

Pennsylvania Convention Center 12th Steet Masonry Repairs



Contract Documents – Issued for Bid Documents

May 5, 2023

VITETTA

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PART 1 The specification sections noted below are included in this submission of the specification manual. The indicated authors (firms) are listed as follows:

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**PENNSYLVANIA CONVENTION CENTER AUTHORITY
COMMONWEALTH OF PENNSYLVANIA**

**STANDARD FORM OF AGREEMENT
FOR FACILITIES PROJECTS**

GENERAL CONDITIONS

ARTICLE 1

GENERAL PROVISIONS

1.1 CONTRACT DOCUMENTS

- 1.1.100 The Contract Documents consist of the agreement, notice to contractors, the bid proposal, the contract bonds (if specified), all riders, drawings and specifications, Special Requirements, General Requirements, and addenda issued to the contract. A modification is (1) a written amendment to the contract signed by both parties or (2) a change order. A modification may be made only after execution of the contract. The work specified in the contract includes all labor, equipment, and materials required and incorporated to complete the work specified in and according to all the Contract Documents.
- 1.1.101 The Contract Documents are complementary, and what is required by any one of the Contract Documents shall be binding as if required by all. The intention of the documents is to include all labor, materials, equipment, and other items necessary for the proper execution and completion of the work. Work not covered under any heading, section, branch, class, or trade of the specifications need not be supplied unless it is required elsewhere in the Contract Documents or is reasonably inferable therefrom as being necessary to produce the intended results. If there is a conflict between the drawings and the specifications, the more stringent specification shall prevail. Words which have well-known technical or trade meaning are used herein in accordance with such recognized meanings.
- 1.1.102 Where the work is shown in complete detail on only half or a portion of a drawing or there is an indication of continuation, the remainder being shown in outline, the work drawn out in detail shall be understood to apply to other like portions of the structure. On all work of a remodeling nature or installation within present buildings, the actual situation at the site controls any information given which may affect the quantity, size, and quality of materials required for a satisfactorily completed contract, whether or not such information is indicated on the drawings or within the specifications.
- 1.1.103 Unless otherwise noted in the Contract Documents, the Authority will provide the Contractor three (3) complete sets of stamped drawings and specifications for permitting, free of charge. The Contractor shall reimburse the Authority if additional sets are required beyond the three provided.

All drawings, specifications, and copies thereof furnished by the Professional are and shall remain the property of the Authority. They are not to be used on any other project, without permission of the Authority, and, with the exception of one contract set for each party to the contract, are to be returned to the Authority on request at the completion of the work.

1.2 GOVERNING LAW

This Agreement shall be governed by and construed in accordance with laws of the Commonwealth of Pennsylvania, notwithstanding any conflict-of-laws doctrines of said jurisdiction to the contrary and without the aid of any canon, custom or rule of law requiring construction against the draftsman. With respect to any suit, action or proceeding relating to this Agreement, Consultant hereby submits to the exclusive jurisdiction of the courts of the

Commonwealth of Pennsylvania.

1.3 NOTICES

Wherever the term "notice" is used, such notices to be effective shall be in writing and if to the Authority shall be mailed certified mail, postage and fees prepaid, or delivered to the Authority, and if to the Professional shall be similarly mailed or delivered to him at this address set forth in the caption of this Agreement, unless and until notice of another address shall be given hereunder, in which case notices shall be so delivered or mailed to the address last so given.

1.4 INTEGRATION

This Agreement contains all the terms and conditions agreed to by the parties hereto, and no other agreements, oral or otherwise, regarding the subject matter of this Agreement exist.

1.5 NO THIRD PARTY RIGHTS

The Contractor agrees to indemnify and hold harmless the Authority and the Commonwealth of Pennsylvania against any costs incurred by the Authority or the Commonwealth of Pennsylvania (including without limitation amounts paid pursuant to judgments or settlements and as counsel fees) in consequence of any claim by a third party against the Authority or the Commonwealth of Pennsylvania, including without limitation any claim by an employee of the Authority or the Commonwealth of Pennsylvania, the Contractor or a subcontractor and any claim by a subcontractor or another contractor, whether filed before or after final payment, based on actual or alleged damage to or destruction of property or injury to persons allegedly caused by the Contractor, or any subcontractor, or by their respective employees, in connection with the work.

The Authority shall promptly notify the other party of the assertion of any claim against which the Authority or the Commonwealth is held harmless pursuant to this condition, shall give such other party the opportunity to defend any such claim, and shall not settle any such claim without the approval of the indemnifying party.

1.6 HOLD HARMLESS

The Contractor shall indemnify and hold harmless the Authority, the Construction Manager, the Professional, their agents and employees from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from the performance of the work, including any and all design work performed by or for the Contractor, provided that any such claim, damage, loss or expense: (1) is attributable to bodily injury, sickness, disease or death or to injury to or destruction of tangible property including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any subcontractor, any one directly or indirectly employed by any of them, or any one for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

In any and all claims against the Authority, Construction Manager or the Professional or any of their agents or employees by any employee or the Contractor, any subcontractor, any one directly or indirectly employed by any of them or any one for whose acts any of them may be liable, the indemnification obligations shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.

The obligations of the Contractor under this Section shall not extend to the liability of the Construction Manager, Professional, their agents or employees arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of, or the failure to give, directions or instructions by the Construction Manager, Professional, their agents or employees provided such giving, or failure to give, is the primary cause of the injury or damages.

1.7 OFFSET PROVISIONS

The Contractor, by execution of the agreement, certifies that it has no outstanding tax liability to Pennsylvania; authorizes the Department of Revenue to release information related to its tax liability to the Authority; and, authorizes the Commonwealth to set off any State and local tax liabilities of the Contractor or any of its subsidiaries, as well as any other amount due to the Commonwealth from the Contractor, not being contested on appeal by the Contractor, against any payment due to the Contractor under an agreement with the Commonwealth.

The certification of no outstanding tax liability is a material representation of fact, upon which reliance is placed by the Authority in entering the agreement. If it is later determined that the Contractor knowingly rendered an erroneous certification, the Authority may find the Contractor in default and terminate the agreement. Such erroneous certification may also be grounds for initiation of civil or criminal proceedings.

1.8 not used

1.9 CONTRACTOR RESPONSIBILITY PROVISIONS

- A. Contractor certifies that it is not currently under suspension or debarment by the Commonwealth, any other state, or the federal government, and if the contractor cannot so certify, then it agrees to submit along with the bid proposal a written explanation of why such certification cannot be made.
- B. If contractor enters into any subcontracts or employs under this contract any subcontractors/individuals who are currently suspended or debarred by the Commonwealth or the federal government or who become suspended or debarred by the Commonwealth or the federal government during the term of this contract or any extensions or renewals thereof, the Commonwealth shall have the right to require the contractor to terminate such subcontracts or employment.
- C. The contractor agrees to reimburse the Commonwealth for the reasonable costs of investigation incurred by the Office of Inspector General for investigations of the contractor's compliance with the terms of this or any other agreement between the contractor and the Commonwealth which results in the suspension or debarment of the contractor. Such costs shall include, but not be limited to, salaries of investigators, including overtime; travel and lodging expenses; and expert witness and documentary fees. The contractor shall not be responsible for investigative costs for investigations that do not result in the contractor's suspension or debarment.

1.10 not used

1.11 not used

1.12 AMERICAN WITH DISABILITIES ACT

Pursuant to federal regulations promulgated under the authority of The Americans with Disabilities Act, 28 C.F.R. 35.101 et seq., the Contractor understands and agrees that no individual with a disability shall, on the basis of the disability, be excluded from participation in this contract or from activities provided for under this contract. As a condition of accepting and executing this contract, the Contractor agrees to comply with the "General Prohibitions Against Discrimination", 28 C.F.R. 35.130, and all other regulations promulgated under Title II of the Americans with Disabilities Act which are applicable to the benefits, services, programs, and activities provided by the Pennsylvania Convention Center Authority through contracts with outside contractors.

The contractor shall be responsible for and agrees to indemnify and hold harmless the Commonwealth of Pennsylvania, the Pennsylvania Convention Center Authority and their

respective officers and employees from all losses, damages, expenses, claims, demands, suits, and actions brought by any party against any of the foregoing as a result of the contractor's failure to comply with the provisions of the paragraph above.

1.13 ASSIGNMENT

This agreement shall be binding on the parties hereto, their heirs, executors, administrators, successors and assigns, but it may not be assigned by the Contractor without the prior written consent of the Authority.

1.14 ASSIGNMENT OF ANTITRUST CLAIMS

The contractor and the Authority recognize that in actual economic practice, overcharges by the contractor's suppliers, resulting from the violations of State or Federal anti-trust laws are, in fact, borne by the Authority. As part of the consideration for the award of this contract, and intending to be legally bound, contractor assigns to the Commonwealth all rights, title and interest in and to any claims contractor now has, or may hereafter acquire, under State or Federal anti-trust laws relating to the goods or services which are the subject of this contract.

1.15 LIENS

In accordance with applicable Commonwealth Law 49 P.S. 1303, the parties hereto hereby specifically waive the right to file any mechanics or other lien or claim for work done or material furnished in or about the performance of this Agreement, and it is hereby expressly agreed that no such claim or claims shall be filed by anyone and that the Contractor shall not file nor permit any subcontractor, material man, mechanics or other person under him to file, nor shall any such contractor, subcontractor, material man or other person file any mechanics or other lien or claim for work done or material furnished in or about the performance of this Contract against the Authority, the Commonwealth of Pennsylvania, and/or the ground upon which the structure or work herein provided for is erected or done, or against any structure thereon erected or to be erected, or against any structure or property whatsoever covered by the Contract.

1.16 NONDISCRIMINATION

The Commonwealth's nondiscrimination / sexual harassment clause, as found in the Bid Proposal Form, is hereby incorporated by reference.

1.17 THE PROFESSIONAL

If retained and so designated by the Authority, a Professional architect or engineer may act as the agent for the Authority in the administration of the contract and may perform any or all of the functions stated herein. The Professional will, as determined by agreement with the Authority, visit the site to review progress in accordance with the contract drawings and specifications, attend job conferences, approve applications for payments, make progress reports to the Authority and review and accept/reject the Contractor's Schedule of Values.

The Professional has the authority to interpret the Contract Documents, reject work which does not conform to the Contract Documents, review and approve shop drawings, prepare drawings and specifications for change orders or modifications, participate in completion inspections, prepare as-built drawings, and review and approve all catalog data, manufacturers operating and maintenance instructions, certificates, warranties, written guarantees, and related documents required by the contract. The Professional may perform additional functions as determined by the Authority necessary to protect the Authority's interest.

1.18 THE CONSTRUCTION MANAGER

If retained and so designated by the Authority, a Construction Manager (CM) may also act as the agent for the Authority in the administration of the contract and may perform any or all of the functions stated herein, as determined by agreement with the Authority. The Construction Manager may visit the site to review progress according to the contract drawings and

specifications, independent of or in conjunction with the Professional. The Construction Manager may, with concurrence of the Professional, reject work that does not conform to the Contract Documents and safe working practices.

As and on behalf of the owner, the CM shall have authority to review with the Professional materials, workmanship, and equipment incorporated, or submitted for incorporation in the work. They shall review and provide an evaluation of the Contractor's testing, inspection, quality assurance, and certification program to the Professional, and they shall review and prepare an independent evaluation of the amount of the request for payment for acceptability of the quantity and quality of work performed or materials and equipment provided, and prepare and/or evaluate prepared schedules for the work.

The Construction Manager shall review the Contractor's construction practices and advise on unsafe working conditions during execution of the work. The Construction Manager shall work with the Professional as the Authority's representative in the administration of the Authority's interest in the project.

ARTICLE 2

2.1 THE AUTHORITY REPRESENTATIVES

Representatives designated by the Authority will have the authority to inspect the work and to reject all work not performed in accordance with the contract provisions. In addition, only those representatives so designated have authority to change, modify, or alter the work or incur or cause to be incurred additional obligations beyond the contract provisions.

2.2 THE AUTHORITY'S RIGHT TO CARRY OUT THE WORK

If the Contractor fails to carry out the work in accordance with the Contract Documents or fails to perform any provision of the agreement, the Authority may, after three (3) working days written notice to the Contractor, and without prejudice to any other remedy the Authority may have, make good such failures. In such case, an appropriate change order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such failures, including the cost for the Professional's additional services made necessary by such failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor and/or the Contractor's Surety shall pay the difference to the Authority.

2.3 RIGHT TO AWARD CONTRACTS

The Authority reserves the right to award other contracts in connection with other portions of the project under these similar conditions of this agreement.

ARTICLE 3

THE CONTRACTOR'S RIGHTS AND RESPONSIBILITIES

3.1 COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee (excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business). For breach or violation of this warranty, the Authority shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, or

contingent fee.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS

- 3.2.100 The Contractor shall perform the work according to good quality industry standards, practices, and procedures, and in accordance with the Contract Documents and submittals approved.
- 3.2.101 The Contractor shall accept all conditions as found upon examination of the site, and take field measurements and verify field conditions and compare carefully such measurements and conditions with the Contract Documents before commencing activities. If the Contractor, in the course of construction finds any conflict, error or discrepancy on or among the Contract Documents, such conflict, error or discrepancy shall be immediately referred to the Professional in writing.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

- 3.3.100 The Contractor shall supervise and direct the work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for the work performed and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the work, unless the Contract Documents give other instructions.
- 3.3.101 The Contractor shall provide all labor, materials, and equipment necessary for the proper prosecution of the work in an acceptable manner and at a satisfactory rate of progress.
- 3.3.102 The Contractor shall be responsible for the acts and omissions of all their employees, all subcontractors and their agents and employees, and all other persons performing portions of the work under a contract with the Contractor.
- 3.3.103 Inclement weather, including but not limited to cold or freezing weather, shall not be considered an excuse for non-performance of work under this contract. The Contractor shall use such methods of protecting as may be necessary to continue to work throughout the period of inclement weather.

3.4 LABOR AND MATERIALS

- 3.4.100 The Contractor shall enforce strict discipline and good order and conduct among their employees and other persons carrying out the contract. Every employee shall be fit and skilled in the performance of tasks assigned to them.
- 3.4.101 Wages: Prior to submitting a Proposal, each Proposer must familiarize itself with all current working conditions, including but not limited to the labor environment and all applicable laws, codes, ordinances, contracts, agreements, rules and regulations that will affect the delivery of the services to be provided by the Proposer.
- 3.4.102 Products incorporated into the Work: The Authority anticipates the Contractor will provide products (i.e., products, materials, and equipment as defined in Section 016000 - Product Requirements) to be incorporated into the work of the project that are new, undamaged, and unused at the time of the installation, unless otherwise indicated in the Contract Documents. The Contractor shall produce, upon request, evidence supporting the source of materials used in the work.

The products provided under the contract shall meet or exceed the quality specified in the Contract Documents. The burden of proof of quality for all products provided rests with the Contractor. The costs incurred for substantiating quality shall be borne by the Contractor. If the Authority accepts substituted materials of a lesser quality than specified, the Authority shall be entitled to a credit equal to the difference in cost of the products specified and the

products provided.

The Contractor shall comply with the requirements of the Reciprocal Limitations 1998-Act 57 Commonwealth Procurement Code; Act 146 of 1986, the Trade Practices Act of July 23, 1968 P.L. 686 (71 P.S. 773.101 et seq.); and Act 3 of March 3, 1978, P.L. 6, commonly referred to as the "Steel Products Procurement Act", as outlined in the Special Requirements.

3.5 TAXES

Refer to Bid Document.

3.6 PERMITS, FEES, AND NOTICES

3.6.100 The Contractor shall obtain and pay for all permits, licenses and certificates required by Law and/or any public authority for the proper execution and completion of its work. The Contractor shall furnish proof of payment for all such permits, licenses and certificates, or proof that no permits, licenses or certificates are required. This proof must be furnished before the second request for payment.

3.6.101 The Contractor shall give all notices and comply with all applicable Laws, ordinances, regulations, rules and orders of any public authority bearing on the performance of the work. If the Contractor observes that any of the Contract Documents is at variance therewith in any respect, it shall promptly notify the Professional in writing. The Professional will make any necessary modifications. If the Contractor performs any work knowing it to be contrary to such applicable laws, ordinances, regulations, rules or orders, and without such written notice to the Professional, it assumes full responsibility therefor and shall bear all costs attributable thereto.

3.6.102 The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the Authority harmless from loss on account thereof. The Authority shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified. However, if the Contractor has reason to believe that the designing process or product specified is an infringement on a patent, it shall be responsible for such loss unless it promptly gives such information to the Authority.

3.7 SUPERINTENDENT

3.7.100 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. The superintendent is responsible for continuous field supervision, coordination and completion of the work, and for the prevention of accidents.

3.7.101 Job conferences shall be scheduled by the Authority and shall be attended by the superintendent or a representative of the Contractor authorized to make all decisions and representations affecting the contract and its progress in the project.

3.8 PROGRESS SCHEDULE

3.8.100 Immediately upon receipt of Notice to Proceed, the Contractor for general construction on the project shall furnish to each separate prime Contractor within fourteen (14) days a schedule of the proposed prosecution of the work under their contract. Each separate prime Contractor shall submit to the Contractor for general construction within twenty-one (21) days after issuance of the Notice to Proceed, a schedule of the proposed prosecution of their work. The

Contractor for general construction shall then submit to the Professional, CM, and the Authority within twenty-eight (28) days after issuance of the Notice to Proceed, a complete project schedule signed by all prime contractors indicating their approval, and showing in detail to the satisfaction of the Professional, CM and the Authority, the proposed dates for the performance of each phase of the work under each contract for the entire project.

- 3.8.101 In the event that the Authority, after the commencing of on-site work, grants an extension of time for sixty (60) days or more to a Contractor, the Contractor receiving the extension of time shall prepare a revised progress schedule for their prime contract. The Contractor involved in the extension shall forward their revised progress schedule to the Authority representatives within thirty (30) days from the approval of their extension. In no event will the granting of an extension of time to a one prime Contractor automatically entitle any other prime Contractor to an extension of time.
- 3.8.102 The Contractor shall complete portions of the work in such order of time as may be stated in the specifications or as required in the progress charts as approved by all prime Contractors and the Authority. The Authority may require the Contractor to apply additional resources to maintain the project schedule, if the Contractor negligently fails to process the work according to the approved project schedule, at no additional cost to the Authority. If the Contractor shall refuse or fails to proceed as directed by the Authority, the Authority may find the Contractor in breach of their contract and/or declare the Contractor in default.
- 3.8.103 In lieu of the project schedule requirements specified in this section, the Authority may specify alternate scheduling procedures in the General Requirements. In that case, the Contractor shall comply with those provisions and a project schedule need not be submitted as specified herein.

