project manual



EL CAMINO HIGH SCHOOL GYMNASIUM WATER PROTECTION PROJECT OCEANSIDE UNIFIED SCHOOL DISTRICT



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A Joint Venture

$\begin{array}{c} 01 \ 01 \ 00 \\ 01 \ 04 \ 00 \\ 01 \ 10 \ 00 \\ 01 \ 23 \ 00 \\ 01 \ 32 \ 16 \\ 01 \ 32 \ 16 \\ 01 \ 32 \ 16 \\ 01 \ 32 \ 16 \\ 01 \ 34 \ 00 \\ 01 \ 41 \ 00 \\ 01 \ 41 \ 00 \\ 01 \ 42 \ 19 \\ 01 \ 45 \ 00 \\ 01 \ 52 \ 00 \\ 01 \ 52 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 52 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 57 \ 00 \\ 01 \ 70 \ 00 \\ 01 \ 70 \ 00 \\ 01 \ 71 \ 00 \\ 01 \ 73 \ 00 \\ 01 \ 73 \ 29 \end{array}$	SUMMARY OF WORK PROJECT COORDINATION SUMMARY OF WORK ALTERNATES CONSTRUCTION PROGRESS SCHEDULE SUBMITTAL PROCEDURES SHOP DRAWINGS, PRODUCT DATA AND SAMPLES APPLICABLE CODES AND STANDARDS REFERENCE STANDARDS QUALITY CONTROL CONSTRUCTION FACILITIES TEMPORARY CONTROLS STORAGE AND PROTECTION SUBSTITUTIONS AND PRODUCT OPTIONS PROJECT CLOSEOUT CLEANING PROJECT RECORD DOCUMENTS OPERATION AND MAINTENANCE DATA CUTTING AND PATCHING		
DIVISION 02		SITE WORK	
NOT USED			
DIVISION 03		CONCRETE	
03 73 00	CONCRETE REHABILITATION		
DIVISION 04	DIVISION 04 MASONF		
04 05 13	VERTICAL OVERHEAD REPAIR MORTAR		
DIVISION 05		METALS	
NOT USED			
DIVISION 06 NOT USED		WOODS & PLASTICS	

DIVISION 07 MOISTURE PROTECTION

07 90 00 JOINT SEALERS ELASTOMERIC AND NON-ELASTOMERIC SEALANT

DOORS & WINDOWS

NOT USED

DIVISION 09	FINISHES
09 83 00ELASTOMERIC COATINGS09 91 13EXTERIOR PAINTING09 96 23GRAFFITI RESISTANT COATINGS	
DIVISION 10	SPECIALTIES
NOT USED	
DIVISION 12	FURNISHINGS
NOT USED	
DIVISION 22	PLUMBING
NOT USED	
DIVISION 23	HVAC
NOT USED	
DIVISION 26	ELECTRICAL
NOT USED	
DIVISION 28	ELECTRONIC SAFETY AND SECURITY
NOT USED	
DIVISION 31	EARTHWORK
NOT USED	
DIVISION 32	EXTERIOR IMPROVEMENTS
NOT USED	

NOT USED

<u>APPENDIX</u>

EL CAMINO HIGH SCHOOL GYMNASIUM WATER INTRUSION ASSESSMENT, DESTRUCTIVE TESTING & WATER TESTING REPORT, dated April 31, 2020, by Allana Buick & Bers, Inc. (ABBAE)

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PART 1 - GENERAL

1.01 PROJECT/WORK IDENTIFICATION

- A. General: The work is comprised of the general re-coating for the purpose of preventing water intrusion into the existing Gymnasium building at El Camino High School, in Oceanside Unified School District, as indicated on the contract documents prepared by PJHM Architects, Inc.
- B. Contract Documents: Indicates the work of the contract and related requirements and conditions that have an impact on the project. This includes, but is not necessarily limited to that shown on the drawings and specified herein.
 - 1. Work to be performed throughout the site within or about the property line of the project.
 - 2. Alternates.
 - 3. Requirements for partial occupancy prior to substantial completion of the contract work.
- C. Summary of References: Work of the Contract can be summarized by references to the Contract, Agreement, General Conditions, Special Conditions, Specification Sections, Drawings, addenda and modifications to the contract documents issued subsequent to the initial printing of this project manual and including, but not necessarily limited to, printed material referenced by any of these. It is recognized that work of the contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

1.02 ABBREVIATED WRITTEN SUMMARY:

Briefly and without force and effect upon the contract documents, the work of the contract can be summarized as follows:

- A. Water Protection Re-Coating of Exterior Surfaces
 - 1. Re-coating of exposed wall surfaces at Main Gymnasium exterior walls, both horizontal and vertical surfaces.
 - a. Removal of existing paints, coatings and sealers
 - b. Application of new protective and impermeable coatings, including all sealers and accessories.
 - c. All new work involving existing roofing membrane and terminations shall be done in such a manner to preserve and maintain the Owner's existing warranty for the roofing membrane and roofing system.
 - d. Power-wash all existing exposed masonry surfaces
 - e. New exterior paint on non-concrete and non-masonry exposed surfaces.
 - f. New miscellaneous water-sealing treatment of exposed exterior accessories, such as electrical boxes, conduits and devices.

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- 2. The basis of the scope of work is the written report "El Camino High School Gymnasium Water Intrusion Assessment, Destructive Testing & Water Testing Report", dated April 31, 2020, by Allana Buick & Bers, Inc. (ABBAE).
 - a. All new work and construction at the existing building shall comply with the "Recommendations" section of the report, whether graphically shown on the drawings or not.
- B. ALTERNATES refer to section 01 23 00 for additional information
 - 1. Application of new graffiti-resistant coating to all exposed concrete masonry exterior surfaces.
- 1.03 PERFORMANCE REQUIREMENTS FOR CONSTRUCTION AND COMPLETED WORK
 - A. General: The Contract Documents indicate the intended occupancy and utilization of the buildings and its individual systems and facilities. Compliance with governing regulations is intended and required for the work and for the Owner's occupancy and utilization.

PART 2 - EXECUTION

2.01 PERFORMANCE

- A. Provide quality workmanship for the related work indicated and specified herein, meeting the quality standards of the trades affected by the scope of work per these contract documents.
- B. Time Line
 - 1. Refer to the Agreement for construction time, which shall start as of the date specified in the initial letter "Notice to Proceed" from the Architect and/or the Owner to the Contractor and end with the date of acceptance of work by the Owner.
 - 2. Substantial completion of work or a designated portion thereof is the date certified by the architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the work or designated portion thereof for the use intended.

END OF SECTION

section 01 04 00 project coordination

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Work Included: The General Contractor shall provide administrative service and supervisory requirements necessary for the coordination of work to insure orderly progress and timely completion of the work in conformance with the design and the contract documents within the time line specified. Work of the project includes but not necessarily limited to the following:
 - 1. Coordination meetings
 - 2. Administrative and supervisory personnel
 - 3. Interface subcontractors/manufacturers/time line
 - 4. Record documentation
 - 5. Material test and inspection
 - 6. General Construction/Installation provisions
 - 7. Maintain safe, clean conditions
 - 8. Conservation and salvage
 - B. Related Requirements: The General Provisions of the Contract Documents.

1.02 QUALITY ASSURANCE

A. Provide administrative staff and employees who are thoroughly experienced to provide quality standards and craftsmanship, who are completely familiar with the California Building Code and the specified requirements needed for the performance and completion of the work indicated and specified herein.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Equipment Access: To avoid conflict, the contractor shall establish and provide adequate area to provide secure storage for handling of stored products away from ongoing activities of the work. Provide access and route of handling products to avoid damage.
- B. Provide secure protection of work and materials against damage.
 Manufactured products shall be stored per manufacturer's recommendations on product handling, storage and protection.
- B. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements.
- D. The architect may reject as non-complying such material and products that do not bear identification satisfactory to the architect as to manufacturer, grade, quality and other pertinent information.
- 1.04 ADMINISTRATIVE/SUPERVISORY PERSONNEL

- A. <u>General</u>: Prepare a written memorandum on required coordination activities. Include such items as required notices, reports and attendance at meetings. Distribute this memorandum to each entity performing work at the project site. Prepare similar memorandum for separate contractors where interfacing of their work is required.
- B. <u>Coordination Drawings</u>: Prepare coordination drawings where work by separate entities requires fabrication off-site of products and materials which must accurately interface. Coordination drawings shall indicate how work shown by separate shop drawings will interface, and shall indicate sequence for installation. Comply with all requirements of the "Submittals" section.
- C. <u>Weekly Coordination Meetings</u>: Hold weekly general project coordination meetings at regularly scheduled times convenient for all parties involved. These meetings are in addition to specific meetings held for other purposes such as regular project meetings and special pre-installation meetings. Request representation at each meeting by every party currently involved in coordination or planning for the work of the entire project. Conduct meetings in a manner which will resolve coordination problems. Record results of the meeting and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.
- D. <u>Verified Reports</u>: Contractor shall make a duly Verified Report to Division of the State Architect per 4.336, Title 24, Part 1.

1.05 LIMITATIONS ON USE OF THE SITE

- A. <u>General</u>: Limitations on site usage as well as specific requirements that impact site utilization are indicated on the drawings. In addition to these limitations and requirements administer allocation of available space equitably among entities needing both access and space so as to produce the best overall efficiency in performance of the total work of the project. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.
- B. <u>Burial of Waste Materials</u>: Do not dispose of organic and hazardous materials on site, either by burial or by burning without the express written consent of the architect.
- 1.06 SPECIAL REPORTS
 - A. <u>General</u>: Submit special reports directly to the Owner within one day of an occurrence. Submit a copy of the report to the architect/engineer and other entities that are affected by the occurrence.
 - B. <u>Reporting Accidents</u>: prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.
- PART 2 PRODUCTS (Not Applicable)
- PART 3 EXECUTION
- 3.01 GENERAL INSTALLATION PROVISIONS

- A. <u>Pre-Installation Conferences:</u> Hold a pre-installation meeting at the project site well before installation of each unit of work which requires coordination with other work. Installer and representatives of the manufacturers and fabricators who are involved in or affected by that unit of work, and with its coordination or integration with other work that has preceded or will follow shall attend this meeting. Advise the Architect/Engineer of schedule meeting dates.
 - 1. At each meeting review progress of other work and preparations for the particular work under consideration.
 - 2. Record significant discussions of each conference, and record agreements and disagreements, along with the final plan of action. Distribute the record of meeting promptly to everyone concerned, including the owner and Architect/Engineer.
 - 3. Do not proceed with the work if the pre-installation conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the work and reconvene preinstallation conference at the earliest feasible date.
- B. <u>Installer's Inspection of Conditions</u>: Require the Installer of each major unit of work to inspect the substrate to receive work and conditions under which the work is to be performed. The Installer shall report all unsatisfactory conditions in writing to the Contractor. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- C. <u>Manufacturer's Instructions:</u> Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements indicated in the contract documents.

Inspect each item of materials or equipment immediately prior to installation. Reject damaged and defective items.

Provide attachment and connection devices and methods for securing work. Secure work true to line and level, and within recognized industry tolerances. Allow expansion and building movement. Provide uniform joint width in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable visual-effect choices to the Architect/Engineer for final decision.

Recheck measurements and dimensions of the work, as an integral step of starting each installation.

Install each unit-of-work during weather conditions and project status that will ensure the best possible results in coordination with the entire work. Isolate each unit of work from incompatible work as necessary to prevent deterioration.

Coordinate enclosure of the work with required inspections and tests, so as to minimize the necessity of uncovering work for that purpose.

D. <u>Mounting Heights</u>: Where mounting heights are not indicated, mount individual units of work at industry recognized standard mounting heights for the particular application indicated. Refer questionable mounting height choices to the Architect/Engineer for final decision.

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3.02 CLEANING AND PROTECTION

A. <u>General</u>: During handling and installation of work at the project site, clean and protect work in progress and adjoining work on the basis of continuous maintenance. Apply protective covering on installed work where it is required to ensure freedom from damage or deterioration at time of substantial completion.

Clean and perform maintenance on installed work as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

B. <u>Limiting Exposures of Work</u>: To the extent possible through reasonable control and protection methods, supervise performance of the work in such a manner and by such means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period.

3.03 CONSERVATION AND SALVAGE

A. General: It is a requirement for supervision and administration of the work that construction operations be carried out with the maximum possible consideration given to conservation of energy, water and materials. In addition, maximum consideration shall be given to salvaging materials and equipment involved in performance of the work but not incorporated therein. Refer to other sections for required disposition of salvage materials that are the Owner's property (Change Order procedure).

