

**GUIDELINE FOR WRITING SPECIFICATIONS WHEN USING
CSP Natural Adhesive
Section 04 03 21.01 – NATURAL ADHESIVE**

**** Specifier can combine the Work of this Section into one comprehensive body of Work including testing and sampling, assembly dismantling, repair, replacement, stain removal and cleaning either concrete or masonry assemblies.*

**** Specified adhesive materials are suitable for use and will not cause adverse effects degrading the integrity of Period or Listed National Register Historic Properties.*

1. PART 1 – GENERAL

1.1. EXISTING CONDITIONS

1.1.1. Period building *** The five wythe thick fired brick and lime-cement-sand mortared bearing wall assemblies have suffered from decades of deferred maintenance, allowing minor deterioration to worsen over time. Erosive forces exploited small cracks and caused them to grow, precipitated erosion in the assembly interior, leading to disintegration and crumbling of some units; evidenced by destabilizing cavities and voids in the assembly; scheduled for partial reconstruction, consolidation, and stabilization employing specified cementitious adhesive materials and methods specified in this Section.

1.1.2. Work of this Section has the potential to produce adverse effects on the period building that was placed in service at a time when archaic materials and other technologies were commonly incorporated in building construction, to the degree that they may behave differently from successor materials reformulated over time.

*** Period Properties are generally fifty years old or older but have not been listed on the National Register of Historic Places; but the decision has been made not to foreclose the possibility of future listing; hence the elevated level of caution in executing the Work, voluntarily specified in accordance with the principles to guide decisions about how best to care for and manage historic resources the National Historic Preservation Act.

*** Properties that have been listed, or are determined eligible for listing on the National Register of Historic Places should be specified with reference to special considerations defined by the National Historic Preservation Act and its implementing regulations, affording protection to historic properties under federal law, and in some instances, state law and/or local ordinances. Material producer can offer specific guidance in regard to that scenario. ***

- 1.1.2.1. Care shall be exercised during the performance of this Work to avoid collateral damages to the building and surrounding area, which may also include other period and/or historic properties listed on the National Register of Historic Places.

1.2. WORK OF THIS SECTION

- 1.2.1. Furnish labor, materials, tools, and equipment needed to repair cracks and stabilize masonry assemblies, including injection of adhesive, as depicted on Drawings and as specified in this Section.
- 1.2.2. Material Substitution Proposals shall be supported by independent laboratory tests, paid for by the submitting party; submitted to the Architect in writing; prior to the receipt of bids; complete with independent laboratory certified test results that establish equivalent or better performance levels, including critical material composition.
 - 1.2.2.1. Do not substitute specified materials or methods without written authorization by the Architect.
- 1.2.3. Provide qualified supervision with relevant experience needed to manage delivery of projects governed by codes and treatment standards regulating the treatment of period properties, including provision of skilled labor force in sufficient number who are trained and certified in the proper use of specified materials, methods, tools, and equipment.
- 1.2.4. Architect's Drawings and Schedules *** (Sheet and Identifier) *** locate and depict the extent of the Work of this Section.
 - 1.2.4.1. Contractor shall inspect, confirm to his satisfaction and state in writing that the Work and building conditions as represented in the documents are acceptable; submitted for Architect approval; or, alternatively, prepare a written and illustrated inspection report noting discrepancies and seeking clarification, submitted for review by the Architect; who shall provide his written and illustrated response.
- 1.2.5. Protect building features not scheduled for treatment in this Work.
 - 1.2.5.1. Secure draped material with edges sealed as needed to protect building features located near or adjacent to the Work but not identified for treatment; including primary building features, landscape and planted areas adjacent to Work.
 - 1.2.5.2. Prevent unintended exposure to treatment materials reaching other buildings, cars, finishes, and improvements not scheduled for treatment under this Section.
 - 1.2.5.3. Draping material shall be clean 6-mil minimum thickness polyethylene sheet; or better; minimizing joints.