3.9 SHOP DRAWINGS

- 3.9.100 The Contractor shall prepare and submit, in accordance with Section 013300-Submittal Procedures, the necessary shop drawings, diagrams, illustrations, schedules, performance charts, brochures, catalog information and other data required to support the proposed installation methods and establish standards by which the work will be judged, according to and within the time schedule submitted by the Contractor and approved by the Professional and the Authority. The times for submission of shop drawings shall be mutually established so as not to delay the project or require a time extension to the contract completion date, without agreement by the Authority.
- 3.9.101 The Professional's approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents, unless the Contractor has informed the Professional in writing of such deviation at the time of submission, has noted the deviation on the shop drawings, and the Professional has given written approval of the specific deviation. The Professional's approval also does not relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.
- 3.9.102 No portion of the work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by the Professional. Any work commenced by the Contractor prior to final approval of the shop drawings and/or samples by the Professional is performed by the Contractor at its own risk.

3.10 JOB CONDITIONS

- 3.10.100 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permit and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment, unless otherwise permitted by the Authority. The Contractor shall at all

times keep the work site free from accumulation of waste materials or rubbish carried by their operations.

The site of the work is defined by limit of contract line shown on the drawings. Contractors may only extend their work beyond this line as may be necessary to satisfy requirements of all permits and to make utility and service connections. Before starting any work beyond the limit of contract, the Contractor will submit to the Professional and the Authority a description of the proposed work for their review and approval.

The Contractor shall cooperate in the arrangements of their work as necessary to least affect the administration or operation of any present building, and shall protect their materials. Existing utility services roads and access ways will not be interrupted without prior approval by the Authority. The Contractor will comply with the Authority's prescribed times for acceptable outage periods.

- 3.10.101 The Contractor shall at all times afford other contractors reasonable access to the site, material storage areas, and shall perform their work so as not to interfere with the work of other contractors.
- 3.10.102 The Contractor shall be responsible for providing temporary heat, light and water as necessary to execute and protect their work, and shall maintain adequate ventilation of the work site to ensure proper air quality for human breathing, material protection, and safety equipment operations.
- 3.10.103 The Contractor shall be responsible to obtain all approvals and certificates of occupancies from local and state authorities having jurisdiction over the project, and submit the completed documents to the Authority.

ARTICLE 4

CLAIMS AND DISPUTES

4.1 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

- 4.1.100 If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the Contractor shall be given to the Authority promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions.
- 4.1.101 The Authority will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the work, will recommend an equitable adjustment in the contract sum or contract time, or both. If the conditions at the site are not materially different from those indicated in the Contract Documents, no change in the terms of the Contract is justified. No adjustment shall be made to the contract sum, however, for concealed conditions encountered during cutting and patching of work.

4.2 CLAIMS FOR ADDITIONAL TIME OR COST

- 4.2.100 If the Contractor wishes to make a claim for an increase in the Contract Sum, written notice shall be given to the Authority before proceeding to execute the work.

- 4.2.101 If the Contractor wishes to make a claim for an increase in Contract Time, written notice shall be given, including an estimate of cost and of probable effect of delay on the progress of the work. If adverse weather conditions are the basis for a claim for additional time, such claim shall be documented by data from a recognized weather authority substantiating that weather conditions were abnormal for the period and could not have been reasonably anticipated. The Contractor shall also substantiate that weather conditions had an adverse effect on the scheduled construction.
- 4.2.102 No claims for increased costs, charges, expenses, or damages of any kind, except as provided in the General Conditions, shall be made by the Contractor against the Authority for any delays or hindrances from any cause whatsoever, including but not limited to strikes, walkouts or work stoppages during the progress of any portion of the work. The Authority may, however, compensate the Contractor for any such delays by extending the time for completion of the work, as provided in the Contract, which extensions shall constitute the exclusive remedy between the parties.

4.3 DISPUTES WITH THE AUTHORITY

- 4.3.100 The Contractor shall carry on the work and maintain the progress schedule during any claims, disputes questions, other related matters or proceedings unless otherwise agreed to in writing by the Contractor and the Authority.
- 4.3.101 In the event of any dispute, claim, question or other matter (hereinafter called disputed item) the Contractor shall immediately refer the disputed item in writing to the Authority Project Manager for a Determination, which said Determination shall be rendered in writing within a reasonable time.
- 4.3.102 Disputed items by the Contractor must be made known by written notice within 21 days after occurrence of the event giving rise to such disputed item, or within 21 days after the Contractor first recognizes the condition giving rise to the disputed item, whichever is later.
- 4.3.103 Claims Procedure: Determinations made by the Authority Project Manager shall be subject to the claims procedure as described herein. Any disputed item which the Contractor may have against the Authority under this contract, except those settled under these provisions, shall be subject to the following procedure for the resolution of same:
- A. Dispute Conference. Any disputed item which the Contractor may have against the Authority under this contract or any breach thereof that has been referred to the Authority Project Manager, except as has been waived by the failure of the Contractor to present a timely claim in accordance with this section, shall be subject to negotiation at a Dispute Conference. A Dispute Conference shall be scheduled by the Authority upon the written demand of the Contractor if submitted no later than thirty (30) days after the date of the Determination by the Authority Project Manager.
- B. Pre-Claim Hearing. Upon written demand by the Contractor, all disputed items which the Contractor may have against the Authority which have not been resolved at a Dispute Conference shall be heard at a Pre-Claim Hearing chaired by the Authority Director for Engineering & Capital Projects.

No demand for a Pre-Claim Hearing shall be made later than thirty (30) days after the date on which the Contractor has received a decision rendered by the Authority Project Manager as a result of a Dispute Conference, or from the fortieth (40th) day after the Dispute Conference was held, if the Contractor has not received a decision. Failure to demand a Pre-Claim Hearing within the required time period shall result in the decision of the Dispute Conference becoming final and binding upon the Contractor.

4.4 DISPUTES WITH OTHER CONTRACTORS

- 4.4.100 The Authority shall have no obligation to any third parties for any claim, nor be a party to any claims, disputes or actions between prime contractors or subcontractors concerning such additional expense or damage. Nor shall such claims or disputes be subject to Board of Claims proceedings.
- 4.4.101 Should the Contractor, either directly or by the Contractor's subcontractors, or their respective agents, servants, or employees, cause damage or injury to the property or work of any other prime contractor or contractors, or by failing to perform the Contractor's work (including the work of the Contractor's subcontractors) hereunder with due diligence, delay any other prime contractors who shall suffer additional expense or damage thereby, the parties involved in such dispute shall settle by agreement or arbitrate said claim, dispute or disputes by referring same to the American Arbitration Association. Said dispute or disputes shall be determined pursuant to the construction industry arbitration rules of the American Arbitration Association then in effect. Notice of the demand for arbitration shall be filed in writing with the other prime Contractors and with either the Philadelphia or Pittsburgh Regional Office of the American Arbitration Association, and a copy shall be filed with the professional and the Authority. The demand for arbitration shall be made within a reasonable time after the claim, dispute or other matter in question has arisen.
- 4.4.102 It is agreed by all parties that disputes or actions between Contractors concerning the additional expense or damage herein before mentioned shall not delay completion of the work which shall be continued by the parties, subject to the rights herein before provided. It is agreed by the parties to the contract (the Authority as promisee and the Contractor as promisor) that the intent of this clause is to benefit the other prime Contractors on the project or related projects and to serve as an indication of the mutual intent of the Authority and the Contractor that this clause raise such other prime Contractors to the status of third party beneficiaries only as to the terms and conditions of sections entitled Subcontractors and Disputes with the Authority. The Contractor agrees that these sections are provided as a benefit to the Contractor and that they specifically exclude claims against the Authority for delay or other damages.
- 4.4.103 The Contractor agrees that all claims, disputes and other matters in question between prime Contractors, which arise out of, or are related to this contract or the breach thereof shall be settled by agreement or resolved by arbitration in accordance with the construction industry arbitration rules of the American Arbitration Association then in effect, unless the parties mutually agree otherwise. This agreement to arbitrate shall be in consideration of the fact that all prime Contractors agree to this same arbitration provision as provided in each separate prime contract and that arbitration of all claims disputes and other matters in question shall be held within a reasonable time after the claim, dispute or other matter in question has arisen.

ARTICLE 5

SUBCONTRACTORS

- 5.1** A Contractor may not, except with the consent of the Authority, have a financial interest in any other contractor, subcontractor, or supplier providing services, labor, or material on this project. Failure to disclose the names of such subcontractors and/or suppliers shall be sufficient grounds for termination of this contract. Such failure may also be grounds for the initiation of civil or criminal proceedings.

- 5.2** Subcontractors employed by the prime contractors are solely responsible to the prime Contractor, and shall have no contractual relationship with the Authority.
- 5.3** All work performed for the Contractor by a subcontractor shall be pursuant to an appropriate agreement between the Contractor and the subcontractor. All agreements between Contractors and subcontractors shall contain provisions that:
- A. Preserve and protect the rights of the Authority and the Professional under the Agreement with respect to the work to be performed under the subcontract, so that the subcontracting thereof will not prejudice such rights.
 - B. Require that such work be performed in accordance with the terms, conditions and requirements of the Contract Documents.
 - C. Require that all claims for additional costs, extensions of time or otherwise with respect to subcontracted portions of the work, shall be submitted to the Contractor in the manner provided in the Contract Documents for like claims by the Contractor upon the Authority.
 - D. Require that each subcontractor and/or supplier fully warrants and guarantees for the benefit of the Authority as purchaser the effectiveness, fitness for the purpose intended, quality and merchantability of any item provided and/or installed by such subcontractor.
 - E. Require that the subcontractor is without privity of Contract to the Authority and that it agrees by signing the subcontract that it neither acquires nor intends to acquire any rights against the Authority on a third party beneficiary theory or any others.
- 5.4** The Contractor shall not sublet any part of this contract without written approval of the Authority. Within 30 days of a Notice to Proceed, the Contractor shall submit a list of all subcontractors they propose to use for written approval by the Authority. In all cases, this shall be prior to the first application for payment being submitted.
- 5.5** The Authority has the right to direct the Contractor to replace any subcontractor that the Authority objects to, for reasons that:
- A. The subcontractor has failed to work in accordance with the contract provisions, rules and regulations regarding Contractor performance, contract compliance, good order and conduct of their employees.
 - B. The subcontractor has defaulted or failed to perform on previous Authority projects.
 - C. The subcontractor has been suspended or debarred from doing business with the Commonwealth. The Contractor shall then submit another subcontractor for approval.
- Should there be a cost differential to the Contractor, the Contractor shall submit evidence to that fact, and the Contract Sum shall be increased or decreased by the cost difference by an appropriate Change Order.

ARTICLE 6

CHANGES IN THE WORK

6.1 RIGHT TO ORDER CHANGES

- 6.1.100 The Authority, without invalidating the agreement, may order changes in the work within the general scope of the agreement consisting of additions, deletions, or other revisions. The contract sum and time shall be adjusted accordingly, as they relate to the cost of the work, and

impact on completion of the work. The Contractor agrees that payment under any method shall be the exclusive compensation for such addition, deletion, or other revision to the original agreement.

- 6.1.101 Minor changes in the work not affecting the contract sum or extension of time, consistent with the intent of the Contract Documents, may be directed by the Authority without additional compensation or time extension.
- 6.1.102 Work that can reasonably be done concurrently with other contract work, without significant addition of labor or equipment or increasing the contract completion date, will not be subject to time extension.

6.2 CHANGE ORDERS

- 6.2.100 The cost or credit of changed work will be determined by one of the methods described herein:
 - A. By a detailed cost breakdown properly itemized. The breakdown shall include size, quantity, type, etc., and may include a maximum of fifteen percent (15%) markup to labor costs and a maximum of ten percent (10%) markup to material and equipment costs for overhead and profit.

The Contractor may include a maximum of ten-percent (10%) total markup to any subcontractor costs for overhead and profit. Subcontractors cannot exceed the markups stated herein for labor, material, or equipment costs.

- B. By unit prices stated in the bid proposal.
 - C. From prices as agreed upon in the Schedule of Values.
- 6.2.101 The Contractor shall not be entitled to profit which is lost as a result of deleted work, but shall be entitled to the overhead attributed to the items of work deleted from the Schedule of Values only when the contract completion date is not reduced.

6.3 UNILATERAL CHANGE ORDER

- 6.3.100 In the event that agreement cannot be reached as to the cost or credit of the changed work, the Authority shall prepare a cost estimate, and the Contractor will be issued a unilateral change order to proceed with the changed work at a cost not-to-exceed the Authority's estimate. The Contractor shall proceed with the work and maintain accurate records of the actual cost of labor and material to perform the work.
- 6.3.101 Upon completion of the work, if the Contractor's actual cost including profit and overhead for the work does not exceed the Authority's not-to-exceed cost estimate, a new change order will be issued in the amount of the Contractor's actual cost.
- 6.3.102 If the work is not completed, and if the Contractor's actual cost has equaled or exceeded the not-to-exceed limit of the unilateral change order, the Authority will audit the Contractor's actual cost and subsequently attempt to negotiate a cost for the remaining work. If agreement cannot be reached for the remaining work, another unilateral change order will be issued at the Authority's revised cost estimate to complete the work. In this case, the Contractor retains the right to claim for equitable adjustment under the disputes clause of this agreement.

ARTICLE 7

TIME

- 7.1 The time specified for the contract completion is the number of calendar days from the date of

the Notice to Proceed. The date for commencement of the work is the date of the Notice to Proceed. On site work shall commence no later than ten (10) days after the date of the Notice to Proceed.

- 7.2** Time extensions may be granted for events impacting the work beyond the control of the Contractor if the changed condition impacts a work item on the critical path of the project schedule, and the scheduled substantial completion date is extended.

ARTICLE 8

PAYMENTS AND COMPLETION

- 8.1** The Contractor warrants and guarantees that title to all work, materials, and equipment covered by an application for payment, whether incorporated in the project or not, will pass to the Authority upon the receipt of such payment, free and clear of all terms, claims, security interests, or encumbrances.

8.2 PAYMENTS

- 8.2.100 Performance by the contractor in accordance with the provisions of the contract shall entitle the contractor to payment by the Authority. The Authority shall pay the contractor according to the provisions of this section for all items that appear on the application for payment and have been satisfactorily completed. Applications for payment will not be considered to be acceptable unless they meet all the requirements specified in Section 012900 - Payment Procedures and as outlined elsewhere in the contract documents.

8.2.101 Schedule of Values:

The contract sum is stated in the agreement and is the total amount payable for the performance of the work in compliance with the Contract Documents. Before any application for payment can be submitted, the Contractor shall submit to the Authority for its approval a detailed breakdown of the costs indicating a schedule of quantities and values for the items of work included in the contract, as required in Section 012900-Payment Procedures. Each item in the Schedule of Values shall include its proper share of overhead and profit.

The Schedule of Values, when approved by the Authority shall be used as a basis for the Contractor's application for payments. This Schedule of Values may also be used to determine the cost or credit to the Authority resulting from the changes in the work.

- 8.2.102 The Authority may decline to approve any Application for Payment, or portion thereof, because of subsequently discovered evidence or subsequent inspections, which may nullify the whole or part of any Application for Payment previously issued, to such extent as may be necessary to protect the Authority from loss because of:
- A. Defective work not remedied.
 - B. Failure of the Contractor to make payments properly to subcontractors or for labor, materials, and equipment.
 - C. Reasonable evidences that the work cannot be completed for the unpaid balance of the Contract Sum.
 - D. Reasonable evidence that the work will not be completed within the Contract Time and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay.

E. Unsatisfactory prosecution of the work by the Contractor.

8.2.103 Retainage:

Normally, payment of the total amount will be made upon substantial completion, final inspection, and acceptance of the work. However, when a contract exceeds \$10,000 and upon written request, partial payments may be made after completion of portions of the work. To ensure proper performance of the contract, the Authority shall retain from all partial payments an amount not to exceed ten percent (10%) of the amount due the contractor until fifty percent (50%) of the contract is completed. The sum to be withheld from the contractor after the contract is fifty percent (50%) completed shall not exceed five percent (5%) of the value of the completed work based on monthly progress payment requests.

When the contract is fifty percent (50%) completed, one half of the amount retained by the Authority shall be returned to the contractor. However, the architect, engineer, or Authority project representative must approve the application for payment for reduction in retainage. The contractor must be making satisfactory progress, and there must be no specific cause for greater withholding.

All money retained by the Authority may be withheld from the contractor until substantial completion of the contractor. However, in the event a dispute arises between the Authority and any prime contractor, which dispute is based upon increased costs claimed by one prime contractor occasioned by delays or other actions of another prime contractor, additional retainage in the sum of one and one-half times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the contractor causing the additional claim furnishes a bond satisfactory to the Authority to indemnify the Authority against the claim.

In absence of sufficient reason, within 20 days of receipt of payment of retainage, the contractor shall pay all subcontractors with which it has contracted their earned share of the retainage payment the contractor received.

8.2.104 Withholding of Payments for Good Faith Claims

The Authority may withhold payment for deficiency items according to the terms of the contract. If the Authority withholds payment from a contractor for a deficiency item, the Authority shall notify the contractor of the deficiency item within the timeframe specified in the contract or 15 calendar days of the date that the application for payment is received.

The Contractor may withhold payment from any subcontractor who is responsible for any deficiency item for good faith claims. If a contractor withholds payment from a subcontractor for a deficiency item, it must notify the subcontractor or supplier and the Authority of the reason within 15 calendar days of the date after receipt of the notice of the deficiency item from the Authority.

8.2.105 Payments to Subcontractors

For the purposes of this section, the contract between the contractor and the subcontractor is presumed to incorporate the terms of the contract between the contractor and the Authority. When a subcontractor has performed in accordance with the provisions of the contract, a contractor shall pay to the subcontractor, and each subcontractor shall in turn pay to its subcontractors, the full or proportioned amount received for each such subcontractor's work and material, 14 days after receipt of a progress payment. Neither the Authority nor any Professional shall have any obligation to pay or see to the payment of any monies to any subcontractor except as may be otherwise required by law.

8.2.106 Substantial Completion and Final Payment:

For all contracts containing a provision for retainage, the design professional shall make a final inspection within 30 days receipt of a request by the contractor for final inspection and

application for final payment. If the work is substantially complete, the design professional shall issue a certificate of substantial completion and a final certificate for payment.