END OF SECTION

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section 01 10 00 summary of work

PART 1 - GENERAL

- 1.01 SECTION INCLUDES:
 - A. Work Covered by Contract Documents
 - B. Contract Method
 - C. Contractor Use of Premises
- 1.02 WORK COVERED BY CONTRACT DOCUMENTS:
 - A. Work Included: The work to be performed by this Prime Contractor shall conform to the requirements of the Project as coordinated with the District through the Construction Manager, all sheets in Drawings and other related documents and includes the furnishing of all supervision, labor, materials, tools, equipment, transportation, plan and services necessary therefore and incidental thereto to complete the project. <u>If Reference is not made to a specific specification section, this does not relieve this prime contractor of his material obligation for specification sections that pertain to his work and are not mentioned herein. The work shall consist of, but not be limited to the following project procedures/scope:</u>
 - This Prime Contractor is to install new continuous concrete mortar onto existing parapet wall. To scrape to remove all existing wall coatings to expose bare concrete substrate, roughen/grind existing concrete wall surface to ensure proper adhesion of new wall coatings, patch to fill all existing voids-rock pockets-bug holes, etc., flush with face of wall. Rout new "V" groove along al existing cracks and concrete lift joints in wall, fill "V" groove with urethane sealant flush to wall, install new protective elastomeric coating (prime, base coat, and top coat over ALL concrete wall/surface, coordinate color selection with District CM).
 - 2. This Prime Contractor shall protect in place all existing finishes adjacent to this prime contractors work. Any cost to repair damage to existing finishes shall be borne by this Prime Contractor at no additional expense to the District.
 - 3. Provide a \$20,000.00 Allowance to be used at the sole discretion of the District through the Construction Manager. All work pertaining to the allowance must be approved by the Construction Manager. If work authorized is less than the Allowance, then a Deductive Change Order will be issued. All work will be directed by the Construction Manager. The allowance shall be listed as a separate line item on the Contractor's Schedule of Values.
 - 4. This Prime contractor is responsible for the coordination of and arranging for any and all inspections for their scope of work as required by the Construction Manager.
 - 5. This Prime Contractor shall conduct weekly Safety and Tailgate meetings with signed attendance forms to be submitted to the Construction Manager on a weekly basis.
 - 6. Continuous housekeeping and daily cleanup of litter and excess building materials is mandatory. A trash dumpster will be provided through another prime contractor.

summary of work 01 10 00 -1 7. Provide for all clean-up scope of work for all of this Prime Contractor's scope of work. All final clean-up must have the Districts final approval through the Construction Manager.

This Prime Contractor shall conform to all the Project requirements as follows:

- 8. Provide all labor, material, and equipment necessary for Rough Carpentry scope as related to this Prime Contractors scope of work.
- 9. Provide all labor, material, and equipment necessary for Misc Metals scope as related to this Prime Contractors scope of work.
- 10. Provide all labor, material, and equipment necessary for Metal Handrailing scope as related to this Prime Contractors scope of work.
- 11. Provide all labor, material, and equipment necessary for Concrete scope as related to this Prime Contractors scope of work.
- 12. Provide all labor, material and equipment necessary for Plaster scope as related to this Prime Contractors scope of work.
- 13. Provide all labor, material, and equipment necessary for Waterproofing scope as related to this Prime Contractors scope of work.
- 14. Provide all labor, material, and equipment necessary for Earthwork scope as related to this Prime Contractors scope of work.

15-18. N/A

The following is additional information, instructions and detailed requirements for this Prime Contractors scope of work as identified in items one (1) through eighteen (18) above. Not all sections are mentioned below, only further detail of this Prime Contractors scope of work.

GENERAL ITEMS

- 19. This Contractor shall review the drawings and site conditions and understand the scope of work indicated in this scoping document.
- 20. This Prime Contractor is required to provide Daily Manpower Reports for all his and all his Sub Contractor personnel to the Construction Manager each day.
- 21. All costs for repairs due to this Prime Contractor negligence shall be borne by this Prime Contractor without impact to the approved construction schedule and without additional cost to the District.
 - 21.1 Contractor shall provide a construction schedule for this Prime Contractor's scope of work for review and approval by the Construction Manager. Schedule shall be submitted in CPM format and shall adhere to District Milestones for the project.
- 22. Provide any applicable shop drawings and submittals so as to not cause any delays to any portion of the construction schedule for this Prime Contractor any other Prime Contractor included in this project.
- 23. Provide adequate penetrations, block outs, outlets, openings, cutouts, fixture locations, backing, and access panel openings. Coordinate as necessary with other Bid Package Prime Contractors.

- 24. Continuous site cleanup of the construction site is mandatory. This includes sweeping, water removal, and litter/debris removal of the interior & exterior of the building and staging areas. If this Prime Contractor fails to perform daily clean up, the Construction Manager, upon written notice to the Prime Contractor, shall order that clean up done at this Prime Contractor's expense and adjust Prime Contractors contract accordingly.
- 25 This Prime Contractor shall coordinate his work with that of other prime contractors, subcontractors and work by the District. All potential space conflicts are to be identified during the bidding and field investigation process. If a field space conflict is encountered, it shall be reworked or rerouted at no additional cost, and only a scope change by the District will be considered for contract price adjustment.
- 26. Request For Information Should there be any obscurity or contradiction, this Prime Contractor will be responsible to submit a Request for Information in writing to the Construction Manager as they relate to issues regarding interpretation and/or clarifications of the plans and this scoping document. The Construction Manager will coordinate the information with the District for response. All requests shall be made in a <u>timely manner</u> allowing for three (3)-calendar days response time so as to not delay the work or overall schedule.
- 27. Revisions/Updating Contract Documents This Prime Contractor is responsible to immediately update all field and office sets of contract documents upon receipt of any revised instructions. This includes addendum, revised drawings, "RFI" responses, Bulletins, etc. This Prime Contractor shall insert, "cut and paste", and revise with red ink or other suitable methods denoting the most current Construction Document changes. Payments to the contractor shall be withheld until drawings are updated.
- 28. N/A
- 29. Prime Contractor Personnel The district has complete authority to review and approve selection of this Prime Contractor's field and office personnel for this project. The district has authority to request replacement of any of the Contractor's personnel for reasons determined by the District. This Prime Contractor shall maintain the same approved personnel throughout the entire duration of the project at the District's discretion. This Prime Contractor will, at the time of award of work, furnish a list of persons assigned to the project showing their titles and telephone numbers. Emergency telephone numbers shall also be provided for after hour use by the District.

This Prime Contractor agrees to provide a minimum of one competent English speaking skilled foreman or superintendent who shall be present at all times during execution of this Prime Contractor's work.

30. Failure to provide an adequate Project Manager or Superintendent shall result in an assessment of Construction Management costs levied to have the Construction Manager coordinate and manage prime contractors / subcontractor's work. In no event shall Construction Manager be liable for any costs associated with this Prime Contractors lack of supervision. This Prime Contractor agrees to use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

summary of work 01 10 00 -3

- 31. Timely requests for clarifications and other information to allow reasonable response time and avoid delay to the construction schedule.
- 32. Provide all hoisting necessary for this Prime Contractors entire scope of work.
- 33. Provide all temporary access as required for the Prime Contractor's entire scope of work. This includes, but is not limited to, trench plates, scaffolding, catwalks, scissors lifts, pettibones, rigging, cranes, gang ways, etc.
- 34. Schedule shall be in accordance with District approved construction milestone schedule and all subsequent revisions.
- 35. Provide punch list, punch list repairs/corrections, final clean up, and closeout for this bid package per contract construction schedule. Parties agree that delays to punch list, final clean up, and closeout would constitute a delay in project completion and, therefore, entitles the District to withhold and retain potential liquidated damages per the Contract Documents from this Prime Contractor's progress payments.
- B. Existing Site Conditions: This Prime Contractor shall make a thorough examination of the site to determine all existing conditions affecting the work prior to beginning any work under this bid package. All conflicts within the contract documents and existing conditions are to be brought to the attention of the Construction Manager during the bidding process by way of the pre-bid clarification form issued at the job walk. Any claims for changes in scope or claims for additional compensation will not be considered for this contractor's failure to notify the Construction Manager of such a conflict/discrepancy.
- C. Location of Site: The site is located at: 400 Rancho Del Oro Dr, Oceanside, CA 92057
- D. Work Not Included: Items specifically listed in other 01 10 00 scopes of work sections.
- 1.03 CONTRACT METHOD:
 - A. Construct the Work under a single Lump Sum Contract with a Schedule of Values.
- 1.04 CONTRACTOR USE OF PREMISES:
 - A. Contractor shall have use of the premises for the execution of the work as outlined in the staging / phasing plan in the drawings.
 - B. Work Week and Job Hours Activities at the Project Site shall be conducted between the hours of 7:00 am and 5:00 pm, Monday through Friday, unless otherwise authorized by the District.
 - C. Coordinate use of the premises under the direction of the Construction Manager.
 - D. Assume full responsibility for the protection and safekeeping of products & Work under this Prime Contract that are stored & installed on the site.
 - E. This Prime Contractor shall enforce that all persons working on the site use only non-permanent markers, tapes and tags to indicate construction techniques and instructions, on construction in progress, and on existing construction. This includes markings on exterior and interior of building and

summary of work 01 10 00 -4 on walks, curbs, walls and other site surfaces. Where work is damaged or defaced by use of permanent marking devices, such work will be subject to cleaning, repair or replacement, as the Architect may require.

- F. Move any stored products under This Prime Contractor's control that interferes with the operations of the Owner and/or any other Contractor that is on a separate contract.
- G. Theft: If any person working on the contract should engage in theft of money, property, supplies, equipment, food, or any other item, whether from the District's personnel, students, facilities, employees, visitors, or from another of the Contractor's personnel or subcontractors, will be immediately and permanently dismissed from the site.
- H. All District property is drug free, alcohol free, weapons free and graffiti free. This Prime Contractor shall enforce these rules to his crew, subcontractors and suppliers.
- I. All contractors shall be required to provide badges from their firm indicating employee identification while in District property. Contractor shall provide Dept. of Justice background checks with the state for all full-time Superintendents and Foremen for the project, and coordinate / provide all documentation necessary to the District through the Construction Manager. The Superintendent or Foreman shall be responsible for signing in all personnel under his/her authority every day and providing the sign-in sheet to the Construction Manager at the close of every business day. This cost shall be included in the Contractor's bid.

END OF SECTION

section 01 23 00 alternates

PART 1 GENERAL

1.01 WORK SPECIFIED IN THIS SECTION

A. Work covers construction of this project as defined in the Construction Documents.

1.02 RELATED WORK IN OTHER SECTIONS

- A. Substitution and product options.
- B. Project record documents, warranties and bonds

1.03 QUALITY ASSURANCE

- A. Insure installation of these systems by persons thoroughly experienced with the type of products specified herein, installation approved by the manufacturer of the products being installed.
- B. Codes and Standards: Project Scope of Work per this section shall conform to the applicable sections of the governing codes indicated throughout these documents.

1.04 SUBMITTALS

- A. Submit shop drawings for review per Section 01 33 00. Show sizes and location of edges, joints and framing conditions, relationships with plumbing, mechanical and electrical items affecting the work.
- B. Submit samples of all materials affecting the work for review.
- C. Provide architect with detail drawings showing dimensions, description of all materials, fabrication, mechanical fasteners and attachments to substrates.

1.05 GUARANTY/GUARANTEES

A. Provide the Owner with a written guarantee against failure of application, workmanship or materials of the products specified herein for a period governed by applicable section of these specifications after the date of building acceptance, and without additional cost to the Owner.

PART 2 ALTERNATES

- 2.01 ADDITIVE ALTERNATE "1"
 - A. Furnish and install new graffiti-resistant coating on all existing exposed concrete masonry unit exterior surfaces.

alternates 01 23 00 - 1

1. The Base Bid shall include power-washing of all existing exposed concrete masonry unit exterior surfaces. Preparation of such exterior surfaces, above and beyond power-washing, to receive new graffiti-resistant coatings shall be included in the pricing for the additive alternate.

PART 3 EXECUTION

3.01 INSPECTION

- A. Check all dimensions of the work, conditions of floors, walls, etc., affecting the installation of the specified item.
- B. Check areas to receive surface mounted items for conditions that would affect the quality and execution of the work.
- C. Do not begin installation of items specified until the above items are acceptable.

3.02 INSTALLATION

A. Installation of all materials shall be in accordance with good trade practice per the recommendations of the manufacturer and/or as indicated on the drawings and with skilled workmanship.

PART 4 ACCEPTANCE OF BIDS AND ALTERNATES

- 4.01 DETERMINATION OF LOW BIDDER
 - A. For the purposes of determining the low bidder, bids shall be evaluated according to the following criteria: The Base Bid will combined with Additive Alternate "1" to establish a Construction Cost. Low Bids shall be awarded based upon that Construction Cost.
 - If the Construction Cost falls below the Project Budget by an amount equal to or greater than the cost of Additive Alternate "1", then Additive Alternate "1" may be accepted at the discretion of the Owner.
 - 2. If the Construction Cost, including Additive Alternate "1", exceeds the Project Budget by an amount equal to or greater than the cost of Additive Alternate "1", then Additive Alternate "1" may be declined at the discretion of the Owner.

