash completed repointing work when finished mortar joints are set with clean water and masonry brushes, scrubbing only as required to clean mortar stains off masonry without scouring the units and joint faces.
   5. Do not use acid or detergent cleaning agents to aid mortar removal and clean-up unless safe.
B. Curing:
   1. Schedule work only when moderate weather is forecast.
   2. Protect completed work from adverse weather, heavy rainfall, freezing, and drying by direct sunlight and winds until cured.
   3. Sprinkle or mist repointed work as required to achieve cure in mortar joints for a minimum of 72 hours after completion.
   4. Lime Mortar: Cures by drying and crystallization, not by hydration; and can be washed out of joints if not protected before it cures.
C. Final Cleaning:
   1. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water spray applied at low pressure.

      NOTE: USE OF METAL SCRAPERS OR BRUSHES IS NOT PERMITTED. USE OF ACID OR ALKALI CLEANING AGENTS IS NOT PERMITTED.

D. Some efflorescence, called new construction “bloom,” occasionally appears on the surface within the first few months following a repointing project. These deposits normally are harmless and are removed by the natural washing of the rain. If not removed by natural weathering, they can be removed with dry brushing with a bristle brush. The use of chemical cleaners to remove this type of efflorescence normally is not necessary. AVOID USING ACIDS, PARTICULARLY MURIATIC ACID.

END OF SECTION

SECTION 06 30 01 – EPOXY REPAIR FOR DETERIORATION AND DECAY IN WOOD 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 major causes 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. Some epoxies have adequate compression strength, but many are not the best choice to repair a member in tension. In this case, replacement, reinforcement, or augmentation 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
Kennelon, NJ 07405
(201) 838-6412

B. Abatron, Inc.
5501 95th Avenue
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

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Epoxy consolidant and epoxy filler: Both are multiple part compunds. Purchase by the gallon unless a large amount of epoxying needs to be done. Use one of the following, or approved equal:

1. "ConServ (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. "ConServ (T) Flexible Patch 200" (Conservation Services): A four-part putty-like filler. It 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 not repetitive, jobs. Abatron carries twenty different types of wood consolidants with varying degrees of penetration.
5. Mineral pigments may be used to tint WoodEpox-2 where appropriate for surface patches that will be subsequently finished with coatings.

B. Oil clay that can be purchased from a hobby store – used to keep consolidant from leaking through cracks.

C. Nitril Rubber Gloves (Abatron, or equal)

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 nosed 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 ok. 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 ¼" 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 several 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 3.3 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 planning 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 06 30 01

SECTION 06 30 02 – PRIMERS AND PAINTS FOR WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. This standard includes general information on primers and paints to be used on interior and exterior wood surfaces.

The primary purpose of paint is to protect wood from deterioration. To do so, paint manufacturers have developed paint systems which are made to work together to protect the wood substrate. These systems include primers and appropriate, compatible top coats which can vary depending on the substrate and can vary between manufacturers. As a result, appropriate primers and compatible top coats both from the same manufacturer should be used.

PART 2 - PRODUCTS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

2.1 PRIMERS FOR WOOD

A. Characteristics

1. They prevent certain chemical reactions from occurring between the wood and the top coats. In wood, water soluble extractives are often a natural constituent of many wood species. Stain blocking primers, either oil- or water-based, are especially important to use in these situations.
2. They provide a more stable substrate for the new top coats.
3. They provide a uniform coat allowing more even color coverage of the top coats.
4. They bind weathered wood fibers, providing a more stable substrate.
5. For areas subject to heavy mildew, mildew resistance primers are also available, making the surface less susceptible to mildew.

B. Types

1. Oil/Alkyd Primers:
   a. Must be applied to a completely dry surface.
   b. Recommended for use when all of the paint has NOT been removed from the surface. Oil based paint is better able to bind with old, chalky paint layers thereby providing a more stable base for the finish coats.

c. Recommended for use if the existing paint type is unknown (oil or latex?), or if a switch to latex top coat is being made.
d. Appropriate for use on wood surfaces from which all paint has been removed but which are subject to less movement, i.e. a wall surface rather than a fence.
e. Advantages:
1) Have excellent stain blocking capabilities.
2) Suited for wood in which the paint has NOT been removed.

2. Acrylic Latex Primers:
a. Found to be successful when used on wood surfaces from which all of the paint has been removed and from wood surfaces which are "fresh".
b. They are especially good for surfaces which are considered difficult situations, i.e. free-standing elements such as fences, columns, balustrades, etc. where wood is constantly moving.
c. They can be applied to wood that is slightly damp.
d. Advantages:
1) More flexible than oil/alkyd paints.
e. Limitations:
1) As latex paint dries it shrinks more than oil and can literally pull off older, more brittle paint layers. Therefore, oil/alkyd paints are usually recommended for use on wood surfaces where all of the paint has not been removed.

C. Products

1. Lucite brand of Forest Products Lab: Found to be adequately flexible and is an acrylic latex primer which has a good stain blocker.
2. If Lucite is unavailable and the wood being painted contains water soluble extractives (cedar and redwood), then an oil/alkyd primer is recommended.
3. If in doubt about the stain-blocking capabilities of a selected latex primer, test it.

2.2 PAINTS FOR WOOD

A. Characteristics

1. Made up of three basic ingredients:
a. A binder – oil or water
b. Thinner – mineral spirits, turpentine or water
c. Pigment – organic or inorganic
2. To these basic ingredients can be added any number of additives to produce specialized paints.
3. The term "vehicle", often used in reference to paint, refers to the binder plus the thinner.

B. Types

NOTE: The paint selected must be from the same manufacturer and made to be used with the primer selected. It should also be selected for use in a specific situation where applicable, such as using porch and deck enamel when painting porch floors.

CAUTION: PAINTS CONTAINING ZINC ARE TO BE AVOIDED WHEN PAINTING WOOD, AS ZINC ATTRACTS MOISTURE.

1. Oil/Alkyd Paints
    a. Opaque coatings which use natural oils, such as linseed oil, or modern alkyds as the binder.
    b. Alkyds are oil modified resins which dry faster and harder than ordinary oils.
    c. They offer the best protection from both liquid and vaporous water but become brittle with age and eventually are unable to move with the substrate and peel, crack, flake, etc.
    d. Advantages:
        1) Durable
    e. Limitations:
        1) Longer drying time
        2) More difficult to clean up than latex paints
        3) Can be odorous, volatile and flammable due to the presence of organic solvents
2. Emulsion or Latex Paints
    a. Also known as water based paints, these paints have a latex binder which has been emulsified or suspended in water.
    b. Acrylic latex resins are particularly durable and favored over polyvinyl acetate and polyvinyl chloride latex resins.
    c. They allow more water vapor to pass through than oil based paints and they are more flexible, even over time. Nevertheless, they will eventually peel, flake, crack, etc.
    d. For optimal results when using acrylic latex paints, make sure that for at least the first 24 hours after application a temperature of 50 degrees F. can be maintained.
    e. Advantages:
        1) General
            a) Easy to clean up
            b) May be thinned with water
            c) More flexible than oil/alkyd paints
            d) Provide better resistance to mildew because there is no oil in the paint. The oil of oil/alkyd paints acts as food for mildew.
            NOTE: THERE HAVE BEEN CASES WHERE MILDEW HAS PROLIFERATED EVEN ON A LATEX PAINT SURFACE; APPARENTLY THE TINT USED TO COLOR THE PAINT PROVIDED THE NECESSARY FOOD SOURCE.
            e) Decreased odor, toxicity and flammability (due to lack of organic solvents and thinners).
        2) Acrylic-based paints:

a) Excellent color and gloss retention
b) Good flexibility and durability

3) Polyvinyl acetate emulsion paints:
a) Low cost
b) Excellent color retention

4) Styrene-butadiene paints: None identified

5) Linseed oil resin-emulsion systems:
a) Easy to make
b) Low material cost
c) Improves paint durability

f. Limitations

1) General
a) Some emulsion paints require the use of a special primer or sealer to seal chalky surfaces and prevent peeling of the new coating

2) Acrylic-based paints
a) Sometimes have poor color retention in dark tints
b) Sometimes combined with alkyd-resins for better adhesion; this increases the potential of mildew growth

3) Polyvinyl acetate emulsion paints
a) Moderate durability when used alone; durability is increased when the vinyl acetate emulsion is blended with other emulsions (i.e. acrylic, linseed oil, alkyd-resin)

4) Styrene-butadiene paints
a) Normally not used on exterior
b) Tend to yellow with age
c) Not very flexible; grain cracking is a frequent problem when applied to wood
d) Not readily available today

5) Linseed-oil resin-emulsion systems: None identified

C. Products/Suppliers

1. Benjamin Moore and Co.
2. Glidden
3. PPG Industries, Pittsburgh Paints
4. Pratt and Lambert
5. The Sherwin-Williams Company

NOTE: There are some paints on the market known as self-cleaning paints. As rainwater runs down the wall the paint is slowly worn away. This is called chalking. Such paints should NOT be used if there is an unpainted surface or contrasting color below the painted surface, such as a red brick foundation wall. The streaking can be unsightly.

END OF SECTION 06 30 02

SECTION 06 30 03 – SURFACE PREPARATION FOR PAINTING WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on preparing wood surfaces for painting.

B. Wood surfaces scheduled to be finished with an opaque finish shall either be stripped or sanded as required to produce a smooth substrate for application of the new coatings.

C. For guidance on paint removal from wood, see 06 40 02 “Supplemental Guidelines for Removing Paint from Interior and Exterior Wood Surfaces.”

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. American International Tool Industries, Inc.
1116-B Park Avenue
Cranston, Rhode Island 02910
(800) 932-5872 or (401) 942-7855

B. Benjamin Moore and Co.
51 Chestnut Ridge Road
Montvale, NJ 07645
(201) 573-9600

C. The Sherwin-Williams Company
101 Prospect Ave. N.W.
Cleveland, OH 44101
(216) 566-2000

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 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 (*).

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Paste Wood Filler: Solvent-based, air-drying, paste-type wood filler for use on open-grain wood on interior wood surfaces such as “Benwood Paste Wood Filler” (Benjamin Moore and Co.), “Sher-Wood Fast-Dry Filler” (The Sherwin Williams Co.), or approved equal.

B. Non-ammoniated detergent such as “Tide”

-OR-

Liquid bleach containing 5% sodium hypochlorite (common household bleach)

C. Boiled linseed oil

D. Turpentine – clean and clear so that it will not adversely affect the texture or durability of the paint

E. Caulking Compound (in order of recommended usage):

1. Polyurethanes – easily workable; paintable; 15-20 year life span; limited availability
2. Polysulfides – slow drying; can be sanded and painted; highly elastic; limited availability
3. Butyls – paintable but cannot be sanded; 7-10 year life span
4. Silicones – some can be painted but generally not sanded
5. Acrylic Latex – for exterior work, their use is best left to tight, narrow joints; short life span especially when compared to polysulfides and polyurethanes.

F. Clean, potable water

2.3 EQUIPMENT

A. Sanding blocks, sanding sponges, orbital sander, all with a variety of grits.

B. Sanding vacuum such as “S344 Sander Vac” (American International Tool Industries, Inc.) or approved equal.

C. Stiff, natural and nylon bristle brushes.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection: Spot-prime exposed ferrous metals such as nails on or in contact with surfaces to be painted with water-based paints. Use a suitable corrosion-inhibiting primer capable of preventing flash rusting and compatible with the coating being used.