The Authority shall make payment in full within 45 days except as provided for in Article 8.2.103 Retainage, less only one and one-half times the amount required to complete any then-remaining uncompleted minor items, which amount shall be certified by the design professional and, upon receipt by the Authority of any guarantee bonds which may be required, in accordance with the contract, to ensure proper workmanship for a designated period of time. The certificate of substantial completion given by the design professional shall list in detail each uncompleted item and a reasonable cost of completion. Final payment of any amount withheld for the completion of the minor items shall be paid upon completion of the uncompleted items listed in the certificate of substantial completion of the design professional.

Payment under this section will be made upon satisfactory completion of the work specified in the Contract Documents and completion of all requirements listed in Section 012900 - Payment Procedures.

8.3 ACCEPTANCE OF WORK

8.3.100 An application for progress payment, a progress payment, or any partial or entire use or occupancy of the project by the Authority shall not constitute an acceptance of any work not in accordance with the Contract Documents.

8.3.101 Partial Occupancy or Use:

The Authority may occupy or use any completed or partially completed portion of the work at any stage when such portion is so designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer, and authorized by public authorities having jurisdiction over the work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Authority and the Contractor have accepted in writing the responsibilities assigned to each of them for payments, security, maintenance, heat, insurance, etc.

Immediately prior to such partial occupancy or use, the Authority, Contractor, and Design Professional shall jointly inspect the area in order to determine and record the condition of the work, and agree to the period for correction of this work and as to the commencement of warranties.

8.4 Any person, co-partnership, association, or corporation furnishing labor, material, equipment or renting equipment or rendering public utility services in connection with performance of this contract shall have a right of action to recover the cost thereof from the Contractor and the Surety on the bond given to secure the payment for such labor, material, equipment or equipment rental and services rendered by public utility as though such person or corporation had been named as obligee in such bond; subject to the provisions of the act 1998 Act 57 Commonwealth Procurement Code.

8.5 NO ESTOPPEL OR WAIVER OF LEGAL RIGHTS

8.5.100 Neither the Authority nor the Professional shall be precluded or estopped by the measurements or approved applications for payment made or given by any of them or by any of their agents or employees, at any time, either before or after the completion and acceptance of the work and payment thereof, from showing the true and correct amount and character of the work performed and materials and equipment furnished by the Contractor. The Authority and/or the Professional may show at any time, that any such measurements or approved applications for payment are untrue or incorrectly made in any particular; or that the work or materials, equipment or any parts thereof do not conform to the Contract Documents.

8.5.101 The Authority shall have the right to reject the whole or any part of the aforesaid work or

materials and equipment should the said measurements or approved applications for payment be found or be known to be inconsistent with the terms of the contract, or otherwise improperly given. The Authority shall not be precluded or estopped, notwithstanding any such measurements or approved applications for payment in accordance therewith, from demanding and recovering from the Contractor or their Surety, or both, such damages as it may sustain by reason of the Contractor's failure to comply with the terms of the Contract Documents, or on account of any over-payments made on any approved applications for payment.

- 8.5.102 Neither the acceptance by the Authority or the Professional or any of their agents or employees, nor any certificate approved for payment of money; nor any payments for, nor acceptance of the whole or any part of the work by the Authority, nor any extension of time, nor any position taken by the Authority or its employees, shall operate as a waiver of any portion of the contract or any power herein reserved by the Authority or any right to damages. A waiver of any breach of the contract will not be held to be a waiver of any other or subsequent breach.

ARTICLE 9

PROTECTION OF PERSONS AND PROPERTY

9.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs required under their portion of the work and maintained during the term of the contract.

9.2 SAFETY OF PERSONS AND PROPERTY

- 9.2.100 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

- A. All employees on the work, and all other persons who may be affected thereby.
- B. All the work materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of their subcontractors.
- C. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

- 9.2.101 The Contractor shall comply with all applicable, laws, ordinances, rules, regulations and orders of any public authority having jurisdiction of the safety of persons or property or to protect them from damage, injury or loss. The Contractor shall erect and maintain as required by existing conditions and progress of the work, until the acceptance of the completion of their portion of the project, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

- 9.2.102 The Contractor shall designate a responsible member of their organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Authority and the Professional.

- 9.2.103 Explosives shall not be used in the work without specific written approval by the Authority of the Contractor's plan for storage and use of them for accomplishing the work, and the Contractor providing the local Blasting Permit if required, the license for the person doing the blasting, and the Certificate for Insurance indicating blasting is included in the coverage.

9.3 EMERGENCIES

In any emergency affecting the safety of persons or property, the Contractor shall act, at their discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor because emergency work shall be determined as provided in Changes in the Work.

ARTICLE 10

INSURANCE

10.1 GENERAL

10.1.100 All policies shall be issued by insurance companies known to be financially sound and authorized to conduct such business under the laws of the Commonwealth of Pennsylvania.

10.1.101 Coverage shall be maintained without interruption from the date of commencement of the work until the date of final payment and termination of any coverage required to be maintained after final payment.

10.1.102 Insurance required herein shall also name the Authority of the Commonwealth of Pennsylvania as an additional insured, as its interest may appear, and Additional Insured Endorsements shall be provided along with the Certificates of Insurance.

10.1.103 Certificates of Insurance: A Certificate of Insurance acceptable to the Authority shall be filed with the Authority prior to the Authority issuing a Notice to Proceed. In no case shall any commencement of work on site be permitted until the required Certificates of Insurance have been provided and accepted by the Authority.

A. The Certificates of Insurance shall contain a provision that "coverage afforded under the policies will not be canceled, allowed to expire, or in any way changed, including alterations to the conditions of the policy, until at least thirty (30) days written notice has been given, by registered mail, to the Authority".

The Contractor will be responsible to ensure these notifications occur. Furthermore, should there be no notifications of policy expirations, terminations, or alterations of the insurance coverage, it will be the understanding of the Authority that the insurance coverage will be as required in the Contract, or as has been indicated in the latest issued Certificate of Insurance accepted by the Authority.

B. All exclusions to the insurance policies shall be either provided on the Certificate of Insurance, or attached to it as a List of Exclusions. Such exclusions must be acceptable to and agreed to by the Authority. If no such listing is provided, it will be understood by the Authority that there are no exclusions to the policies.

C. The deductible amounts for the coverage provided shall be indicated by the insurance company or companies providing the policies. This information shall be sent along with the Certificates of Insurance.

10.1.104 Copies of all insurance policies shall be made available upon request of the Authority.

10.1.105 At any time the insurance provisions of the agreement, as described herein, are not being maintained, the work of the Contractor may be terminated or suspended, according to the provisions of Article 12-Suspension of the Work and Article 13-Termination of the Work

Agreement.

10.2 CONTRACTOR'S LIABILITY INSURANCE

10.2.100 The Contractor shall purchase and maintain such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by the Contractor or by a subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- A. Claims under Workers Compensation Disability Benefit and other similar employee benefit Acts. Employees Liability Insurance, with a minimum of \$1,000,000 aggregate coverage, is to be provided on the same operations.
- B. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees.
- C. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees.
- D. Claims for damages because of injury to or destruction of tangible property including loss of use resulting therefrom.

10.2.101 The Contractor's commercial general liability insurance and automobile liability insurance shall be written for not less than \$500,000 for injuries including accidental death to any one person, and subject to the same limit for each person, in an amount not less than \$3,000,000 for each occurrence. The Contractor's property damage liability insurance shall be in an amount not less than \$3,000,000 for each occurrence.

10.2.102 The commercial general liability insurance shall:

- A. Include completed operations and products liability coverage.
- B. Shall include contractual liability coverage as necessary to meet the Contractor's obligations under Third Party Indemnification and Authority Indemnification and Hold Harmless.
- C. Shall include the special property damage liability coverage commonly referred to as XCU (explosion, collapse, and underground damage), unless the Authority approves a Contractor's request to exclude this coverage.
- D. Shall include adequate protection against special hazards when required, i.e.: blasting, etc.

10.2.103 Subcontractors Insurance:

- A. The Contractor shall either require each of its subcontractors to procure and to maintain during the life of its subcontract subcontractor's commercial general liability, automobile liability, and property damage liability insurance of the type and in the same amounts as specified in this Article, or insure the activity of its subcontractors in its own insurance policies.
- B. The Contractor shall require each subcontractor to provide Worker's Compensation and Employer's Liability insurance covering all persons employed by such subcontractors on work to be performed on this contract.

- C. The Contractor must submit to the Authority, prior to any subcontractors or sub-subcontractors commencing of any on site work, evidence that the subcontractors or sub-subcontractors are covered by insurance as required herein.

10.3 PROPERTY INSURANCE

- 10.3.100 The Contractor shall purchase and maintain property insurance for all insurable work included in the Contract, in the amount of the original Contract Sum as well as subsequent modifications thereto, in the names of the Authority and the Contractor as their respective interests may appear, in full 100% of the insurable value thereof, including:
 - A. Items of labor and materials connected therewith whether in or adjacent to the structure insured.
 - B. Materials in place or to be used as part of the permanent construction, including surplus materials, protective fences, bridges, temporary structures, miscellaneous materials and supplies incident to the work.
- 10.3.101 The property insurance will include and fully protect the interest of the Authority, the Commonwealth of Pennsylvania, the Contractor, subcontractors, and sub-subcontractors. The Contractor shall submit to the Authority for its approval all items deemed to be uninsurable.
- 10.3.102 Property insurance shall be on an all-risk policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse due to ice and snow, temporary structures, and debris removal as associated hereto.
- 10.3.103 The risk of damage to the construction work due to the perils covered by the said property insurance with extended coverage, is that of the Contractor, and no claims for such loss or damage will be recognized by the Authority, nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.
- 10.3.104 Partial occupancy or use in accordance with Article 8.3.101 Partial Occupancy or Use shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise.

ARTICLE 11

UNCOVERING AND CORRECTION OF WORK

11.1 UNCOVERING OF WORK

- 11.1.100 Work performed under the contract is subject to inspection by the Authority. If a portion of the work is covered contrary to the request of the Authority or Professional, it must, if required by the Authority or Professional, be uncovered for its observation, and replaced at the Contractor's expense without change in Contract Time.
- 11.1.101 If a portion of the work has been covered which the Authority or Professional has not specifically requested to observe prior to being covered, the Authority or Professional may request to see such work, and it shall be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall be charged to the Authority.

If the work is not in accordance with the Contract Documents, the work will be removed and

replaced by the Contractor, within the period specified by the Authority by written notice, at no additional cost to the Authority. The Authority may, upon failure by the Contractor to replace the nonconforming work, have the work removed and replaced at the Contractor's expense.

11.2 CORRECTION OF DEFECTIVE OR NON-CONFORMING WORK

11.2.100 The Contractor shall promptly correct all work rejected by the Authority or Professional as defective or as failing to conform to the Contract Documents, whether observed before or after substantial completion and whether or not fabricated, installed or completed. All defective or non-conforming work shall be promptly removed from the site. The Contractor shall bear all costs of correcting such rejected work, including the cost of the Professional's additional services and any additional cost incurred by the Authority. Should the Contractor fail to respond in an expedient manner, the Authority may correct the work under Article 2.2-the Authority's Right to Carry Out the Work.

11.2.101 If, within one year after the date of substantial completion and acceptance of all work performed under the Contract or within such longer period of time as may be prescribed by Law or by the terms of any applicable special guarantee required by the Contract Documents, any of the work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Authority to do so, unless the Authority has previously given the Contractor a written acceptance of such specific condition. The Authority shall give such notice promptly after discovery of the condition.

If required, the Maintenance Bond hereto attached and made a part hereof shall provide a guarantee in the sum of ten percent (10%) of the total Contract sum of the work done for the correction and remedy of such defect. If the corrective work is not completed within thirty (30) days after notification by the Authority to the Contractor, the Authority may do the work and submit those costs to the Contractor's Surety for reimbursement.

11.2.102 The Contractor shall bear the cost of making good all work of other Prime Contractors destroyed or damaged by such removal or correction.

11.2.103 If the Contractor does not remove such defective or non-conforming work within the time fixed by written notice from the Authority, the Authority may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Authority may, upon ten (10) additional days written notice, sell such work at auction or at private sale and, after deducting all the costs that should have been borne by the Contractor pursuant to the provisions of this paragraph, shall account for the net proceeds of the sale. If such proceeds of sale do not cover all costs that the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate change order shall be issued. If the payments then or thereafter due to Contractor are not sufficient to cover such amount, the Contractor and/or the Contractor's Surety shall pay the difference to the Authority.

11.2.104 The obligations of the Contractor under this section are in addition to and not in limitation of any obligations imposed upon the Contractor by special guarantees required by the Contract Documents or otherwise prescribed by law. Correction of defective work in no way reduces or eliminates the Contractor's responsibilities under the warranty provisions of the contract.

11.3 ACCEPTANCE OF NON-CONFORMING WORK

If the Authority elects to accept non-conforming work, it may do so instead of requiring its correction or removal and replacement. If nonconforming work is accepted, a change order shall be issued to reflect an appropriate reduction in the Contract Sum to reflect the actual cost reduction of the change in the work, or, if the amount is determined after final payment, it shall be paid by the Contractor and/or its Surety. In this case, all the costs of uncovering and recovering the work shall be at the expense of the Contractor, and which costs shall not be included as part of any deduct change order.

ARTICLE 12

SUSPENSION OF THE WORK

12.1 SUSPENSION OF WORK FOR CONVENIENCE

12.1.100 The Authority may order the Contractor in writing to suspend all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the Authority. This paragraph does not apply under conditions enumerated in Paragraph 12.2--Suspension of Work due to Unfavorable Conditions.

12.1.101 If the performance of all or any part of the work is, for an unreasonable period of time, suspended by the Authority, an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) necessarily caused by such unreasonable suspension. The Contract shall be modified in writing accordingly. No adjustment shall be made under this clause for any suspension to the extent that performance would have been so suspended by any other cause, including the fault or negligence of the Contractor; or for which an equitable adjustment is provided for or excluded under any other provision of this Contract.

12.1.102 No claim under this clause shall be allowed unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension. The claim may not be asserted later than the date of Final Completion under the Agreement.

12.2 SUSPENSION OF WORK DUE TO UNFAVORABLE CONDITIONS

12.2.100 If, in the judgment of the Authority, the Contractor is taking undue risk of damage to any part of a structure or installation by proceeding with the work during unfavorable weather or other conditions, then the Authority may suspend the work temporarily, either wholly or in part for such periods as are necessary. In case of such suspension, a proper extension of time will be allowed as provided herein, but no allowance will be made to the Contractor for any expense or damages resulting from the suspension. The failure of the Authority to suspend the work does not relieve the Contractor of its responsibility to perform the work in accordance with the Contract Documents.

12.2.101 The Authority may require a suspension of the work if, in its opinion, unforeseen conditions warrant such stoppage. When the Authority directs resumption of the work, the Contractor shall resume full operations within a period of ten (10) days after the date of written notice to do so. The Authority is not liable for any damage or anticipated profits on account of the work being suspended.

12.2.102 Any work done by the Contractor during the period of suspension is its responsibility. The contractor shall receive no payment for the work unless the construction is subsequently resume and the work done during the intervals of suspension can be utilized in the resumed work.

12.2.103 Suspensions of work as outlined above shall not in themselves operate to extend the Contract date of completion. Requests for extensions of time shall be submitted in writing by the Contractor, setting forth its reasons for the extension.

12.3 SUSPENSION OF WORK FOR FAULT OF THE CONTRACTOR

Should the Contractor fail to comply with the orders of the Authority relative to any particular parts of the work, the Authority may suspend the work on any or all parts until its orders respecting the particular parts are complied with. In case of such suspension, which shall be considered due to the fault of the Contractor, no extension of time shall be given and no allowance will be made for the expenses incurred by the Contractor during the suspension period.

ARTICLE 13

TERMINATION OF THE AGREEMENT

13.1 TERMINATION FOR CONVENIENCE

13.1.100 The Authority may, at any time and for any reason, terminate this Agreement for the convenience of the Authority. In such case, the Contractor shall be paid (and shall accept payment) for that portion of the entire Contract actually performed to the date of termination, excluding, however, any loss of anticipated profits. Disputes as to the sum payable to the Contractor shall be settled in accordance with the Disputes Article of the Agreement.

13.1.101 Such termination shall be effective in the manner and at the time specified in such notice and shall be without prejudice to any claims that the Authority may have against the Contractor. Upon receipt of such notice from the Authority, the Contractor shall immediately discontinue all work and the placing of all orders for materials and equipment, facilities and supplies in connection with the performance of this Contract. The Contractor shall cancel promptly all existing orders and terminate work under all subcontracts so far as such orders and work are chargeable to this Contract. The Contractor shall take such measures for the protection of the property of the Authority as may be directed by the Authority.

13.1.102 Upon termination of this Agreement, as provided by this paragraph, full and complete adjustment and payment of all amounts due the Contractor arising out of this Agreement as determined by an audit conducted by or for the Authority, as soon as practicable after such termination, shall be made as follows:

- A. The Authority shall reimburse the Contractor for all costs incurred to date of termination, including reasonable overhead and expense made in the performance of this Contract, less amounts previously paid.
- B. The Authority shall also reimburse the Contractor for all costs to which the Contractor has been subjected or is legally liable for by reason of the termination of this Contract, including reasonable costs related to cancellation of orders, termination of subcontracts, etc.
- C. The Authority shall also reimburse the Contractor for the reasonable cost of providing protection of the property of the Authority as directed by the notice of termination.
- D. The sum total of the payments made under this paragraph shall not exceed the total amount of the Agreement, less payments previously made.
- E. Title to all property accruing to the Authority by reason of the termination of this Contract shall immediately vest in the Authority, and the Contractor will execute and deliver to the Authority all papers necessary to transfer title.

- F. The Authority or its representative shall be afforded full access to all books, correspondence, data and papers of the Contractor relating to this Contract in order to determine the amount due.

13.2 TERMINATION FOR DEFAULT OF THE CONTRACTOR

- 13.2.100 If the Contractor persistently or repeatedly refuses or fails to supply enough properly skilled workmen or proper materials, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or fails to proceed as directed by the Authority, or performs the work unsuitably, or neglects or refuses to remove materials or replace rejected work, or discontinues the prosecution of the work without approval of the Authority, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the Authority may, without prejudice to any of its other rights or remedies, give the Contractor and its Surety written notice that the Contractor has seven (7) days from the date of the Authority's notice to cure the default set forth in the notice.