- 1.2.6. Organize Work as series of discrete treatment areas, sized to permit easy completion of treatment operations from start to finish in a single Workday.
- 1.2.7. After crack repair has reached thumbprint firmness (without unyielding hardness characteristic of final set), clean stains, overage, and other residue with water and sponges, removing all traces from wall; taking care not to disturb repair finish.
 - 1.2.7.1. Do not allow excess adhesive to reach final hardness before removing all traces from wall surfaces. Otherwise, removal may become very difficult or impossible

1.3. RELATED WORK

- 1.3.1. Delivery and acceptance of the Work of this Section is governed by provisions in other documents comprising integral parts of this Agreement, including the Construction Agreement, General and Special Conditions, General Requirements, Drawings, Specifications, and cited Standards fully incorporated into the Agreement by reference; and defining the Project as a whole.
- 1.3.2. Coordinate the delivery of the complementary Work specified under other Sections.

*** (Related Sections noted here as complementary can be incorporated into a single Section 02 03 00 Conservation Treatment for Existing Period Conditions or specified individually.) ***
- 1.3.3. Section 00 43 25 Substitution Request Form (During Procurement)
- 1.3.4. Section 00 63 25 Substitution Request Form (During Construction)
- 1.3.5. Section 01 00 00 Contractor Quality Control
- 1.3.6. Section 01 56 39 Temporary Protection of Site and Plantings
- 1.3.7. Section 01 35 91 Rehabilitation Treatment Procedures
- 1.3.8. Section 01 54 23 Hoists and Scaffolding
- 1.3.9. Section 01 74 19 Construction Debris Management and Disposal
- 1.3.10. Section 02 42 96 Removal and Dismantling (Selective Demolition)
- 1.3.11. Section 04 03 10 Masonry Cleaning (Soiling, Biological, Paint Removal)
- 1.3.12. Section 04 03 22 Brick Unit Repair (Repair, Patch, Replace)
- 1.3.13. Section 04 03 23 Masonry Repointing

1.4. REFERENCE STANDARDS

- 1.4.1. Material manufacturer's written specifications and instructions.
- 1.4.2. National Park Service Advisory Publication - Guidelines for the Treatment of Historic Properties, offers preservation strategies and technical advice for adoption in planning and executing Work on period properties where no federal (or applicable state)

stakeholder interests will be granted in the form of permits, funding, or other federal assistance.

- 1.4.3. Where no government authority has jurisdiction over this Work, adoption of and compliance with these standards shall be incorporated by reference and enforced as stated requirements of this Construction Agreement.

1.5. QUALITY MANAGEMENT

1.5.1. Quality Assurance

- 1.5.1.1. Contractor management assumes full responsibility to formulate and implement Quality Assurance practices that focus on ensuring quality requirements can be met before the Work is performed.
 - 1.5.1.1.A. Demonstrate relevant experience, including minimum of five years' documented history of successfully managing comparable period masonry projects before the Contractor will be deemed eligible to Bid and then Work on the project.
 - 1.5.1.1.B. Employ adequate numbers of skilled Workmen trained and certified to install and Work with the specified materials.
 - 1.5.1.1.B.i. Successful completion of masonry repair material producer's Certification Workshop will be required of all supervisors and tradesmen scheduled to Work on this project; offered through the treatment materials manufacturer.
 - 1.5.1.1.B.ii. Training shall include acceptable methods for preparation of substrate, handling, application and finishing of specified treatment materials.
 - 1.5.1.1.B.iii. Each Worker completing this course will be provided with a personal photo identification badge evidencing successful completion of the training course. Badge shall be worn at all times when performing the work of this section.
 - 1.5.1.1.B.iv. Adding Workers to the Workforce prior to certification shall be prohibited.

1.5.2. Quality Control

- 1.5.2.1. Contractor management shall form and implement proactive Quality Control practices that focus on ensuring quality requirements are met during performance of the Work.