B. Surface Preparation:

1. Lightly sand surfaces as required, either by hand or with an orbital sander, using fine grade sandpaper.
   CAUTION: WORKERS SHOULD USE PROTECTIVE CLOTHING AND RESPIRATORS FOR PROTECTION AGAINST CONTAMINATION WITH LEAD DUST.
   NOTE: CHEMICAL REMOVERS MAY RAISE THE GRAIN OF THE WOOD. SUCH ROUGH FIBERS WILL WEAKEN THE PAINT FILM CAUSING PREMATURE PAINT FAILURE. THERMAL METHODS OFTEN LEAVE BEHIND HARD PARTICLES OF PAINT RESIDUE WHICH ALSO NEED TO BE REMOVED TO ENSURE A SMOOTH FINISHED SURFACE.
2. If only limited paint removal is required, feather edges of sound paint to provide a smooth transition between the old and the new paint. Use either hand methods or an orbital sander.
   NOTE: BELT SANDERS SHOULD ONLY BE USED BY EXPERIENCED PERSONNEL. THEY WORK VERY QUICKLY AND IT IS EASY TO DAMAGE THE WOOD SUBSTRATE IF THEY ARE NOT USED CAREFULLY.
   NOTE: SANDING DUST MAY CONTAIN LEAD; USE SANDING EQUIPMENT EQUIPPED WITH A SANDING VACUUM TO PREVENT LEAD DUST FROM GETTING INTO THE AIR. FOLLOW OTHER REGULATIONS PROVIDED BY THE EPA REGIONAL OFFICE AND/OR THE STATE OFFICE OF ENVIRONMENTAL QUALITY CONCERNING THE HANDLING OF LEAD-BASED PAINT.
3. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of putty or plastic wood filler to finish surface imperfections. Sand smooth when dried.
4. Fill all nail holes, voids, surface defects, etc. prior to refinishing.
   a. Putty stop holes where nails are set and screws countersunk on all finished woodwork.
   b. Include puttying or spackling repairs to voids, cracks, minor splits, and similar surface defects in finished woodwork to be painted or stain-varnish finished.
5. Recondition wood to ensure a tight bond between the new paint and the wood. Wood that is not reconditioned after paint removal is often left very dry and, therefore, may absorb too much of the binder in the paint resulting in poor binding of the prime coat.
   a. Mix 2 parts boiled linseed oil with 1 part turpentine

b. Apply liberally with a brush and allow to dry
c. Repeat as necessary until dry surface has a slight sheen

6. If all paint has not been removed, wash the painted surfaces to remove all grease, dirt and mildew, and to ensure adequate adhesion of the prime coat.
   a. Wash dirt and grease using a solution of 3 quarts warm water mixed with 2/3 cup trisodium phosphate (TSP) and ½ cup non-ammoniated detergent.
   b. If mildew is a problem add 1 quart of liquid bleach. For stubborn mildew, straight bleach may be necessary. Scrub surfaces with a medium bristle brush and rinse with clean, clear water. Make sure the surface is completely rinsed before painting.

   NOTE: WHEN TSP IS MIXED WITH WATER IT FORMS FREE ALKALI. THIS FREE ALKALI WILL CAUSE OIL-BASED PAINTS TO BECOME SOAPY SO THAT THEY WILL NOT STICK TO THE SUBSTRATE. RINSE THOROUGHLY WITH CLEAN WATER BEFORE PROCEEDING (CHECK LABEL FOR INGREDIENTS. SODIUM CARBONATES FOUND IN SOME DETERGENTS HAVE SIMILAR PROBLEMS).

   CAUTION: DO NOT MIX AMMONIA WITH CHLORINE BLEACHES. A POISONOUS GAS WILL RESULT! DO NOT USE BLEACH ON BIRD DROPPINGS.
7. Apply a Water Repellant (WR) or Water-Repellant Preservative (WRP). (See 06310-01-S and 06310-01-P for guidance on preparation and application).

   NOTE: THIS TREATMENT IS RECOMMENDED FOR EXTERIOR ITEMS SUBJECT TO EXTREME WEATHERING CONDITIONS, OR WHICH ARE ESPECIALLY DRY OR MAY HAVE BEEN CONSOLIDATED. SOME OF THESE EXTERIOR ITEMS MAY INCLUDE WINDOWS, CORNICES, OR OTHER ITEMS WHICH MY HAVE HAD SEVERELY PEELING PAINT AND EXPOSED WOOD FOR A NUMBER OF YEARS.

   NOTE: ALL UNPAINTED WOOD WHICH IS TO BE REPAINTED USUALLY BENEFITS FROM THE APPLICATION OF EITHER A WR OR WRP.
8. Caulk any end grain wood subject to water infiltration. Also, caulk where wood trim pieces or door and window frames meet wall surfaces.
9. Wood trim which has been removed, or new pieces to be installed, may be “back-primed” or painted along the end grain for additional moisture-proofing. When transparent finish is required, back-prime with spar varnish.

END OF SECTION 06 30 03

SECTION 06 31 01 – APPLYING A WATER-REPELLANT PRESERVATIVE TO WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on applying a water-repellant preservative (WRP) to wood. This coating will prolong the service life of wood and provide some protection against agents of deterioration. NOTE: WATER REPELLANTS AND WATER-REPELLANT PRESERVATIVES ARE ONLY EFFECTIVE ON UNPAINTED WOOD. IF IT IS APPLIED TO PREVIOUSLY PAINTED WOOD, BRUSH IT THOROUGHLY INTO ANY JOINTS OR CRACKS AND WIPE ANY EXCESS OFF PAINTED SURFACES. ALLOW PROPER DRYING TIMES.

B. Natural causes of deterioration include decay, ultraviolet degradation, insect infestation and excess moisture.

C. WRPs are often recommended for humid, southern climates. Their use can significantly reduce the problems of peeling, flaking, blistering, etc. of painted wood surfaces.

D. Some types of problems resulting from the weathering process include:

1. Fungi and/or mildew growth
2. Warped boards
3. Loose fasteners
4. Changes in surface texture resulting in cracks and checks

E. In addition to opaque paints, various so-called “natural” finishes and colored stains provide this necessary protection. And, like paints, proper surface preparation and application are vital to long-lasting protection.

F. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 DEFINITIONS

A. Water-Repellant Preservative (WRP):

1. Natural, colorless liquids which, when brushed onto or soaked into the wood, render the wood impervious to liquid water, inhibit the growth of mildew and other fungi, and provide protection against termite and other insect infestation.
2. Their use reduces warping and checking and prevents water staining at edges of boards and at the end grain. They do not, however, protect wood from water vapor or ultraviolet degradation.
3. WRPs will darken wood somewhat though in and of themselves, they contain no coloring agents. Though it varies with wood species, the ultimate color is usually a golden tan.
4. WRPs can be used as a natural finish.

1.3 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Unless otherwise recommended by the manufacturer, the ambient temperature shall be between 50 degrees F. and 95 degrees F. when applying either a stain or WRP.
2. Do not apply when the relative humidity exceeds 85% or the moisture content of the wood exceeds 12% as measured by an electronic moisture meter.
3. Do not apply a WRP in the direct sun. They shall be applied only when the surface to be treated is in the shade and the sun is shining on the opposite elevation. The west elevation should be treated in the morning when the sun is shining on the east elevation; the north elevation should be treated around noon when the sun is shining on the south elevation; the east elevation should be treated in the afternoon when the sun is shining on the west elevation; and the south elevation should be treated late in the afternoon when it is in full shade.
4. Do not apply WRPs to damp surfaces, in misty or rainy weather, in the snow or where there is visible ice or frost on the surfaces.

1.4 MAINTENANCE

A. Water-Repellant Preservative Finish (WRP):

1. On smooth wood surfaces, a water-repellant preservative will remain effective for about a year. If the first application was applied to the point of refusal, it may remain effective for two years. On rough or weathered wood, expect a WRP to remain effective from one to three years.
2. To determine if it is still effective, splash some water on the surface.
    a. If the water beads up the WRP is still providing the necessary protection.

b. If the water soaks into the wood, and/or the wood has a blotch appearance (caused by mildew) it is necessary to re-treat.

3. Before applying a new coat of WRP, clean the old surface with a non-ferrous bristle brush.
4. To kill any mildew, wash with a solution of 1/3 cup household detergent (NO AMMONIA), 1 quart 5% bleach, and 3 quarts warm water.
5. Rinse well and let dry thoroughly before re-applying the WRP
6. After the treated wood has achieved a uniform tan color, re-treatment will be required every 2 to 4 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. American Building Restoration Chemicals, Inc.
9720 South 60th Street
Franklin, WI 53132
(800) 346-7532 or (414) 421-4125

2.2 MATERIALS

NOTE: SIMPLE WATER REPELLANTS (WR), BY THEMSELVES, DO NOT PROVIDE ADEQUATE PROTECTION AGAINST DECAY AND ULTRAVIOLET DEGRADATION AND ARE NOT TO BE USED AS THE SOLE FINISH.

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Commercial water-repellant preservatives such as “X-100 Natural Seal” (American Building Restoration Chemicals, Inc.), or approved equal,

OR

A home-made preservative based on the USDA Forest Products Laboratory formula (see 06310-01-S for guidance on preparation).

B. Household detergent (NO AMMONIA)

C. Household Bleach:

1. Other chemical or common names include Sodium Hypochlorite (NaOC1); Bleaching solution*; laundry bleach*; solution of chlorinated soda*.
2. Potential Hazards: CORROSIVE TO FLESH

3. Available from chemical supply house, grocery store or supermarket, hardware store or janitorial supply distributor.

D. Clean, clear water.

2.3 EQUIPMENT

A. Brushes:

1. Use natural bristle paint brushes for oil/alkyd stains. Pecondition by soaking in raw linseed oil for 24 hours. Use nylon bristle brushes for latex stains. Do not use the same brush for both types of stain.
2. For thin, runny stains, foam pad applicators can be used.
3. Stiff natural bristly scrub brushes.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: The surface should be free of all loose fibers, dust, and grease before application of a WRP.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Prepare the Water-Repellant Preservative (Forest Products Laboratory formula). See 06 31 01-P for guidance.

OR

Use one of the proprietary products listed above. NOTE: ON A SMOOTH SURFACE 1 GALLON OF WRP WILL COVER APPROXIMATELY 250 SF. IT WILL COVER APPROXIMATELY 100-150 SF ON A ROUGH SURFACE.

B. Dipping is the most effective means of treatment, especially for the ends of wood members. Brushing, to the point of refusal, is the next best method of treatment.

1. For treated lumber, dip freshly cut surfaces before installation, 10 seconds to 3 minutes.
2. For untreated lumber, dip, brush or spray with preservative. Pay particular attention to end grain joints.
3. For wood shingles, dip before installation, with a second coat brushed onto the surface after installation.
4. On fixed surfaces, use a minimum of two successive coats.

5. For pieces that are removable, soak for 10 seconds to 3 minutes.

C. Allow adequate time to dry before repainting so that paint will adhere properly. Follow manufacturer's instructions.

1. In general, if the surfaces have been brush treated, 48 hours at 70 degrees F. is generally sufficient drying time.
2. Longer drying times will be required if it gets colder than 70degrees F. at any time during this drying period.
3. Wood that has been dipped for 10 seconds will need a minimum of one week of similar, ideal drying time.
4. If work is being done late in the year and it is too cold in the evenings for a paint film to dry properly, only apply a WRP and wait until spring to prime and paint.

D. In addition to adequate drying times, some WR/WRPs must be allowed to weather before painting. Follow manufacturer's instructions. Time can vary from six months to two years.

3.3 ADJUSTING/CLEANING

A. Caulking joints is an important part of surface preparation. Also caulk after a WR or WRP has been applied.

END OF SECTION 06 31 01

SECTION 06 31 01P- PREPARING A NON-TOXIC WATER-REPELLANT PRESERVATIVE

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on preparing a non-toxic water-repellant preservative. It is a formula provided by the United States Department of Agriculture Forest Products Laboratory.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. United States Department of Agriculture
Forest Products Laboratory
P.O. Box 5130
Madison, WI 53705
(608) 231-9200

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 (*).

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Mineral spirits:

NOTE: MINERAL SPIRITS SHALL BE CLEAN AND CORLORLESS SO THAT IT WILL NOT ADVERSELY AFFECT THE TEXTURE OR DURABILITY OF THE STAIN.