The discretion to declare the Contractor in default is solely the Authority's, and, no party, whether bound by Agreement to the Authority or attempting to raise a third party relationship, which this Contract specifically precludes, has standing to raise the failure of the Authority to exercise its discretion, if default is the basis of a claim against the Authority.

Should the Contractor fail to cure said default within the specified time, the Authority may terminate the Agreement between the Authority and the Contractor and may take possession of the site and of all materials, equipment, tools, construction equipment and machinery, which is owned by the Contractor, located on the property and may finish the work by whatever method it may deem expedient.

- 13.2.101 In such case, the Contractor is not entitled to receive any further payment until the work is finished, at which time the Contractor shall be paid any excess remaining. If the unpaid balance of the Contract sum exceeds the cost of finishing the work, including compensation for the Professional's additional services and any other damages which the Authority has incurred in accordance with the Agreement, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor or the Surety or both shall pay the difference to the Authority.
- 13.2.102 In the event the Authority wrongfully terminates the contract, as determined by disputes resolution procedures in the disputes section of the General Conditions, such termination shall be considered termination for convenience. The Contractor shall be paid only for the work completed to the termination date and for the materials delivered to the site that is peculiar to the project, and for other costs incidental to termination to the date of termination.

ARTICLE 14

DEFINITIONS

- 14.1** As used in these General Conditions, and in the Agreement, the following definitions shall be described herein, unless the context clearly dictates otherwise.
- A. Agreement means the Agreement or Contract, for construction services of which these general conditions are made a part. The term "Agreement" shall be interchangeable with the term "Contract" throughout this document.
 - B. Change Order is a written order to the Contractor, signed by the Authority, and issued after the execution of the Contract, authorizing a change in the work or an adjustment in the Contract sum or the Contract time. The Contract sum and the Contract time may be changed only by change order.

- C. Claim or Disputed Item means a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract.
- D. Contract Sum is the sum stated in the Agreement, and, including authorized adjustments, is the total amount payable by the Authority to the Contractor for performance of the work under the Contract Documents.
- E. Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for substantial completion of the work.
- F. Contractor, or Prime Contractor shall be the entity with whom the Authority shall enter into an agreement to provide the means and methods to construct the Project in accordance with the Contract Documents.
- G. Deficiency Item is work performed but which the design professional, the contractor, or the inspector will not certify as being completed according to the contract.
- H. Final Completion is when the project is completed, in accordance with the Contract Documents.
- I. Inspector is the person authorized or engaged by the Authority to inspect the work performed and materials furnished pursuant to a contract to determine whether the work completed is in compliance with the contract.
- J. Professional is a person or entity that acts as an agent for the Authority in the administration of the contract and may perform any functions deemed necessary as determined through agreement with the Authority.
- K. Subcontractor is a person or entity who has contracted to furnish labor or materials to or has performed labor for a contractor or another subcontractor in connection with a contract.
- L. Substantial Completion is the stage in the progress of the work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Authority can occupy or utilize the work for its intended use. In no event shall a project be certified as substantially complete until at least 90% of the work on the project is completed.
- M. Authority shall mean the Authority or Pennsylvania Convention Center Authority authorizing the contract or any authorized representative thereof.
- N. Work includes all services and labor necessary to produce the construction required by the Contract Documents. It also includes all material and equipment incorporated or to be incorporated into such construction.

END OF SECTION

SECTION 004321 - ALLOWANCE FORM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 BID INFORMATION

- A. Bidder: _____.
- B. Project Name: PCC – 12th Street Masonry Repairs.
- C. Project Location: 1101 Arch Street.
- D. Owner: PA Convention Center.
- E. Architect: VITETTA Architects and Engineers.
- F. Architect Project Number: 6309.28.
- G. Construction Manager: Joseph Jingoli & Son, Inc.

1.3 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 012100 "Allowances."

1.4 SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this ____ day of _____, <Insert year>.
- B. Submitted By: _____ (Insert name of bidding firm or corporation).
- C. Authorized Signature: _____ (Handwritten signature).
- D. Signed By: _____ (Type or print name).
- E. Title: _____ (Owner/Partner/President/Vice President).

END OF DOCUMENT 004321

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and drawing conventions.
9. Miscellaneous provisions.

- B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Pennsylvania Convention Center Trainshed 12th Street (West) Masonry Wall Renovations, VITETTA Project Number 6309.2800.

1. Project Location: 1101 Arch Street, Philadelphia, PA 19107.

- B. Owner: Pennsylvania Convention Center Authority.

1. Owner's Representative: Stephen Shepper, Director of Engineering and Capital Projects, Pennsylvania Convention Center, 215-218-4742, sshepper@paconvention.com.

- C. Architect: VITETTA, Architects and Engineers.

1. Architect's Representative: Nan R Gutterman, FAIA, FAPT, Project Manager, 105 Chesley Drive, Media PA , 19063, 215-218-4883, gutterman@vitetta.com.

- D. PCCA Anti-Discrimination Policy:

1. Contractors are referred to the Authority's Anti-Discrimination Policy attached to the General Conditions. Bidders must comply with all requirements outlined in the Policy and submit evidence of their Best and Good Faith Efforts, which include their solicitation of and commitments with M/W/DSBEs, to the Authority due with the submission of their bid.

- E. Field Supervision: General Contractor shall maintain an experienced full-time supervisor on the Site per Section 3.7 of the General Conditions.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following exterior work:
1. Repointing of Masonry on 12th Street; brick and granite at the piers, infill walls, and masonry below storefronts along 12th Street.
 2. Repair and replacing of brick units in the masonry on 12th Street; brick and granite at the piers, infill walls, and masonry below storefronts along 12th Street. There are approximately 800 bricks indicated to be replaced as part of this contract. The Contractor shall include in their base bid the furnishing and installation of 1000 brick Type 1 (2 pallettes of brick - each palette containing 500 bricks)
 3. Repair of the granite along 12th street.
 4. Cleaning of Masonry on 12th Street; brick and granite at the piers, infill walls, and masonry below storefronts along 12th Street.
 5. Removal and installation of sealant and backer rod at all joints where sealant is existing on the 12th Street Elevation not limited to the following: between cast iron and storefronts, cast iron and masonry, the entire perimeter of the storefronts and the merchant windows/displays, all vertical joints between masonry piers and masonry infill where sealant is currently installed and the entire length of the building(both sides of Filbert Street.
- B. Type of Contract:
1. Project will be constructed under a single prime contract. The prime contractor shall be able to complete a minimum of 45% of the contract work with their only staff.

1.5 PHASED CONSTRUCTION

- A. The Work shall be conducted in a single phase but will need to be scheduled with both the PCCA and the Reading Terminal Market in order to insure the continuous operations of the Convention Center and the Market.
1. The Contractor shall anticipate the work commencing within 30 days after the Notice to Proceed unless directed otherwise by the Owner.
- B. Before commencing Work, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates for all phases of the Work.

1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by PCCA's and the Market's right to continue to use the building for events.
- B. The Contractor shall not impede exiting on any of the fire exit stairs when completing the work. The Contractor shall also need to coordinate the work with all doors into the Reading Terminal market – as no doors can be blocked during the hours that the Market is opened.
- C. Use of Site: Limit use of Project site to areas within the Contract limits as indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits: Confine construction operations to the areas provided by the Owner.
 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, Market employees and all emergency vehicles at all times. Do not use these areas for parking or storage of materials except in locations indicated on the contract documents.

- a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
- b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy the site and the existing building during the entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the day-to-day operations of the building. Maintain existing exits unless otherwise indicated or permitted. Owner will require access to all areas of the Project Site and the building during the entire Project duration.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction. All request and approvals must be in writing.
 2. Notify Owner in writing not less than 72 hours in advance of activities that may affect Owner's operations.
 3. The Contractor will also need to coordinate their work with other projects being completed by the Reading Terminal Market.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to normal business working hours defined as 7 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated. The Contractor shall confirm and meet all requirements of the City of Philadelphia code.
1. Weekend Hours: Limit work to 8 am to 5 pm and as permitted by the City of Philadelphia.
 2. Early Morning Hours: Only with approval in writing by authorities having jurisdiction for restrictions on noisy work. The Contractor must comply with the City Noise Ordinance as specified in the Philadelphia Code Chapter 10-400.
 3. If portions of the Work require construction activities to take place before or after Normal Working Hours, during weekends and/or on holidays. All costs to work before or after Normal Working Hours, including but not limited to, any differential labor rates are to be included in the Contractor's bid amount.
 4. All loading and un-loading shall be coordinated by the Contractor with the Owner's schedule.
 5. For any work to take place before or after Normal Working Hours, during weekends, or on national or City holidays, Contractors must have approval of the Authority having Jurisdiction and request in writing the Owner's approval a minimum of 72 hours in advance. This time limit shall not apply to unforeseeable instances when a particular operation must be performed in a continuous sequence that extends beyond the Normal Working Hours, but the Owner's Representative shall be notified immediately of such instances.
 6. Contractors shall use overtime, premium time, and/or multiple-shift time as is necessary to meet the Project requirements. This includes any costs associated with requirements

- to meet the contract schedule; work in an Occupied Building; schedule work so as not to disrupt the tenants; and any other requirement set forth in the Contract Documents.
7. The need to perform work before or after Normal Working Hours, on weekends, and/or on holidays shall not be considered cause for an extension of Contract Time, or additional costs or a delay claim by a Contractor.
 8. Failure by the Owner to approve a Contractor's request to perform Work before or after Normal Working Hours, on weekends, and/or on holidays shall not be considered cause for an extension of Contract Time or a delay claim by the Contractor.
 9. Denial by the Owner of a Contractor's request to perform Work before or after Normal Working Hours, on weekends, and/or on holidays shall not be considered cause for an extension of Contract Time or a delay claim by the Contractor.
 10. Hours for Utility Shutdowns: There should be no utility shutdowns required. If required, the Contractor shall coordinate with the Owner' schedule and shall include all costs in the Contractor's bid amount.
 11. Comply with all regulations of governing authorities having jurisdiction relative to traffic, safety, erosion, noise, pollution control, and other matters of public concern and safety.
 12. Limit use of the premises to the areas identified on the contract documents. Do not disturb or use portions of the site beyond the locations shown and scheduled except as required for approved means of egress.
 13. Ensure that construction activities and operations do not unnecessarily impact upon or distract the building's occupants, visitors or the public. Control dust, noise and visual distraction.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner's representative and Architect in writing not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's Representative written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Owner's Representative and Architect in writing not less than two days in advance of proposed disruptive operations.
 2. Obtain Owner's Representative and Architect's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted on the scaffold, high -reach or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes. A designated smoking area will be identified by the Owner for the Contractor's use if requested in writing by the Contractor.
- F. The use of radios is not permitted.
- G. Trash/Construction Debris
1. All materials that are disposed of shall be placed in a dumpster. Failure to place the materials in a dumpster in a timely manner or upon request of the Owner or the city will result in a back charge for the cost of moving the materials to the dumpster.
 2. Placing construction debris in any of the Owner's dumpsters is not allowed.
 3. There is limited space available for the contractor's dumpsters. General Contractor to submit proposed locations for review with the Owner and shall coordinate the locations

with the Owner's operations. Placement/emptying dumpsters on the site shall not impact the Owner's operations.

- H. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- I. Occupied Building: Contractors shall assume that the building is fully occupied during Normal Working Hours. Each Contractor shall take every reasonable precaution to minimize disruption to the building's occupants and visitors at all times during the Project. Additionally, the following specific restrictions shall be strictly adhered to:
 - 1. Any work to be performed on the building – producing welding flash, potentially hazardous fumes, fumes that might irritate occupants or interfere with the occupancy shall be performed before or after Normal Working Hours, on weekends, and/or on holidays, unless the Contractor has requested in writing a specific exception (assuring the Owner that the work will not create any hazard for or disruption of the occupants) and received written approval of the exception from the Owner. Contractor shall not cause fumes, dirt, dust or noise to disrupt the occupants or operations of the building. If Owner or any occupant is disrupted for whatever reason, Contractor shall stop Work immediately clean-up, remove the source of the complaint and reschedule the Work so as to eliminate the disruption. All costs associated with this requirement are to be included in the Contractor's Bid.
 - 2. The Contractor and his Sub-Contractors will be allowed by the Owner to use "designated" toilet facilities in the building. If the Contractor and his Sub-Contractors are found to be damaging the toilet facilities, this privilege will be taken away from the Contractor and other provisions will need to be made by the Contractor at no cost to the Owner.
 - 3. All restrictions and constraints indicated in the Contract Documents shall be incorporated into the Construction Schedule to be prepared by the General Contractor. All associated costs shall be included in each Prime Contractor's bid.

1.9 PROTECTION OF FACILITIES AND MAINTENANCE OF BUILDING SERVICES

- A. The General Contractor shall be responsible for providing the temporary protection measures required for the Project, to protect, throughout the duration of the entire Project, the building occupants, the public, and all elements, surfaces, and contents of the building and Project Site exposed to the construction activities and operations of the Contractors. The required temporary protection measures shall be coordinated with the Owner.
- B. Contractors shall restore all areas impacted by their construction activities and operations to the conditions prior to the impacts. This includes the complete repair of all damage to any element, surface, or contents of the building and Project Site exposed to the construction activities and operations of the Contractors, which repair shall be completed at no additional cost to the Owner and to the Owner's satisfaction.

1.10 SPECIFICATION ON SITE STORAGE

- A. Contractor will not be permitted to use on-site storage or laydown areas other than the staging areas as designated by the Owner. The contractor shall adjust their schedule for delivering materials based on the available site storage and laydown areas.
- B. The contractor is responsible for securing their materials.
- C. Do not overload the building structure with stored materials.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.12 THE OWNER AND THE DESIGN TEAM

- A. The Owner and the Design Team shall have full and complete access to the Project Site during the entire Project. This includes access to observe all portions of the Work in progress at the locations where they are being performed.
- B. The General Contractor shall provide any and all safety-related personal protection devices needed or requested by the Owner or the Design Team for their observation of any portion of the Work in progress.
- C. The Owner and the Design Team shall have the required access to any specific location of Work at any time through the final acceptance of the specific Work.

1.13 ROLE OF THE DESIGN TEAM

- A. The Design Team is defined as the Architect.
- B. The Design Team in conjunction with the Owner's Representative will provide administration of the Contracts as described in the Contract Documents.
- C. The Design Team will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents.
- D. Based on the Design Team's observations, the Design Team will assist the Owner's Representative in making recommendations to the Owner regarding payment of amounts due the Contractors on their Applications for Payment.
- E. The Design Team will have authority to reject Work that does not conform to the Contract Documents.
- F. The Design Team will review and take appropriate action upon the Contractors' submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for

conformance with information given and the design concept expressed in the Contract Documents.

- G. The Design Team in conjunction with the Owner's Representative will conduct inspections to determine the dates of Substantial Completion and the date of Final Completion.
- H. The Design Team will interpret and, in conjunction with the Owner's Representative, will decide matters concerning requirements of the Drawings and Specifications. Interpretations and decisions of the Design Team will be in writing and will be consistent with the intent of and reasonably inferable from the Drawings and Specifications. Subject to the final decisions of the Owner's Representative and the Owner, the Design Team's decisions on matters relating to the interpretation of the Drawings and Specifications will be final.

1.14 ENVIRONMENTAL CONCERNS.

- A. All Contractors shall perform their work in a manner that shall minimize the possibility of air, water, ground or noise pollution. The existing sanitary drainage systems, rainwater collection systems and site drainage systems at the Project Site shall not be used by the Contractors without the Contractors' having informed the Owner as to the content of waste-water run-off and without their having obtained the Owner's written consent. Consent may be withheld at the sole discretion of the Owner.
- B. Contractors shall comply with all statutes and regulations of the Commonwealth of Pennsylvania concerning environmental quality control as administered by the Department of Environmental Protection. These include, but are not limited to, the Clean Streams Law, Clean Water Act, Pennsylvania Sewage Facilities Act, Air Pollution Control Act, Surface Mining Conservation and Reclamation Act, Bituminous Coal Open Pit Mining Conservation Act, Dams and Encroachments Act, Water Well Driller's Act, Water Works Act and Atomic Energy Act, all as amended to-date. Each Contractor shall be solely responsible for any violations and shall be responsible for securing all required permits, including an erosion control permit if required.
- C. Burning of materials shall not be permitted at the Project Site.
- D. Storage, collection, transportation, processing and final disposal of solid waste shall be in accordance with the Solid Waste Management Act regulations and standards of DEP. Immediately upon notice of award of contract, the Contractor shall apply for the necessary permit from DEP and conduct waste disposal on sites approved under this permit. A copy of this permit must be submitted to Owner before commencing waste disposal.

1.15 PERMITS, INSPECTIONS, LICENSES

- A. The General Contractor shall pay for all building permits required for the entire Project and all additional inspections, permits, licenses and approvals required for the Project as a whole by authorities having jurisdiction over the Project.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Contingency allowances.
- C. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Quantity Allowance: Include a quantity allowance for unforeseen conditions related to masonry repairs and cleaning. The amount to be included in the bid shall be \$25,000 (Twenty-five Thousand Dollars). The Contractor will need to provide tickets for labor and material when charging to the allowance. The Contractor will need to have approval in writing prior to charging to the allowance.

END OF SECTION 01 2100

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 calendar days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect and Owner.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form acceptable to Architect and Owner.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Sub-schedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values coordinated with each phase of payment.

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one-line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts, in excess of [five] 5 percent of the Contract Sum.
 - a. Include separate line items under Contractor and subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Provide evidence of insurance.
 7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: Submit Application for Payment to Architect by the 25th day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.

4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.

- f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
- 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site. Include the following: [Software log with not less than the following:]
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 30 days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned

parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Construction waste management and recycling.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
4. Minutes: Contractor will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:

- 1) Interface requirements.
- 2) Sequence of operations.
- 3) Status of submittals.
- 4) Deliveries.
- 5) Off-site fabrication.
- 6) Access.
- 7) Site utilization.
- 8) Temporary facilities and controls.
- 9) Progress cleaning.
- 10) Quality and work standards.
- 11) Status of correction of deficient items.
- 12) Field observations.
- 13) Status of RFIs.
- 14) Status of proposal requests.
- 15) Pending changes.
- 16) Status of Change Orders.
- 17) Pending claims and disputes.
- 18) Documentation of information for payment requests.

4. Minutes: Contractor will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Special reports.

- B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting schedules and reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.