- 1.5.2.1.A. Implementation of Quality Controls shall conform with other project management objectives: deliver Work in accordance with the Contract Documents, applicable codes, regulations, and governing authorities.
- 1.5.2.2. Conform to applicable provisions of Section 01 40 00 – Contractor Quality Control; supplemented by the following minimum requirements.
 - 1.5.2.2.A. Take appropriate precautions to avoid harm to building occupants, pedestrians and nearby property.
 - 1.5.2.2.A.i. Temporarily cordon off active Work areas to prevent public entry.
 - 1.5.2.2.A.ii. Employ warning signage.
 - 1.5.2.2.A.iii. Train Workers to politely but firmly warn others away from Work area.
 - 1.5.2.2.A.iv. Terminate Work at times when wind drift may expose passersby to risk, or cause damage to vehicles and adjacent property.
 - 1.5.2.2.B. Protect adjacent site and building areas, surfaces, materials, and assemblies not scheduled for treatment under this Section, avoiding chemical, mechanical impact, and other damage resulting from delivery of this Work.
 - 1.5.2.2.C. Protect trees, plants, foliage, storm sewers, and surrounding surfaces from chemical removers, neutralizers, residue, and rinse waters.
 - 1.5.2.2.D. Provide protective barriers capable of resisting effects from specific chemical compounds applied in the Work.
 - 1.5.2.2.E. Cover air intakes, air conditioning vents and similar openings that may come in contact with the chemical cleaners, residues, and their fumes.
 - 1.5.2.2.F. Leave covers in place throughout the performance of this work.

1.6. SUBMITTALS

- 1.6.1. Related Section 01 33 00 – Submittal Procedures shall govern Work of this Section.
 - 1.6.1.1. Submittal Procedures obligate Contractor to submit certifications, shop drawings, product data, material samples, and mockups to the design team for review and approval, to verify that the contractor's understanding and planned execution of the design complies with due regard for specified materials, methods, and the Designer's intentions, for approval by Architect.
- 1.6.2. Submittals
 - 1.6.2.1. Contractor's (written and illustrated) Work Plan shall include intended subdivision of Work into manageable Sections identifying estimated dates of

delivery, estimated schedule of accumulating payment values, and other administrative items.

- 1.6.2.2. Copies of Qualification Certificates evidencing each field supervisor and Worker has successfully completed relevant training programs, evidencing demonstrated ability to properly install the specified materials.
- 1.6.2.3. Contractor's Request for Payment shall be accompanied by copies of related purchase orders, shipping tickets, receipts, materials tracking cards, etc. as evidence that the specified materials for the Work of this Section were ordered, received, and stored at the job site, annotated with date related items were incorporated into the Work.
 - 1.6.2.3.A. Falsified certification will be interpreted as fraud and will be prosecuted accordingly.
- 1.6.2.4. Permit accepting offsite disposal of construction debris.
- 1.6.2.5. Product Data: Manufacturer's specifications and information about materials, products, and systems.
- 1.6.2.6. Samples: Physical examples of materials, finishes, or colors submitted for Owner approval before installation.
- 1.6.2.7. Material Safety Data Sheets (MSDS) Material manufacturer's written instructions confirming that the Contractor has received instructions for the proper handling of the specified materials.
- 1.6.2.8. Shop Drawings: Detailed drawings showing how specific project elements will be fabricated and installed, when noted as a project requirement; for Architect approval.
 - 1.6.2.8.A. Scaffolding
 - 1.6.2.8.B. Safety plan including barrier placement for mobile hoist operations.

1.7. DELIVERY, STORAGE, HANDLING

- 1.7.1. Deliver the product in original factory packaging with product listing label and manufacturing label.
 - 1.7.1.1. Comply with the Manufacturer's written specifications and recommendations.
 - 1.7.1.2. Handle and store all products with appropriate precautions as outlined in the Manufacturer's product literature and Material Safety Data Sheets (MSDS).