1. A petroleum distillate that is used especially as a paint or varnish thinner.
2. Other chemical or common names include Benzine* (not Benzene); Naphtha*; Petroleum spirits*; Solvent naphtha*.
3. Potential Hazards: TOXIC AND FLAMMABLE
4. Safety Precautions:

a. AVOID REPEATED OR PROLONGED SKIN CONTACT
b. ALWAYS wear rubber gloves when handling mineral spirits
c. If any chemical is splashed onto the skin, wash immediately with soap and water.

5. Available from construction specialties distributor, hardware store, paint store, or printer's supply distributor.

B. Paraffin wax

C. Boiled linseed oil:

1. Boiled linseed oil shall be used rather than raw linseed oil as raw linseed oil does not dry.
2. The linseed oil shall be clean and colorless so that it will not adversely affect the texture or durability of the paint.

D. Clean, clear water

2.3 EQUIPMENT

A. Double boiler

B. Stiff bristle brush

PART 3 - EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

NOTE: THIS WILL MAKE 5 GALLONS OF SOLUTION.

A. Melt (1 lb.) paraffin in double boiler being careful not to get it too hot as it can ignite. Temperature should range between 80 and 100 degrees F.

B. Allow to cool to about 70 degrees F. before adding the preservative.

CAUTION: FUMES ARE HIGHLY TOXIC; WEAR PROTECTIVE CLOTHING INCLUDING GOGGLES; WORK OUTSIDE; USE ORGANIC VAPOR RESPIRATOR.

C. Add (3 gallons) boiled linseed oil and (I gallon) mineral spirits, or whatever resin and solvent is being used.

D. Apply the mixture at 70 degrees to 80 degrees F. Below 40 degrees F. the paraffin is not sufficiently liquid and the material cannot penetrate. Above 80 degrees F. the mixture dries too fast and will not achieve sufficient penetration.

END OF SECTION 06 31 01-P

SECTION 06 40 01 – 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.

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.

D. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection

6. Protection During Use of Heat-Generating Equipment

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

E. See also 06 40 02 for supplemental information on removing paint from wood features.

F. For additional information on the history and properties of paint along with general procedures for paint removal, see “Preservation Brief 28: Painting Historic Interiors,” and “Preservation Brief 10: Exterior Paint Problems on Historic Woodwork.”

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 noted.

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-rinseable.
      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 rinseable 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 for 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 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-rinseable, 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 non-flammable, biodegradable active ingredients to soften the paint. Most are water-rinseable, 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, CA 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. 3M D-I-Y Division Wood Refinishing Products
   P.O. Box 33053
   St. Paul, MN 55133-3053
   800-255-4255 or 612-737-6501
7. 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.
8. Red Devil, Inc.
   2400 Vauxhall Road
   Union, NJ 07083
   800-423-3845 or 201-688-6900
9. Reliable Remover & Lacquer Corporation
   62 Woolsey Street
   Irvington, NJ 07111
   201-399-2121
   Distributor: Pacoa, 133-36 36 Road, Flushing, NY.
10. Savogran Company
    P.O. Box 130
    Norwood, MA 02062
    800-225-9872 or 617-762-5400
11. Specialty Environmental Technologies, Inc.
    4520 Glenmeade Lane

Auburn Hills, MI 48326
810-340-0400

12. 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

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 stripers 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 scrapers 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 rinseable 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 alkalis so clean-up is simplified. Follow manufacturer’s instruction for removal or residue.

E. For guidance on repainting wood features, see 06 30 02 and 06 30 03. For guidance on refinishing wood with a varnish or stain, see 06 30 04.

3.4 ADJUSTING/CLEANING

A. Upon completion of this work, all floors, walls and other adjacent surfaces that are stained, marred, or 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 06 40 01

SECTION 06 40 02 – SUPPLEMENTAL GUIDELINES FOR REMOVING PAINT FROM INTERIOR AND EXTERIOR WOOD SURFACES

PART 1 - GENERAL

1.1 SUMMARY

This standard reviews the causes of paint failure on wood surfaces and provides basic guidelines for deciding to what extent deteriorated paint layers should be removed. This procedure should be used in conjunction with 06 40 01, “Chemically Removing Paint from Wood Features.”

A. Exterior surfaces are painted both for aesthetics and for protection. Paint protects the wood substrate from ultraviolet degradation due to sunlight exposure and rotting due to excess moisture.

B. Interior wood surfaces are usually painted for decorative reasons rather than for protection.

C. Causes for premature paint failure include:

1. Excess moisture in wood causes the wood to swell, breaking the bond between the wood and the paint.
2. Poor surface preparation interferes with the bond between the new paint layer(s) and the substrate.
3. The wrong type of paint used in the wrong way and/or in the wrong place.

PART 2 - TYPES OF PAINT FAILURE

2.1 PEELING/FLAKING

Paint may peel for a number of reasons:

A. When applied over damp wood (usually only a problem when water blasting has been used to remove loose paint)

B. If painting was begun too soon after heavy rains

NOTE: USE A MOISTURE METER TO DETERMINE THE AMOUNT OF MOISTURE IN THE WOOD. MAXIMUM MOISTURE CONTENT IS 14%.

C. When excessive moisture inside the wall migrates to the outside. The moisture may come from poorly vented bathrooms, kitchens, and laundries, or leaky gutters and flashing, or broken plumbing.

D. When applied to a dirty or greasy surface. The paint will not adhere and will cause intercoat peeling. The new paint film will simply peel off leaving the bottom paint layers intact. This is especially a problem:

1. Under roof eaves and other protected areas not readily washed by rain
2. When a slick surface is painted without first sanding it
3. When an incompatible top coat is used

E. When the top coat is applied more than two weeks after the surface was painted with an oil-based primer. A soap-like material forms on the surface of the primer which needs to be scrubbed off with detergent and water before the top coat is applied. If the surface is not scrubbed clean, the top coat will peel.

F. If the existing thickness of paint layers has reached or exceeded 16 mils and additional layers of paint have been added. Paint film thickness at 16 mils or more is said to have reached its saturation point. Additional layers of paint cause peeling for a number of reasons:

1. The thick paint layers are less permeable to water vapor. Since the moisture cannot evaporate, pressure builds up behind the paint and peeling or blisters result.
2. The individual layers of paint can no longer expand and contract at the same rate and the older, more brittle layers fail, resulting in peeling and cracking.

G. When exterior wooden elements have exposed end grain. Water absorbed in these areas causes the wood to swell, which loosens the bond between the wood and the paint.

1. Susceptible areas include the ends of clapboard where they meet door and window trim or corner boards, butt and miter joints of clapboard and other trim pieces, and porch floor boards.

H. When water becomes trapped inside exterior hollow wooden elements such as columns or built-up fence newels, and adequate ventilation is not provided. Water vapor trapped inside can condense and settle at the base of the element, creating ideal conditions for rot.

I. When the surface has not been adequately washed. This is especially a problem if latex paint is applied over calcimine paint which is water soluble.

J. When protected areas are not readily washed by rain, causing dirt to accumulate on the surface. The dirt may have a tendency to attract and hold moisture against the building.

1. The prolonged presence of moisture, combined with the lack of sunlight, can cause the top layer of paint to expand and contract more frequently than the lower layers, often resulting in a breaking of the bond between the paint layers and the wood substrate.
2. Protected areas to watch include eaves, soffits, tops of walls, or areas protected by trees and other vegetation.

K. If the species of wood used in construction is not suited dimensionally to provide the least amount of stress on the paint film, given the expansion and contraction rates associated with normal changes in relative humidity. For example, edge-grain, or quarter-sawn, softwoods are more dimensionally stable than flat sawn boards, warping and shrinking less. This places less stress on the paint film, thereby reducing the likelihood of cracking and peeling.

2.2 BLISTERS

Blisters may occur for several reasons:

A. If the paint was applied in direct sunlight. The paint film forms a skin before the thinners of the paint have had a chance to evaporate and a blister forms. Usually a sound layer of paint is visible when the blister is split open.

B. When paint has reached its saturation point as described above, or when paint has been applied to a wet surface. Usually bare wood is visible when the blister is split open.

C. If a primer containing zinc oxide, or a finish coat containing zinc oxide without a proper prime coat is used. Zinc oxide is hydrophilic, meaning it has a strong affinity for water and will readily absorb moisture.

2.3 CRAZING AND CRACKING

A. Crazing and cracking usually occur when old, thick layers of paint can no longer expand and contract at the same rate as the wood substrate. Initially, only the top layers are affected. However, as water gets into these fine, hairline cracks, they eventually deepen and widen to form major cracks.

2.4 ALLIGATORING

A. Alligatoring is an advanced stage of cracking where the deteriorated paint film takes on the appearance of alligator skin. It may occur when a top coat is applied over a glossy paint surface that has not first been roughened to provide a proper “tooth” for the new paint film.

2.5 WRINKLING

A. Wrinkling is when the top layer of paint moves, or dries, while the paint underneath is also still drying, and also still moving, but at a different rate. This may occur:

1. When the top coat is applied to thickly or not fully brushed out, allowing the top of the paint film to dry before the bottom of the film dries.
2. When the second coat is applied before the first coat has had a chance to dry.
3. If the paint is applied in hotter weather than the manufacturer recommends. High temperatures cause the top of the paint film to dry too quickly, before the bottom of the film has had a chance to dry.

2.6 MILDEW

A. Mildew is likely to occur:

1. On damp paint films.
2. On crazed, cracked or peeling paint surfaces. Paint layers that are crazed and cracked are especially prone to mildew growth because moisture concentrates in the cracks.

   Note: Painting over mildew without first killing it will not solve the problem. Mildew will just grow through the new paint. A sunny south or west façade is no guarantee that mildew will not grow.

PART 3 - DECIDING WHEN AND HOW MUCH PAINT TO REMOVE

3.1 GENERAL

It is important when making the decision to remove paint to determine why the paint is to be removed, because to do so is a time consuming and expensive job. If the decision is made to remove all of the paint, samples of the existing paint layers should be taken to document and identify the paint colors used throughout the history of the building. A section of the existing paint film, located in an inconspicuous area, should be left alone and covered to allow for future study.

A. Paint should be removed when it has built up to the point of obscuring decorative details.

B. Selective paint removal is also often done to expose a previous decorative finish such as graining or stenciling, or to restore a varnished or shellacked finish.

C. The appropriate finish should be consistent with the original finish treatment. To expose the “natural beauty” of the wood, if the wood has always been painted is to impose modern tastes in interior decoration and should be avoided.

3.2 PEELING/FLAKING

A. For wholesale peeling and/or paint which has reached its saturation point, remove all of the paint before repainting.

B. For localized paint failures:

1. Remove only the affected layers of paint.
2. Sand the edges of the sound paint to provide a smooth transition between the old and the new.
3. Spot prime the area and repaint as required and as described in procedure 06 30 03.

3.3 BLISTERS

A. For solvent blisters, or those where sound layers of paint are still visible under the blister:

1. Remove only the failed layers of paint. It is usually not necessary to remove paint to the bare wood.
2. Prime and repaint as required and as described in procedure 06 30 03.

B. For localized water blisters:

1. Treat as for solvent blisters above if the surrounding paint is sound.

C. For localized water blisters in conjunction with massive peeling of thick layers of paint:

1. Remove all of the paint.
2. Prime and repaint as required and as described in procedure 06 30 03.

3.4 CRACKING AND CRAZING

A. For surface crazing:

1. Sand the paint film only as necessary to remove the crazed layers of paint.
2. Repainting may or may not be necessary.

B. For cracking that reveals bare wood or a dark varnish or shellacked surface:

1. Completely remove all paint.
2. Prime and repaint as required and as described in procedure 06 30 03.

3.5 WRINKLING

A. For wrinkles in paint surfaces:

1. Sand the surface to the next unwrinkled layer.
2. Repaint as required and as described in procedure 06 30 03.

3.6 ALLIGATORED

A. For paint that has alligatored to form deep cracks:

1. Completely remove all of the paint.
2. Prime and repaint as required and as described in procedure 06 30 03.

3.7 MILDEW

A. For mildew growth:

1. Wash with a solution of bleach to kill the mildew. If the surface is also dirty, adding TSP to the bleach solution will aid in the cleaning process. However, bleach and TSP will not be appropriate for all situations, particularly when the wood and wood finishes are particularly significant and/decorative.

