CHAPTER 11 – APPENDICES

APPENDIX 11 – STONE RESTORATION AND CLEANING
Appendix 11  Stone Restoration and Cleaning

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Section 04902
Stone Restoration and Cleaning

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings of Fairchild and Durland/Rathbone Halls apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Cleaning exposed stone surfaces.

B. Unit Prices: Stone restoration and cleaning to be provided under unit prices are to be quoted as a cost per square foot to add or deduct wall surfaces from the bid. The Unit Price is to include all costs associated with the work as specified herein.

C. Contact:

Gerald R. Carter, AIA Director/University Architect
Division of Facilities Planning
204 Dykstra Hall, Kansas State University
Manhattan, KS 66505-0903

Phone: (785) 532-6377

Contact for assistance in exploring the areas of work.

1.3 DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi (690 to 2750 kPA); 4 to 6 gpm (0.25 to 0.4 L/s)

B. Medium-Pressure Spray: 400 to 800 psi (2750 to5500 kPA); 4 to 6 gpm (0.25 to 0.4 L/s)

C. High-Pressure Spray: 800 to 1200 psi (5500 to 8250 kPA); 4 to 6 gpm (0.25 to 0.4 L/s)

1.4 SUBMITTALS

A. Product Data: For each product indicated, include recommendations for application and use. Include test reports and certifications substantiating that products comply with requirements.

1. Baking Soda, Bicarbonate of Soda (may also be known by manufacturers product name.)

B. Samples for verification.

1. Example of chemical cleaner (said Baking Soda).
C. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information detailing the extent of similar work undertaken and completed.

D. Cleaning program indicating cleaning process, including protection of surrounding materials on building and Project site, and control of runoff during operations. Describe in detail the materials, methods and equipment to be used.

1. If materials and methods other than those indicated are proposed for cleaning work, provide a written description, including evidence of successful use on other comparable projects, and a testing program.

1.5 QUALITY ASSURANCE

A. Restoration Specialist: Engage an experienced stone restoration and cleaning firm that has completed work similar in material, design, and extent to that indicated or this Project and with a record of successful in-service performance.

1. Field Supervision: Require restoration specialist firms to maintain an experienced full-time supervisor on the Project site during times that stone restoration and cleaning are in progress.

B. Chemical Manufacturer Qualifications: A company regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project site inspection and assistance at no additional cost.

C. Pre-application Conference: Approximately two (2) weeks prior to the scheduled commencement of the cleaning and associated work, conduct conference at Project site. Notify participants at least 5 working days before scheduled conference.

1. Meet with Owner; Architect; testing and inspecting agency representative, cleaning firm representative and site foreman; and cleaning system manufacturer representative.

2. Review methods and procedures related to cleaning system, including manufacturer's written instructions.

3. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.

4. Review protective measures to be taken for the protection of materials not to be cleaned.

5. Review provisions for temporary walks, ramps, scaffolding, shoring, bracing and other equipment required for proper progress of Work and the removal of same at the completion of Work.

6. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

7. Establish which areas on the site that will be available for use as storage and work areas, and firm's responsibility of protection and restoration of said storage and work areas to pre-construction conditions.
8. Review University parking requirements, regulation, and the procedure for the firm and its employees to obtain permits for parking during the course of the work. Any parking fees and/or fines are the responsibility of the Cleaning firm.

D. Mockups: Prepare field samples for cleaning procedures to demonstrate aesthetic effects and qualities of materials and execution. Use materials and methods proposed for completed Work and prepare samples under same weather conditions to be expected during remainder of Work.
   1. Locate mockups on the building where directed by Architect.
   2. Cleaning: Prepare samples approximately 25 sq. ft (2.3 sq. m) in area for each type of stone and surface condition:
      a. Test cleaner and methods on samples of adjacent materials for possible adverse reaction, unless cleaners and methods are known to have a deleterious effect.
      b. Allow a waiting period of not less than 7 days after completion of sample cleaning to permit a study of sample panels for negative reactions.
   3. Notify Architect 7 days in advance of the dates and times when samples will be prepared.
   4. Obtain Architect's approval of mockups before starting the remainder of stone cleaning.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with type and name of product and manufacturer.

B. Use air conveying/mechanical systems for bulk transfer to storage. For manual handling of bulk transfer use mechanical ventilation to remove airborne dust from railcar, ship or truck. Use approved respiratory protection when ventilation systems are not available. Selection of respirators is based on the dust cloud generated.