- B. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

- C. Construction Schedule Updating Reports: Submit with Applications for Payment.
- D. Daily Construction Reports: Submit at weekly intervals.
- E. Site Condition Reports: Submit at time of discovery of differing conditions.
- F. Special Reports: Submit at time of unusual event.

1.5 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values,[list of subcontracts,] submittal schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each phase area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 4. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Use of premises restrictions.
 - e. Provisions for future construction.
 - f. Seasonal variations.
 - g. Environmental control.

3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion]
- E. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- F. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for [commencement of the Work] [the Notice to Proceed] [the Notice of Award]. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report for each day that on-site work occurs, recording the following information concerning events at Project site as may be applicable:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Accidents.

8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting photographic documentation.
 - 2. Section 017700 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

1.3 UNIT PRICES

- A. Basis for Bids: Base number of construction photographs on average of 5 photographs per week over the duration of Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For photographer.
- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Include same information as corresponding photographic documentation.
- C. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 4 megapixels.
 - 2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.

- e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.
- D. Construction Photographs: Submit digital files of each photographic view within seven days of taking photographs.

1.5 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.6 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 4 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
- 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
- D. Preconstruction Photographs: Before commencement of the project, take photographs of Project site and surrounding area including existing items to remain during construction, from different vantage points, as directed by Architect and/or Owner.

1. Take a minimum of ten photographs on each elevation to show existing conditions.
 2. Take additional photographs as required to record settlement or damage of adjacent structures, pavements, and improvements.
- E. Periodic Construction Photographs: Take a minimum of 12 photographs weekly adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Final Completion Construction Photographs: Take 20 photographs after date of Substantial Completion for submission as project record documents. Architect and/or Owner will inform photographer of desired vantage points.
1. Do not include date stamp.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.

1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
 1. Project name.
 2. Date.
 3. Name of Architect.
 4. Name of Contractor.
 5. Name of firm or entity that prepared submittal.
 6. Names of subcontractor, manufacturer, and supplier.
 7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 8. Category and type of submittal.
 9. Submittal purpose and description.
 10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 11. Drawing number and detail references, as appropriate.
 12. Indication of full or partial submittal.
 13. Location(s) where product is to be installed, as appropriate.
 14. Other necessary identification.
 15. Remarks.
 16. Signature of transmitter.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

- E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 10 days for review of each resubmittal.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 10 days for review of each submittal. Submittal will be returned to through Architect, before being returned to Contractor.

- a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.

- b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 5. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
 6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
 1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests

performed before installation of product. Include written recommendations for substrate preparation and primers required.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action, as follows:
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 01 4100 CODES, REGULATIONS AND STANDARDS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section describes each the Contractor's responsibilities regarding codes, regulations and standards included in the Contract Documents by reference.

1.3 APPLICABLE CODES AND REGULATIONS

- A. The Work shall comply with all applicable codes, regulations and standards, including but not limited to all City of Philadelphia and State of Pennsylvania building codes, other codes and regulations.
- B. It is not the intent of the Contract Documents to conflict with any Code or Regulation. Report any conflicts to the Architect for clarification.

1.4 REFERENCED STANDARDS

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes or intended use.
- B. The referenced standards shall have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- C. Should referenced standards conflict with the Contract Documents, request clarification from the Architect before proceeding, but generally the more stringent requirement shall apply.
- D. In the absence of specific instructions in the specifications, materials, products, equipment, and their installation shall conform to the applicable codes, regulations and standards.
- E. The contractual relationship of the parties to the Contract shall not be altered from what is indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- F. Dates of standards specifically referenced in the Specifications shall be as indicated in the Specifications or if not indicated shall be the latest date prior to the date of issue of the Contract Documents. In cases where standards specifically referenced in the Specifications have been subsequently modified or replaced by the applicable codes and their supplements and amendments adopted by the authorities having jurisdiction, request clarification from the Architect before proceeding,
- G. Each entity engaged in construction of the Project shall be familiar with industry standards applicable to its construction activity. If unfamiliar, obtain copies and review with all workers.

Obtain copies of standards when required by individual specification sections. Maintain copies at job site until Substantial Completion.

1.5 ASSOCIATIONS, INSTITUTIONS AND SOCIETIES

- A. Associations, Institutions, and Societies and their abbreviations if any, appearing in the Specifications or elsewhere in the Contract Documents, shall be as generally recognized in the industry. Refer to the "Encyclopedia of Associations" published by Gale Research Company for abbreviations, addresses and phone numbers.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4500 CONTRACTOR'S QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Related Sections include the following:
 - 1. Section 013300 Submittal Procedures for administrative requirement for submittal procedures.
 - 2. Section 016000 Products Requirements for material and product quality.

1.03 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- E. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as

"carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

- F. Experienced: When used with an entity, "experienced" means – unless defined differently in other Sections of these Specifications for particular entities – having successfully completed a minimum of three (3) previous projects within the last five (5) years similar in size and scope to this Project, demonstrating familiarity with the special requirements indicated for this Project.

1.04 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.05 SUBMITTALS

- A. Qualification Data: For testing agencies to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Test Reports: After each test/inspection, promptly submit two copies of the report as submittal to the Architect, Owner and appropriate Contractors.
- C. Prepare and submit certified written test reports promptly that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Type of Test/Inspection
 - 10. Date of Test/Inspection
 - 11. Test and inspection results and an interpretation of test results.

12. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 13. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 14. Name and signature of laboratory inspector.
 15. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.06 TESTING AND INSPECTION AGENCIES

- A. The Contractor shall employ an independent testing agency to perform specified testing as required by the Contract Documents.
- B. Employment of agency in no way relieves the Contractor or any Sub-Contractor of the obligation to perform the work in accordance with the requirements of the contract documents.

1.07 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Mockups: Before installing portions of the Work requiring mockups, complete mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Complete mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect no less than seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
5. Allow no less than seven days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Remove mockups when directed, unless otherwise indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REPAIR AND PROTECTION

- A. Protect construction exposed by or for quality-control service activities.
- B. Repair and protection are the Contractor's responsibility, regardless of the Contractor's assignment to others of the performing of any of the required quality-control services.

3.02 CONTROL OF INSTALLATION

- A. Monitor Quality Control over Suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality,
- B. Comply with manufacturer's instructions including each step in sequence.
- C. Should manufacturers' instruction conflict with contract documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Confirm that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion and disfigurement.
- H. Do not anchor any equipment, piping, etc. to historic fabric without prior written approval of the Architect.

3.03 TESTING AND INSPECTION

A. Testing Agencies Responsibilities

- 1 Provide qualified personnel at Site. Cooperate with Architect, Owner, Engineers and Contractor in the performance of services.
- 2 Perform specified sampling and testing of products in accordance with specified standards.
- 3 Ascertain compliance of materials and mixes with requirements of contract documents.
- 4 Promptly notify Architect, Owner and appropriate Contractor or sub-contractor of observed irregularities or non-conformance of work or products.
- 5 Perform additional tests and inspections as required by the results of the tests or as requested by the Architect or Owner.
- 6 Submit copies of all reports of all tests/inspections as specified.

B. Limits on testing/inspection agency authority

- 1 Agency may not release, revoke, alter, or enlarge on requirements of contract documents.
- 2 Agency may not approve or accept any portion of the work.
- 3 Agency may not assume any duties of contractor.
- 4 Agency has no authority to stop the work.

C. Contractor responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
 - a. To provide access to work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
4. Notify Architect, Owner and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by contractor beyond specified requirements but the Township must be informed immediately of any additional work being required before it is undertaken. .
6. If results do not meet the requirements on the contract, arrange and pay for additional samples, tests, and inspections as required beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by the Architect and the Owner.

- E. Re-testing required because of non-conformance to specified requirements shall be paid for by contractor at no additional cost to the Owner.

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Logistics Plan: Show temporary facilities, utility hookups, staging areas, and designated parking areas for construction personnel, if provided by the Authority.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

3. Indicate sequencing of work that requires water, such as cleaning of stone, painting, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- D. Dust Plan: Submit coordination drawing and narrative that indicates the dust measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. Waste handling procedures.
 3. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 SCAFFOLDING ACCESS

- A. Elevated scaffold access: In addition to all other facilities required for the execution of the Work, provide the following if required to complete the work:
 1. Fixed-scaffold providing access to all portions of the Project areas for a period determined necessary by the Contractor. Allow additional time, after the scaffolding is no longer required by the Contractor for use by the Architect and Owner to complete the review requirements for Substantial Completion and Final review of the finished Project areas and Work.

- B. All scaffolding, staging and platforms shall be designed as stable, self-supporting systems. Drilled in anchors or fastening systems to the existing building components and/or surfaces are prohibited.
 - 1. Arrange scaffolding such that all building entrances, exits, passageways and egress routes are maintained to full capacity throughout the Project duration. Where pathways must penetrate or cross scaffolding support structure, provide overhead construction to allow full unobstructed pedestrian access.
 - a. Where overhead protection is required provide plywood construction providing a minimum of eight (8) feet vertical clearance, properly marked and illuminated for safe passage. Plywood used shall be ¾" (min) fire retardant MDO plywood.
- C. All scaffolding support points shall be provided with an intermediary wood support block, sized to sufficiently distribute the imposed loading to the supporting surface. Support blocks shall be arranged to protect against trip hazards. Screw jack handles shall be provided with padding and oriented in such manner to eliminate protrusions. Support blocks shall be arranged to protect against trip hazards.
- D. Provide ladder access to all scaffolding levels.
- E. Protect all existing finishes from scaffold supports.
- F. The Contractor is referred to and agree to comply with the terms, regulations and conditions contained in the latest edition of OSHA, the Department of labor and Industry "Regulations for Construction and Repairs" and "Regulations for Railings, Toe Boards, Open Side Floors, Platforms and Runways," and Regulations for protection from Fire and Panic".
- G. The contractor shall provide at his own cost and expense all additional scaffolding, trestles, ladders, platforms and other equipment that is required for the execution of the work.
- H. All scaffolding used shall be new or completely clean, free of rust, corrosion or debris. Scaffolding and components not complying with this requirement will be rejected and shall be immediately removed from the Project site. The Contractor shall maintain clean scaffolding and protect the surrounding building surfaces throughout the Project duration.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work and daily operations and facility access. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- B. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 1. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 2. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- C. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- D. Lighting: Provide temporary lighting with local switching that provides adequate illumination for door modification operations, observations, inspections, and traffic conditions.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Only one on-site parking spot may be provided at the discretion of the Convention Center Authority .
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed

or altered. Repair damage to existing facilities if caused by the contractor before substantial completion is scheduled.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request.

Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
 2. Store materials in a manner that will not endanger Project structure or impede access or exit pathways.
 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 5. Protect stored products from damage and liquids from freezing.
 6. Delete subparagraph below if Owner provides own storage facilities.

7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. **Manufacturer's Warranty:** Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
 2. **Specified Form:** When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. **Submittal Time:** Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. **General Product Requirements:** Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. **Standard Products:** If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. **Or Equal:** For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. **Product Selection Procedures:**
 1. **Product:** Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 01 7329 CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Procedural requirements for cutting and patching.

1.03 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.
- C. In-place Construction: New construction of these Contracts requiring alteration during execution of the work.

1.04 ACTION SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.

5. Design Professional's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.05 QUALITY ASSURANCE

- A. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
- B. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
 1. Equipment supports.
 2. Piping and equipment.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the interior or in occupied spaces in a manner that would, in Design Professional's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.

2. Report to unsatisfactory conditions to Architect. Do not proceed until directed.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.03 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- B. Do not cut or alter the work without written consent of the Owner and the Architect.
- C. Execute cutting and demolition by methods that will prevent damage to other work, and provide proper surfaces to receive installation of repairs.
- D. Remove excess materials resulting from cutting and patching and dispose of legally off site.
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original installer; comply with original installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Proceed with patching after construction operations requiring cutting are complete.
- F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Match joint type and coursing of existing masonry. Provide materials and comply with installation requirements specified in other Sections.
 1. Patch surfaces which will be exposed to weather in the finished work to be airtight and weather tight.
 2. Patch surfaces to comply with fire ratings, smoke tight ratings, acoustical criteria and other performance criteria indicated.
 3. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 4. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing as acceptable to the Owner and the Design Professional.

- a. Clean conduit and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - c. If surface to be cut and patched is indicated or specified to be covered by painting or other finish system, and if cutting and patching is performed prior to installation of finish, then finishing of cut and patched area shall be included as work of finishing Section and shall not be part of cutting and patching work.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 7329

SECTION 01 7400 - CLEANING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. This Section describes the Contractor's responsibilities for cleaning of the Work and work areas during construction and before completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 PERIODIC CLEANING

- A. Employ experienced workers for cleaning.
- B. Maintain work areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- C. Collect and remove waste materials, debris, and rubbish from site daily and dispose of legally off-site.
- G. Maintain cleaning until Project or portion thereof is reviewed for substantial Completion and Certificate of Substantial Completion is issued. If minor work is required after Substantial Completion, clean affected areas to the satisfaction of the Architect and Owner.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Employ experienced workers or professional cleaners. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for Final Completion for a portion of Project:
 - a. Clean Project in areas disturbed by construction activities, of rubbish, waste material, litter, and other foreign substances.

- b. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - c. Clean exposed exterior surfaces of the building affected by the construction operations to a dirt-free condition, free of dirt, stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
 - d. Repair and restore marred exposed finishes.
- B. Comply with safety standards for cleaning. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (*Contractor's punch list*), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 2. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. On advice of Owner's legal counsel, revise "Partial Occupancy" Paragraph below to suit Project. Sometimes, extended warranties may be necessary.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

END OF SECTION 017700

SECTION 01 7820 WARRANTIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. This Section describes the Contractor's procedural requirements for executing, assembling, and submitting warranties.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. All materials and workmanship shall be completely warranted from all defects for a minimum period of two years or as identified in the individual specification sections for a longer warranty period. The start of all warranties is the date of Approval by the Owner of the final Payment Application. This warranty period does not preclude any specific requirements for warranties, special warranties or service/maintenance contracts as identified in the individual specification sections.

1.4 SUBMITTAL REQUIREMENTS

- A. Submit two (2) sets of original signed copies of warranties and bonds, executed by the respective manufacturers, suppliers, and contractors.
- B. Contents - Neatly type, in orderly sequence, the following information for each item.
 - 1. Product or work item.
 - 2. Contractor's, supplier's, and manufacturer's names, addresses, and telephone numbers.
 - 3. Date of beginning and duration time of warranty, bond, or service and maintenance contract.
 - 4. Proper procedure for making claims against warranty or bond.
 - 5. Instances which might affect the coverage of the warranty or bond.
- C. Bind each set in 8 1/2 inch by 11-inch commercial quality, three-ring binders with plastic covers. Identify each binder with typed or printed title "Warranties," with title of project and location.

1.5 TIME OF SUBMITTALS

- A. Make other submittals within ten (10) days after Date of Substantial Completion, prior to final request for payment.
- B. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one hard copy and one pdf electronic copy of marked-up record prints.
 - 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints.
 - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned Record Prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Accurately record information in an acceptable drawing technique.
 - b. Record data as soon as possible after obtaining it.
 - c. Record and check the markup before enclosing concealed installations.
 - d. Cross-reference record prints to corresponding photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Changes made by Change Order or Change Directive.
 - d. Changes made following Architect's written orders.
 - e. Details not on the original Contract Drawings.
 - f. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
 7. Format: Annotated PDF electronic file with comment function enabled.
 8. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 9. Refer instances of uncertainty to Architect through Construction Manager for resolution.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's] reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

SECTION 040110 - MASONRY CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cleaning the following:

1. Brick surfaces.
2. Stone surfaces.

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 to 5510 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).
- C. High-Pressure Spray: 800 to 1200 psi (5510 to 8250 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 1. Review methods and procedures related to cleaning masonry including, but not limited to, the following:
 - a. Verify masonry-cleaning equipment and facilities needed to make progress and avoid delays.
 - b. Materials, material application, and sequencing.
 - c. Cleaning program.
 - d. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

- A. Work Sequence: Perform masonry-cleaning work in the following sequence:
 1. Remove plant growth.
 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 3. Repair masonry, including replacing existing masonry with new masonry materials.
 4. Rake out mortar from joints to be repointed.
 5. Point mortar joints.
 6. After waiting a minimum of 28 days, complete general cleaning of masonry.

7. Complete any special cleaning to remove biological growth.
8. Complete any/all repairs with composite materials.
9. Point with sealant where shown on documents.
10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from all work.

- B. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to masonry repair Sections. Patch holes in mortar joints according to masonry repointing Sections.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include material descriptions and application instructions.
 2. Include test data substantiating that products comply with requirements.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For chemical-cleaner manufacturer.
- B. Preconstruction Test Reports: For cleaning materials and methods.
- C. Cleaning program.

1.8 QUALITY ASSURANCE

- A. Special Cleaning Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.
- B. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.
- C. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue.
- D. Qualification Data: For Sub-contractor firms to submit on the required forms, to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses, names and addresses of architects and owners and other information specified.
- E. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Contractor will need to collect and dispose of all cleaning effluents in accordance with the authority having jurisdiction. Include provisions for supervising worker performance and preventing damage.

1. If materials and methods other than those indicated are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.
- F. Hot Water Equipment: Manufacturer of hot water pressure equipment: K'A'RANCHE HDS 3.5/35 Liberty Hot Water Pressure Unit.
- G. Qualification Data: For Sub-contractor firms to submit on the required forms, to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses, names and addresses of architects and owners and other information specified.
- H. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
1. Cleaning: Clean an area approximately 5 sq. ft. for each type of masonry and surface condition.
 - a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
 - b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage one or more chemical-cleaner manufacturers to perform preconstruction testing on masonry surfaces.
1. Use test areas as indicated and representative of proposed materials and existing construction.
 2. Propose changes to materials and methods to suit Project.
 3. Construction Schedule: Verify availability of materials, Restoration Specialist's personnel, equipment, and facilities needed to make progress and avoid delays

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry cleaning work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits, General: Clean masonry only when air temperature is forecast to be between 45 and 90 deg F for seven days prior to the start of the work, the duration of the work and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated. The masonry wall must measure a minimum of 45 degrees when the wall is scheduled to be cleaned and for the duration of the cleaning process.