B. For mildew associated with cracks in the paint film or other type of paint deterioration:

1. Treat the paint film as directed above for complete paint removal and repaint as required and as described in procedure 06 30 03.

PART 4 - PAINT REMOVAL TECHNIQUES

4.1 Paint removal is achieved through a variety of means:

A. Abrasive methods, such as by hand or with an orbital sander.

B. Chemical methods; see procedure 06 40 01, “Chemically Removing Paint from Wood Features” for guidance.

Applications of the above methods should be reviewed in accordance with the Secretary of the Interior’s Standards for Rehabilitation.

END OF SECTION 06 40 02

SECTION 06 40 10 - REFINISHING INTERIOR WOOD

BEFORE UNDERTAKING ANY PROJECT INVOLVING PAINT REMOVAL, APPLICABLE STATE AND FEDERAL LAWS ON LEAD PAINT ABATEMENT AND DISPOSAL MUST BE CONSIDERED AND CAREFULLY FOLLOWED. STATE AND FEDERAL REQUIREMENTS MAY AFFECT OPTIONS AVAILABLE TO OWNERS ON BOTH PAINT REMOVAL AND REPAINTING. THESE LAWS, AND ANY REQUIREMENTS PROHIBITING VOLATILE ORGANIC COMPOUNDS (VOCs), SHOULD BE REQUESTED FROM THE AUTHORITIES HAVING JURISDICTION.

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on removing an existing wood finish and refinishing with a stain, varnish or wax.

B. Safety Precautions:

1. Dispose of all used solutions, paint stripper residue and soiled rags in sealed non-combustible containers daily to prevent fire hazard.
2. The Contractor shall maintain a healthy level of air circulation within the space being treated. Exhaust fans or other air moving devices shall be regularly employed and maintained to the satisfaction of the Architect or designated representative.
3. Areas being treated shall be curtained off from other trades or occupants to prevent fumes from reaching other parts of the building.
4. All workers in the area being treated shall wear appropriate safety devices, including but not limited to, respirators fitted with the correct cartridge, gloves, and other clothing.

C. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 SUBMITTALS

A. Samples:

1. The Contractor shall refinish two (2) sample areas for approval by the Architect or designated representative. Locations of sample areas shall be as selected by the Architect or designated representative.
2. The Contractor shall obtain written approval from the Architect or designated representative of wood refinishing methods, materials, and sample panels before proceeding with the work of this section. Approved sample panels shall be marked and protected for the duration of the project. They shall be used as the standard for similar work throughout the project.
3. In the case of rejection of the sample areas, these locations shall be re-stripped and refinished until approved by Architect.

1.3 QUALITY ASSURANCE

A. General Objective: The objectives of wood refinishing and cleaning are to give wood surfaces a smooth, uniform appearance consistent with the original design intent, and to preserve the inherent patina. Splotches, streaks, runs, or any other kind of spotty appearance shall not be accepted. Too aggressive cleaning or sanding shall not be accepted.

B. Work Standards: Basic reference and standard for wood refinishing shall be “Wood Finishing and Refinishing Revised Edition,” by S.W. Gibbia (New York: Van Nostrand Reinhold Co., 1971).

C. Contractor: A firm with not less than five (5) years in wood refinishing and restoration. The Contractor shall be required to submit reference for six (6) other projects of similar nature. The Architect or designated representative reserves the right to approve or disapprove the use of the Contractor contingent upon their experience.

D. Refinish Standard: Sample areas shall be prepared which shall form a standard for wood refinishing.

E. Refinishing is defined as all the process(es) necessary to restore woodwork. Stripping is defined as the process of removing existing coatings from woodwork without damage to the wood. Finishing is defined as the process of applying stain and protective coating and al related preparatory and follow-up tasks. Cleaning is defined as the removal of dirt embedded in the upper finish layers and does not include the removal of any finish layer.

F. Single Source Responsibility: Provide compatible finish coating, thinner, sanding sealer, and wood filler that are produced by the same manufacturer.

G. Regulatory Requirements: Comply with municipal, state and Federal regulations governing the refinishing operations, chemical waste disposal, and scaffolding.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Bonakemi USA, Inc.
14805 East Moncrief Place
Aurora, CO 80011
(800) 872-5515 or (303) 371-1411

B. Butcher Polish Company
120 Barlett Street
Marlborough, MA
(617) 481-5700

C. 3M Consumer Products Group
Box 33053
St. Paul, MN 55133-3053
(612) 737-6501 or (800) 364-3577

D. The Sherwin Williams Co.
101 Prospect Ave. NW
Cleveland, OH 44101
(216) 566-2000

E. Specialty Environmental Technologies, Inc.
4520 Glenmeade Lane
Auburn Hills, MI 48326
(810) 340-0400

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 may be less expensive. Common names are shown below by an asterisk (*).

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Commercial Paint and Varnish Remover such as “Citristrip” (Specialty Environmental Technologies, Inc.), “Safest Stripper” (3M), or approved equal.

B. Mineral Spirits:

1. A petroleum distillate that is used especially as paint or varnish thinner.
2. Other chemical or common names include Benzine* (not Benzene); Naphtha*; Petroleum spirits*; solvent naphtha*.
3. Potential Hazards: TOXIC AND FLAMMABLE
4. Safety Precautions:

    a. AVOID REPEATED OR PROLONGED SKIN CONTACT.
    b. ALWAYS wear rubber gloves when handling mineral spirits.
    c. If any chemical is splashed onto the skin, wash immediately with soap and water.
    d. Available from construction specialties distributor, hardware store, paint store, or printer’s supply distributor.

OR

Turpentine:

5. Typically used as a solvent and thinner.
6. Potential Hazards: TOXIC AND FLAMMABLE.
7. Safety Precautions:

    a. Work in a well-ventilated area.
    b. Observe safety rules as turpentine is flammable, and the fumes can trip an ionization smoke detection system.
    c. Store soiled cloths in a metal safety container to guard against spontaneous combustion.
8. Available from hardware store or paint store.

OR

Solvent Wax Remover such as “Woodline Renovator” (Bonakemi USA, Inc.), or approved equal.

C. Wood filler in color to match original stain.

CAUTION: WOOD FILLERS CONTAINING A LINSEED OIL VEHICLE MAY CAUSE WHITE SPOTS TO DEVELOP IN THE LACQUER FINISH COAT.

D. Oil stain or universal stain (Sherwin Williams), or approved equal.

E. Alkyd or urethane-based satin varnish (Sherwin Williams), or approved equal.

F. Paste wax (non-yellowing) such as “Butcher’s Paste Wax” (Butcher Polish Company), or approved equal.

2.3 EQUIPMENT

A. 000 steel wool

B. Steel or brass wire brushes

C. Stiff fiber bristle brushes

D. Putty knife or broad knife

E. Clean, dry cloths (cheese cloth or gauze)

F. Orbital sander

G. Electric floor polisher

H. Nylon web scrubbing pads

I. Lamb’s wool buffing pads

PART 3 - EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Remove Existing Coating:

1. Work in areas approximately 4’ by 4’ at one time.
2. Apply chemical stripper using a brush or roller. Follow manufacturer’s instructions.
3. Allow stripper to stand for length of time as recommended by manufacturer, depending upon the number of surface layers to be stripped; if necessary, cover with plastic sheeting to keep the stripper moist.
4. Using a broad knife or scraper, remove paint and stripper from the surface.
5. Safely dispose of paint and stripper residue. Follow EPA regulations for disposal of lead-based paint.
6. Specifically for varnish buildup:

    a. Wet steel wool with solvent and rub over the wood surface to remove varnish buildup and to smooth out any checks on the surface.
    b. Replace steel wool frequently with clean, and continue the wiping process until a smooth surface is achieved.

NOTE: DO NOT USE WATER ON THE WOOD SURFACE.

7. Wipe wood with a clean cloth soaked in mineral spirits to remove chemical residue.
8. Allow to dry and dry-brush loose material from the surface using a short fiber bristle brush.
9. Repeat as necessary to sufficiently remove the previous coating.

NOTE: For more detailed information on paint removal from wood, see 06 40 01 and 06 40 02.

10. Special Procedures for Varnished Wood Floors:

    a. Sand the floor with an orbital sander to remove stains, old finish and indentations in the wood. Sand in direction of wood grain.

       NOTE: DO NOT REMOVE MORE THAN 1/16" OF THE WOOD SURFACE.

    b. Remove dust from floor with vacuum and tack cloth.

11. Special Procedures for Waxed Wood Floors

    NOTE: Some sophisticated modern waxes, formulated for long wear and for high production commercial use, require special strippers that most often are not appropriate for historic materials because the ingredients cannot be readily detected. Some silicon waxes can only be removed by abrasion.

    NOTE: WORK IN A WELL-VENTILATED ROOM. OBSERVE SAFETY RULES AS BOTH THE TURPENTINE AND THE WAX ARE FLAMMABLE AND THE FUMES CAN TRIP AN IONIZATION SMOKE DETECTION SYSTEM. STORE SOILED CLOTHS IN A METAL SAFETY CONTAINER TO GUARD AGAINST SPONTANEOUS COMBUSTION.

    a. Dampen a small area of floor with turpentine or mineral spirits, or applyh wax remover evenly over the floor following manufacturer's instructions.
    b. Using a 16" electric floor machine, scrub lightly with a piece of 000 steel wool or nylon web scrubbing pad. Change steel wool or pads as they become clogged with old wax.
    c. Wipe up solvent and wax with clean cloths.
    d. Continue cleaning in this manner until all of the old wax has been removed. Allow floor to dry, approximately 15-20 minutes after the last area has been cleaned.
    e. Apply wax and buff. Apply two or more thin coats rather than one thick coat. Buff after each coat.

B. Fill scratches, gouges and dents with wood filler.

C. Apply a high quality paste wood filler with a brush to all open grain wood species (i.e. oak) before staining.

1. Dampen a cloth with mineral spirits and wipe the paste off across the grain of the wood to enable the filer to remain in the grain depressions.
2. Allow the filler to fully dry before applying the stain or varnish.

D. Stain and Varnish the Wood:

1. On a SAMPLE area 12 inches square, brush-apply oil stain or universal stain.
2. Allow the stain to penetrate the wood for at least 5-10 minutes.
3. Remove excess stain with a clean, lint-free cloth. Rub the wood parallel to the grain.
4. Allow the stain to dry at least 12 hours before applying varnish.
5. Brush-apply one coat of alkyd or urethane-base satin varnish. Varnish should be thin, but not watery.
6. Allow to dry for at least 24 hours.
7. When dry, buff the surface with 000 steel wool and dry-brush with a fiber bristle brush to remove any metal particles left behind from the steel wool. A tack rag may also be used to remove dust from the surface.
8. Apply second coat of satin varnish (full strength).
9. Allow to fully dry.
10. Buff the surface with 000 steel wool and dry-brush with a fiber bristle brush to remove any metal particles left behind from the steel wool.
11. If sample is approved by Architect, follow the same procedures for all remaining wood.
12. For areas subject to wear (i.e. handrails, wainscot, etc.):

    a. After buffing the final coat of varnish, apply one coat of non-yellowing paste wax.

END OF SECTION 06 40 10

SECTION 06 40 11 – REPAIRING WATER-DAMAGED WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on repairing woodwork stained from minor water damage.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood stain

B. Wood bleach: Solution of sodium perborate, hydrogen peroxide or proprietary mixture suitable for oak.

C. Wood filler, colored to match wood.

D. Sandpaper, extra fine grit

E. Mild cleaner such as “Murphy’s Oil Soap”

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation:

1. Mask all adjacent surfaces and protect other exposed surfaces in the work area.
2. Fill any splits in existing wood and sand smooth prior to sealer application.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Select an inconspicuous area on which to test materials and application for each method type required. Test area must be approved by the Architect.