C. No more material should be stored at the job site than will be used within two weeks. For expected storage periods greater than two weeks, the material should be properly warehoused.

D. Store in a cool, dry area, away from acids avoiding contamination.

E. Comply with manufacturers written instructions for minimum and maximum temperature requirements for storage.

1.7 PROJECT CONDITIONS

A. Clean stone surfaces only when air temperature is 40 deg F (4 deg C) and above and will remain so for at least 7 days after completion of cleaning.

B. Protect windows, doors, and all other materials not specifically designated for cleaning within said specifications, from undesired blasting, in particular:
1. Fairchild Hall painted window frames, downspouts and fire stair. These items have been tested and were found to contain high lead levels and inadvertent cleaning should be avoided. The cleaning firm shall discuss with the Architect the methodology proposed for use to protect the painted areas of Fairchild Hall during the cleaning process.

C. The cleaning firm shall verify the location of all sources of power and ensure that such sources are compatible with the requirements of the tools for application. If the sources of appropriate power do not exist or are not available, said firm shall supply an appropriate source at the firm's expense.

1.8 SEQUENCING AND SCHEDULING

A. Perform stone restoration work in the following sequence:

1. Adjust or remove obstructing plant growth. Inform architect of the area and need for removal.

2. Proceed with stone cleaning process.

3. Recycle or dispose of waste materials into a secured landfill in accordance with all local, state and federal environmental regulations.

PART 2 -- PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Baking Soda (Blasting Media and cleaning material for food and non-food contact surfaces)
   a. SodaClean Maintenance Plus, MMLJ Inc.
   b. Contam-Away Blast Media, Contam-Away
   c. The Soda Works
   d. Enviro-Clean
   e. Evans Products Inc.

B. Should a bidder wish to incorporate, in the base proposal, brands or products other than those named in the Specifications, he shall submit written request for substitution approval to the Architect no later than ten (10) days prior to date proposals are due. Approved substitutions will be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

C. Products submitted for request for substitution shall meet the minimum requirements as shown in section 2.2 below. Any products not meeting the above criteria will not be approved for substitution.

2.2 CLEANING MATERIALS
A. Baking Soda (Sodium Bicarbonate): CAS# 144-55-8, White, granular solid. Odorless, soluble in water and maintains an optimum pH of 8.4.

B. Potable Water for mixture with Baking Soda during blasting process.

C. Additional tools and/or machinery as prescribed by the manufacturer.

PART 3 – EXECUTION

3.1 PREPARATION

A. General: Comply with manufacturer's written instructions for protecting building surfaces against damage from exposure to their products.

1. The cleaning firm shall seal all fresh air intakes and other possible interior entries for soda dust in area of cleaning. Cleaning firm shall notify Architect prior to sealing fresh air intakes.

B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from injury resulting from stone restoration work.

1. Prevent solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be injured from such contact.

2. Do not clean stone during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

3. Collect all un-treatable wastes for disposal off Owner's property.

4. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

5. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles that must remain in operation during course of stone restoration work.

3.2 CLEANING STONE, GENERAL

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Work from bottom to top of the building for each scaffold drop.

B. Use only those cleaning methods indicated for each stone material and location.

1. Some areas of stone will require more attention than others. These areas will be specially noted in the drawings.

2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage stonework.

   a. Equip units with pressure gauges.
3. For water spray application, use a fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.

4. For high-pressure water spray application, use a fan-shaped spray tip that disperses water at an angle of at least 40 degrees.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging stone surfaces.

D. Removing Plant Growth: The Contractor is responsible to completely remove plant, moss, and shrub growth from stone surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil or debris from open joints to whatever depth they occur.

E. Baking Soda Applications: Apply chemical cleaners to stone surfaces to comply with chemical cleaner manufacturer's written instructions.

1. Spray Applications: Spray apply water to stone surfaces to comply with requirements indicated for location, purpose, water temperature, pressure, volume, and equipment. Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from surface of stone and apply water from side to side in overlapping bands to produce uniform coverage and an even effect.

2. Rinse any remaining residues by working upward from bottom to top of each treated area at each stage or scaffold setting.

3. Repeat cleaning procedure above where required to produce the cleaning effect established by the mockup.

END OF SECTION 04902