- C. Cold-Weather Requirements: Comply with the following procedures for masonry cleaning unless otherwise indicated:
1. If the contractor elects to work when the mean daily air temperature is forecast to be between 35 degrees and 45 degrees, the contractor must provide an enclosure and heat to maintain temperatures above 45 deg F within the enclosure for seven days before, during the duration and for seven days after repair. The Contractor is also required to have a high-low temperature gauge in each of the enclosures and record the temperatures on a daily basis. This record shall be submitted each week to the Architect and Owner. No work is allowed if the temperatures are forecast to be below 35 degrees.
- D. Hot-Weather Requirements: Protect masonry cleaning operations when temperature and humidity conditions produce excessive evaporation of water from wall that might pose a risk to cleaning chemicals. Provide artificial shade and wind breaks as required to minimize evaporation. Do not apply clean substrates with temperatures of 90 deg F (32 deg C).

PART 2 - PRODUCTS

2.1 PAINT REMOVERS

- A. Low-Odor, Solvent-Type Paste Paint Remover: Manufacturer's standard low-odor, water-rinsable, solvent-type paste, gel, or foamed emulsion formulation, for removing paint from masonry; containing no methanol or methylene chloride.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cathedral Stone Products, Inc.
 - b. EaCo Chem, Inc.
 - c. PROSOCO, Inc.

2.2 CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).
- C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of trisodium phosphate (TSP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of water for every 5 gal. (20 L) of solution required.
- D. Mold, Mildew, and Algae Remover: Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of a low suds commercial detergent, 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.
- E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents with chelating agents and is specifically formulated for cleaning masonry surfaces.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Cathedral Stone Products, Inc.
- b. PROSOCO, Inc.
- c. Chemique -Artisan Cleaners

2.3 ACCESSORY MATERIALS

- A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. PROSOCO, Inc.
- B. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.
- C. Reinforced plastic sheeting secured to wood frames that are custom fit to each masonry opening and secured in a manner that does not anchor to the masonry.
- D. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 1. Previous effectiveness in performing the work involved.
 2. Little possibility of damaging exposed surfaces.
 3. Consistency of each application.
 4. Uniformity of the resulting overall appearance.
 5. Do not use products or tools that could do the following:
 - a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
 - b. Leave a residue on surfaces.

2.4 CHEMICAL CLEANING SOLUTIONS

- A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended in writing by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 MASONRY-CLEANING SPECIALIST

- A. Masonry-Cleaning Specialist Firms: Engage an experienced masonry cleaning firm to perform work of this Section. Firm shall have completed at least three projects in the last 5 years of work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience cleaning new masonry is not sufficient experience for this project.

1. Field Supervision: Specialist firm shall maintain experienced full-time supervisors on Project site during times that cleaning work is in progress. Supervisors shall not be changed during Project except for causes beyond control of restoration specialist firm.
2. Restoration Worker Qualifications: Persons who are experienced and specialize in restoration work of types they will be performing. They shall have experience using the chemicals and equipment specified to be used on this project.
3. Each worker will need to demonstrate proficiency with each the specified equipment and have a good understanding of the chemical cleaning process.

3.2 PROTECTION

- A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent paint removers and chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 1. Cover adjacent surfaces with materials that are proven to resist paint removers and chemical cleaners used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents according to manufacturer's written instructions. Do not apply liquid strippable masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
 2. Do not apply chemical solutions during winds of enough force to spread them to unprotected surfaces.
 3. Neutralize alkaline and acid wastes before disposal.
 4. Dispose of runoff from operations by legal means and in a manner approved in writing by the Authority having jurisdiction and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- B. Protect awnings, signs and associated hardware adjacent to immediate work area. Remove protection after masonry cleaning is complete.

3.3 CLEANING MASONRY, GENERAL

- A. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 10 feet (3 m) away by Architect.
- B. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces. Ensure that masonry below the area being rinsed is also damp so as not to damage masonry when the chemicals are rinsed down the wall surface.
- C. Use only those cleaning methods indicated for each masonry material and location.
 1. Brushes: Use only natural bristle brushes. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
 2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.
 - a. Equip units with pressure gages.

- b. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
 - c. For heated water application use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated
- D. 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 masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.
- E. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.
- F. Water Application Methods:
 - 1. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 12 inches (300 mm) from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- G. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces according to chemical-cleaner manufacturer's written instructions; use brush application. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.
- H. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
 - 1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.
- I. Hot Water Cleaning: Use hot water to clean masonry surfaces at the pressures indicated for each type of masonry. Hold nozzle at least 6 inches (150 mm) from masonry surface and apply hot water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- J. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.4 PRELIMINARY CLEANING

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open joints to whatever depth they occur.
- B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, calking, asphalt, and tar.
 - 1. Carefully remove heavy accumulations of rigid materials from masonry surface with sharp chisel. Do not scratch or chip masonry surface.
 - 2. Remove paint and calking with solvent-type paint remover.

- a. Comply with requirements in "Paint Removal" Article.
 - b. Repeat application up to two times if needed.
3. Remove asphalt and tar with solvent-type paste paint remover.
- a. Comply with requirements in "Paint Removal" Article.
 - b. Apply paint remover only to asphalt and tar by brush without prewetting.
 - c. Allow paint remover to remain on surface for 10 to 30 minutes.
 - d. Repeat application if needed.

3.5 PAINT REMOVAL

- A. Paint-Remover Application, General: Apply paint removers according to paint-remover manufacturer's written instructions. Do not allow paint removers to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.
- B. Paint Removal with Solvent-Type Paste Paint Remover:
- 1. Remove loose and peeling paint using low to medium-pressure water spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
 - 2. Apply thick coating of paint remover to painted surface with natural-fiber cleaning brush or large paint brush. Apply in one or two coats according to manufacturer's written instructions.
 - 3. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
 - 4. Rinse with cold water applied by low to medium-pressure spray to remove chemicals and paint residue.
- C. Paint Removal with Covered, Solvent-Type Paste Paint Remover:
- 1. Remove loose and peeling paint using low to medium-pressure water spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
 - 2. Apply paint remover to dry, painted surface with trowel, spatula, or as recommended in writing by manufacturer.
 - 3. Apply cover according to manufacturer's written instructions.
 - 4. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
 - 5. Scrape off paint and remover.
 - 6. Rinse with cold water applied by low to medium-pressure spray to remove chemicals and paint residue.

3.6 CLEANING MASONRY

- A. Cold-Water Wash: Use cold water applied by low to medium-pressure spray.
- B. Hot-Water Wash: Use hot water applied by **medium to high**-pressure spray as demonstrated in the mock-up.
- C. Detergent Cleaning:
- 1. Wet surface with cold water applied by low-pressure spray.
 - 2. Scrub surface with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar

joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.

3. Rinse with hot water applied by medium to high pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

D. Mold, Mildew, and Algae Removal:

1. Wet surface with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush.
3. Scrub surface with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that surface remains wet.
4. Rinse with hot water applied by medium to hot pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

E. Nonacidic Gel Chemical Cleaning:

1. Wet surface with cold water applied by low-pressure spray.
2. Apply gel cleaner in 1/8-inch (3-mm) thickness by brush, working into joints and crevices. Apply quickly and do not brush out excessively, so area is uniformly covered with fresh cleaner and dwell time is uniform throughout area being cleaned.
3. Let cleaner remain on surface for period as established by mockup.
4. Remove bulk of gel cleaner.
5. Rinse with cold water applied by low to medium-pressure spray to remove chemicals and soil.
6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than the number of applications established by the mock-up.

3.7 FERROUS STAIN REMOVAL

A. Acidic Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply cleaner to stone in two applications by brush. Let cleaner remain on surface for period indicated below:
 - a. As determined by test mockups and
 - b. As recommended by chemical-cleaner manufacturer.
3. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than three times.

3.8 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Wash adjacent woodwork and other nonstone surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.
- E. Reinstall any signs and lights removed as part of this project. Clean lights and signs prior to reinstallation.

END OF SECTION 040110

SECTION 040120.63 - BRICK MASONRY REPAIR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Repairing brick masonry, including replacing units.
 - 2. Dismantling and reconstruction of the brick wall.
 - 3. Removing abandoned anchors.
 - 4. Painting steel uncovered during the work.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
 - 1. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.4 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 to 5510 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).
- C. High-Pressure Spray: 800 to 1200 psi (5510 to 8250 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).
- D. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.
- E. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to brick masonry repair including, but not limited to, the following:
 - a. Verify brick masonry repair specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Confirm quantity of owner's supplied brick. The Contractor will need to supplement this quantity with additional brick to complete the masonry repairs. Contractor will also need to provide new brick for repairs where identified under the market storefronts.
 - e. Coordination with building occupants.
 - f. Source and delivery time/schedule for new brick.

1.6 SEQUENCING AND SCHEDULING

- A. Order materials for mortar immediately after approval of mockups. Take delivery of and store at Project site enough quantity to complete Project.
- B. Work Sequence: Perform brick masonry repair work in the following sequence, which includes work specified in this and other Sections:
 - 1. Remove plant growth.
 - 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 - 3. Repair masonry, including replacing existing masonry with new masonry materials.
 - 4. Rake out mortar from joints to be repointed.
 - 5. Point mortar joints.
 - 6. After waiting a minimum of 28 days, complete general cleaning of masonry.
 - 7. Complete any special cleaning to remove rust or copper stains, paint and biological growth.
 - 8. Complete any/all repairs with composite materials.
 - 9. Point with sealant where shown on documents.
 - 10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from all work.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to "Masonry Unit Patching" Article. Patch holes in mortar joints according to Section 040120.64 "Brick Masonry Repointing."

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of replacement masonry units on the structure, showing relation of existing and new or relocated units.
2. Show provisions for other sealant joints.
3. Show provisions for lighting fixtures, conduits, and weep holes as required.
4. Show locations of scaffolding and points of scaffolding in contact with masonry. Include details of each point of contact or anchorage.

C. Samples for Initial Selection: For the following:

1. Mortar: Submit sets of mortar that will be left exposed in the form of sample mortar strips, 6 inches (150 mm) long by dimension to match existing brick joint, set in aluminum channels.
 - a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching existing, cleaned mortar when cured and dry.
 - b. Submit with precise measurements on ingredients, proportions, gradations, and source of colored sands from which each Sample was made.
2. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.
 - a. Have each set contain a close color range of at least six Samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.
3. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For the following:

1. Each type of brick unit to be used for replacing existing units. Include sets of Samples to show the full range of shape, color, and texture to be expected. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range. Contractor can install brick from the Owner's supply. The Contractor will need to provide additional brick as required to complete all the repair as shown on the drawings.
2. Each type of patching compound in the form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.
3. Accessories: Each type of accessory and miscellaneous support.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For brick masonry repair specialist including field supervisors and workers and testing service.
- B. Preconstruction Test Reports: For existing mortar units.
- C. Quality-control program.

1.9 QUALITY ASSURANCE

- A. Brick Masonry Repair Specialist Qualifications: Engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed a minimum of three project in the last five years of work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.
 - 1. Field Supervision: Brick masonry repair specialist firm shall maintain experienced full-time supervisors on Project site during times that brick masonry repair work is in progress.
 - 2. Brick Masonry Repair Worker Qualifications: When masonry units are being patched, each of the workers completing this task must be trained and certified by manufacturer of patching compound to apply its products and must submit a certificate that supports this training. They also must have work on at least two projects in the last 3 years where they were installing brick repairs.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
 - 1. Masonry Repair: Prepare sample areas for each type of masonry repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 24 inches (600 mm) in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
 - a. Replacement: Eight brick units replaced.
 - b. Patching: Three small holes at least 1 inch (25 mm) in diameter for each type of brick indicated to be patched.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: No preconstruction testing will be required. The existing mortar has already been tested and the new mortar is a lime based mortar.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons and protected against impact and chipping.
- B. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- E. Store sand where grading and other required characteristics can be maintained and contamination avoided.
- F. Handle masonry units to prevent overstressing, chipping, defacement, and other damage.

1.12 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits, General: Repair masonry units only when air temperature is forecast to be between 45 and 90 deg F for seven days prior to the start of the work, the duration of the work and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated. The masonry wall must measure a minimum of 45 degrees when the new mortar or brick units are being installed.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:
 1. If the contractor elects to work when the mean daily air temperature is forecast to be between 35 degrees and 45 degrees, the contractor must provide an

enclosure and heat to maintain temperatures above 45 deg F within the enclosure for seven days before, during the duration and for seven days after repair. The Contractor is also required to have a high-low temperature gauge in each of the enclosures and record the temperatures on a daily basis. This record shall be submitted each week to the Architect and Owner. No work is allowed if the temperatures are forecast to be below 35 degrees.

- D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C).
- E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer unless the specifications are more stringent.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain each type of material for repairing brick masonry (brick, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MASONRY MATERIALS

- A. Face Brick 1: New Custom Brick to complete brick masonry repair work at the piers and infill adjacent to the storefronts.
 - 1. Face Brick 1: Contractor shall be required to furnish new custom units. The new brick units shall match the historic brick in surface texture, size, and shape. The brick shall also match the physical properties of the existing brick. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.
 - 2. After the owner supplied brick have been installed, the Contractor shall furnish and install a stained fire brick. The fire brick can be sourced from Church Brick (Fieldsboro, NJ, <https://churchbrick.com/>). The dimension of the proposed fire brick shall match the dimensions of the existing yellow brick at the piers. The Contractor shall then apply various stains to achieve the variation of yellow brick found on the building. The proposed color variations can be achieved using The Brick Match Kit by Masonry Cosmetics (South Bend, Indiana <https://www.masonrycosmetics.com/home>). The application of the stain will alter the pale yellow face of the fire brick. The following formulas and processes were utilized to achieve approved color matches on another yellow brick building. The successful contractor shall formulate and test color matches for the architect to

review using the following formulas. These formulas may need to be tweaked for this project, The Contractor shall anticipate making up to 15 color options.

- a. Brick 1: ½ cup water, 1 tsp yellow dye, ¼ tsp white dye, mix applied 3 times, applied uniformly across face of brick.
 - b. Brick 2: Mix 1- ½ Cup water, 1 tsp yellow dye, ¼ tsp white dye, apply across the face of the brick.
 - c. Brick 3: Mix ½ Cup water, ¼ tsp black dye, apply mix 1 across face of entire brick followed by application of Brick Mix 3 to ½ of brick.
 - d. Brick 3A, - Same mix as Brick Mix 3 but to be applied sporadically in dabs and wiped off.
 - e. Brick 4: ½ cup water, 1 tsp yellow, ¼ tsp white, applied once to entire brick, applied 2nd time in sporadic portions of brick and wipe off.
 - f. Brick 5: Mix 1: ½ cup water, 1 tsp yellow to be applied to the entire face of the brick.
 - g. Brick 5A: Mix 2: ¼ tsp white, mix 1 applied entire face of brick, Mix 2 applied sporadically in dabs
 - h. Brick 6: Mix ½ cup water, 1 tsp yellow, ¼ tsp white, to be applied once to edge of brick and wiped off.
3. Tolerances as Fabricated: According to tolerance requirements in ASTM C 216, Type FBX.
- B. Face Brick 2: New Custom Brick to complete brick masonry repair work under the storefronts. The brick measures 3 x 5 ½ inches.
1. Brick Matching Existing: Contractor shall be required to furnish and install new custom brick Custom units. The new brick units shall match the historic brick at these locations in color range, color variation within units, surface texture, size, and shape that match each of the two existing brick types and with the physical properties matching the existing brick. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.
 2. Tolerances as Fabricated: According to tolerance requirements in ASTM C 216, Type FBX.
- C. Building Brick: ASTM C 62, of same vertical dimension as face brick, for masonry work concealed from view.
1. Grade SW where in contact with earth.
 2. Grade SW or MW for concealed backup.

2.3 MORTAR MATERIALS

- A. NHL 3.5, Ecologic Mortar as distributed by Limeworks – Custom Colored. Along the Arch Street wall, the following mortar mix was used for repointing the brick wall. The Contractor shall match the following custom color mix.
- B. Custom Color Code: EMBJRT-1002
- C. Grade: Butter Joint.
- D. Water: Potable.

2.4 MANUFACTURED REPAIR MATERIALS

- A. Brick Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching brick masonry.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cathedral Stone Products, Inc.
 - b. Conproco Corporation.
 - 2. Use formulation that is vapor and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than masonry units being repaired, and develops high bond strength to all types of masonry.
 - 3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.
 - 4. Formulate patching compound in colors and textures to match each masonry unit being patched. Provide no fewer than ten colors to enable matching of the color, texture, and variation of each unit.

2.5 ACCESSORY MATERIALS

- A. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of masonry units, less the required depth of pointing materials unless removed before pointing.
- B. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.
- C. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer according to SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.
 - 1. Surface Preparation: Use coating requiring no better than SSPC-SP 3, "Power Tool Cleaning" surface preparation according to manufacturer's literature or certified statement.

2. VOC Limit: Use coating with a VOC content of 400 g/L (3.3 lb/gal.) or less.
- D. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
1. Previous effectiveness in performing the work involved.
 2. Minimal possibility of damaging exposed surfaces.
 3. Consistency of each application.
 4. Uniformity of the resulting overall appearance.
 5. Do not use products or tools that could leave residue on surfaces.

2.6 MORTAR MIXES

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
- B. Mix custom mortar in accordance with manufacturer's instructions.
- C. Do not use admixtures in mortar.

PART 3 - EXECUTION

3.1 REPAIR SPECIALIST

- A. Brick Masonry Repair Specialist Firms: Subject to compliance with requirements, engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed a minimum of three project in the last five years of work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding masonry and other surfaces.
1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
 2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
 3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.
- B. Remove any items mounted to the masonry; signs, lights, and store during masonry repair. Reinstall when repairs are complete.
1. Provide temporary rain drainage during work to direct water away from building.

3.3 MASONRY REPAIR, GENERAL

- A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 10 feet (3 m) away by Architect.

3.4 ABANDONED ANCHOR REMOVAL

- A. Remove abandoned anchors, brackets, wood nailers, and other extraneous items.
 - 1. Remove items carefully to avoid spalling or cracking masonry.
 - 2. Notify Architect before proceeding if an item cannot be removed without damaging surrounding masonry. Do the following where directed:
 - a. Cut or grind off item approximately 3/4 inch (20 mm) beneath surface and core drill a recess of same depth in surrounding masonry as close around item as practical.
 - b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.
 - 3. Patch hole where each item was removed unless directed to remove and replace masonry unit.