- 1.7.1.3. Organize material inventory storage to clearly distinguish between different material formulations and any differences with respect to areas of intended application; organized to prevent damage and deterioration.

2. PART 2 – PRODUCTS

2.1. DESIGN STANDARD MATERIALS

2.1.1. Mineral-Based Natural Adhesive

2.1.1.1. Application

- 2.1.1.1.A. Moisten the substrate using clean water. Natural Adhesive should be applied to glistening wet surface on vertical application and a well dampened surface (with no pooling water) on horizontal surfaces. If the surfaces are allowed to dry out before applying Natural Adhesive this step must be repeated.
- 2.1.1.1.B. Apply a small amount of Adhesive to one of the substrates with a trowel or other appropriate tool.
 - 2.1.1.1.B.i. Be sure to coat any dowels or pins with Natural Adhesive as well.
- 2.1.1.1.C. Firmly press the pieces together. Use a clamp or other method to ensure contact is not broken between the substrates.
- 2.1.1.1.D. Do not disturb the repair until curing is complete; usually 24 hours.

2.1.2. Materials are available through:

Cathedral Stone Products, Inc.
7266 Park Circle Drive
Hanover, MD 21076

Telephone (410) 782-9150
Fax: (410) 782-9155

Email info@cathedralstone.com
Order online: cathedralstone.com

2.2. ACCESSORIES

2.2.1. Other Materials

- 2.2.1.1. Clean potable water and hose.
- 2.2.1.2. Heavy duty packaging tape, clear
- 2.2.1.3. Painter's canvas, drop cloth

2.2.1.4. Polyethylene sheeting, 6-mil thickness, heavy duty, clear or black.

2.2.2. Tools **Never Use Wire Brush on Masonry** .

2.2.2.1. Surface Temperature Gauge

2.2.2.2. Soft, clean, absorbent rags.

2.2.2.3. Stiff natural-bristle brushes.

2.2.2.4. Stainless steel and plastic putty knives, paint scrapers.

2.2.3. Personnel Protection

2.2.3.1. Eye and skin protection

2.2.3.2. Rubber gloves

2.2.4. Equipment

2.2.4.1. Standard Pressure Washers (Clean up)

2.2.4.1.A. Controllable pressure, 600 psi minimum to no greater than 1200 psi at tip.

2.2.4.1.B. Fan Tip size 0.19-inch diameter or larger, with chemical resistant packings.

2.2.5. Provide other equipment and materials not specifically described but required for a complete and proper installation, selected by the Contractor, subject to the approval of the Architect.

3. PART 3 - EXECUTION

3.1. OBSERVERS

3.1.1. Architect will periodically observe progress of the Work and issue timely supplemental instructions, answers to questions, and approvals as needed; facilitating the orderly and efficient delivery of the Work by the Contractor.

3.1.1.1. Contractor shall allow qualified observers access to and assisted use of lift devices and scaffolding, as needed, to monitor progress and review completed Work.

3.2. SITE CONDITIONS

3.2.1. Cold Weather Requirements: Do not perform specified work in air temperatures below 40° F, if substrate temperature is below 40° F, or if conditions are to be such within a 24-hour period.

3.2.2. Hot Weather Requirements: Do not install material in temperatures exceeding 90° F. When needed, protect work area from direct sunlight, to prevent repair from drying out prematurely.

3.2.3. Examine the areas and conditions under which Work of this Section will be performed to establish extent of Work, adequacy of access, and extent to which protection will be needed by adjacent improvements.

3.2.4. Inspect existing conditions considering the Work and confirm that conditions in the field conform to information provided in these Contract Documents.

3.2.4.1. If conditions are not as expected, notify the Architect immediately seeking supplemental instructions.

3.2.4.2. Do not proceed with Work until unsatisfactory conditions are corrected or acceptable supplemental instructions are issued by Architect.