END OF SECTION

alternates 01 23 00 - 2

section 01 32 16 construction progress schedule

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Construction Progress Schedule Procedures
- B. Related Sections
 - A. 01 01 00 Summary of Work
 - B. 01 33 00 Submittal Procedures
 - C. 01 63 00 Substitutions and Product Options
 - D. 01 70 00 Project Closeout

1.02 SUBMITTALS

- A. Schedule Submittals
 - 1. CONTRACTOR shall submit Construction Progress Schedules as follows:
 - a. Preliminary Schedule: Submit a preliminary Baseline Schedule within fourteen days after Notice of Award. OWNER will review the Preliminary Schedule and return comments within ten workdays.
 - b. Initial Schedule: Revise the preliminary Schedule and resubmit within ten days, to provide the Project's Baseline Schedule.
 - c. Weekly Schedule Update: While retaining the Baseline Schedule, revise copies to show actual construction progress to date, and submit at scheduled weekly dates, or as otherwise required by the OWNER.
 - In the event that the progress of the Work or the sequencing d. of the activities of the Work differs significantly from that indicated in the Baseline Schedule, the Contractor shall submit a Recovery Schedule to the OWNER, demonstrating the CONTRACTOR'S plan to recover lost time, achieve all contractual milestones, and complete the work within the contract time. Appropriate recovery actions include, but are not limited to, assignments of additional labor or equipment, shift or overtime work, expediting of submittals or deliveries, overlapping of activities, or sequencing changes to increase activity concurrence. An accompanying narrative shall describe the cause of the problems and the actions planned by the Contractor to recover the schedule. The OWNER will review the Recovery Schedule and provide comments, leading to approval of the schedule.
 - e. With each Application for Payment.
- 1.03 SCHEDULING
 - A. Form and Content of Schedules

- 1. Schedule shall be in the form of a computer-generated Critical Path Method (CPM) or Gantt format showing all construction activities required to complete the Work of the Project within the Contract Time and any OWNER-defined Milestones.
- 2. CONTRACTOR shall utilize an established standard, centralized, Internet-based scheduling program.
- 3. Schedule shall include but not be limited to the following:
 - a. Complete sequence, with start and completion dates, of each and every activity of construction or element of the construction process.
 - b. Phases of construction, with start and completion Milestones, as well as any other Milestones defined by the OWNER.
 - c. Critical submittals, including OWNER and ARCHITECT review and approval periods, including 15 workdays for the first submittal (10 days for resubmittal), 21 days when the ARCHITECT's consultants must review, and 30 days for review of submittals of Structural Steel, Door Hardware, and Hollow Metal Doors and Frames.
 - d. Procurement, manufacture and/or fabrication; testing and delivery to the Project site of special long-lead-time material and equipment.
 - e. Operational start-up, test and balance, performance testing, and training of operators for systems and equipment; for Substantial Completion and for Final Completion.
 - f. Temporary facilities; construction of mock-ups, prototypes and/or samples; punch list; interfaces with Separate Work Contracts; and regulatory agency approvals and permits required for performance of the Work.
 - g. Deferred Approvals, allowing a minimum of ninety (90) days for all Deferred Approval items.
 - h. OWNER interfaces and Owner-Furnished equipment, either installed by CONTRACTOR (OFCI) or by OWNER (OFOI).
 - i. Decision dates for products specified by allowances, selection of finishes, and other ARCHITECT- or OWNERfurnished schedules or decisions.
- 4. Schedule shall be updated periodically as specified to show progress of each activity and all changes since the previous submission, including:
 - a. Major changes in scope.
 - b. Activities modified since previous updating.
 - c. Revised projections due to changes.
 - d. Other identifiable changes.

B. Schedule Requirements

- 1. Schedule shall represent CONTRACTOR'S plan to complete the Work within the Milestones and/or Contract Time. However:
 - a. A schedule extending beyond the Milestones and/or Contract Time will not be acceptable.

construction progress schedule 01 32 16 - 2

- b. A schedule indicating Work completed in less than the Milestones and/or Contract Time will not be acceptable. CONTRACTOR shall indicate any available float.
- c. A schedule found unacceptable by the OWNER shall be revised by CONTRACTOR and resubmitted within five (5) days.
- 2. Schedule shall be in sufficient detail to assure adequate planning and execution of Work, including but not limited to:
 - a. Start and completion of all items of Work and their major components, and all designated dates identified as Milestones by OWNER.
 - b. Construction activity durations shall be limited to no more than two reporting periods, with exception of fabrication and procurement activities, unless approved otherwise by OWNER. Activity durations shall be total of actual workdays to perform and complete that activity and shall not include consideration of weather impact on the activity.
 - c. Activities for procurement, delivery, and installation of equipment, materials and other supplies, including time for submittals, reviews and re-submittals. Include decision dates for selection of finishes.
 - d. Time for fabrication and delivery of manufactured products for the Work, showing interdependence of procurement and construction activities.
 - e. Identify each activity with applicable CSI Specification Division number, and coordinate with the CONTRACTOR'S approved "Schedule of Values." Include adequate breakdown of activities for the Mechanical and Electrical elements of the work, to enable accurate monitoring and to assure full coordination with OWNER'S operating personnel.
 - f. Each activity shall be capable of being cost and resourceloaded with the resulting cost total equal to the Contract Amount
 - g. Activities shall include all associated interface activities contained within the Contract Documents including, but not limited to, OWNER maintenance-and-operations activities
 - h. Each activity shall be defined to permit reasonable monitoring and evaluation of progress in performance of the Work.
- 3. Notwithstanding acceptance of the Schedule, failure to identify and/or include any element of the Contract into the Schedule shall not release CONTRACTOR from obligation of completing all required Work in accordance with the Contract Completion Date or any Milestones.
- 4. Submittal of the Schedule shall constitute CONTRACTOR'S confirmation that the Schedule meets the requirements of the Contract Documents, and the Work will be executed in the sequence indicated in the Schedule.
- 5. If CONTRACTOR fails to comply with the specified requirements, OWNER reserves the right to engage an independent scheduling consultant and/or provide its own expertise to fulfill these requirements, and shall be entitled to recover by assessment all incurred costs for the services from the CONTRACTOR.
- 6. Submittal of any Schedule is subject to review and acceptance by ARCHITECT and OWNER. OWNER retains the right to withhold

construction progress schedule 01 32 16 - 3 progress payments in whole or part until CONTRACTOR submits a Schedule acceptable to OWNER.

PART 2 PRODUCTS - NOT APPLICABLE

PART 3 EXECUTION - NOT APPLICABLE

END OF SECTION

construction progress schedule 01 32 16 - 4

section 01 33 00 submittal procedures

PART 1 GENERAL

- 1.01 SUMMARY
 - A. Section Includes
 - 1. Submittal Procedures.
 - 2. Shop Drawings.
 - 3. Product Data.
 - 4. Samples.
 - 5. Manufacturers' Instructions.
 - 6. Manufacturers' Certificates.
 - 7. Coordinated Drawings.

1.02 SUBMITTALS

- A. Procedures
 - 1. CONTRACTOR shall submit a Schedule of Submittals, listing their required submission and review dates to the ARCHITECT for review and acceptance. The schedule shall allow sufficient time for checking by the ARCHITECT. In addition, the submittal schedule shall be incorporated into and coordinated with the construction progress schedule. Additional service fees will be required, paid by the CONTRACTOR at no cost to the OWNER, to the ARCHITECT for ARCHITECT's review of out of sequence submittals, excessive resubmittal attempts, expedited review requests, and submittals not in conformance with the submittal schedule time limits.
 - 2. Transmit separate request for each submittal directly to the ARCHITECT.
 - a. Bind submittals sturdily, neatly label covers.
 - b. Include ARCHITECT'S job number as it appears on Contract Documents.
 - c. Include LAHJ application or approval numbers.
 - e. Digital submissions will be accepted at the discretion of the ARCHITECT.
 - 3. Sequentially number the transmittal forms. Re-submittals are to have original number with the letter 'R' followed by revision number. Example Naming: Submittal 07 92 00 R2
 - 4. Identify Project, CONTRACTOR, subcontractor or supplier; pertinent Drawing sheet and detail number(s) and specification section number, as appropriate.
 - a. Provide name and telephone number of individuals who may be contacted for further information.
 - 5. Apply CONTRACTOR'S dated stamp with CONTRACTOR'S original signature or initials affixed thereto, certifying that review, verification of Products required, field dimensions, adjacent construction Work and coordination of information is in accordance

submittal procedures 01 33 00 - 1 with the requirements of the Work and Contract Documents. Stamped signatures or initials are not acceptable.

- 6. Schedule submittals to expedite the Project. Coordinate submission of related items.
 - a. Make all submittals in accordance with the progress schedule and far enough in advance of scheduled dates of installation to provide required time for reviews for securing necessary approvals for possible revision and re-submittal and for placing orders and securing delivery.
- 7. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- 8. State effect of substitution on construction schedule and changes required in other work or products.
- 9. Provide space for CONTRACTOR and ARCHITECT review stamps.
- 10. Revise and re-submit submittals as required, identify all changes made since previous submittal with revision clouds and revision delta symbols.
- 11. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- 12. Determine and verify all field dimensions and conditions, materials, catalog numbers and similar data.
- 13. Coordinate as required with all trades and all public agencies involved.
- 14. Unless otherwise specifically authorized by ARCHITECT, make all submittals in groups pertaining to specification sections, containing all associated items. ARCHITECT will reject partial submittals as not complying with the provisions of this section.
- B. Product Data
 - 1. Submit six (6) copies or (1) digital (.pdf)
 - 2. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.
 - 3. After review, distribute and provide copies for Record Documents.
- C. Shop Drawings
 - 1. Submit newly prepared information, drawn to accurate scale. Highlight, encircle or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project will not be approved as Shop Drawings.

submittal procedures 01 33 00 - 2

- 2. Shop Drawings shall include fabrications and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 - a. Dimensions.
 - b. Identification of products and materials included.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
- 3. Sheet Size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8½ inch x 11 inch, but not larger than 30-inch x 42-inch or (1) digital (.pdf)
- 4. The CONTRACTOR shall review, stamp with his approval as herein required, and submit with reasonable promptness and in orderly sequence, in accordance with the submittal schedule, all shop drawings required by the Contract Documents or subsequently by the ARCHITECT as covered by modifications. Shop drawings shall be properly identified. At the time of submission, the CONTRACTOR shall inform the ARCHITECT in writing of any deviation in the shop drawings from the requirements of the Contract Documents.
- 5. Stamp: Each page of shop drawings shall bear the CONTRACTOR'S stamp, which shall signify the CONTRACTOR'S representation that he/she has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained in the shop drawings. Each stamp shall be accompanied by a wet signature of the CONTRACTOR who may be contacted for information. Stamped signatures or initials are not acceptable.
- 6. Method of Review: Make initial submittal of six (6) hard copies or (1) digital (.pdf) of the shop drawings to the ARCHITECT. Comments or corrections will be noted and returned to the CONTRACTOR, who shall identify all changes made since the previous submittal and re-submit in the same manner. When reviewed, the shop drawings will be stamped and returned to the CONTRACTOR who shall make distribution of copies to his/her subcontractors.
- 7. The ARCHITECT will review shop drawings with reasonable promptness so as not to cause any delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. The ARCHITECT'S favorable review of a separate item shall not indicate acceptance of an assembly in which the item functions.
- 8. Submittal of shop drawings to the ARCHITECT shall be made by the CONTRACTOR with a dated transmittal form or letter and not by subcontractors or suppliers.
- 9. The ARCHITECT'S review of shop drawings shall not relieve the CONTRACTOR of responsibility for any deviation from the requirements of the Contract Documents unless the CONTRACTOR has informed the ARCHITECT in writing of such deviation at the time of submission and the ARCHITECT has given written acceptance to the specific deviation, nor shall the ARCHITECT'S favorable review

relieve the CONTRACTOR from responsibility for errors or omissions in the shop drawings.

- 10. No portion of work requiring shop drawings shall be commenced until the shop drawings have been returned with a favorable review by the ARCHITECT.
- D. Samples
 - 1. Submit samples to illustrate functional and aesthetic characteristics of the Product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 2. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for ARCHITECT selection or in custom colors selected.
 - 3. Include identification on each sample with full Project information.
 - 4. Submit a minimum of five (5) samples or as specified in individual sections of the specifications, four (4) of which will be retained by the ARCHITECT.
 - 5. Reviewed samples which may be used in the Work are indicated in individual specification Sections.
 - 6. Selection or rejection of samples will be made by the ARCHITECT in writing.
- E. Quality Assurance/Control Submittals
 - 1. Design Data, Test Reports, Certificates, Manufacturers' Instructions, Manufacturers' Field Reports, Qualification Statements
 - a. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for Product Data.
 - b. Identify conflicts between manufacturers' instructions and Contract Documents.
 - c. When specified in individual specification sections, submit manufacturers' certificate to ARCHITECT for review in quantities specified for Product Data.
 - d. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate.
 - e. Certificates may be recent or previous test results on material or product but must be acceptable to ARCHITECT.
- F. Closeout Submittals
 - 1. When specified in individual specification sections, submit eight (8) copies. Seven (7) copies will be retained by the ARCHITECT.
 - 2. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.
 - 3. After review, distribute and provide copies for Record Documents.