3.5 BRICK REMOVAL AND REPLACEMENT

- A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units. Remove all deteriorated brick at each location for the depth of the deterioration. Reconstruct with new sound brick for the depth of the wall and the replacement face brick.
 - 1. When removing single bricks, remove material from center of brick and work toward outside edges.
- B. Support and protect remaining masonry that surrounds removal area.
- C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.
- E. Remove in an undamaged condition as many whole bricks as possible.
 - 1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
 - 2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.

3. Store brick for reuse. Store off ground, on skids, and protected from weather.
 4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.
- F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.
- G. Replace removed damaged brick with new brick matching existing brick in color, size and shape. Do not use broken units unless they can be cut to usable size.
- H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
1. Maintain joint width for replacement units to match existing joints.
 2. Use setting buttons or shims to set units accurately spaced with uniform joints.
- I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.) Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
 2. Rake out mortar used for laying brick before mortar sets according to Section 040120.64 "Brick Masonry Repointing." Point at same time as repointing of surrounding area.
 3. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.
- J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.6 PAINTING STEEL UNCOVERED DURING THE WORK

- A. Notify Architect if steel is exposed during masonry removal. Where Architect determines that steel is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
1. Surface Preparation: Remove paint, rust, and other contaminants according to SSPC-SP 3, "Power Tool Cleaning", as applicable to comply with paint manufacturer's recommended preparation.
 2. Antirust Coating: Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).

- B. If on inspection and rust removal, the thickness of a steel member is found to be reduced from rust by more than 1/16 inch (1.6 mm), notify Architect before proceeding.

3.7 MASONRY UNIT PATCHING

- A. Patch the following masonry units unless another type of repair or replacement is indicated:

1. Units indicated to be patched.
2. Units with holes.
3. Units with small areas of deep deterioration. Patch deep deteriorations measuring more than 3/4 inch (19 mm) in least dimension and more than 1/2 inch (12 mm) deep.

- B. Remove and replace existing patches [where indicated] [unless otherwise indicated or approved by Architect].

- C. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/2 inch (12 mm) thick, but not less than recommended in writing by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of masonry unit.
3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
8. Keep each layer damp for 72 hours or until patching compound has set.
9. Remove and replace patches with hairline cracks or that show separation from brick at edges, and those that do not match adjoining brick in color or texture.

3.8 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

- B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.9 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

3.10 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.
- B. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

END OF SECTION 040120.63

SECTION 040120.64 - BRICK MASONRY REPOINTING AND RECONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Repointing joints with mortar.
 - 2. Repointing joints with sealant.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
 - 1. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.4 DEFINITIONS

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

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to repointing brick masonry including, but not limited to, the following:
 - a. Verify brick masonry repointing specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Coordination with building occupants.

1.6 SEQUENCING AND SCHEDULING

- A. Order materials immediately after approval of mockups. Take delivery of and store at Project site enough quantity to complete Project.

- B. Work Sequence: Perform brick masonry repointing work in the following sequence, which includes work specified in this and other Sections:
1. Remove plant growth.
 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 3. Repair masonry, including replacing existing masonry with new masonry materials.
 4. Rake out mortar from joints to be repointed.
 5. Point mortar joints.
 6. After waiting a minimum of 28 days, complete general cleaning of masonry.
 7. Complete any special cleaning to remove rust or copper stains, paint and biological growth.
 8. Complete any/all repairs with composite materials.
 9. Point with sealant where shown on documents.
 10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from all work.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to Section 040120.63 "Brick Masonry Repair." Patch holes in mortar joints according to "Repointing Masonry" Article.

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 2. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.
- B. Shop Drawings:
1. Include plans, elevations, sections, and locations of repointing work on the structure.
 2. Show provisions for expansion joints or other sealant joints.
 3. Show locations of scaffolding and points of scaffolding in contact with masonry. Include details of each point of contact or anchorage.
- C. Samples for Initial Selection: For the following:
1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches (150 mm) long by [1/4 inch (6 mm)] [1/2 inch (13 mm)] wide, set in aluminum or plastic channels.
 - a. Have each set contain a close color range of at least six Samples of different mixes that produce a mortar matching existing, cleaned mortar when cured and dry.
 - b. Submit with precise measurements on ingredients, proportions, gradations, and source of colored sands from which each Sample was made.
 2. Sealant materials.
 3. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For the following:

1. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches (150 mm) long by 1/8 inch (3 mm) wide, set in aluminum channels.
 - a. Include with each Sample a list of ingredients with proportions of each.
2. Sealant materials.
3. Accessories: Each type of accessory and miscellaneous support.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For brick masonry repointing specialist including field supervisors and workers and testing service.
- B. Quality-control program.

1.9 QUALITY ASSURANCE

- A. Brick Masonry Repointing Specialist Qualifications: Engage an experienced brick masonry repointing firm to perform work of this Section. Firm shall have completed a minimum of 3 projects in the last 5 years where the scope of work is similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance. Projects to have been completed under the jurisdiction of a local or State Historic Preservation office. Experience in only installing masonry is insufficient experience for masonry repointing work.
 1. Field Supervision: Brick masonry repointing specialist firms shall maintain experienced full-time supervisors with experience repointing brick on this project site during times that brick masonry repointing work is in progress.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of brick masonry repointing to demonstrate aesthetic effects and to set quality standards for materials and execution.
 1. Repointing: Rake out joints in two separate areas, each approximately 36 inches (900 mm) high by 48 inches (1200 mm) wide for each type of repointing required and repoint one of the areas.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

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

- B. Store materials on elevated platforms, under cover, and in a dry location. Do not use materials that have become damp.
- C. Store materials in manufacturer's original and unopened containers. Discard if containers have been damaged or have been opened for more than two days.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits, General: Repoint masonry units only when air temperature is forecast to be between 45 and 90 deg F for seven days prior to the start of the work, the duration of the work and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated. The masonry wall must measure a minimum of 45 degrees when the new mortar or brick units are being installed.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:
 - 1. If the contractor elects to work when the mean daily air temperature is forecast to be between 35 degrees and 45 degrees, the contractor must provide an enclosure and heat to maintain temperatures above 45 deg F within the enclosure for seven days before, during the duration of the work and for seven days after the work has been completed. The Contractor is also required to have a high-low temperature gauge in each of the enclosures and record the temperatures on a daily basis. This record shall be submitted each week to the Architect and Owner. No work is allowed if the temperatures are forecast to be below 35 degrees.
- D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures forecast to be 90 deg F (32 deg C) or higher.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain each type of material for repointing brick masonry from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MORTAR MATERIALS

- A. NHL 3.5: US Ecologic Mortar as distributed by Limeworks – Custom Colored. Along the Arch Street wall, the following mortar mix was used for repointing the brick wall. The Contractor shall match the following custom color mix.
- B. Custom Color Code: EMBJRT-1002
- C. Grade: Butter Joint.

- D. Water: Potable.

2.3 ACCESSORY MATERIALS

A. Sealant Materials:

1. Sealant manufacturer's standard elastomeric sealant(s) of base polymer and characteristics indicated below and according to applicable requirements in Section 079200 "Joint Sealants."
 - a. Type: Dow Corning Dowsil 795 Cast Iron and Masonry and Cast Iron and Metal Storefronts .
 - b. Type: Dow Corning: 790 Masonry and Concrete
2. Colors: Provide colors of exposed sealants to match colors of mortar adjoining installed sealant unless otherwise indicated.
3. Ground-Mortar Aggregate: Custom crushed and ground pointing mortar sand or existing mortar retrieved from joints. Grind to a particle size that matches the adjacent mortar aggregate and color. Remove all fines passing the No. 100 sieve.

B. Joint-Sealant Backing:

1. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended in writing by sealant manufacturer for preventing sealant from adhering to rigid, inflexible, joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

C. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.

D. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Minimal possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could leave residue on surfaces.

2.4 MORTAR MIXES

A. Measurement and Mixing: Measure materials in dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix dry materials before adding any water. Then mix again, adding only enough water to produce a damp, unworkable mix that retains its form when pressed into a ball in accordance with the manufacturer's instructions. Maintain

mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

- B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
- C. Do not use admixtures in mortar.
- D. Mixes: Mix mortar materials in the following proportions:
 - 1. Mortar for rebuilding existing masonry wall: Use same mix as specified for repointing existing brick masonry.

PART 3 - EXECUTION

3.1 REPOINTING SPECIALIST

- A. Brick Masonry Repointing Specialist Firms: Subject to compliance with requirements, engage an experienced brick masonry repointing firm to perform work of this Section. Firm shall have completed a minimum of three projects in the last five years of work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
 - 2. Keep wall area wet below pointing work to discourage mortar from adhering.
 - 3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

3.3 MASONRY REPOINTING, GENERAL

- A. Appearance Standard: Repointed surfaces are to have a uniform appearance as viewed from 10 feet (3 m) away by Architect.

3.4 REPOINTING MASONRY

- A. Rake out all joint by hand as the existing joints are very narrow and no electrical cutting tools will be allowed. Repoint joints to the following extent:
 - 1. All joints in areas indicated.
 - 2. Joints indicated as sealant-filled joints.
 - 3. Joints at locations of the following defects:
 - a. Holes and missing mortar.
 - b. Cracks that can be penetrated 1/4 inch (6 mm) or more by a knife blade 0.027 inch (0.7 mm) thick.

- c. Cracks 1/16 inch (1.6 mm) or more in width and of any depth.
 - d. Hollow-sounding joints when tapped by metal object.
 - e. Eroded surfaces 1/4 inch (6 mm) or more deep.
 - f. Deterioration to point that mortar can be easily removed by hand, without tools.
 - g. Joints filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
 - 1. Remove mortar from joints to depth of 2-1/2 times joint width, but not less than the dimension required to expose sound, unweathered mortar. Do not remove unsound mortar more than 3 inches (75 mm) deep; consult Architect for direction.
 - 2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 - 3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Pointing with Mortar:
 - 1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
 - 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch (9 mm) until a uniform depth is formed. Fully compact each layer, and allow it to become thumbprint hard before applying next layer.
 - 3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than 3/8 inch (9 mm). Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
 - 4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
 - 5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
 - 6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.
- F. Pointing with Sealant: Comply with Section 079200 "Joint Sealants." and as follows:
 - 1. After raking out, keep joints dry and free of mortar and debris.
 - 2. Clean and prepare joint surfaces. Prime joint surfaces unless sealant manufacturer recommends against priming. Do not allow primer to spill or migrate onto adjoining surfaces.
 - 3. Fill sealant joints with specified joint sealant.
 - a. Install cylindrical sealant backing beneath the sealant. Where space is insufficient for cylindrical sealant backing, install bond-breaker tape.

- b. Install sealant using only proven installation techniques that ensure that sealant is deposited in a uniform, continuous ribbon, without gaps or air pockets, and with complete wetting of the joint bond surfaces equally on both sides. Fill joint flush with surrounding masonry and matching the contour of adjoining mortar joints.
 - c. Install sealant as recommended in writing by sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
 - 1) Fill joints to a depth equal to joint width, but not more than 1/2 inch (13 mm) deep or less than 1/4 inch (6 mm) deep.
 - d. Tool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant from surfaces adjacent to joint.
 - e. Do not allow sealant to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces, particularly rough textures. Remove excess and spillage of sealant promptly as the work progresses. Clean adjoining surfaces by the means necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes, as demonstrated in an approved mockup.
- G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.5 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage qualified testing agency to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
- B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- C. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION 040120.64

SECTION 040140.61 - STONE REPAIR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Repairing stone masonry.
 - 2. Removing abandoned anchors.
 - 3. Painting steel uncovered during the work.
- B. Related Requirements:

1.3 ALLOWANCES

- A. Allowances for stone repair are specified in Section 012100 "Allowances."

1.4 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
 - 1. Unit prices apply to authorized work covered by quantity allowances.
 - 2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.5 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. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.
- C. Rift: The most pronounced direction of splitting or cleavage of a stone.
- D. Stone Terminology: ASTM C119.

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to stone repair including, but not limited to, the following:
 - a. Verify stone repair specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Coordination with building occupants.

1.7 SEQUENCING AND SCHEDULING

- A. Order materials immediately after approval of mockups. Take delivery of and store at Project site enough quantity to complete Project.
- B. Work Sequence: Perform stone repair work in the following sequence, which includes work specified in this and other Sections:
 1. Remove plant growth.
 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints. Repair masonry, including replacing masonry with new masonry materials or resetting existing stone.
 3. Rake out mortar from joints to be repointed.
 4. Point mortar joints.
 5. After waiting a minimum of 28 days, complete general cleaning of masonry.
 6. Complete any special cleaning to remove rust or copper stains, paint and biological growth.
 7. Complete any/all repairs with composite materials.
 8. Point with sealant where shown on documents.
 9. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from all work.
 10. Where water repellents are to be used on or near stonework, delay application of these chemicals until after pointing and cleaning.
- C. If scaffolding is installed, patch anchor holes used to attach scaffolding as the scaffolding is removed. Patch holes in stone according to Section 040140.62 "Stone Repointing." Patch holes in mortar joints according to "Repointing Stonework" Article.

1.8 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 2. Include recommendations for product application and use.
 3. Include test data substantiating that products comply with requirements.
- B. Samples for Initial Selection: For the following:
 1. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of stone representative of the range of stone colors on the building.

- a. Have each set contain a close color range of at least six Samples of different mixes of patching compound that matches the variations in existing stone when cured and dry.
 2. Include similar Samples of accessories involving color selection.
- C. Samples for Verification: For the following:
1. Each type of replacement stone. Include sets of Samples to show full range of color, texture, grain, veining, and finish to be expected. Provide sets of at least three 12-by-12-inch (300-by-300-mm) Samples for each type, but no fewer than necessary to indicate full range and proportion of variations within range.
 2. Each type of patching compound in form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.
 3. Each type of adhesive.
 4. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.9 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For stone repair specialist including field supervisors and workers.
- B. Quality-control program.

1.10 QUALITY ASSURANCE

- A. Stone Repair Specialist Qualifications: Engage an experienced stone repointing firm to perform work of this Section. Firm shall have completed a minimum of 3 projects in the last 5 years where the scope of work is similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance. Projects to have been completed under the jurisdiction of a local or State Historic Preservation office. Experience in only installing standard unit masonry or new stone masonry is insufficient experience for stone repair work.
 1. Field Supervision: Stone repair specialist firms shall maintain experienced full-time supervisors on Project site during times that stone repair work is in progress.
 2. Stone Repair Worker Qualifications: When stone units are being patched, assign at least one worker per crew who is trained and certified by manufacturer of patching compound to apply its products.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging stonework. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of stone repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
 1. Stone Repair: Prepare sample areas for each type of stone indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 12 inches (400 mm) in one dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise

indicated. Demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:

- a. Partial Stone Replacement: Two partial stone replacements (dutchman repairs).
 - b. Stone Plug Repair: Two stone plug repairs for each type of stone indicated to be plugged.
 - c. Crack Injection: Apply crack injection in two separate areas, each approximately 12 inches (300 mm) long.
 - d. Patching: Three small holes at least 1 inch (25 mm) in diameter.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver stone units to Project site strapped together in suitable packs or pallets or in heavy-duty crates and protected against impact and chipping.
- B. Deliver each piece of stone with code mark or setting number on unexposed face, corresponding to Shop Drawings, using nonstaining paint.
- C. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- D. Store materials on elevated platforms, under cover, and in a dry location. Do not use materials that have become damp.
- E. Store in manufacturer's original and unopened containers. Discard if containers have been damaged or have been opened for more than two days.
- F. Handle stone to prevent overstressing, chipping, defacement, and other damage.

1.12 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit stone repair work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits, General: Repoint masonry units only when air temperature is forecast to be between 45 and 90 deg F for seven days prior to the start of the work, the duration of the work and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated. The masonry wall must measure a minimum of 45 degrees when the new mortar or stone units are being installed
- C. Cold-Weather Requirements: Comply with the following procedures for stone repair unless otherwise indicated:

1. If the contractor elects to work when the mean daily air temperature is forecast to be between 35 degrees and 45 degrees, the contractor must provide an enclosure and heat to maintain temperatures above 45 deg F within the enclosure for seven days before, during the duration of the work and for seven days after the work has been completed. The Contractor is also required to have a high-low temperature gauge in each of the enclosures and record the temperatures on a daily basis. This record shall be submitted each week to the Architect and Owner. No work is allowed if the temperatures are forecast to be below 35 degrees.
- D. Hot-Weather Requirements: Protect stone repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and patching materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures forecast to be 90 deg F (32 deg C) or higher.
- E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer unless requirements of the specifications are more restrictive. .

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Source Limitations: Obtain each type of material for repairing stone (stone, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 STONE MATERIALS

- A. Stone Matching Existing: Natural building stone of variety, color, texture, grain, veining, finish, size, and shape that match existing stone.
1. For existing stone that exhibits a range of colors, texture, grain, veining, finishes, sizes, or shapes, provide stone that proportionally matches that range rather than stone that matches an individual color, texture, grain, veining, finish, size, or shape within that range.
- B. Cutting New Stone: Cut each new stone so that, when it is set in final position, the rift or natural bedding planes will match the rift orientation of existing stones.

2.3 MORTAR MATERIALS

- A. NHL 3.5: US Ecologic Mortar as distributed by Limeworks – Custom Colored. Along the Arch Street wall, the following mortar mix was used for repointing the granite wall. The Contractor shall match the following custom color mix.
- B. Grade: SCG(G) Coarse
- C. Color Code: 90% DGM 050 - 10% DGM 250 with XF Slag
- D. Water: Potable.

Retain "Exposed Mortar" Subparagraph below if required; revise to suit Project.

- E. Cementitious Crack Filler: Ultrafine superplasticized grout that can be injected into cracks, is suitable for application to wet or dry cracks, exhibits low shrinkage, and develops high bond strength to all types of stone.
 - 1. Cathedral Stone Jahn M30 #31 and Jahn M30#32.
 - 2. Conproco Injection Grout.

- F. Stone-to-Stone Adhesive: Two-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F (21 deg C), recommended in writing by adhesive manufacturer for type of stone repair indicated, and matching stone color.
 - 1. Cathedral Stone Natural Adhesive
 - 2. Hilti, HIT Renovation Anchor System
 - 3. Rawl "Powerfast"
 - 4. Redhead "Epcon",

- G. Stainless steel wire mesh screen tube, and 1/8", 1/4", 3/8", or 1/2" diameter or as required for size of crack x length indicated threaded stainless steel rod, AISI Type 304.

2.4 ACCESSORY MATERIALS

- A. Stone Repair Anchors and Pins: Mechanical fasteners and pins of Type 304 stainless steel; designed for stone stabilization and pinning stone pieces; matching shape and size of existing anchors unless otherwise indicated.