B. After each test area has been prepared, receive approval from the Architect before commencing general application.

C. Check area with a moisture meter to verify that wood does not have moisture on surface.

D. Sand stained areas to bare wood.

E. If bare wood is stained, apply wood bleach to remove stain. Minimize flow of bleach onto areas not stained. Allow to dry and sand wood lightly to remove chemical residue. Wood bleach will not be an appropriate treatment for all species, finishes, and features. All treatments will be subject to review by the Architect prior to execution.

F. Fill wood if required and apply stain of color to match existing.

3.3 ADJUSTING/CLEANING

A. Wash woodwork with mild detergent and water.

B. Dry immediately with clean cloth.

C. Finish to match historic finish.

END OF SECTION 06 40 11

SECTION 06 40 15 – REPLACING DETERIORATED WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on wood restoration work including repairing existing woodwork by removing damaged or deteriorated material and replacing with new to match existing.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 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 indicated.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Submit written program for each phase of 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.

1.4 QUALITY ASSURANCE

A. 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.

1.5 PROJECT/SITE CONDITIONS

A. Existing Conditions:

1. Installer shall advise Contractor of temperature and humidity requirements for woodwork installation areas. Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
2. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within a 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.
3. Determine that surface 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 Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. New or Replacement Materials:

1. Wood Moisture Content: Provide kiln-dried lumber with an average moisture content range of 6% to 11% for interior work. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed the above range.
2. Replacement Wood: Match species, grade, grain pattern, and other special characteristics of existing woodwork.

B. Clean, soft cloths

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation:

1. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.
2. Back prime woodwork on all surfaces which will be concealed with one coat of wood primer. Schedule delivery to allow time for application and drying of back prime coat before installation of woodwork.
3. Remove miscellaneous hardware, nails, etc. from all existing woodwork as required to provide a first class installation of new or replacement woodwork.
4. 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.

3.2 ERECTION, INSTALLATION, APPLICATION

A. 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.

B. For partial replacement of existing pieces, use a neat, well-fitted level cut with grain aligned in transparent finished wood.

C. Install new pieces as described below:

1. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims.
2. 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.
3. 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.
4. 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 fastener 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.

D. Finish replacement woodwork to match adjacent woodwork surfaces.

3.3 ADJUSTING/CLEANING

A. Upon completion of this work, all floors, walls, and other adjacent surfaces that are stained, marred, or otherwise damaged by work under this section shall be cleaned

and repaired and all work and the adjacent areas shall be left in a clean and perfect 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.

C. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

D. Clean woodwork: Dust and damp wipe woodwork with a soft cloth dampened in clean water; dry rub with soft cloth to maintain the polish, rubbing along the grain of the wood.

E. Stain and Spot Removal:

1. Stains may be cleaned by prompt damp wiping with cloth dampened in clear water or rubbing with cloth dampened in solvent. Dry the wood with a soft cloth.
2. White spots may be removed by rubbing them with a small amount of linseed oil.

END OF SECTION 06 40 15

SECTION 08 01 52.93 – REHABILITATING WOOD WINDOWS

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 and should be followed along with recommendations from the Architect.

B. The steps in the repair of deteriorated sash include but are not limited to the following:

1. Examination, survey and condition assessment of windows.
2. Removal of existing sash, 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 and trim.
5. Installation of repaired sash.

C. See Division 1 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Project Management and Coordination
2. Submittal Procedures
3. Special Procedures for Historic Treatment
4. Quality Requirements
5. Execution

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

D. For general information on the repair of wood windows see *Preservation Brief 9: The Repair of Historic Wooden Windows*.

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 Architect 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 shall be completed before doing any interior restoration/rehabilitation work to insure weather-tight integrity of interior spaces.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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 survey to determine existing conditions and identify the specific work needs of each window.

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 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 08 01 052.96, "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 06 30 00, "Epoxy Repair for Wood"

D. Remove paint from both interior (where applicable) and exterior surfaces.

1. See 06 50 00 "Chemically Removing Paint From Wood Features"

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 08 52 13, "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.

G. Provide weatherstripping as required.

H. Refinish both interior and exterior sides of sash, frame, and trim with appropriate paint, stain or natural finish as specified.

1. See 06 30 13, "Preparing a Non-toxic Water-repellent Preservative"
2. See 06 30 16, "Applying a Water-repellent Preservative to Wood"

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, gently and non-abrasively cleaned to bare existing metal finish and repaired to its original condition.
3. Where hardware is missing or damaged, provide new hardware of same design, material and finish as original missing 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 units will not be damaged throughout the remainder of any restoration or rehabilitation work.

END OF SECTION 08 01 52.93

SECTION 08 01 52.96 – 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 063000). If sill is beyond repair as determined by the Architect, it must be replaced (see procedure outlined below).

C. See Division 1 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Project Management and Coordination
2. Submittal Procedures
3. Special Procedures for Historic Treatment
4. Quality Requirements
5. Execution

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

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, and moisture content 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.

B. 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.

C. Remove exposed portions of nails that secured the dadoes.

D. 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.

E. Cut sill to match original and sand sill before installation. Bevel ends slightly to ease installation.

F. Nail sill into casing from underneath. Countersink nail and fill hole with putty and seal. Seal edge of sill with caulk at jamb connection.

G. Prime and paint.

END OF SECTION 08 01 52.96

SECTION 08 01 52.99 – RESTORING WOOD WINDOW SASH AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on restoring wood window sash and frames and preserving the wood. This includes removing the existing paint by hand, removing deteriorated glazing compound, treating weathered wood surfaces with wood preservative, reglazing as needed, priming and repainting.

B. The choice to fully restore wood windows will likely reduce future maintenance costs and extend the life of the original windows.

C. See Division 1 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Project Management and Coordination
2. Submittal Procedures
3. Special Procedures for Historic Treatment
4. Quality Requirements
5. Execution

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
201/933-8800

B. DAP
855 N. Third St.
P.O. Box 277
Dayton, OH 45401-0277

2.2 MATERIALS

A. 80 to 120 grit sandpaper

B. Rust-inhibiting Alkyd-based Primer

C. Penatrol

D. Wood Preservative: A mixed solution consisting of 60% boiled linseed oil and 40% mineral spirits. NOTE: THE DRYER THE WOOD, THE GREATER PERCENTAGE OF LINSEED OIL SHOULD BE USED.

E. Caulking Compound such as "SikaFlex" (Sika Corporation), or other durable, flexible caulk that bonds well with the combination of latex and alkyd paints.

F. Linseed Oil

G. Glazing Compound such as "DAP 33" (DAP), or approved equal.

H. Latex or alkyd paint - compatible with primer

2.3 EQUIPMENT

A. Hand-held orbital sander

B. Stiff bristle brushes

C. Paint brushes

D. Putty knife

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Determine the type of wood used and understand its properties. Pine for instance is much softer than oak. Therefore, special care should be taken on the pine elements so as not to damage or obscure any detail.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Remove paint from sash, frame and sill by hand.

1. Carefully sand the surface by hand using 80 to 120 grit sandpaper. Hand-held orbital sanders may be used on large, flat surfaces. Follow the grain of the wood. NOTE: THIS EQUIPMENT SHOULD BE USED BY EXPERIENCED OPERATORS ONLY.

CAUTION: PAINT MAY CONTAIN LEAD. FOLLOW ALL REGULATIONS AND SAFETY GUIDELINES INCLUDING THOSE REQUIRED FOR THE REMOVAL AND DISPOSAL OF LEAD-BASED PAINT.

2. Reset all exposed nail heads and treat with rust- inhibiting primer. Penatrol may be added to the primer to aid in preventing oxidation of old nail heads.

B. Remove deteriorated glazing compound and glazing.

C. Brush-apply wood preservative to all wood surfaces.

D. Caulk seam cracks and crevices in the surface with the caulking compound.

E. Sand smooth transitions between muntin/mullion and remaining original glazing.

F. Soak any bare weathered wood with linseed oil.

G. Replace glazing and apply the glazing compound smooth and evenly to the surface.

H. Apply a final coat of paint to match the existing paint.

END OF SECTION 08 01 52.99

SECTION 08 50 02 – CLEANING AND PAINTING STEEL WINDOWS

BEFORE UNDERTAKING ANY PROJECT INVOLVING PAINT REMOVAL, APPLICABLE STATE AND FEDERAL LAWS ON LEAD PAINT ABATMENT 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 AUTHORITIES HAVING JURISDICTION.

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on the cleaning and painting of exterior steel windows. It also includes information on removing all deteriorated caulking and re-caulking all joints between metal elements and masonry.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Devcon Corporation
30 Endicott Street
Danvers, MA 01923
(800) 933-8266

2.2 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Metal Filler: Steel filled two-part epoxy metal filler, putty grade, such as “Devcon Plastic Steel A” (Devcon Corporation), or approved equal.

B. Dry Grit Blasting: Fine grit No. 16 at 80-100 psi.

C. Paint for Metal: Paint products shall be fresh and well ground; shall not settle readily, cake or thicken in the container; shall be broken up readily with a paddle to a smooth consistency and shall have easy application properties. Other painting materials such as linseed oil, turpentine, mineral spirits, and miscellaneous thickeners, shall be the highest quality of an approved manufacturer.

1. Colors: Each primer coat to be clearly different in color; base coat to be clearly different from primer and finish coat; finish coat to match existing or as approved by Architect.
2. Dry Film Thickness: Primer, base and finish, each 2 mils.

D. Sealant Backer Rod: Polyethylene compressible rod 50% larger in diameter than joint.

E. Sealant: Polysulfide sealant, white or light grey in color.

F. Mineral Spirits:

1. A petroleum distillate that is used especially as a paint or varnish thinner.
2. Other chemical or common names include Benzine (not Benzene); Naphtha; Petroleum spirits; Solvent naphtha.
3. Potential Hazards: TOXIC AND FLAMMABLE.
4. Safety Precautions:

    a. AVOID REPEATED OR PROLONGED SKIN CONTACT.
    b. ALWAYS wear rubber gloves when handling mineral spirits.
    c. If any chemical is splashed onto the skin, wash immediately with soap and water.

5. Available from construction specialties distributor, hardware store, paint store, or printer’s supply distributor.

2.3 EQUIPMENT

A. Chisels

B. Joint tools

C. Putty knife

D. Stiff bristle brushes

E. Paint brushes

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection:

1. Enclose any dry grit blasting work areas with temporary scaffolding or framework sufficient to support tarpaulin enclosure to prevent escape of abrasive.
2. Shield adjacent masonry and glass with a temporary covering of cardboard or fiberboard held in place with heavy-duty strapping tape or wood bracing.

B. Surface Preparation:

1. Determine surfaces to which paint is to be applied are even, smooth, sound, clean, dry and free from defects affecting proper application. Report defective surfaces to Architect.
2. All painting should be executed at a temperature range of 50 to 80 degrees F, at a relative humidity below 60%.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Remove all paint to bare metal from the surface of the frames and sash. Restore sash to full operation.

B. Paint removal may be done by dry grit blasting, scraping or sanding. See also 05010-05-R for additional guidance on paint removal from steel.

C. Remove, by hand, all caulking between metal and masonry.

D. Clean off dirt and grease by rubbing the surface with mineral spirits. Remove residual grit from all surfaces by air blasting.

E. Seal all open joints between metal elements and masonry with backer rods and sealant. Joints shall be concave with smooth finish. Do not allow sealant to extend over the edges of the metal or the face of the stone. See also 07900-01-R for guidance on replacing joint sealants between window frames and masonry.

F. Prime all metal within two hours of cleaning. Use color distinct from finish color.

G. Paint to match color specified by the Architect.

1. Brush-apply material evenly without runs, sags, or other defects. Work each coat onto the material being coated at an average rate of coverage recommended in manufacturer's printed instructions.
2. Cover surfaces completely to provide uniform color and appearance with a minimum of dry, film thickness of 2 mils.
3. Make edges of paint, adjoining other materials or colors, sharp and clean and without overlaps.
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. Ensure that corners, edges, crevices and exposed fasteners receive a dry film thickness equal to that of flat surfaces.
5. Each coat of paint is to be slightly darker than the preceding coat with the final coat exactly matching the accepted samples.