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION – NOT APPLICABLE

END OF SECTION

submittal procedures 01 33 00 - 5

section 01 34 00 shop drawings, product data and samples

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Submit schedule for shop drawings, product data and samples required by Contract Documents within 30 days of receipt of contract.
- B. Dates for submission and review of shop drawings, product data and samples will be established by the Contractor, as recommended by the subcontractor with respect to required dates for return of reviewed submittals to maintain production of materials or products to meet scheduled installation.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Substitutions and product options.
- B. Project record documents, warranties and bonds.
- 1.03 SHOP DRAWINGS
 - A. Present drawings in a clear and thorough manner.
 - 1. Identify details by reference to sheet, detail, or schedule shown on drawings.
 - B. Produce drawings on 24 by 36 inch sheets drawn to 1/8 or 1/4 inch scale, or other appropriate architectural scale.
 - C. NOTE: CAD files of Architectural and/or Engineering drawings may be made available for the generation of shop drawings. Should the Contractor choose to utilize files and acquire them from the Architect, the Contractor shall fill out the Architect's Release of Liability form, and the files will be made available with a nominal processing fee for each file.
 - 1. Architectural drawings available in CAD format shall consist of plans and elevations. Schedules and details will not be provided.
 - 2. Architectural drawings to be provided will have all notes, dimensions, section references, etc. removed from the drawing files.

1.04 PRODUCT DATA

- A. Preparation:
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Show dimensions, clearances, performance characteristics and capacities.

shop drawings, product data and samples 01 34 00 - 1

- B. Manufacturer's standard schematic drawings and diagrams:
 - 1. Modify drawings and diagrams to delete information which is not applicable to this work. Supplement standard information to provide information specifically applicable to this work.

1.05 SAMPLES

- A. Provide samples of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product with integrally related parts and attachment devices.
- B. Field samples and mock-ups:
 - 1. Erect specified materials, products or systems at the project site, at an approved location.
 - 2. Fabricate each sample and mock-up complete and finished.
 - 3. Remove mock-ups at conclusion of work or when accepted, unless they are to become part of the completed work.

1.06 SUBCONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data and samples prior to submission.
- B. Determine and verify for accuracy:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
 - 4. Conformance with these specifications and local authorities and jurisdictions.
 - 5. NOTE: Contractor is responsible for verification that shop drawings are accurate and properly dimensioned (where required) and accurately representative of the building and/or site construction, regardless of any image files provided by the Architect.
- C. Coordinate each submittal with requirements of the Contract Documents
- D. At the time of submission, document in writing any deviations in the submittals from the requirements of the Contract Documents, identifying such deviations clearly on the submittals.
- E. Do not commence any fabrication or work which requires submittals until submittals have been reviewed and approved.

1.07 SUBMISSION REQUIREMENTS

- A. Make submittals promptly and in such sequence as to cause no delay in work or work of any other subcontractor.
- B. Number of submittals required:
 - 1. Shop drawings: Submit 6 copies (digital files acceptable in lieu of hard copies).
 - 2. Product data: Submit 6 copies (digital files acceptable in lieu of hard copies).
 - 3. Samples: Submit number of samples stated in each specifications section; or if not specified, submit two samples of each color, texture, size, etc. as applicable to each material requiring a sample.
- C. Provide the following with each submittal:
 - 1. Date of submission and dates of any previous submissions.
 - 2. Project title and number
 - 3. Contract identification
 - 4. Name of subcontractor, supplier, manufacturer
 - 5. Identification of product, with specifications section number
 - 6. Field dimensions, clearly identified as such
 - 7. Relation to adjacent or critical features of the work or materials
 - 8. Applicable standards such as the CBC, Military Standard, NSA, ASTM, Federal Specifications, CBC, ICC, UL, FM, AGA, NFPA, or other applicable codes and standards specified in he individual sections of these specifications.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on resubmittals
 - 11. An 8 x 3 inch blank space for stamps
 - 12. Initialed or signed stamp certifying review of submittal verification of products, field measurements, and field construction criteria, and coordination of the information with the submittals with requirements of the work and of the Contract Documents.

1.08 RESUBMISSION REQUIREMENTS

- A. Shop drawings and product data:
 - 1. Make corrections and changes in the submittals required and resubmit in the same quantities and format until accepted.
- B. Samples: Submit new samples as required for initial submittals.

END OF SECTION

section 01 41 00 applicable codes and standards

PART 1 - GENERAL

1.01 APPLICABLE CODES AND STANDARDS

- A. This project is under the jurisdiction and is subject to the requirements of the following list of codes and standards:
 - 2019 Building Standards Administrative Code Part 1, Title 24, C.C.R.
 - 2019 California Building Code (CBC), Part 2, Title 24, C.C.R. (2018 International Building Code Volumes 1-2 and 2016 California Amendments)
 - 2019 California Electrical Code (CEC) Part 3, Title 24, C.C.R. (2018 National Electrical Code and 2016 California Amendments)
 - 2019 California Mechanical Code (CMC), Part 4, Title 24, C.C.R.
 (2018 Uniform Mechanical Code and 2016 California Amendments)
 - 2019 California Plumbing Code (CPC), Part 5, Title 24, C.C.R.
 (2018 Uniform Plumbing Code and 2016 California Amendments)
 - 2019 California Energy Code, Part 6, Title 24, C.C.R.
 - 2013 ASME A17.1 Safety Code for Elevators and Escalators. 2016 C.C.R. Title 8, Section 3141.
 - 2016 California Fire Code (CFC), Part 9, Title 24, C.C.R. (2016 International Fire Code and 2016 California Amendments)
 - 2016 California Referenced Standards, Part 12, Title 24, C.C.R.
 - Title 19, C.C.R., Public Safety, State Fire Marshal Regulations
 - NFPA 13 Automatic Sprinkler Systems 2016 Edition
 - NFPA 14 Standpipes Systems 2013 Edition
 - NFPA 17 Dry Chemical Extinguishing Systems 2013 Edition
 - NFPA 17a Wet Chemical Systems 2013 Edition
 - NFPA 20 Stationary Pumps 2016 Edition
 - NFPA 24 Private Fire Mains

applicable codes and standards 01 41 00 - 1

NFPA 72	National Fire Alarm Codes (California Amended) (Note See UL Standard 1971 For "Visual Devices") 2016 Edition
NFPA 80	Standard for Fire Rooms and Other Opening Protectives 2016 Edition
NFPA 253	Critical Radiant Flux Of Floor Covering Systems 2015 Edition
NFPA 2001	Clean Agent Fire Extinguishing Systems 2015 Edition
Reference Code	e Section For NFPA Standards 2019 CBC (SFM) Chapter 35
UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
UL 521	Standard for Heat Detectors for Fire Protective Signaling Systems
UL 1971	Standard for Signaling Devices for the Hearing Impaired

PART 2 PRODUCTS – Not Applicable.

PART 3 EXECUTION – Not Applicable.

END OF SECTION
section 01 42 19 reference standards

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Section Includes
 - 1. Definitions
 - 2. Specifications Format and Content
 - 3. Industry Standards
 - 4. Code and Standards
 - 5. Governing regulations/authorities

1.02 REFERENCES

The standards are referenced in these specifications by acronyms which are listed below with the full name of the sponsoring organization and the address from which copies may be obtained.

AA Aluminum Association 900 19th Street NW, Suite 300 Washington, DC 20006 www.aluminum.org

AABC Associated Air Balance Council 1518 "K" Street, NW, Suite 503 Washington, DC 20005 www.aabchq.com

AAMA American Architectural Manufacturers Association 1827 Walden Office Square, Suite 104 Schaumburg, IL 60173-4268 www.aamanet.org

AASHTO American Association of State Highway and Transportation Officials 444 North Capitol Street, Suite 249 Washington, DC 20001 www.aashto.org

AATCC American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Drive Research Triangle Park, NC 27709-2215 www.aatcc.org

ACI American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 www.aci-int.org

ACPA American Concrete Pipe Association 222 West Las Colinas Blvd., Suite 641 Irving, TX 75039-5423 www.concrete-pipe.org

ADC Air Diffusion Council 104 South Michigan Avenue, Suite 1500 Chicago, IL 60603

AF&PA American Forest and Paper Association 1111 19th Street, NW, Suite 800 Washington, DC 20036 www.afandpa.org

AGA American Gas Association 400 North Capitol Street N.W. Washington, D.C. 20001 www.aga.com

AHA American Hardboard Association 1210 West Northwest Hwy Palatine, IL 60067-1897 www.hardboard.org

AHAM Association of Home Appliance Manufacturers 1111 19th Street NW, #402 Washington, DC 20036 www.aham.org

AI Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org

AIA The American Institute of Architects 1735 New York Avenue, NW Washington, DC 20006-5292 www.e-architect.com

AISC American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001 www.aisc.org

AISI American Iron and Steel Institute P.O. Box 4321 Chestertown, MD 21690 www.steel.org

AITC American Institute of Timber Construction 7012 South Revere Parkway, Suite 140 Englewood, CO 80112 www.aitc-glulam.org

ALCA Associated Landscape Contractors of America

12200 Sunrise Valley Drive, Suite 150 Reston, VA 20191 www.alca.org

ALI Associated Laboratories, Inc. P.O. Box 152837 1323 Wall Street Dallas, TX 75315

ALSC American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875

AMCA Air Movement and Control Association International, Inc. 30 West University Drive Arlington Heights, IL 60004-1893 www.amca.org

ANLA American Nursery and Landscape Association 1250 "I" Street, NW, Suite 500 Washington, DC 20005-3922 www.anla.org

ANSI American National Standards Institute 11 West 42nd Street, 13th Floor New York, NY 10036-8002 www.ansi.org

APA APA-The Engineered Wood Association 2130 Barret Park Drive, Suite 102 Kennesaw, GA 30144-3681 www.apawood.org

APA Architectural Precast Association 6710 Winkler Road, Suite 8 Fort Myers, FL 33919 www.archprecast.org

ARI Air Conditioning and Refrigeration Institute 4301 Fairfax Drive, Suite 425 Arlington, VA 22203 www.ari.org

ARMA Asphalt Roofing Manufacturers Association 1156-15th Street, NW, Suite 900 Washington, DC 20005 www.asphaltroofing.org

ASA Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797 www.acoustics.org

ASCE American Society of Civil Engineers World Headquarters (703) 295-6300 1801 Alexander Bell Drive Reston, VA 20190-4400

www.asce.org

ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org

ASLA American Society of Landscape Architects 4401 Connecticut Avenue, NW, Fifth Floor Washington, DC 20008-2369 www.asla.org

ASME ASME International Three Park Avenue New York, NY 10016-5990 www.asme.org

ASPE American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362-3649

ASQC American Society for Quality 611 East Wisconsin Avenue Milwaukee, WI 53201-3005 www.asq.org

ASSE American Society of Sanitary Engineers 28901 Clemens Road Westlake, OH 44145 www.asse-plumbing.org

ASTM American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org

AWCI Association of the Wall and Ceiling Industries - International 307 East Annandale Road, Suite 200 Falls Church, VA 22042-2433 www.awci.org

AWI Architectural Woodwork Institute 1952 Isaac Newton Square Reston, VA 20190 www.awinet.org

AWPA American Wood-Preservers' Association 3246 Fall Creek Highway, Suite 1900 Granbury, TX 76049-7979

AWS American Welding Society 550 NW LeJeune Road Miami, FL 33126 www.amweld.org

AWWA American Water Works Association 6666 West Quincy Avenue Denver, CO 80235

www.awwa.org

BHMA Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Floor New York, NY 10017-6603

BIA Brick Institute of America 11490 Commerce Park Drive Reston, VA 22091-1525 www.bia.org

CE Corps of Engineers (U.S. Department of the Army) 20 Massachusetts Avenue, NW Washington, DC 20314 CRD standards are available from:

> U.S. Army Corps of Engineers Waterways Experiment Station Technical Report Distribution Section Services Branch, TIC 3909 Halls Ferry Road Vicksburg, MS 39180-6199

CBM Certified Ballast Manufacturers Association 1422 Euclid Avenue, Suite 402 Cleveland, OH 44115-2094

CCC Carpet Cushion Council P.O. Box 546 Riverside, CT 06878-0546 www.carpetcushion.org