3.3. PERSONNEL AND PUBLIC SAFETY

3.3.1. Contractor shall provide for the safety of his Workers and for the public at all times.

3.3.2. Erect temporary protective covers over walkways and at points where pedestrian and vehicular entrance and exit that must remain in service during course of Work.

3.3.3. Specified materials are not intended for internal consumption and shall be kept out of reach of children and animals.

3.4. PROPERTY PROTECTION

3.4.1. Protect public and private property, including motor vehicles, adjacent surfaces of building, mechanical equipment, building site, plants, and other properties from harm resulting from Work.

3.4.2. Cover or otherwise protect adjacent areas from adhesive material contact when area is not scheduled for treatment under this Section.

3.4.2.1. Heavy-duty plastic (polyethylene) sheets often provide adequate protection from material risks of this type.

3.4.2.2. Special care shall be paid to placement and sealing protective sheeting applied to windows and glass, concrete mosaic tile ornamentation, and historic materials not scheduled for Work under this Section.

3.4.2.3. Cost of repair and restoration of adjacent surfaces, materials, and assemblies damaged by the Work of this Section shall be borne by the Contractor with no added cost to the Owner.

3.4.2.3.A. Remediation Work to correct collateral damage shall be performed by tradesmen skilled that that type of work.

3.5. MATERIAL HANDLING

3.5.1. General Requirements

- 3.5.1.1. Read and consider the Safety Data Sheet for important health/safety information.
- 3.5.1.2. Industry practices suggest that it would be prudent to wear safety goggles, gloves, and a dust mask when handling these products.
- 3.5.1.3. Complete preparations for repairs, including ports and cleaning, before mixing.
- 3.5.1.4. Add clean water to dry powdered adhesive and mix as prescribed.
- 3.5.1.5. Mixed adhesive has approximately 30-minute pot life and cannot be retempered.
- 3.5.1.6. Prepare only so much adhesive as can be injected within 30 minutes.
- 3.5.1.7. Discard mixed adhesive that has hardened or been unused for 30 minutes or more.
- 3.5.1.8. Only use these materials for approved applications.
- 3.5.1.9. Never add bonding agents, accelerators, or retarders to these adhesive materials.
- 3.5.1.10. Never retemper prepared adhesive.
- 3.5.1.11. Never allow these materials to freeze.
- 3.5.1.12. Test surface temperatures before commencing work; confirming substrate surface temperature between 40° F and 95° F (5° C to 32° C).
- 3.5.1.13. Discarded adhesive shall be placed in clearly labeled containers identifying content as unusable; segregated from useable material stock, it shall be removed from staging area as soon as practical.

3.6. SUBSTRATE PREPARATION

- 3.6.1. Transverse Cracks aligned across the face of substrate assembly, drill a series of injection ports in the center of the crack, sloped downward into masonry.
 - 3.6.1.1. Between these ports, seal the crack; either temporarily with removable, non-staining clay: or permanently with JAHN Patching Mortar.
- 3.6.2. Lateral Cracks (Delaminating Layers) or Voids, drill a series of injection ports located to form a square “drill frame” on the surface, with ports drilled in a downward sloping direction.
- 3.6.3. After completing port drilling, wash with hose and clean water flushing the interior of the crack-void system to remove all dust, or loose or deleterious material that could prevent proper flow and/or compromising the adhesion to substrate interior.

- 3.6.3.1. Assuming some time will pass between port preparation and injection operations, re-wet prepared substrates as needed to ensure substrate materials are damp when adhesive injection operations commence; using clean water, sprayed by hose or low-pressure tank.

3.7. MIXING

3.7.1. Hairline Fracture Adhesive

- 3.7.1.1. ADD by volume, 1-part clean water to approximately 2- to 5-parts mineral-based powder, mixing mechanically until homogenous; using a high-speed drill (3,000 RPM or higher) equipped with a Jiffler-type mixing paddle.

- 3.7.1.1.A. Injections can commence after straining the prepared adhesive mix through a sieve directly into a freshly cleaned container.