- B. Setting Buttons and Shims: Resilient plastic, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units, less the required depth of pointing materials unless removed before pointing.

- C. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.

- D. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer according to SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.
 - 1. Surface Preparation: Use coating requiring no better than SSPC-SP 3, "Power Tool Cleaning". Surface preparation shall be completed in accordance with manufacturer's literature or certified statement.
 - 2. VOC Limit: Use coating with a VOC content of [400 g/L (3.3 lb/gal.) or less.

- E. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.
 - 2. Minimal possibility of damaging exposed surfaces.
 - 3. Consistency of each application.
 - 4. Uniformity of the resulting overall appearance.
 - 5. Do not use products or tools that could leave residue on surfaces.

2.5 MORTAR MIXES

- A. Measurement and Mixing: Measure materials in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
- B. Do not use admixtures.
- C. Mixes: Mix mortar materials in the following proportions:
 - 1. Rebuilding (Setting) Mortar by Type: ASTM C270, Proportion Specification, Type N with cementitious material limited to portland cement and lime.

PART 3 - EXECUTION

3.1 REPAIR SPECIALIST

- A. Stone Repair Specialist Firms: Subject to compliance with requirements, Subject to compliance with requirements, engage an experienced brick masonry repointing firm to perform work of this Section. Firm shall have completed a minimum of three projects in the last five years of work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding stone and other surfaces.
 - 1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
 - 2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
 - 3. Immediately remove mortar splatters in contact with exposed stone and other surfaces.

3.3 STONE REPAIR, GENERAL

- A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 10 feet (3 m) away by Architect.

3.4 ABANDONED ANCHOR REMOVAL

- A. Remove abandoned anchors, brackets, wood nailers, and other extraneous items.
 - 1. Remove items carefully to avoid spalling or cracking stone.
 - 2. Notify Architect before proceeding if an item cannot be removed without damaging surrounding stone. Do the following where directed:
 - a. Cut or grind off item approximately 3/4 inch (20 mm) beneath surface and core drill a recess of same depth in surrounding stone as close around item as practical.
 - b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.

3. Patch hole where each item was removed unless directed to remove and replace stone unit.

3.5 PAINTING STEEL UNCOVERED DURING THE WORK

- A. Notify Architect if steel is exposed during stone removal. Where Architect determines that steel is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
 1. Surface Preparation: Remove paint, rust, and other contaminants according to SSPC-SP 3, "Power Tool Cleaning" as applicable to comply with paint manufacturer's recommended preparation.
 2. Antirust Coating: Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).
- B. If on inspection and rust removal, the thickness of a steel member is found to be reduced from rust by more than 1/16 inch (1.6 mm), notify Architect before proceeding.

3.6 PARTIAL STONE REPLACEMENT

- A. Remove defective portion of existing stone unit (backing stone). Carefully remove defective portion of stone by making vertical and horizontal saw cuts at face of backing stone and removing defective material to depth required for fitting partial replacement (dutchman).
 1. Make edges of backing stone at cuts smooth and square to each other and to finished surface; essentially rectangular. Make back of removal area flat and parallel to stone face.
 2. Do not overcut at corners and intersections. Hand trim to produce clean sharp corners with no rounding and no damage to existing work to remain.
 3. If backing stone becomes further damaged, remove damaged area and enlarge partial replacement as required.
- B. Remove mortar from joints that abut area of stone removal to same depth as stone was removed. Remove loose mortar particles and other debris from surfaces to be bonded and surfaces of adjacent stone units that will receive mortar by cleaning with stiff-fiber brush.
- C. Cut and trim partial replacement to accurately fit area where material was removed from backing stone. Fabricate to size required to produce joints between partial replacement and backing stone of no more than 1/16 inch (1.6 mm) in width, and to produce joints between partial replacement and other stones that match existing joints between stones.
- D. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm) diameter holes drilled into backing stone and into, but not through, the partial replacement. Center and space pins 3 to 5 inches (75 to 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 3 inches (75 mm) into backing stone and 2 inches (50 mm) into partial replacement, but no closer than 3/4 inch (19 mm) from exposed face of partial replacement.]
- E. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of backing stone and partial replacement, completely filling all crevices and voids.

- F. Apply partial replacement while adhesive is still tacky and hold securely in place until adhesive has cured. Use temporary shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of backing stone.
- G. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes as specified in "Stone Patching" Article.

3.7 STONE PLUG REPAIR

- A. Remove cylindrical piece of damaged stone by core-drilling perpendicular to stone surface.
- B. Prepare a replacement plug by core-drilling replacement stone. Use a drill sized to produce a core that will fit into hole drilled in damaged stone with only minimum gap necessary for adhesive. Cut and install plug so that, when it is set in final position, natural bedding planes will match the orientation of bedding planes of the backing stone.
- C. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of existing stone and plug, completely filling all crevices and voids.
- D. Apply plug while adhesive is still tacky and hold securely in place until adhesive has cured.
- E. Clean adhesive residue from exposed surfaces.

3.8 STONE-FRAGMENT REPAIR

- A. Carefully remove cracked or fallen stone fragment indicated to be repaired. Reuse only stone fragment that is in sound condition.
- B. Remove soil, loose particles, mortar, and other debris or foreign material from fragment surfaces to be bonded and from parent stone where fragment had broken off, by cleaning with stiff-fiber brush.
- C. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm) diameter holes drilled into parent stone and into, but not through, the fragment. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into parent stone and 2 inches (50 mm) into fragment, but no closer than 3/4 inch (19 mm) from exposed face of fragment.
- D. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of fragment and parent stone, completely filling all crevices and voids.
- E. Fit stone fragment onto parent stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of fragment with face of parent stone.
- F. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes as specified in "Stone Patching" Article.

3.9 CRACK INJECTION

- A. General: Comply with cementitious crack-filler manufacturer's written instructions.

- B. Drill 1/4-inch- (6-mm-) diameter injection holes as follows:
 - 1. Transverse Cracks Less Than 3/8 inch (9 mm) Wide: Drill holes through center of crack at 12 to 18 inches (300 to 500 mm) o.c.
 - 2. Transverse Cracks More Than 3/8 inch (9 mm) Wide: Drill holes through center of crack at 18 to 36 inches (500 to 900 mm) o.c.
 - 3. Delaminations: Drill holes at approximately 18 inches (500 mm) o.c. both vertically and horizontally.
 - 4. Drill holes 2 inches (50 mm) deep.
- C. Clean out drill holes and cracks with compressed air and water. Remove dirt and organic matter, loose material, sealants, and failed crack repair materials.
- D. Place plastic injection ports in drilled holes and seal face of cracks between injection ports with clay or other nonstaining, removable plugging material. Leave openings at upper ends of cracks for air release.
- E. Inject cementitious crack filler through ports sequentially, beginning at one end of area and working to opposite end; where possible, begin at lower end of injection area and work upward. Inject filler until it extrudes from adjacent ports. After port has been injected, plug with clay or other suitable material and begin injecting filler at adjacent port, repeating process until all ports have been injected.
- F. Clean cementitious crack filler from face of stone before it sets by scrubbing with water.
- G. After cementitious crack filler has set, remove injection ports, plugging material, and excess filler. Patch injection holes and surface of cracks as specified in "Stone Patching" Article.

3.10 STONE PATCHING

- A. Patch the following stone units unless another type of repair or replacement is indicated:
 - 1. Units indicated to be patched.
 - 2. Units with holes.
 - 3. Units with small areas of deep deterioration.[Patch deep deteriorations measuring more than 3/4 inch (19 mm) in least dimension and more than 1/2 inch (12 mm) deep.
- B. Remove and replace existing patches where indicated.
- C. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least [1/4 inch (6 mm)] thick, but not less than recommended in writing by patching compound manufacturer.
- D. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of stone unit.
- E. Mix patching compound in individual batches to match each stone unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
- F. Brush-coat stone surfaces with slurry coat of patching compound according to manufacturer's written instructions.

- G. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
 - 1. Simple Details: Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.
 - 2. Carved Details: Build patch up 1/4 inch (6 mm) above surrounding stone, and carve surface to match adjoining stone after patching compound has hardened.
- H. Keep each layer damp for 72 hours or until patching compound has set.
- I. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

3.11 FINAL CLEANING

- A. After 28 days when mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent nonstone surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.12 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

3.13 STONE WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess stone materials are Contractor's property.
- B. Stone Waste: Remove stone waste and legally dispose of off Owner's property.

END OF SECTION 040140.61

SECTION 040140.62 - STONE REPOINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Repointing joints with mortar.
 - 2. Repointing joints with sealant.

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. Rift: The most pronounced direction of splitting or cleavage of a stone.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to repointing stonework including, but not limited to, the following:
 - a. Verify stone repointing specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. Quality-control program.
 - d. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

- A. Order materials for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site enough quantity to complete Project.
- B. Work Sequence: Perform stone repointing work in the following sequence, which includes work specified in this and other Sections:
 - 1. Remove plant growth.
 - 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
 - 3. Repair masonry, including replacing existing masonry with new masonry materials.
 - 4. Rake out mortar from joints to be repointed.

5. Point mortar joints.
 6. After waiting a minimum of 28 days, complete general cleaning of masonry.
 7. Complete any special cleaning to remove rust or copper stains, paint and biological growth.
 8. Complete any/all repairs with composite materials.
 9. Point with sealant where shown on documents.
 10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from all work.
- C. If scaffolding is installed, patch anchor holes used to attach scaffolding as the scaffolding is removed. Patch holes in stone according to Section 040140.61 "Stone Repair." Patch holes in mortar joints according to "Repointing Stonework" Article.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 2. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.
- B. Samples for Verification: For the following:
1. Pointing Mortar: Submit mortar sample in the form of sample mortar strips, 6 inches (150 mm) long by 1/4 inch (6 mm) wide, set in aluminum channels.
 - a. Submit with precise measurements on ingredients, proportions, gradations, from which sample was made.
 2. Sealant materials.
 3. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For [stone repointing specialist] [including field supervisors and workers].
- B. Quality-control program.

1.8 QUALITY ASSURANCE

- A. Stone Repointing Specialist Qualifications: Engage an experienced stone repointing firm to perform work of this Section. Firm shall have completed a minimum of 3 projects in the last 5 years where the scope of work is similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance. Projects to have been completed under the jurisdiction of a local or State Historic Preservation office. Experience in only installing standard unit masonry or new stone masonry is insufficient experience for stone repointing work.

1. Field Supervision: Stone repointing specialist firms shall maintain experienced full-time supervisors with experience repointing stone on this project site during times that stone repointing work is in progress.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging stonework. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of stone repointing to demonstrate aesthetic effects and to set quality standards for materials and execution.
 1. Repointing: Rake out joints in two separate areas[, each approximately 36 inches (900 mm) high by 48 inches (1200 mm) wide for each type of repointing required and repoint one of the areas.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- B. Store materials on elevated platforms, under cover, and in a dry location. Do not use materials that have become damp.
- C. Store materials in manufacturer's original and unopened containers. Discard if containers have been damaged or have been opened for more than two days.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.
- B. Temperature Limits, General: Repoint masonry units only when air temperature is forecast to be between 45 and 90 deg F for seven days prior to the start of the work, the duration of the work and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated. The masonry wall must measure a minimum of 45 degrees when the new mortar or stone units are being installed.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repointing unless otherwise indicated:
 1. If the contractor elects to work when the mean daily air temperature is forecast to be between 35 degrees and 45 degrees, the contractor must provide an enclosure and heat to maintain temperatures above 45 deg F within the enclosure for seven days before, during the duration of the work and for seven days after the work has been completed. The Contractor is also required to have a high-low temperature gauge in each of the enclosures and record the temperatures on a daily basis. This record shall be submitted

each week to the Architect and Owner. No work is allowed if the temperatures are forecast to be below 35 degrees.

- D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures forecast to be 90 deg F (32 deg C) or higher.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain each type of material for stone repointing from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MORTAR MATERIALS

- A. NHL 3.5: US Ecologic Mortar as distributed by Limeworks – Custom Colored. Along the Arch Street wall, the following mortar mix was used for repointing the granite wall. The Contractor shall match the following custom color mix.
- B. Grade: SCG(G) Coarse
- C. Color Code: 90% DGM 050 - 10% DGM 250 with XF Slag
- D. Water: Potable.

2.3 ACCESSORY MATERIALS

A. Sealant Materials:

1. Sealant manufacturer's standard elastomeric sealant(s) of base polymer and characteristics indicated below and according to applicable requirements in Section 079200 "Joint Sealants."
 - a. Type: Dow Corning Dowsil 795 between stone and metal or 790 between granite and concrete.
2. Colors: Provide colors of exposed sealants to match colors of mortar adjoining installed sealant unless otherwise indicated.
3. Ground-Mortar Aggregate: Custom crushed and ground pointing mortar sand or existing mortar retrieved from joints. Grind to a particle size that matches the adjacent mortar aggregate and color. Remove all fines passing the No. 100 sieve.

B. Joint-Sealant Backing:

1. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended in writing by sealant manufacturer for preventing sealant from adhering to rigid, inflexible, joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- C. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.
- D. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 1. Previous effectiveness in performing the work involved.
 2. Minimal possibility of damaging exposed surfaces.
 3. Consistency of each application.
 4. Uniformity of the resulting overall appearance.
 5. Do not use products or tools that could leave residue on surfaces.

2.4 MORTAR MIXES

- A. Measurement and Mixing: Measure materials in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 1. Mixing Pointing Mortar: Thoroughly mix materials before adding any water. Add water and mix in accordance with manufacturer's instructions. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- B. Do not use admixtures in mortar.

PART 3 - EXECUTION

3.1 REPOINTING SPECIALIST

- A. Stone Repointing Specialist Firms: Subject to compliance with requirements, engage an experienced brick masonry repointing firm to perform work of this Section.

3.2 PROTECTION

- A. Prevent mortar from staining face of surrounding stone and other surfaces.
 1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
 2. Keep wall area wet below pointing work to discourage mortar from adhering.
 3. Immediately remove mortar splatters in contact with exposed stone and other surfaces.
- B. Remove or protect signs that cannot be removed before completing the work of this section.

3.3 STONE REPOINTING, GENERAL

- A. Appearance Standard: Repointed surfaces are to have a uniform appearance as viewed from [10 feet (3 m)] away by the Architect.

3.4 REPOINTING STONWORK

- A. Rake out and repoint joints to the following extent:
1. All joints in areas indicated.
 2. Joints indicated as sealant-filled joints.
 3. Joints at locations of the following defects:
 - a. Holes and missing mortar.
 - b. Cracks that can be penetrated 1/4 inch (6 mm) or more by a knife blade 0.027 inch (0.7 mm) thick.
 - c. Cracks 1/16 inch (1.6 mm) or more in width and of any depth.
 - d. Hollow-sounding joints when tapped by metal object.
 - e. Eroded surfaces 1/4 inch (6 mm) or more deep.
 - f. Deterioration to point that mortar can be easily removed by hand, without tools.
 - g. Joints filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
1. Remove mortar from joints to depth of 2-1/2 times joint width, but not less than [1/2 inch (13 mm)] [3/4 inch (20 mm)] or not less than that required to expose sound, unweathered mortar. Do not remove unsound mortar more than 2 inches (50 mm) deep; consult Architect for direction.
 2. Remove mortar from stone surfaces within raked-out joints to provide reveals with square backs and to expose stone for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 3. Do not spall edges of stone units or widen joints. Replace or patch damaged stone units as directed by Architect.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose stone, rotted wood, rusted metal, and other deteriorated items.
- E. Pointing with Mortar:
1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch (9 mm) until a uniform depth is formed. Fully compact each layer and allow it to become thumbprint hard before applying next layer.
 3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than 3/8 inch (9 mm). Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing stone has worn or rounded edges, slightly recess finished mortar surface below face of stone to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed stone surfaces or to featheredge the mortar.
 4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
 5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

F. Pointing with Sealant: Comply with Section 079200 "Joint Sealants" and as follows:

1. After raking out, keep joints dry and free of mortar and debris.
2. Clean and prepare joint surfaces. Prime joint surfaces unless sealant manufacturer recommends against priming. Do not allow primer to spill or migrate onto adjoining surfaces.
3. Fill sealant joints with specified joint sealant.
 - a. Install cylindrical sealant backing beneath the sealant. Where space is insufficient for cylindrical sealant backing, install bond-breaker tape.
 - b. Install sealant using only proven installation techniques that ensure that sealant is deposited in a uniform, continuous ribbon, without gaps or air pockets, and with complete wetting of the joint bond surfaces equally on both sides. Fill joint flush with surrounding stonework and matching the contour of adjoining mortar joints.
 - c. Install sealant as recommended in writing by sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
 - 1) Fill joints to a depth equal to joint width, but not more than 1/2 inch (13 mm) deep or less than 1/4 inch (6 mm) deep.
 - d. Tool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant from surfaces adjacent to joint.
 - e. Sanded Joints: Immediately after first tooling, apply ground-mortar aggregate to sealant, gently pushing aggregate into the surface of sealant. Lightly retool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant and aggregate from surfaces adjacent to joint.
 - f. Do not allow sealant to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces, particularly rough textures. Remove excess and spillage of sealant promptly as the work progresses. Clean adjoining surfaces by the means necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes, as demonstrated in an approved mockup.

- G. Where repointing work precedes cleaning of existing stone, allow mortar to harden at least 30 days before beginning cleaning work.

3.5 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
1. Do not use metal scrapers or brushes.
 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent nonstone surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

3.6 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION 040140.62

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Nonstaining silicone joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer.
- C. Field-Adhesion-Test Reports: For each sealant application tested.
- D. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Dow Corning Corporation Dowsil 795 for cast iron to masonry or cast iron to aluminum storefront.
 - b. Dow Corning Corporation 790 for masonry to concrete at the base of the building.

2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal – cast iron and aluminum.

- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates at each location as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform [5] tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints between masonry surfaces- masonry and concrete JS-#1.
 - 1. Joint Locations:
 - a. Joints between the masonry base and the concrete or brick pavers of the sidewalk.
 - 2. Joint Sealant: Silicone, nonstaining. DOW 790
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces – all joints in cast iron JS-#2.
 - 1. Joint Locations:
 - a. Construction joints at all other locations not limited to cast-iron panels and masonry, cast iron and aluminum.
 - 2. Joint Sealant: Silicone, nonstaining, Dowsil 795.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200