CDA Copper Development Association 260 Madison Avenue, 16th Floor New York, NY 10016-2401 www.copper.org

CGA Compressed Gas Association 1725 Jefferson Davis Highway, Suite 1004 Arlington, VA 22202-4102 www.cganet.com

CISCA Ceilings & Interior Systems Construction Association 1500 Lincoln Highway, Suite 202 St. Charles, IL 60174 www.cisca.org

CISPI Cast Iron Soil Pipe Institute 5959 Shallowford Road, Suite 419 Chattanooga, TN 37421 www.cispi.org

CLFMI Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, #B-215 Columbia, MD 21046 www.chainlinkinfo.org

CPSC Consumer Product Safety Commission

East West Towers 4330 East-West Highway Bethesda, MD 20814

CPPA Corrugated Polyethylene Pipe Association 432 North Superior Street Toledo, OH 43604

CRA California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949 www.calredwood.org

CRI Carpet and Rug Institute 310 South Holiday Avenue Dalton, GA 30722-2048 www.carpet-rug.com CRSI Concrete Reinforcing Steel Institute 933 North Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org

CSSB Cedar Shake and Shingle Bureau 515 116th Avenue, NE, Suite 275 Bellevue, WA 98004-5294 www.cedarbureau.org

CTI Ceramic Tile Institute of America 12061 West Jefferson Blvd. Culver City, CA 90230-6219 www.ceramic-tile.com

DHI Door and Hardware Institute 14170 Newbrook Drive Chantilly, VA 20151-2223 www.dhi.org

DIPRA Ductile Iron Pipe Research Association 245 Riverchase Parkway East, Suite O Birmingham, AL 35244 www.dipra.org

DOC Department of Commerce 5285 Port Royal Road Springfield, VA 22161

DOT Department of Transportation 400 Seventh Street, SW Washington, DC 20590

EIMA EIFS Industry Members Association 402 North Fourth Street, Suite 102 Yakima, WA 98901-2470 www.eifsfacts.com

EJMA Expansion Joint Manufacturers Association 25 North Broadway Tarrytown, NY 10591-3201

www.ejma.org

EPA Environmental Protection Agency 401 "M" Street, SW Washington, DC 20460 www.epa.gov

FCICA Floor Covering Installation Contractors Association 7439 Millwood Drive West Bloomfield, MI 48322-1234 www.fcica.com FM Factory Mutual 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062-9102 www.fmglobal.com

FCCHR Foundation for Cross-Connection Control and Hydraulic Research University of Southern California KAP-200 University Park MC-2531 Los Angeles, CA 90089-25319

FS Federal Standards (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407

FTI Facing Tile Institute % Stark Ceramics P.O. Box 8880 Canton, OH 44711

GA Gypsum Association 810 First Street NE, Suite 510 Washington, DC 20002 www.gypsum.org

GANA Glass Association of North America 3310 SW Harrison Street Topeka, KS 66611-2279 www.glasswebsite.com/gana

HMA Hardwood Manufacturers Association 400 Penn Center Blvd., Suite 530 Pittsburgh, PA 15235-5605 www.hardwood.org

HPVA Hardwood Plywood and Veneer Association 1825 Michael Farraday Drive P.O. Box 2789 Reston, VA 20195 www.hpva.org

IEEE Institute of Electrical and Electronic Engineers 445 Hoes Lane (212) 705-7900 Piscataway, NJ 08855-1331 www.standards.ieee.org

IESNA Illuminating Engineering Society of North America 120 Wall Street, 17th Floor New York, NY 10005-4001 www.iesna.org

ILI Indiana Limestone Institute of America Stone City Bank Building, Suite 400 Bedford, IN 47421 www.iliai.com

ITS Intertek Testing Services P.O. Box 2040 3933 US Route 11 Cortland, NY 13045-7902 www.itsglobal.com

KCMA Kitchen Cabinet Manufacturers Association 1899 Preston White Drive Reston, VA 22091-4326 www.kcma.org

LMA Laminating Materials Association 116 Lawrence Street Hillsdale, NJ 07642-2730 www.lma.org

MBMA Metal Building Manufacturer's Association 1300 Sumner Avenue Cleveland, OH 44115-2851 www.mbma.org

MCAA Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850-4329 www.mcaa.org

MFMA Maple Flooring Manufacturers Association 60 Revere Drive, Suite 500 Northbrook, IL 60062 www.maplefloor.org

MIA Marble Institute of America 33505 State Street Farmington, MI 48335 www.marble-institute.com

MIA Masonry Institute of America 2550 Beverly Blvd. Los Angeles, CA 90057 www.masonryinstitute.org

ML/SFA Metal Lath/Steel Framing Association (A Division of the NAAMM) 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603

MSS Manufacturers Standardization Society for the Valve and Fittings Industry

127 Park Street, NE Vienna, VA 22180-4602 www.mss-hq.com

NAA National Arborist Association P.O. Box 1094 (603) 673-3311 Amherst, NH 03031-1094 www.natlarb.com

NAAMM National Association of Architectural Metal Manufacturers 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603 www.naamm.org

NAIMA North American Insulation Manufacturers Association 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314 www.naima.org

NAPA National Asphalt Pavement Association NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413

NBGQA National Building Granite Quarries Association 1220 "L" Street, NW #100-167 Washington, DC 20005 www.nbgqa.com

NCMA National Concrete Masonry Association 2302 Horse Pen Road Herndon, VA 20171-3499 www.ncma.org

NCPI National Clay Pipe Institute P.O. Box 759 253-80 Center Street Lake Geneva, WI 53147 www.ncpi.org

NCRPM National Council on Radiation Protection and Measurements 7910 Woodmont Ave., Suite 800 Bethesda, MD 20814-3095 www.ncrp.com

NCSPA National Corrugated Steel Pipe Association 1255 23rd Street, NW, Suite 850 Washington, DC 20037 www.ncspa.org

NEBB National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877-4121 www.nebb.org

NECA National Electrical Contractors Association

3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814-5372 www.necanet.org

NEI National Elevator Industry 185 Bridge Plaza North, Suite 310 Fort Lee, NJ 07024

NEMA National Electrical Manufacturers' Association 1300 North 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org

NFPA National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 www.nfpa.org

NHLA National Hardwood Lumber Association P.O. Box 34518 Memphis, TN 38184-0518 www.natlhardwood.org

NIA National Insulation Association 99 Canal Center Plaza, Suite 222 Alexandria, VA 22314 www.insulation.org

NOFMA National Oak Flooring Manufacturers Association P.O. Box 3009 Memphis, TN 38173-0009 www.nofma.org

NPA National Particleboard Association 18928 Premiere Court Gaithersburg, MD 20879-1569 www.pbmdf.com

NPCA National Paint and Coatings Association 1500 Rhode Island Avenue, NW Washington, DC 20005-5597 www.paint.org

NRCA National Roofing Contractors Association P.O. Box 809261 Chicago, IL 60680-9261 www.roofonline.org

NRMCA National Ready Mixed Concrete Association 900 Spring Street Silver Spring, MD 20910 www.nrmca.org

NSA National Stone, Sand and Gravel Association 2101 Wilson Blvd. Arlington, VA 22201 www.nssga.org

NSF NSF International P.O. Box 130140 Ann Arbor, MI 48113-0140 www.nsf.org

NSSEA National School Supply and Equipment Association 8300 Colesville Road, Suite 250 Silver Spring, MD 20910 www.nssea.org

NTMA National Terrazzo and Mosaic Association 3166 Des Plaines Avenue, Suite 121 Des Plaines, IL 60018 www.ntma.com

NUSIG National Uniform Seismic Installation Guidelines 12 Lahoma Court Alamo, CA 94526

NWWDA The Window and Door Manufacturer's Door Association 1400 East Touhy Avenue, Suite 470 Des Plaines, IL 60018 www.wdma.org OSHA Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Avenue, NW Washington, DC 20210

PCA Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077-1083 www.portcement.org

PCI Precast/Prestressed Concrete Institute 175 W. Jackson Blvd. Chicago, IL 60604 www.pci.org

PDCA Painting and Decorating Contractors of America 3913 Old Lee Highway, Suite 33-B Fairfax, VA 22030 www.pdca.com

PDI Plumbing and Drainage Institute 45 Bristol Drive (508) 230-3516 South Easton, MA 02375 www.pdionline.org

PEI Porcelain Enamel Institute 4004 Hillsboro Pike, Suite 224-B Nashville, TN 37215 www.porcelainenamel.com

RFCI Resilient Floor Covering Institute 401 East Jefferson #102 Rockville, MD 20850 www.rfci.com

RIS Redwood Inspection Service c/o California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949-7206 www.calredwood.org

SDI Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60012 www.sdi.org

SDI Steel Door Institute 30200 Detroit Road Cleveland, OH 44145-1967 www.steeldoor.org

SIGMA Sealed Insulating Glass Manufacturers Association 401 N. Michigan Avenue Chicago, IL 60611-4267

SJI Steel Joist Institute 3127 Tenth Avenue, North Ext. Myrtle Beach, SC 29577-6760 www.steeljoist.org

SMA Stucco Manufacturers Association 14006 Ventura Blvd. Sherman Oaks, CA 91403

SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc. 4201 Lafayette Center Drive Chantilly, VA 20151-1209 www.smacna.org

SPI Society of the Plastics Industry, Inc. Spray Polyurethane Division 1801 "K" Street, NW, Suite 600K Washington, DC 20006 www.socplas.org

SPIB Southern Pine Inspection Bureau 4709 Scenic Highway Pensacola, FL 32504-9094 www.spib.org

SPRI (Formerly: Single Ply Roofing Institute) 200 Reservoir Street, Suite 309A Needham, MA 02494 www.spri.org

SSPC The Society for Protective Coatings 40 24th Street, Sixth Floor Pittsburgh, PA 15222-4656 www.sspc.org

SWI Steel Window Institute

c/o Thomas Associates, Inc. 1300 Sumner Avenue Cleveland, OH 44115-2851 www.steelwindows.com

TCA Tile Council of America 100 Clemson Research Blvd. Anderson, SC 29625 www.tileusa.com

TPI Truss Plate Institute 583 D'Onofrio Drive, Suite 200 Madison, WI 53719

TPI Turfgrass Producers International 1855-A Hicks Road Rolling Meadows, IL 60008 www.turfgrasssod.org

UL Underwriters Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062 www.ul.com

UNI Uni-Bell PVC Pipe Association 2655 Villa Creek Drive, Suite 155 Dallas, TX 75234 www.uni-bell.org

USDA U.S. Department of Agriculture 14th Street and Independence Avenue, SW Washington, DC 20250

USPS U.S. Postal Service 475 L'Enfant Plaza, SW Washington, DC 20260-0010

WA Wallcoverings Association 401 North Michigan Avenue Chicago, IL 60611-4267 www.wallcoverings.org

WCLIB West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281-3145 www.wclib.org

WCMA Window Covering Manufacturers Association 355 Lexington Avenue, 17th Floor New York, NY 10017-6603

WIC Woodwork Institute of California P.O. Box 980247 West Sacramento, CA 95798-0247 www.wicnet.org

WLPDIA Western Lath/Plaster/Drywall Industries Association 8635 Navajo Road

San Diego, CA 92119

WMMPA Wood Moulding & Millwork Producers Association 507 First Street Woodland, CA 95695 www.wmmpa.com

WRI Wire Reinforcement Institute P.O. Box 450 Findlay, OH 45839-0450 www.wirereinforcementinstitute.org

WWPA Western Wood Products Association - Yeon Building 522 S.W. Fifth Avenue, #500 Portland, OR 97204-2122 www.wwpa.org

1.03 DEFINITIONS

A. Regulations: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the work.

1.04 SYSTEM DESCRIPTIONS

- A. Specification Format and Content
 - 1. Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2004 Masterformat numbering system.
 - 2. The sections are placed in the Project Manual in numeric sequence; however, this sequence is not complete, and the Table of Contents of the specifications must be consulted to determine the total listing of sections.
 - 3. The section title is not intended to limit the meaning or content of the section, nor is it to be fully descriptive of the requirements specified therein.
 - 4. The organization of the specifications shall not control the division of the work among subcontractors or establish the extent of work to be performed by any trade.
 - 5. Specifications use certain conventions regarding style of language and the intended meaning of certain terms, words and phrases when used in particular situations or circumstances. These conventions are:
 - a. Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable to maintain the context of the Contract Document indicated.