3.3 ADJUSTING/CLEANING

A. Cleanup: Remove all paint where it has spilled or spattered. Use paint thinner or solvent as necessary to effect complete removal.

END OF SECTION 08 50 02

SECTION 08 80 01 – 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. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

1.2 SYSTEM DESCRIPTION

A. A window glass is in proper condition when it is set 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

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Linseed oil putty (for wood windows)

B. Glazing compound or elastomeric sealant (for metal windows);

1. Two-party polysulfide glazing sealant such as “Chem-Calk 200” (Bostik Construction Products Division), “Synthacalk GC-5” (Pecora Corp.), or approved equal.
2. One-part non-acid-curing silicone glazing sealant such as “Chem-Calk 1000” (Bostik Construction Products Division), “Dow Corning 790” (Dow Corning Corp.), “864” (Pecora Corp.), “Omniseal” (Southern Building Products Div., Rexnord Chemical Products, Inc.), “Spectrum 1” (Tremco, Inc.), or approved equal.
3. These glazing sealants should comply with the following requirements:

    a. Must be compatible with other materials with which they will come into contact.
    b. Must be suitable for applications indicated and conditions at time of installation.
    c. Colors: Provide color of exposed sealants as selected from manufacturer’s standard colors.

d. Hardness: Consult the manufacturer to determine the actual hardness recommended for the conditions of installation and use.
e. Sealants and materials used with laminated glass to be 100% solids, containing no solvents.

C. 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);

f. A strong corrosive irritating acid.
g. Other chemical or common names include Chlorhydric acid; Hydrochloric acid; Hydrogen chloride; Marine acid; Spirit of salt; Spirit of sea salt.
h. Potential Hazards: TOXIC, CORROSIVE TO FLESH; CORROSIVE TO CONCRETE, STEEL, WOOD, OR GLASS; FLAMMABLE.
i. Available from chemical supply house, drugstore or pharmaceutical supply distributor, or hardware store.

OR

Linseed oil or thinned primer

D. Glass to match existing (see 2.1 Manufacturers)

E. Glazier's points (if old ones are not usable)

F. Neoprene setting blocks and shims

G. Clean, potable water

H. Ammonia

I. 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 metal components, especially at the joints.

C. Examine the condition of the metal 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 conditions 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.

F. Submit samples of proposed replacement glass for review and approval of the Architect.

3.2 PREPARATION

A. Surface Preparation:

1. Prior to reglazing, remove all oil, dirt, rust and other materials from the glass and the metal framing members using solvents such as toluol or xylol or using other rust removal techniques.
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 HARMCUL 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. Special Procedures for Metal Windows:

1. While the glass is out, clean/repair/replace, prime and paint the metal frame, the mullions, muntins, sash, and other window components prior to glass reinstallation.
2. Apply glazing compound to the grooves of the window sash.
3. Salvage, repair, and reinstall existing metal glazing clips, glazing beads, and other fasteners that hold the glass to the sash. Where existing metal glazing clips are missing, supply and install new wire (metal) glazing clips to match existing.

E. 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 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, use a stained glass craftsperson.

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 08 80 01

SECTION 09 20 08 – CLEANING AND STRIPPING PAINT FROM PLASTER SURFACES

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 THOSE HAVING JURISDICTION.

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on cleaning and chemically removing paint from existing plaster surfaces.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Diedrich Technologies, Inc.
7373 South 6th Street
Oak Creek (Milwaukee), WI 53154
(800) 323-3565 or (414) 764-0058

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 (*).

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Commercial paint remover, such as “Diedrich 400-Enviro-Safe Strip” (Diedrich Technologies, Inc.), or approved equal.

B. For Glaze Remover:

1. Denatured Alcohol:

a. Other chemical or common names include Methylated spirit*.
b. Potential Hazards: TOXIC AND FLAMMABLE.
c. Available from hardware store, paint store or printer’s supply distributor.
d. Denatured alcohol should be a satisfactory substitute for ethyl alcohol for stain removing purposes.

2. Mineral Spirits:

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.

3. Acetone (C3H6O):

a. A volatile fragrant flammable liquid ketone used chiefly as a solvent and in organic synthesis and found abnormally in urine.
b. Other chemical or common names include Dimethyl ketone; Propanone.
c. Potential Hazards: VOLATILE AND FLAMMABLE SOLVENT.
d. Available from chemical supply house or hardware store.

C. Clean, potable water.

2.3 EQUIPMENT

A. Clean, dry cloths

B. Sponge or heavy-nap cloth

C. Soft, fiber bristle brushes

D. Putty knife

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection:

1. Protect surrounding surfaces from damage resulting from chemical cleaning and paint stripping work.
2. Dispose of by-products from cleaning and paint stripping operations by legal means and in manner which prevents damage to other surfaces.
3. Develop a work plan indicating recommended treatments for surfaces/areas.
4. Surface Preparation: Prior to cleaning and stripping work, remove cellophane tape, masking tape, etc. from surface.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Cleaning Existing Plaster Surfaces:

1. Prepare cleaning solution according to manufacturer's instructions.
2. Scrub surface with a cloth, sponge or soft-fibered brush and cleaning solution.

    a. Proceed with cleaning and stripping in an orderly manner; work from bottom to top of each surface and from one end of each surface to the other.
    b. Perform each cleaning and stripping method indicated in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices and which produces an even effect without streaking or damage to surfaces.

3. Sponge rinse surfaces thoroughly using clean water to completely remove chemical residue and soil. Change rinse water frequently.

a. Rinse off chemical residue and soil by working upwards from bottom to top of each surface and from one end of each surface to the other.

NOTE: THERE IS SOME DIFFERENCE OF OPINION AS TO WHETHER IT IS BEST TO WASH A WALL WORKING FROM THE TOP DOWN OR FROM THE BOTTOM UP. BOTTOM UP IS SAFER BECAUSE SOLUTION STREAKS RUNNING DOWN A DIRTY WALL CANNOT BE REMOVED. THE IMPORTANT THING IS TO WORK DRY ENOUGH TO AVOID DRIPS.

4. Repeat process as required
5. Wipe the surface with a dry clean cloth to prevent streaking.

B. Stripping Paint from Plaster Surfaces:

1. Carefully apply commercial stripper to painted surface with a brush. Follow manufacturer's instructions and precautions.

OR

Prepare a glaze remover: Mix 5 parts denatured alcohol, 3 parts mineral spirits and 1 part acetone and apply to the surface.

2. Allow commercial stripper or glaze remover to remain on surface for length of time recommended by manufacturer and required to emulsify paint build-up.
3. Carefully remove emulsified paint with a putty knife.
4. Repeat process as many times as required to remove paint build-up.
5. Neutralize chemical stripper by wiping surface with a cloth wet with clean water. Change water frequently.

3.3 ADJUSTING/CLEANING

A. Upon completion of this work, all floors, walls and other adjacent surfaces that are stained, marred, or otherwise damaged by work under this section shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and perfect 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.

END OF SECTION 09 20 08

SECTION 09 20 12 – PATCHING LARGE HOLES IN PLASTER WITH DRYWALL

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on patching holes in wall plaster larger than 4 inches in diameter. When large sections of plaster are missing, drywall patches can be used as a base.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Drywall and joint compound

B. Nails and screws

C. Joint tape (cloth mesh preferred)

2.2 EQUIPMENT

A. 6 inch taping knife

B. 12 inch taping knife

C. Float

D. Hawk

E. Sanding sponge (medium fine grit)

F. Stiff putty knife

G. Goggles, work gloves, and dust mask

H. Hammer and cold chisel

I. Needlenose pliers and wire cutter

J. Screwgun and drill

K. Spray bottle and drop cloths

L. Tin snips

M. Vacuum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Determine the extent of damaged plaster. Look for:

1. Holes
2. Water Stains: Brownish rings on the plaster, especially the ceilings, indicate that the plaster has been wet. If the water was stopped quickly, the surface may only need to be sealed with pigmented shellac to prevent the stain from bleeding through the new paint or wallpaper. However, if the leak continued for a long period, the plaster may need to be replaced, and will often have a powdery appearance.
3. Chipping, flaking and delamination of plaster due to water infiltration.

3.2 ERECTION/INSTALLATION/APPLICATION

A. Removing Deteriorated Plaster:

1. Wear a dust mask, goggles and gloves and pull loose plaster from the walls with your hands (a flat prybar may also be helpful in removing plaster that is difficult to remove by hand).
2. To remove sound plaster, for whatever reason, drill holes in the line of your cut with a carbide drill bit; holding the chisel at a shallow angle, carefully cut directly

from hole to hole with a cold chisel. Cut the resulting plaster free from the lath by chipping the keys from the side.

3. Cut the plaster back to the nearest studs to make a regular opening, and re-secure the lath with drywall nails.
4. Use plaster washers and wood screws to re-secure weakly-keyed areas of sound plaster to the wall or ceiling.
5. Knock any plaster stuck between the lath back into the wall cavity.
6. Vacuum all dust, loose plaster, and other debris from the hole with a shop-vac, or sweep it out with an old paint brush.

B. Making a Sheetrock Patch:

1. Shim the sheetrock as required to bring it flush with the surface of the adjacent plaster.
2. Cut a sheetrock patch to fit neatly in the opening.
3. Nail or screw the sheetrock in place. Nailheads or screwheads should be set slightly below the surface of the sheetrock, but without breaking the paper.
4. Using the 6 inch taping knife, fill the joint between the sheetrock and the plaster with a small amount of joint compound.
5. Apply a fairly smooth, heavy coat of compound over the joint a little wider than the tape width.
6. Center the joint tape over the length of the joint. Hold the 6 inch taping knife at a 45 degree angle and press the tape into the compound. Smooth out any air pockets under the tape.
7. Apply a thin layer of compound over the tape and apply a first coat of compound to nails or screws.
8. Knock off any ridges or pimples that develop from shrinkage and cracking in the compound.
9. Apply the second coat of compound with the 6 inch taping knife and feather the edges out 6-8 inches; scrape off any ridges or bumps.
10. When the second coat is dry, apply the third coat of compound with the 12 inch taping knife and feather the edges out 12-14 inches.
11. Touch up low spots with additional compound or high spots by light sanding with a wet sanding sponge.

END OF SECTION 09 20 12

SECTION 09 21 02 – PATCHING HAIRLINE CRACKS IN PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on patching hairline cracks in plaster with reinforcing tape and joint compound.

B. Cracks may be cyclical, opening and closing with seasonal variation in humidity which causes the lath to swell and shrink.

C. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

1.2 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Keep the room temperature above 55 degrees F. until the plaster/joint compound has set.
2. Provide plenty of ventilation as the plaster dries.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. U.S. Gypsum Association
810 First Street NE, #510
Washington, DC 20002

(202) 289-5440, FAX (202) 289-3707

B. Tuff-Kote Company, Inc.
210 Seminary Avenue
Woodstock, IL 60098
(815) 338-2006

2.2 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Joint compound such as “Durabond Wallboard Compound” (U.S. Gypsum Association), “Krack-kote” (Tuff-Kote Co.), or approved equal.

1. “Krack-kote”: Good for problem cracks that may break through the sheetrock tape and compound.

a. It uses a pliable adhesive and a glass fiber reinforcing tape; it has more flexibility and strength than ordinary joint compound.
b. Available from large paint supply stores.
c. It is more expensive and more timely to apply than ordinary joint compounds.

B. Reinforcing tape (cloth or paper): Cloth is better for flat surfaces because of its open weave, but it is difficult to find in the U.S.

C. Acrylic latex caulk

2.3 EQUIPMENT

A. Wide joint knife (approximately 5 to 6 inches wide)

B. Sponge or heavy-nap cloth

C. Caulking gun

D. Crack widener or triangular can opener

E. Stiff bristle brushes or vacuum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Types of plaster cracking include map cracking, alligatoring, settlement cracks, hairline cracks, stress-related cracks and cracks due to moisture.