- 3.7.1.1.B. If the material is not immediately used, resume constant mechanical mixing (3,000 RPM or higher) until placement commences.

3.7.2. Crack and Void Adhesive

- 3.7.3. ADD by volume, 1-part clean water to approximately 3 – 3½ parts mineral-based powder, mixing for a minimum of three minutes or until homogenous, either manually or mechanically with a slow speed drill (400-600 RPM) equipped with a Jiffler-type mixing paddle.

- 3.7.3.1. Injections can commence after pouring the prepared adhesive mix into a freshly cleaned container.

- 3.7.3.2. If the material is not immediately used, resume constant mechanical mixing until placement commences.

3.7.4. Large Crack and Void Adhesive

- 3.7.4.1. ADD by volume, 1-part clean water to approximately 2 – 2½ parts mineral-based powder, mixing for a minimum of three minutes or until homogenous, either manually or mechanically with a slow speed drill (400-600 RPM) equipped with a Jiffler-type mixing paddle.

- 3.7.4.1.A. Injections can commence after pouring the prepared adhesive mix into a freshly cleaned container.

- 3.7.4.1.B. If the material is not immediately used, resume constant mechanical mixing until placement commences.

3.8. INJECTION

- 3.8.1. Provide sufficient manpower to perform the various stages of the Work and monitor its progress, record and confirm that appropriate treatment protocol will be used.
- 3.8.2. Substrate repairs performed under other Sections shall be fully cured prior to commencing these operations.
- 3.8.3. Transverse Cracks
 - 3.8.3.1. Inject adhesive into lowest port and continue until it flows freely back out from this port and other ports at the same level.
 - 3.8.3.2. Seal ports using non-staining clay, sealant, or caulk and proceed in identical fashion at next higher open ports, repeating steps until the crack is filled.
 - 3.8.3.3. Clean up overflow immediately.
- 3.8.4. Lateral Cracks (Delaminating Layers) or Voids
 - 3.8.4.1. The order of injection is lower left, lower right, upper left, then upper right.
 - 3.8.4.2. Inject adhesive into lower left port and proceed until it flows back out freely from this and other ports at the same level.
 - 3.8.4.3. Seal ports using non-staining clay, sealant, or caulk.
 - 3.8.4.4. Inject adhesive into lower right port and proceed in identical fashion.
 - 3.8.4.5. Clean up overflow immediately.
- 3.8.5. When injection is wholly or partially resisted, insert threaded stainless steel dowel into the port, agitate or tap several times to remove any voids or air pockets, and resume injection until port is full and excess adhesive flows freely from other ports at the same level.
- 3.8.6. Finishing
 - 3.8.6.1. Remove plugs after 24 to 48 hours and permanently repair the ports and the crack surface, if not previously performed, using an appropriate Jahn Mortar to match color and type of existing masonry.

3.9. CLEAN UP

- 3.9.1. Remove uncured adhesive from surfaces before it dries using clean water and a rubber sponge. Fully cured adhesive may only be removed chemically or mechanically.
- 3.9.2. Remove uncured adhesive from tools and equipment with water as soon as possible. Cured material may only be removed chemically or mechanically.

3.10. CORRECT UNACCEPTABLE WORK

3.10.1. Remediate unacceptable repairs when Architect determines that the quality of the finished Work has been degraded by inappropriate installation techniques.

3.10.1.1. Submit written remediation plan detailing methods and materials to be employed when addressing unacceptable Work; for Architect's review and approval.

3.11. JOB SITE CLEANING

3.11.1. As the Work progresses, remove construction debris and discarded packaging, rubbish, cans, sponges, and rags at the end of each workday.

3.11.2. Upon completion of Work, remove all construction debris, including scaffolding, temporary construction, material overage, containers and product packaging, and selectively demolished building materials; and dispose legally off-site at Contractor's expense.

END OF SECTION 05/20/2025

**Cathedral Stone Products
Technical Support
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