- b. Imperative and streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the CONTRACTOR. Subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the CONTRACTOR, or by others when so noted.
- c. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

B. Industry Standards

- 1. Except where Contract Documents include more stringent requirements, applicable construction industry standards shall apply as if bound into the Contract Documents to the extent referenced. Such standards are made part of Contract Documents by reference.
- 2. Conform to reference standard by date of issue current on date for receiving bids except when a specific date is indicated.
- 3. Where compliance with two (2) or more standards is specified and where standards may establish different or conflicting requirements for quantities or quality levels, the more stringent, higher quality and greater quantity of work shall apply.
- 4. The quantity or quality level shown or specified shall be the minimum provided or performed. Indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements.
- 5. Each entity engaged in construction of the work is required to be familiar with industry standards applicable to its construction activity.
- 6. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required activity, CONTRACTOR shall obtain copies directly from publication source.
- 7. Trade association's names and titles of general standards are frequently abbreviated. Where such abbreviations are used in the Specifications or other Contract Documents, they shall mean the recognized trade association, standards-generating organization, authority having jurisdiction or other entity applicable to the content of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries. A partial list is included at the end of this section.
- 8. Refer to individual specification sections and related drawings for names and abbreviations of trade associations and standards applicable to specific portions of the work.
- 9. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

END OF SECTION

section 01 45 00 quality control

- PART 1 GENERAL
- 1.01 SUMMARY
 - A. Section Includes
 - 1. Quality assurance and control of installation.
 - 2. Certifications
 - 3. Field samples.
 - 4. Mock-up.
 - 5. Manufacturers' field services and reports.

1.02 QUALITY ASSURANCE

- A. Qualifications
 - 1. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce work of specified quality.
 - 2. Comply fully with manufacturers' instructions including each step-in sequence.
 - 3. Should manufacturers' instructions conflict with Contract Documents, request clarification from ARCHITECT before proceeding.
 - 4. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
 - 5. Perform work by persons qualified to produce workmanship of specified quality.
 - 6. Where experience minimums for workmen, applicators, companies or manufacturers are required in individual sections, written certification and documentation substantiating such minimums shall be submitted and approved by the ARCHITECT, when requested.
 - 7. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
- B. Regulatory Requirements
 - 1. All work pertaining to and all materials supplied for executing and completing this Contract shall comply with provisions specified in

quality control 01 45 00 - 1 the Contract Documents and with all applicable laws, regulations and ordinances governing Work.

- C. Certifications
 - 1. Manufacturers' Field Services and Reports
 - a. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable and to initiate instructions when necessary.
 - b. Manufacturers' Representatives shall report observations and site decisions, or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
 - c. Submit report of observation to ARCHITECT for review.

D. Field Samples

- 1. Install field samples at the site as required by individual specifications sections for review by ARCHITECT.
- 2. Accepted samples represent a quality level for the Work.
- 3. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by ARCHITECT and is no longer required for reference.

E. Mock-ups

- 1. Tests will be performed under provisions identified in this section.
- 2. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals and finishes.
- 3. Where mock-up is specified in individual sections to be removed, clear area after mock-up has been accepted by ARCHITECT and is no longer required for reference.
- F. Pre-installation Meetings
 - 1. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to attend meetings regarding installation of specified Work.

END OF SECTION

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section 01 52 00 construction facilities

- PART 1 GENERAL
- 1.01 SUMMARY
 - A. Section Includes
 - 1. Furnishing and Installing:
 - a. Temporary Water
 - b. Temporary Sanitary Facilities
 - c. Fences and Barricades
 - d. Construction Equipment
 - e. Storage
 - f. Temporary Job Office
 - g. Temporary Electrical
 - h. Temporary Lighting
 - i. Temporary Heat
 - j. Temporary Ventilation
 - k. Barriers
 - I. Noise Control
 - m. Pollution Control
 - n. Exterior Enclosures
 - o. Access Roads
 - p. Progress Cleaning
 - q. Fire Protection

1.02 PROJECT CONDITIONS

- A. Regulatory Requirements
 - 1. Comply with governing regulations and utility company regulations and recommendations.
 - 2. Comply with pollution and environmental protection regulations for use of water and energy, for discharge of wastes and storm drainage from Project Site and for control of dust, air pollution and noise.
 - 3. Temporary construction shall conform to requirements of State, County and Local authorities and underwriters which pertain to operation, health, safety and fire hazard. CONTRACTOR shall furnish and install items necessary for conformance with such requirements, whether or not called for under the separate divisions of these specifications.
- B. Temporary Water
 - 1. The OWNER shall provide construction water at the closest existing fire hydrant as approved by the local jurisdiction. OWNER supplied point of connection shall include applicable temporary meter and backflow devices. CONTRACTORS requiring construction water shall provide all labor and materials (including cut and patch) to distribute.

construction facilities 01 52 00 - 1

- C. Temporary Sanitary Facilities
 - 1. CONTRACTOR will provide and maintain required temporary chemical type toilet facilities and enclosures.
 - 2. Existing facilities shall not be used.
- D. Fences and Barricades
 - 1. After completion of site grading and before start of Work on the project site, CONTRACTOR may install a six (6) foot high temporary chain link fence with locked entrance gates to substantially enclose the entire project site. Any activities schedule to commence prior to the installation of fencing will be temporarily fenced by CONTRACTOR requiring same.
 - 2. The CONTRACTOR requiring same shall construct and maintain planking, barricades, lights and warning signs as indicated as required by Local authorities and State safety ordinances and as necessary for the protection of the public.
- E. Construction Equipment
 - 1. CONTRACTOR shall erect, equip and maintain construction equipment in strict accordance with applicable statues, laws, ordinances and regulations of authority having jurisdiction.
 - 2. CONTRACTOR shall provide, maintain and move upon completion of the Work all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, ramps, stairs, runways, platforms, ladders, railings and other temporary construction as required for all work hereunder.

F. Storage

- 1. Operations of the CONTRACTOR, including storage of materials, shall be confined to areas approved by OWNER. CONTRACTOR shall be liable for damage caused by him/her during such use of property of the OWNER or other parties. CONTRACTOR shall save the OWNER along with their respective officers, employees and agents, and the ARCHITECT and his employees, free and harmless from liability of any nature or kind arising from any use, trespass or damage occasioned by his operations on premises of third persons. Storage facilities shall provide protection of products from excessive cold, heat, moisture, humidity or physical abuse as specified in the respective sections for the products stored. Each CONTRACTOR requiring same shall provide their own temporary storage and security for same.
- 2. Staging areas will be under the supervision of the CONTRACTOR. Materials shall be placed and relocated as necessary for the progress of the project.
- G. Temporary Job Office
 - 1. Should any CONTRACTOR require office space, the CONTRACTOR requiring office space shall provide.

- H. Temporary Electrical
 - 1. If requested by CONTRACTOR, OWNER shall provide temporary power as follows:
 - a. One (1) 200-amp single phase service.
 - b. A 50-amp sub-panel mounted on a post will not be more than 50 feet away from each building pad.
 - c. Each sub-panel shall be equipped with two (2) 110-volt receptacles, one (1) 220-volt receptacle and one (1) 50 amp twist-lock pigtail.
 - 2. Any temporary power requirements beyond these provided will be the responsibility of the CONTRACTOR requiring same.
 - 3. All welding will be done with self-contained gas-powered units.
- I. Temporary Lighting
 - 1. Each CONTRACTOR shall be responsible to provide and maintain all temporary lighting as required to safely access and perform their work.
- J. Temporary Heat
 - 1. Temporary heat will be supplied and maintained by the CONTRACTOR requiring same.
 - 2. Do not use permanent equipment for temporary heating purposes unless specifically noted otherwise in the contract documents.
- K. Temporary Ventilation
 - 1. All CONTRACTORS shall ventilate enclosed areas to assist cure of materials, dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases as the above may be generated by them.
- L. Barriers
 - 1. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
 - 2. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
 - 3. Provided protection for plant life and trees designated to remain and for soft and hardscape areas adjacent to work, replace damaged materials as directed by the ARCHITECT.
 - 4. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
 - 5. Construction workers shall not interact or communicate with students or staff except in emergency or safety related situations. (Post a sign to this effect at entry.)

- M. Noise Control
 - 1. CONTRACTORS shall ensure that all construction equipment utilized include noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer of such equipment.
 - 2. CONTRACTORS shall review and be knowledgeable of any CEQA documentation for this project restricting or limiting noise and implement any and all scheduling or mitigation methods necessary to conform with the CEQA documents. This includes any Mitigated Negative or Negative Declaration instrument the OWNER has produced.
 - 3. CONTRACTORS shall review and be knowledgeable of any federal, state or local agency requirements for noise restrictions and adhere to the policies outlined by the applicable laws and codes.
- N. Pollution Control
 - 1. Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- O. Exterior Enclosures
 - 1. Provide temporary weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for materials, to allow for temporary heating and maintenance or required ambient temperatures identified in individual specification Sections and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- P. Access Roads
 - 1. Provide and maintain access to fire hydrants, free of obstructions.
 - 2. Existing on-site roads may be used for construction traffic.
 - 3. CONTRACTORS may not park or drive on concrete walks or in the buildings at any time.
- Q. Progress Cleaning
 - 1. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
 - 2. Each applicable CONTRACTOR shall remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to the space being enclosed.
 - 3. Each applicable CONTRACTOR shall broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
 - 4. Remove waste materials, debris and rubbish from site periodically and dispose off-site.

- R. Fire Protection
 - 1. Fire protection during construction shall be provided in accordance with CFC, Chapter 33.

END OF SECTION

construction facilities 01 52 00 - 5

section 01 57 00 temporary controls

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Section Includes
 - 1. Water Control
 - 2. Dust Control
 - 3. Noise Control
 - 4. Pollution Control
 - 5. Removal

1.02 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Water Control
 - a. Do not permit surface or subsurface water or other liquids to accumulate in or about the premises and vicinity thereof. Should such conditions be encountered or develop, control the water or other liquid and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams or other methods as approved by the ARCHITECT and/or the authority having jurisdiction.
 - 2. Dust Control
 - a. Conduct earthwork operations in a manner to prevent windblown dust and dirt from interfering with the progress of the Work, the OWNER'S activities and the existing occupied structures in the areas immediately adjacent as well as adjacent properties.
 - b. Periodically water construction areas as required to minimize accumulation of dust and dirt.
 - c. Water spray or cover with tarpaulins truckloads of soil to additionally minimize generation of dust and dirt from construction operations.
 - d. Prevent dust and dirt from accumulating on walks, roadways, parking areas and from washing into sewer and storm drain lines.
 - 3. Noise Control
 - a. Avoid excessive noise where adjacent operations may be detrimentally affected.

temporary controls 01 57 00 - 1

- 4. Pollution Control
 - a. Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
 - b. Burning of refuse, debris or other materials will not be permitted on the Site.
 - c. Comply with regulatory requirements and anti-pollution ordinances during the course of construction and disposal operations.

5. Removal

a. Remove all temporary control measures in accordance with regulatory requirements at the completion of construction.

END OF SECTION

section 01 62 00 storage and protection

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Upon delivery to the site, provide adequate storage area in protecting products scheduled for use in the work and finish improvements until completion and acceptance.
 - B. Related Requirements: The General Provisions of the Contract Documents.
 - C. Related Work: Additional procedures also may be prescribed in other sections of these specifications.

1.02 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance such procedures required to assure full protection of the work, materials and finish improvements.
- 1.03 MANUFACTURERS' RECOMMENDATIONS
 - A. Except as otherwise specified, determine and comply with the manufacturers' recommendations on product handling, storage and protection.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Equipment Access: To avoid conflict, the Contractor shall establish and provide adequate area to provide secure storage for handling of stored products away from ongoing activities of the work. Provide access and route of handling products to avoid damage.
- B. Provide secure protection of work and materials against damage.
 Manufactured products shall be stored per manufacturer's recommendations on product handling, storage and protection.
- C. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements.
- D. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality and other pertinent.

1.05 PROTECTION

- A. Protect existing finish improvements through which equipment and material are handled.
- B. Provide protection for horizontal finish surfaces in traffic areas prior to allowing equipment to be moved over surfaces.
- C. Maintain finished improvement surfaces clean, unmarred, and suitably protected until acceptance by the Owner.

1.06 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION

section 01 63 00 substitutions and product options

PART 1 - GENERAL

1.01 SUMMARY

A. Provide, install and finish of products specified, under options and conditions for substitutions stated in this section of specifications, and as needed for a complete, proper and operable installation.

1.02 RELATED REQUIREMENTS

A. General provisions of the Contract Documents.

1.03 PRODUCTS LIST

- A. Submit six copies (digital files acceptable in lieu of hard copies) of complete list of major products and systems which are proposed for installation, whose installed cost is greater than five hundred dollars.
- B. Tabulate products and systems by specifications section number, and title.
- C. For products and systems specified only by reference standards, list for each such product or system:
 - 1. Name and address of manufacturer or fabricator.
 - 2. Trade name.
 - 3. Model or catalog designation, including date.
 - 4. Manufacturer's or fabricator's data and literature on: Reference standards, performance test data, certifications.

1.04 OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named.
- C. For products specified by naming one or more products or manufacturers and stating "or other approved," or "or approved equal," or other such wording on drawings or within specifications sections, submit a request for substitutions for any product or manufacturer which is not specifically named, but only after submitting bid on specified products and systems.