B. If a wall has an enormous number of cracks to be taped, consider replastering or canvassing the surface.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Slightly widen the crack with a sharp, pointed tool like a crack widener or a triangular can opener.

B. Brush or vacuum surface to remove dust and debris.

C. Apply joint compound with a wide joint knife. Butter the compound into the crack, spreading it about 3 inches on either side of the crack.

D. Center mesh reinforcing tape over the crack, and force the tape down into the bed of the joint compound with the knife. Remove any excess compound by wiping with the joint knife.

E. When the tape is bedded, cover surface with a thin layer of compound and smooth as much as possible by working with the joint knife.

F. When the first coat has dried (at least 24 hours), smooth out any ridges by “wet sanding” with a damp sponge or a heavy-nap cloth folded flat or wrapped around a suitable block.

G. Apply a second coat of joint compound and feather the edge at least 1 inch beyond the first coat.

H. After the second coat has dried, wet-sand lightly and apply a thin finishing coat.

I. Lightly sand the surface again, and clean off the area with a damp sponge.

J. After the surface has dried, brush off any plaster residue or dust.

NOTE: for gaps between plaster surfaces and surrounding woodwork, apply acrylic latex caulk using a caulking gun.

END OF SECTION 09 21 02

SECTION 09 21 04 – RE-SECURING LOOSE WALL OR CEILING PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes guidance on re-securing loose plaster by injecting adhesive behind the loose plaster and securing it with plaster washers.

B. Plaster is in need of re-securing when sound plaster has lost its keys and is floating away from the lath or when the plaster and lath are no longer attached to stud or joist.

C. If wood lath strips are placed too close together, or the lath is nailed directly over planks, keys do not form properly and the plaster may eventually sag away from the lath. Other factors contributing to sagging plaster include wood shrinkage, weight of plaster or broken vertical ties.

D. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Charles Street Supply Co.
54 Charles St.
Boston, MA 02114
(617) 367-9046

B. U.S. Gypsum Association
810 First Street NE, #510

Washington, DC 20002
(202) 289-5440, FAX (202) 289-3707

C. Tuff-Kote Company, Inc.
210 Seminary Ave.
Woodstock, IL 60098
(815) 338-2006

2.2 MATERIALS

NOTE: When the common name of a chemical is used on the label, it is usually a sign that the substance is not as pure as the same chemical sold under its chemical name. However, the grade of purity of the common-name substance is almost certain to be adequate for stain removal work, and because it is likely to be less expensive, the common –name product should be purchased when available. Common names are indicated by an asterisk (*).

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Denatured Alcohol:

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.

B. Plaster washers (Charles Street Supply Co.), or approved equal.

C. Acrylic, latex or polymer emulsion adhesive (all water-based), such as "Big Stick" Construction Adhesive (DAP), "Liquid Nails", or approved equal.

D. Foam carpet pad.

E. Wood shingles

F. Joint compound such as "Durabond Wallboard Compound" (U.S. Gypsum Co.), "Krack-Kote" (Tuff-Kote Co.), or approved equal.

G. Flat head wood screws or drywall screws and plaster washers

H. Clean, potable water

2.3 EQUIPMENT

A. Electric drill

B. Bent wire tool

C. Vacuum

D. Ladder

E. ½ inch plywood

F. 1x2 or 2x4 wood braces

G. Caulking gun

H. Phillips head screwdriver

PART 3 - EXECUTION

3.1 EXAMINATION

A. Determine the extent of the damage and evaluate work requirements and causes before proceeding.

1. Thumping with a finger makes a solid, snappy sound on good plaster; it makes a hollow and dull sound on loose plaster.
2. Gently press the plaster surface with palm offhand or with a T-brace made from 2x4s. If plaster moves in relation to the studs and lath, then the keys are broken. With more pressure, a similar movement indicates that the plaster is well keyed to the lath, but the lath is loose from the studs.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Re-securing Plaster by Injected Adhesive Bonding:

1. Determine the areas of loose plaster and mark them out with chalk (see Section 3.1 EXAMINATION).
2. Ceilings (accessible backside):

a. From the backside of the surface to be repaired, drill ¼ inch injection holes through the lath, 3 to 6 inches apart and at the center of the lath (use a drill stop on the bit to keep from drilling into the plaster).

b. Using a bent wire tool and a vacuum, loosen and suck dust out through the injection holes.

3. Ceilings (inaccessible backsides) and Walls:

a. Drill through plaster and lath with holes 3 to 6 inches apart, and if possible, through the center of the lath.
b. In walls, break the plaster open at the bottom of loose areas and vacuum up debris left by broken keys.

4. Have ½ inch plywood as big as the patch area and enough ½ wood braces on hand.
5. Trim the tip of the caulking-gun cartridge so that it fits in the wood-lath holes.
6. If selected adhesive has an adhesive primer, squirt into pre-drilled holes according to manufacturer's instructions.
7. If adhesive has no primer, mix 4 parts water, 2 parts denatured alcohol and 1 part adhesive (water-based only),
8. Pre-wet both the plaster and lath.
9. Inject adhesive into the pre-drilled holes, giving the adhesive enough time to flow into the space between the plaster and the lath.
10. T-brace a ½ inch layer of foam carpet between the plywood and plaster; add additional braces as necessary or drive screws through washers and wood shingles to draw the plaster up against the lath.
11. When the adhesive has set, carefully remove the plywood (it may need to be twisted gently to break the bond).
12. Fill holes and/or tape and mud cracks and finish as required.

B. Re-securing Loose Plaster with Plaster Washers: Use plaster washers (also called repair discs or ceiling buttons) to pull sound plaster back up to the lath (when the keys have broken), or to pull plaster and lath back to the studs or joists.

1. If the lath was nailed directly to the joists or rafters, find the joists, then measure and mark their locations with chalk lines snapped across the ceiling.
2. From below, drive 1-1/2 to 2 inch gyp-board screws, fitted with plaster washers, through the plaster and lath up into the joists. Space every 4 inches on each joist where sagging is apparent, or as often as necessary, and 1-1/2 inches from the edge of the loose section (only screws that hit lath will hold).
3. Tighten the screws gradually all along the edge.
4. Patch the holes with spackling or joint compound and finish with a skim coat of joint (taping) compound.

3.3 ADJUSTING/CLEANING

A. Remove all rubbish and debris cause by plastering work.

B. Clean all affected surfaces of room and furnishings to their prior condition.

END OF SECTION 09 21 04

SECTION 09 21 05 – PATCHING SMALL CHIPS AND CRACKS IN PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on patching small chips, cracks or depressions in plaster surfaces.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

C. For guidance on repairing hairline cracks, see 09 21 02; for guidance on repairing large holes, see 09 20 12.

1.2 REFERENCES

A. American National Standards Institute (ANSI) Standard Specifications
ANSI
1430 Broadway
New York, NY 10018

B. American Society for Testing and Materials (ASTM) Standard Specifications
ASTM
1916 Race Street
Philadelphia, PA 19103-1187
(215) 299-5400

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. U.S. Gypsum Association
810 First Street NE, #510
Washington, DC 20002
(202) 289-5440, FAX (202) 289-3707

2.2 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Gypsum Plaster Materials:

1. General: Gypsum plastering materials shall conform to ANSI A42.1. Provide neat or ready-mixed materials at installer's option unless indicated otherwise.
2. Base coat plaster: Perlite gypsum plaster such as "Structo-Lite" (U.S. Gypsum Association), or approved equal.
3. Base coat aggregate: Sand
4. Finish coat plaster: Keene's cement
5. Finishing lime: Type is installer's option.

B. Bonding Materials: Bonding agent shall conform to ASTM C631.

2.3 EQUIPMENT

A. Joint knife

B. Sponge or heavy-nap cloth

C. Crack widener or triangular can opener

D. Stiff bristle brushes

E. Hawk

F. Slicker (flexible straight edge)

G. Plasterer's trowel

H. Margin trowel

I. Mortarboard and mudpan

J. Pointing trowel

PART 3 - EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Scrape loose or damaged finish plaster and peeling paint from surface with chisel or joint knife. Remove material where required to enlarge cracks, chips, holes, etc. to at least ½ inch across and undercut to improve bonding of new material.

B. Brush or vacuum surface to remove dust and debris.

C. Moisten the surface by lightly spraying a fine mist of clean water from a spray bottle.

D. Apply skim finish coat over low areas to bring entire finished surface out flush with the projecting firm and sound layers of adjacent plaster or paint. Form plaster as required to match original configuration and design or ornamental plaster.

E. Once dry, sand by hand to produce a surface without bumps, cracks or depressions, ready to receive finish treatment.

3.2 ADJUSTING/CLEANING

A. Upon completion of this work, all floors, walls and other adjacent surfaces that are stained, marred, or otherwise damaged by work in this procedure shall be cleaned and repaired and all work and the adjacent areas shall be left in a clean and perfect 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 09 21 05

SECTION 09 31 03 – REPLACING DAMAGED OR MISSING CERAMIC TILES

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance or replacing individual ceramic tiles that have been damaged or are missing.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

1.2 REFERENCES

A. American National Standards Institute, Inc. (ANSI)
1430 Broadway
New York, NY 10018

1.3 QUALITY ASSURANCE

1. All new tile should conform to minimum grade standard specifications for ceramic tile published by ANSI; use most recent version.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Bostik
(800) 726-7845

B. Custom Building Products
(800) 282-8786

C. Dow Corning Corporation
P.O. Box 994
Midland, MI 48686-0994
(800) 662-0661 ext. 40 or (517) 496-4000

2.2 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Non-abrasive cleaner such as “Soft Scrub” (Dow Chemical Company), or approved equal.

B. Replacement tile to match original in color, finish and size. Existing tile from other areas of the building may be used when properly cleaned and evaluated for soundness and compatibility, where appropriate and subject to approval in advance by the Architect.

C. Adhesive: Water resistant, such as “Hydroment 7000” (Bostik), “Acryl-4000 Multi-Purpose Ceramic Tile Mastic” (Custom Building Products), or approved equal.

1. Must be compatible with grout.
2. Complying with ANSI A108.1, for cement mortars and setting of ceramic glazed tile on masonry or concrete substrates.

D. Grout such as “Hydroment” (Bostik), or approved equal.

1. Must be compatible with adhesive.
2. Must match original grout in dimension, color and texture.

E. Clean, potable water.

2.3 EQUIPMENT

A. Sponges

B. Trowel for spreading mastic

C. Chisel of appropriate size for removing damaged tile

D. Rubber mallet

E. Stiff, natural bristle brushes

F. Spray bottle

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean all tile with a non-abrasive cleaner.

B. Remove cleaner residue by wiping the tile surface with a damp sponge and clean, potable water.

C. Select replacement tiles to match cleaned surrounding tiles.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Carefully remove damaged tile by hand using a chisel and rubber mallet. Take care not to damage surrounding material or substrate.

B. Prepare the substrate following adhesive manufacturer’s instructions.

C. Set new tile even and flush with existing surrounding tile. Follow tile manufacturer’s instructions. Allow to set for length of time as recommended by manufacturer.

D. Remove any excess adhesive from surrounding tiles using a clean, soft cloth.

E. Once the tile has set for the recommended length of time, apply grout to match existing dimensions, color and texture.

F. Remove any residual grout from the surface using a clean, soft cloth.

END OF SECTION 09 31 03

SECTION 09 31 08 – REGROUTING CERAMIC TILE

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on re-grouting ceramic tile where the grout is deteriorating, loose or missing.

NOTE: EXTENSIVE REGROUTING OF TILE WORK SHOULD BE DONE BY A SKILLED MASON.

NOTE: WHERE TILE MEETS A DISSIMILAR MATERIAL, CAULK OR SEALANT SHOULD BE USED INSTEAD OF GROUT.