1.05 SUBSTITUTIONS

- A. Within ten (10) days **prior to bid opening**, formal requests will be considered for substitutions of products in place of those specified. Substitution requests will be considered to provide competition or only if the specified product or system has gone out of production prior to bidding, or specified product or system has been deemed illegal or dangerous by governing agencies having jurisdiction over this project.
- B. It is the intent of the Owner and architect to have this project constructed with materials, products and systems originally designed and specified into project. This opportunity to request substitutions is not for the convenience of bidders or contractors to submit bids for materials, products and systems which may be more familiar to them, or having a lesser cost.
- C. Submit separate request for each substitution. Support each request with an explanation for the request, and include:
 - 1. Complete data substantiating compliance of proposed substitutions with requirements stated in contract documents:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify: Product description, reference standards, performance and test data.
 - c. Samples, as applicable
 - d. Name and address of similar projects on which product has been used, and date of each installation, as well as servicing agency and installer.
 - 2. Itemized comparison of the proposed substitution with products specified, listing significant variations.
 - 3. Data relating to changes in the construction schedule.
 - 4. Any effect of substitution on separate contracts.
 - 5. Any effect of substitution on in-place construction, or other materials and systems to be installed.
 - 6. Accurate cost data comparing proposed substitution with product specified.
 - 7. Designation of required license fees or royalties.
 - 8. Designation of availability of maintenance services and sources of replacement materials.
- D. Substitutions will not be considered for acceptance when:
 - 1. Lesser material cost is the sole reason for request.

- 2. They are indicated or implied on shop drawings or product data submittals without formal request.
- 3. Acceptance may require revision of contract documents.
- E. Substitute products shall not be ordered or installed without written acceptance and authorization of Owner, architect and the Division of the State Architect. Substitutions shall be considered change orders and are subject to review and approval by the Division of the State Architect.
- F. Only the Owner and his representatives will determine the acceptability of proposed substitutions.

1.06 REPRESENTATIONS

- A. In making a legitimate, authorized formal request for substitution, represent that:
 - 1. A thorough investigation has transpired concerning the proposed product, and it has been determined that it is equal to or superior in all respects to that specified.
 - 2. The same warranties or bonds, and guarantees will be provided as for that specified.
 - 3. Installation of the accepted substitution will be coordinated into the work; and such changes to in-place work, ordered materials and products, or other work to be in progress prior to installation of the requested substitutions, will be performed without any additional cost to Owner.

1.07 DUTIES

- A. Requests for substitutions must be expeditiously forwarded for consideration.
- B. Notification of decisions concerning acceptance or rejection will be in writing, and are final without need for clarification.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

- A. Definitions: Project closeout is the term used to describe certain collective project requirements, indicating completion of the work that are to be fulfilled near the end of the contract time in preparation for final payment to the Contractor and the normal termination of the Contract.
 - 1. Specific requirements for individual units of work are included in the appropriate sections in Division 22 through 33.
- B. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout may be either a single time period for the entire work or a series of time periods for individual elements of the work that have been certified as substantially complete at different dates. This time variation, if any, shall be applicable to the other provisions of this section.

1.03 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. General: Complete the following before requesting the Architect/Engineer's inspection for certification of substantial completion, either for the entire work or for portions of the work. List known exceptions in the request.
- B. In the progress payment request that coincides with, or is the first request following, the date substantial completion is claimed, show either 100% completion for the portion of the work claimed as "substantially complete", or list incomplete items, the value of incomplete work, and reasons for the work being incomplete.
 - 1. Include supporting documentation for completion as indicated in these contract documents.
- C. Submit a statement showing an accounting of changes to the contract sum.
- D. Advise Owner of pending insurance change-over requirements.
- E. Deliver tools, spare parts, extra stock of material and similar physical items to the Owner.
- F. Make the final change-over of locks and transmit the keys to the Owner. Advise the Owner's personnel of the change-over in security provisions.
- G. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock-ups and similar elements.

- H. Complete final cleaning up requirements, including touch-up painting of marred surfaces.
- 1.04 INSPECTION PROCEDURE
 - A. Upon receipt of the contractor's request for inspection, the Architect/Engineer will either proceed with inspection or advise the contractor of unfilled prerequisites.
 - B. Following the initial inspection, the Architect/Engineer will either prepare the certificate of substantial completion, or will advise the Contractor of work which must be performed before the certificate will be issued. The Architect/Engineer will repeat the inspection when requested and when assured that the work has been substantially completed.
 - C. Results of the completed inspection will form the initial "punch list" for final acceptance.

1.05 PREREQUISITES TO FINAL ACCEPTANCE

- A. General: Complete the following before requesting the Architect/Engineer's final inspection for certification of final acceptance, and final payment as required by the General Conditions. List known exceptions, if any, in the request.
 - 1. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - 2. Submit a certified copy of the Architect/Engineer's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Architect/Engineer.
 - 3. Submit consent of surety.
 - 4. Submit a final liquidated damages settlement statement, acceptable to the Owner.
- B. Re-inspection Procedure: The Architect/Engineer will re-inspect the work upon receipt of the Contractor's notice that the work including punch list items resulting from earlier inspections, has been completed, except for these items whose completion has been delayed because of circumstances that are acceptable to the Architect/Engineer.
 - 1. Upon completion of re-inspection, the Architect/ Engineer will either prepare a certificate of final acceptance, or will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.
 - 2. If necessary, the re-inspection procedure will be repeated.
- 1.06 RECORD DOCUMENT SUBMITTALS
 - A. General: Specific requirements for record documents are in the individual sections of these specifications. Other requirements are indicated in this

section. General submittal requirements are indicated in the various submittals" sections.

- 1. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect/Engineer's reference during normal working hours.
- B. Record Drawings: Specific requirements are indicated in the section of project record documents. In addition to, maintain record shop drawings and submittals a clean, undamaged condition, mark up the record documents where the actual installed work varies substantially from the work originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately; however, where shop drawings are used for mark up, record a cross reference at the corresponding location on the working drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.
- C. Record Specifications: Maintain one complete copy of the Project Manual including specifications and addenda, and one copy of other written construction documents such as change orders and similar modifications issued in printed form during construction. mark these documents to show substantial variations in the actual work performed in comparison with the text of the specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable.
 - 1. Upon completion of the work, submit record specifications for the Architect/Engineer for the Owner's records.
- D. Record Product Data: Maintain one copy of each product data submittal. Mark these documents to show significant variations in the actual work performed in comparison with the submitted information. Include both variations in the products as delivered to the site, and variations from the manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark up of record drawings and specifications.
 - 1. Upon completion of mark up, submit complete set of record product data to the Architect/Engineer for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of substantial completion, the Contractor will meet at the site with the Architect/Engineer and the Owner's personnel, if desired, to determine which, if any, of the submitted samples that have been maintained by the Contractor during progress of the work, are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's sample storage area.
- F. Miscellaneous Record Submittals: Refer to other sections of these specifications for requirements of miscellaneous record keeping and submittals in connection with the actual performance of the work. Immediately prior to the date or dates of substantial completion, complete or filed, ready for continued use and reference. Submit to the Architect/Engineer for the Owner's records.

- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind data into individual binders properly identified and indexed. Bind each set of data in a heavy duty 2 inch, 3 ring vinyl covered binder, with pocket folders for folded sheet information. Mark the appropriate identification on both front and spine of each binder.
 - 1. Include the following types of information in Operation and Maintenance manuals:

Emergency instructions Spare parts listing Copies of warranties Wiring diagrams Recommended "turn-around" cycles Inspection procedures Shop drawings and product data Testing and adjusting procedures

H. All Prime Contractors and/or first-tier Subcontractors to provide 1-year workmanship guarantee; unless a longer warrantee period is specified.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

- 3.01 CLOSEOUT PROCEDURES
 - A. General Operating and Maintenance Instructions: Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instruction in the proper operation and maintenance of the entire work. Where installers are not experienced in the required procedures, include instruction by the manufacturer's representatives.
 - 1. As part of this instruction provide a detailed review of the following items:

Maintenance manuals Record documents Spare parts and materials Tools Lubricants Fuels Identification systems Control sequences Hazards Cleaning Warranties, bonds, maintenance agreements and similar continuing commitments

END OF SECTION
section 01 71 00 cleaning

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Provide throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this section.
 - B. Related Work.
 - 1. Documents affecting work of this section include, but are not necessarily limited to, the General Provisions of the contract documents as indicated in the Agreement of the contract.
 - 2. In addition to standards described in this section, comply with requirements for cleaning as described in pertinent other sections of these specifications.

1.02 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
- B. In addition to the standards described in this section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2- PRODUCTS

- 2.01 CLEANING MATERIALS AND EQUIPMENT
 - A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 EXECUTION

3.01 PROGRESS CLEANING

- A. General.
 - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
 - 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this work.
 - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waster material from the job site.

cleaning 01 71 00 - 1

- 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.
- B. Site.
 - 1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.01-A-1 above.
 - 3. Maintain the site in a neat and orderly condition at all times.
- C. Structures.
 - 1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, sweep interior spaces clean.
 - a. "Clean" for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
 - 3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions hereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
 - 4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.
 - a. "Clean" for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material.

3.02 FINAL CLEANING

- A. "Clean" for the purpose of this article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

- C. Site.
 - 1. Unless otherwise specifically directed by the architect, broom clean paved areas on the site and public paved areas adjacent to the site.
 - 2. Completely remove resultant debris.
- D. Structures.
 - 1. Exterior.
 - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
 - d. In the event of stubborn stains not removable with water, the architect may require light sandblasting or other cleaning at no additional cost to the Owner.
 - 2. Interior.
 - a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed material from adjacent surfaces.
 - c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
 - 3. Glass: Clean inside and outside.
 - 4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.
- E. Schedule final cleaning as approved by the architect to enable the Owner to accept a completely clean work.
- 3.03 CLEANING DURING OWNER'S OCCUPANCY
 - A. Should the Owner occupy the work or any portion hereof prior to its completion by the contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the architect in accordance with the General Conditions of the contract.

END OF SECTION

section 01 72 00 project record documents

PART 1 - GENERAL

1.01 SUMMARY

- A. The General Contractor shall maintain record documents throughout progress of the work, record accurate changes in the contract documents, as described herein. Upon completion of the work, shall transfer the recorded changes to a set of record documents as described herein.
- B. Related Requirements:
 - 1. Documents affecting work of this section include, but are not necessarily limited to the general provisions of the contract documents.
 - 2. Other requirements affecting project record documents may appear in pertinent other sections of these specifications.

1.02 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one qualified person on the Contractor's staff for coordination of recordings as approved by the Architect.
- B. Accuracy of Records:
 - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of specifications and each sheet of drawings and other documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future search for items shown in the contract documents may rely reasonably on information obtained from the approved project record documents.
- C. Make entries within 24 hours after receipt of information that the change has occurred.

1.03 SUBMITTALS

- A. The Architect's approval of the current status of project record documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the contract.
- B. Prior to submitting each request for progress payment, secure the Architect's approval of the current status of the project record documents.
- C. Prior to submitting request for final payment, submit the final project record documents to the Architect and secure his approval.
- 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Maintain the job set of record documents completely protected from deterioration and from loss and damage until completion of the work and transfer of all recorded data to the final project record documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.
 - 1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
 - 2. In such case, provide replacements to the standards originally required by the contract documents.

1.05 RESIDENT INSPECTOR

A. Responsibility for reviewing all approved changes and verify accurate recordings to the job site record document set and shall sign and date the recorded change.

PART 2 - PRODUCTS

2.01 RECORD DOCUMENTS

- A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Architect at no charge to the Contractor one complete set of blue lines of all documents comprising the contract.
- B. Final Record Documents: At a time nearing the completion of the work, secure from the Architect at no charge to the Contractor one complete set of transparencies of all drawings in the contract.

PART 3 - EXECUTION

- 3.01 MAINTENANCE OF JOB SET
 - A. Immediately upon receipt of the job set (blue lines) described herein, identify each of the documents with the title "Record Documents" job set, date of start, General Contractor's name, resident inspector's name and project completion date.
 - B. Preservation:
 - 1. Considering the contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Architect.
 - 2. Do not use the job set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to final project record documents.
 - 3. Maintain the job set at the site of work as that site is designated by the Architect.
 - C. Making entries on the documents.