B. See 01 35 28 for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Definitions
2. Submittals
3. Storage and Protection of Historic Materials
4. Project Site Conditions
5. General Protection
6. Protection During Use of Heat-Generating Equipment
7. Historic Treatment Procedures

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. American-Olean Tile Co.
1000 Cannon Ave.
P.O. Box 271
Lansdale, PA 19446-0271

B. The Stanley Gold-blatt Tool Co.
511 Osage Ave.
Kansas City, KS 66105-2198
(913) 621-3010

C. Harrington Tool Co.
P.O. Box 39879
Los Angeles, CA 90039
(818) 552-4020

D. Marshalltown Trowel Co.
P.O. Box 738
Marshalltown, IA 50158
(515) 753-5999

2.2 MATERIALS

A. Pre-mixed grout – either Portland cement or organic grout. Available from lumber yards or tile supply stores such as American-Olean Tile Co. or U.S. Gypsum Co., or approved equal.

B. Clean, potable water

C. Kraft paper or grocery bags

2.3 EQUIPMENT

A. Dental pick

B. Grout saw (Harrington Tool Co., American-Olean Tile Co.). Also available from hardware stores or home centers.

C. Tile grouting float (Marshalltown Trowel Co., The Stanley Gold-blatt Tool Co.). Also available from hardware stores or home centers, OR window squeegee.

D. Tempered Plexiglas jointers – for tooling narrow tile joints. Available in different sizes from building supply stores.

E. Grout bags. Available in two sizes from tile supply stores.

F. Clean natural fiber rags, or sponges

G. Stiff bristle brushes (no iron wire)

H. Goggles

PART 3 - EXECUTION

3.1 EXAMINATION

1. Examine the ceramic tile surface carefully to detect the type and cause of staining before proceeding with any cleaning operation.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Remove loose grout using a dental pick and grout saw. Clear the joints to at least 1/8" deep and form a squared-off bottom to receive the grout.

B. Brush out or vacuum loose debris from the joints.

C. Mix grout thoroughly following manufacturer's instructions.

D. For Portland cement grout:

1. Dampen joints to receive grout.
2. Apply grout using a tile grouter's float, forcing the grout deep into the joints, or apply by squeezing grout into tile joints through grout bags.

OR

E. For organic grout:

1. Apply grout using a window squeegee, or apply by squeezing grout into tile joints through grout bags.

F. Wipe off excess grout and allow to set until it feels firm.

G. Clean tile surface with a damp sponge.

H. Tool joints at curved edges with a Plexiglas joint tool. Square-edged tiles can be filled flush with the tile surface.

I. Damp cure the re-grouted area for at least 72 hours. Cover the area with Kraft paper or grocery bags. DO NOT USE PLASTIC SHEETING.

J. When dry, remove any residue from the tile surface by wiping with a clean, dry cloth.

3.3 PROTECTION

A. For the first month after re-grouting, wash the tile surface every 2-3 days with warm water and bar soap (such as Ivory), rinse thoroughly with clean, clear water and dry with a clean, soft cloth.

B. DO NOT USE DETERGENT ON THE TILE SURFACE UNTIL THE GROUT HAS FULLY CURED, APPROXIMATELY 30 DAYS.

END OF SECTION 09 31 08

SECTION 09 31 09 – REPAIRING BROKEN TILES

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes guidance on using epoxy to repair broken tiles that are cracked or split cleanly through the tile. SURFACE CRAZING OR SMALL SURFACE FLAWS IN THE GLAZE DO NOT NEED REPAIRING.

B. Repair is preferable to replacement if the break is clean because the removal of even one tile runs the risk of causing damage to adjacent tiles.

PART 2 - PRODUCTS

2.1 MATERIALS

NOTE: Verify that recommended products are legal for sale and use in the State of California.

A. Patching resin: Manufacturer's standard 2-component epoxy resin, designed specifically for patching of ceramic tile materials.

1. Tint to match color of existing tile following manufacturer's recommendations.

B. Enamel to match color of tile.

C. Clean, potable water.

2.2 EQUIPMENT

A. Stiff bristle brush

B. Caulking gun

C. Repointing tools (such as a hacksaw blade, chisel, and steel trowel)

PART 3 - EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Clean out the crack of any loose dust and debris using a stiff bristle brush or by blowing air into the crack.

B. Blend the resin materials to match the color matrix, adding pigment as required.

C. Following manufacturer's instructions, force mixed resin into the void using repointing tools or a caulking gun, making sure it is pressured into the crack as deep as possible. Fill until flush with the surface. Sometimes, the supplier will instruct using a primer for their materials.

D. Touch up repaired surface with enamel to match color of tile.

E. Do not extend patch material into the grout or mortar joint. Crack repairs should be limited to individual tiles.

END OF SECTION 09 31 09

SECTION 23 01 03 – GUIDELINES FOR LOCATING NEW DUCTS, GRILLES, LIGHT FIXTURES AND SWITCHES IN HISTORIC BUILDINGS

PART 1 - GENERAL

1.1 SUMMARY

A. When possible, install new systems that are reversible.

B. Reuse existing holes where possible.

C. Use existing interstitial spaces to conceal systems.

D. Conceal wiring when possible.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 DUCTWORK

A. Conceal piping and ductwork as much as possible, but DO NOT install suspended ceiling systems to do so.

1. If suspended ceiling systems must be installed, DO NOT allow system to abut glazing. The historic appearance of the window should be maintained where possible. This can be accomplished by “boxing” around window heads and leaving the complete window exposed to view. A rule of thumb is to maintain a minimum horizontal dimension of 2’-0” between the inside wall at a window opening and the vertical fascia of a “box” bulkhead; however, minimum distances will vary according to scale, context, character, and jurisdiction.

B. Where piping cannot be easily concealed by providing alternative routes through less significant spaces, provide gypsum board enclosures of the minimum size necessary to sufficiently conceal the pipes.

C. Preserve ornamental walls and ceilings as much as possible. Avoid penetrating or attaching to ornamental finishes.

1. Where possible, place pipes, conduit, etc. along recessed ledges or other areas of minimal visibility.
2. Where possible, use piping of minimum diameter for purposes specified.

3. Paint pipes, conduit, etc. where possible to blend with adjacent finishes.
4. Where possible, use decoration patterns to disguise new placement of wiring systems.

D. Conceal ductwork in unused closets when possible and provide adequate ventilation.

E. Use an air-sampling system instead of a smoke detector when possible; only a small hole in the ceiling is required and very little space in the ceiling is required for the pipe.

F. Conceal sprinkler heads and smoke detectors in decorative plaster ceilings.

G. Use unused fireplaces for return air ducts.

H. Use permanently placed furniture to disguise ductwork.

3.2 GRILLES

A. Reuse original hardware, such as grilles, etc., where possible.

B. Specify new grilles, light fixtures, etc. to match original as closely as possible, in material and pattern.

C. If reuse of an existing grille is not possible, leave original grille in place and locate new grille within five feet of original location – preferably on a non-ornamental surface such as flat plaster.

CAUTION: FOR SOME SYSTEMS SUCH AS FIRE ALARM PULLS AND BELLS/HORNS, FIRE SAFETY STANDARDS MAY PROHIBIT THE RETENTION OF A DEFUNCT SYSTEM, AS THIS MAY CAUSE CONFUSION BETWEEN THE ACTIVE AND INACTIVE SYSTEM DURING AN EMERGENCY.

3.3 LIGHT FIXTURES

A. Rewire, clean and refinish original fixtures when possible.

B. NEVER attach fluorescent fixtures directly to ceiling medallions.

C. Conceal the light source when installing indirect lighting.

D. Introduce as few new fixtures and holes in the ceiling as possible.

E. Provide emergency lighting that is as unobtrusive as possible; use a small fixture if possible; make sure the battery pack is concealed.

F. Conceal ambient lighting behind ceiling moldings when possible.

3.4 SWITCHES

A. Conceal conduit for light switches, fire alarms and other controls behind decorative surfaces if possible rather than attaching it onto the surfaces.

B. Paint switch plates and access panels separately so t hey can be easily removed.

C. Conceal fire alarm equipment behind unused heating grilles.

D. Use wireless fire alarm systems when possible to eliminate unsightly conduit and wiring.

E. Conceal electrical panelboards in unused closets when possible and provide adequate ventilation.

F. Conceal smoke detectors in decorative plaster ceilings.

END OF SECTION 23 01 03

SECTION 23 30 01 – DESIGN GUIDELINES FOR INSTALLING SPRINKLER SYSTEMS IN HISTORIC BUILDINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This procedure includes general guidelines to follow when installing sprinkler systems in historic buildings. It identifies specific design issues and outlines recommended installation solutions that have the least visual or physical impact on the historic materials.

1.2 GUIDELINES

A. To the maximum extent possible, design sprinkler installations to be reversible, i.e. removable without sustaining major damage to historic finishes.

B. Conceal Piping:

1. Conceal piping to significant spaces such as lobbies, corridors, and executive suites by routing pipes through adjoining office space. Use these pipes to feed sidewall heads in the significant spaces. In general, DO NOT install suspended ceilings to conceal overhead piping.

2. In contiguous significant spaces where no alternative route for concealing piping exists, install pipes in the space of lesser importance. Conceal piping in gypsum board enclosures of the minimum size needed to allow access for maintenance, subject to review by the Architect.

3. Do not channel masonry walls to conceal piping. This alternative is costly and destructive.

4. Use low-tack masking tape to mark all proposed cuts for installation and obtain Architect's approval prior to cutting.

C. Specify sprinkler heads having the least physical and visual impact on historic materials and design:

1. Specify the smallest available pendant or sidewall sprinkler head. (For normal ceiling and wall sprinkler installations, Omega Commercial Extended Coverage Pendant Model EC-20 and Omega Commercial Extended Coverage Sidewall Model HEC-12 are recommended. See G.2 below, for guidance on selecting sprinkler heads for ornamental ceilings and exposed pipe installations.)

2. Recessed heads are not generally recommended because of the danger that they will become painted shut; however, they are the most appropriate alternative in many applications. Semi-recessed heads, despite the advantage of projecting less into the space than pendant heads, are not recommended for installation in plaster ceilings. The holes created to accommodate these heads give ceilings a pockmarked appearance.
3. As a rule, use sidewall heads in significant spaces with plaster walls. Use pendant heads in spaces that have both flat plaster ceilings and ornamental wall finishes (such as wood paneling or stone).

D. Match sprinkler heads to original finishes:

1. Match heads and escutcheons to the dominant original metal in the area of the building where sprinklers are to be installed.
2. Custom match heads and escutcheons to the historic paint color of the wall or ceiling in which they will be installed.

E. Detail sprinkler head installations for minimum visibility. Specify the minimum possible sprinkler head projection from the wall or ceiling.

F. Detail suspended ceilings to preserve exterior appearance of windows:

1. In standard office space and other areas approved for installation of suspended ceilings, hold back suspended ceilings from the window plane sufficiently to maintain the historic appearance of the window.
2. Do not allow suspended ceilings to abut window glass. Keep back 3 feet and minimize difference of ceiling height to window height.

G. Preserve ornamental walls and ceilings:

1. Avoid penetrating ornamental finishes. Where neither walls nor ceilings are flat plaster, use the following guidelines:

    a. Place pipes on deep cornices and other ledges, exposed but not visibly noticeable.
    b. Use copper piping of minimum diameter needed to achieve required pressure.
    c. Paint pipes prior to placement to match adjoining finishes.
    d. Where unavoidably penetrating ornamental ceilings, distribute heads symmetrically and take advantage of decoration patterns to disguise heads. Camouflage heads in rosettes and other repeating motifs. Omit escutcheon plates. Specify glass bulb pendant heads.

2. For exposed pipe installations and installations involving penetration of ornamental ceilings, specify glass bulb heads, such as Central GB-QR Glass Bulb Quick Response Pendant or GB-QR Glass Bulb Quick Response Sidewall heads. Glass bulb heads have the following advantages for these installations:

a. Omission of escutcheon plates will not violate their UL listing.
b. They are the smallest available head for this type of installation.
c. The entire head, excluding the small heat-sensitive glass bulb activator, can be custom coated to match any finish. This coating must be done by the manufacturer (you supply the paint).

END OF SECTION 23 30 01