- 1. Using a red erasable pencil (not ink or indelible), clearly describe the change by graphic line and/or note as required. All entries shall be dated and signed by the General Contractor, Subcontractor involved and the Inspector.
- 2. Call attention to the entry by a "cloud" drawing around the area or areas affected.
- 3. In the event of overlapping changes, use different colors and date the overlap entry.
- D. Coordination Field Engineering
 - 1. Summary: Before proceeding with the layout of actual work, verify the layout information shown on the drawings, in relation to the property survey and existing benchmarks. As work proceeds, check every major element for line, level and plumb. Maintain a surveyor's log or record book of such checks; make this log or record book available for the Architect or Engineer's reference. Record deviations from required lines and levels, and advise the Architect or Engineer promptly upon detection of deviations that exceed indicated or recognized tolerances. Record deviations which are accepted, and not corrected, on record drawings.
- E. Record conversion of schematic layout: Final physical arrangements/layouts are determined by the Contractor's involved in the work and subject to Architect/Engineer's approval.
 - 1. Site underground utilities: Record indicated complete "as installed" layouts of all underground systems as indicated on the drawings up to the buildings indicating all horizontal/vertical locations to the center line of each system.
 - a. Storm drainage
 - b. Automatic fire extinguishing
 - c. Plumbing: Sewer, gas, water, etc.
 - d. Electrical: Power, signal, etc.
 - e. Landscape: Irrigation
 - 2. Buildings interior utilities: Record indicated complete all horizontal/vertical dimensions "as installed" layouts of interior systems as indicated on the drawings not readily visible (under slab, ceiling plenum) extending out to point of connection to site utilities.
 - a. Plumbing systems
 - b. H.V.A.C. systems
 - c. Electrical systems
 - 3. Make all entries by dimensions, symbols and notes, accurate identification so descriptive that it may be related reliably to the specifications. Measurements and drawings for underground work required by Par. E1 and E2 shall be made by a California registered Civil Engineer or a California licensed Land Surveyor and the record documents shall bear his license, registration number and signature.
 - 4. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

project record documents 01 72 00 - 3 F. Deviations from the original documents: Where deviations occur in construction, finishes, equipment, layout of ducts, door/glass, controls, systems, wiring and related work shall be so recorded.

3.02 FINAL PROJECT RECORD DOCUMENTS

- A. The purpose of the final project record documents is to provide factual information regarding all aspects of the work, both concealed and visible, to enable future modification of the work to proceed without lengthy and expensive site measurement, investigation, and examination.
- B. Approval of recorded data prior to transfer:
 - 1. Following receipt of the transparencies described in Paragraph 2.1-B above, and prior to start of transfer of recorded data thereto secure the Architect's approval of all recorded data.
 - 2. Make required revisions.
- C. Transfer of data to drawings:
 - 1. Carefully transfer change data shown on the job set of record drawings to the corresponding transparencies, coordinating the changes as required.
 - 2. Clearly indicate at each affected detail and other drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.01-E above.
 - 3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
 - 4. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.
- D. Transfer of data to other documents:
 - 1. If the documents other than drawings have been kept clean during progress of the work, and if entries thereon have been orderly to the approval of the Architect, the job set of those documents other than drawings will be accepted as final record documents.
 - 2. If any such document is not so approved by the architect, secure a new copy of that document from the Architect at the Architect's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the Architect.
- E. Review and submittal:
 - 1. Submit the completed set of project record documents to the Architect as described in Paragraph 1.03 above.
 - 2. Participate in review meetings as required.
 - 3. Make required changes and promptly deliver the final project record documents to the Architect.

project record documents 01 72 00 - 4

3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

A. The Contractor has no responsibility for recording changes in the work subsequent to final completion, except for changes resulting from work performed under warranty.

END OF SECTION

section 01 73 00 operation and maintenance data

PART 1 - GENERAL

1.01 SUMMARY

- A. To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding products incorporated into the work, furnish and deliver the data described in this section and in pertinent other sections of these specifications.
- B. Related Work:
 - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and sections in Division 1 of these specifications.
 - 2. Required contents of submittals also may be amplified in pertinent other sections of these specifications.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 34 00.
- B. Submit two copies of a preliminary draft of the proposed manual, or manuals, to the Architect for review and comments.
- C. Unless otherwise directed in other sections, or in writing by the Architect, submit three copies of the final manual to the Architect prior to indoctrination of operation and maintenance personnel.

1.03 QUALITY ASSURANCE

A. In preparing data required by this section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this section, and skilled in technical writing to the extend needed for communicating the essential data.

PART 2 - PRODUCTS

2.01 INSTRUCTION MANUALS

- A. Where instruction manuals are required to be submitted under other sections of these specifications, prepare in accordance with the provisions of this section.
- B. Format: (Digital format accepted only with district approval)
 - 1. Size: 8-1/2" x 11".
 - 2. Paper: White bond, at least 20 lb. weight.
 - 3. Text: Neatly written or printed.

- 4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the manual and provide a drawing pocket inside rear cover or bind in with text.
- 5. Flysheets: Separate each portion of the manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
- 6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the manual; 3-ring binders will be acceptable; all binding is subject to the Architect's approval.
- 7. Measurements: Provide all measurements in U.S. standard units such as feet and inches, pounds, and cfm; where items may be expected to be measured within 10 years in accordance with metric formulae, provide additional measurements in the "International System of Units"(SI).
- C. Provide front and back covers for each manual, using durable material approved by the Architect, and clearly identified on or through the cover with at least the following information:

name and address of work
name of Contractor
general subject of this manual
space for signature of the Architect and approval date

OPERATING AND MAINTENANCE INSTRUCTIONS

- D. Contents: Include at least the following:
 - 1. Neatly typewritten index near the front of the manual, giving immediate information as to location within the manual of all emergency information regarding the installation.
 - 2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly and reassembly.
 - 3. Complete nomenclature of all parts of all equipment.
 - 4. Complete nomenclature and part number of all replaceable parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
 - 5. Copy of all guarantees and warranties issued.
 - 6. Manufacturers' bulletins, cuts and descriptive data, where pertinent, clearly indicating the precise items included in this installation, and deleting, or otherwise clearly indicating, all manufacturers' data with which this installation is not concerned.
 - 7. Such other data as required in pertinent sections of these specifications.

operation and maintenance data 01 73 00 - 2

PART 3 - EXECUTION

3.01 INSTRUCTION MANUALS

- A. Preliminary:
 - 1. Prepare a preliminary draft of each proposed manual.
 - 2. Show general arrangement, nature of contents in each portion, probable number of drawings and their size, and proposed method of binding and covering.
 - 3. Secure the Architect's approval prior to proceeding.
- B. Final: Complete the manuals in strict accordance with the approved preliminary drafts and the Architect's review comments.
- C. Revisions:
 - 1. Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the manual with the Architect.
 - 2. If the Contractor is required by the Architect to revise previously approved manuals, compensation will be made as provided for under "Changes" in the General Conditions.

END OF SECTION

section 01 73 29 cutting and patching

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies procedural requirements for cutting and patching.

1.02 RELATED SECTIONS

- A. General Conditions.
- B. Section 01 04 00: Project Coordination.
- C. Section 01 33 00: Submittal Procedures.
- D. Section 01 70 00: Project Closeout.

1.03 SUBMITTALS

- A. The word "cutting" as used in the Contract Documents includes, but is not limited to, cutting, drilling, chopping, and other similar operations and the word "patching" includes, but is not limited to, patching, rebuilding, reinforcing, repairing, refurbishing, restoring, replacing, or other similar operations.
- B. Cutting and Patching Proposal: CONTRACTOR shall submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Contract Documents requires approval of these procedures before proceeding. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required. Denote how it will be performed and indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance or other significant visual elements.
 - 3. List products to be used and firms or entities that will perform this Work.
 - 4. Indicate dates when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching operations will disturb or affect. List utilities to be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
 - 7. Review by ARCHITECT prior to proceeding with cutting and patching does not waive ARCHITECT right to later require complete removal and replacement of defective Work.

1.04 QUALITY ASSURANCE

- A. Requirements for structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
 - 1. Obtain approval from ARCHITECT for the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Timber and primary wood framing.
 - g. Structural decking.
 - h. Stair systems.
 - i. Miscellaneous structural metals.
 - j. Exterior curtain-wall construction.
 - k. Equipment supports.
 - I. Piping, ductwork, vessels, and equipment.
 - m. Structural systems of special construction
- B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
 - 1. Obtain review of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Water, moisture, or vapor barriers.
 - d. Membranes and flashings.
 - e. Fire protection systems.
 - f. Noise and vibration control elements and systems.
 - g. Control systems.
 - h. Communication and/or data systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the opinion of ARCHITECT, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.
 - 1. If possible, retain the original installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.
 - a. Firestopping.
 - b. Acoustical ceilings.

cutting and patching 01 73 29 - 2

- c. Acoustical panels.
- d. Finished wood flooring.
- e. Synthetic sports flooring.
- f. Carpeting.
- g. HVAC enclosures, cabinets, or covers.
- h. Ceramic and quarry tile.
- i. Gypsum board.
- j. Masonry (exterior and interior where exposed).
- k. Tack boards.
- I. Casework.
- m. Finish carpentry.
- 1.05. WARRANTY
 - A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.
- PART 2 PRODUCTS (Not applicable)
- PART 3 EXECUTION
- 3.01. INSPECTION
 - A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
 - 1. Before proceeding, meet at the 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.

3.02. PREPARATION

- A. Temporary support: Provide adequate temporary support of existing improvements or Work to be cut.
- B. Protection: Protect existing improvements and Work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of existing improvements or Work that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Where the Work requires sandblasting of existing surfaces in order to receive new materials secured by cementitious, adhesive or chemical bond, completely remove existing finishes, stains, oil, grease, bitumen, mastic and adhesives or other substances deleterious to the new bonding or fastening of new Work. Utilize wet sand blasting for interior surfaces and for exterior surfaces where necessary to prevent objectionable production of dust.

3.03. PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay. Carefully remove existing Work to be salvaged and/or reinstalled.

cutting and patching 01 73 29 - 3 Protect and store for reuse into the Work. Verify compatibility and suitability of existing substrates before starting the Work.

- B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining Work. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.
 - 1. In general, where cutting, use hand or small power tools designed for sawing or 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. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or a diamond-core drill. Saw cut reinforcing bars and paint ends with bituminous paint except where bonded into new concrete or masonry.
 - 4. Comply with requirements of applicable Sections of Divisions 31, 32, and 33 where cutting and patching requires excavating, backfill, and recompaction.
 - 5. Woodwork: Cut and or remove to a panel or joint line.
 - 6. Sheet Metal: Remove back to joint, lap, or connection. Secure loose or unfastened ends or edges and seal watertight.
 - 7. Glass: Remove cracked, broken, or damaged glass and clean rebates and stops of setting materials.
 - 8. Plaster: Cut back to sound plaster on straight lines, and back bevel edges of remaining plaster. Trim existing lath and prepare for new lath.
 - 9. Gypsum: Cut back on straight lines to undamaged surfaces with at least two opposite cut edges centered on supports.
 - 10. Acoustical ceilings: Remove hanger wires and related appurtenances where ceilings are not scheduled to be installed.
 - 11. Tile: Cut back to sound tile and backing on joint lines.
 - 12. Flooring: Completely remove flooring and clean backing of prior adhesive. Carefully remove wood flooring for patching and repairing of existing wood flooring scheduled to remain.
 - 13. Curb, gutters, and flat work: Saw cut joint to nearest joint.
- B. Patching: Patch with durable seams that are as invisible as possible. Comply with required tolerances.

- 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation. Verify conditions of existing substrates prior to executing Work.
- 2. Restore exposed finishes of patched areas and extend finish restoration into retaining adjoining construction in a manner that will eliminate all evidence of patching and refinishing.
- 3. Non-Structural Concrete Flatwork: Finish placed concrete to match existing unless noted otherwise. Concrete shall have a compressive strength of 2,500 psi where installed to repair and match existing improvements, unless noted otherwise.
- 4. Metal Fabrications: Items to remain exposed shall have their edges cut and ground smooth and rounded.
- 5. Sheet Metal: Replace removed or damaged sheet metal items for new Work.
- 6. Glass: Install matching glass and re-seal exterior window assemblies.
- 7. Lath and Plaster: Install new lath materials to match existing and fasten to supports at 6-inch centers. Provide a 6-inch lap where new lath adjoins existing lath. Fasten new lath as required for new Work. Restore paper backings as required. Apply a bonding agent on cut edges of existing plaster. Apply three coat plaster of the type, thickness, finish, texture, and color to match existing.
- 8. Gypsum: Fasten cut edges of wallboard. Install patches with at least two opposite edges centered on supports and secure at 6-inch centers. Tape and finish joints and fastener heads. Patching shall be non-apparent when painted or finished.
- 9. Acoustical Ceilings: Comply with the requirements for new Work specified in related sections of the Contract Documents.
- 10. Resilient Flooring: Completely remove flooring and prepare substrate for new material.
- 11. Painting: Prepare areas to be patched, patch and paint as specified under related sections of the Contract Documents.

3.04 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged coverings to their original condition.

END OF SECTION

section 03 73 00 concrete rehabilitation

PART 1 - GENERAL

1.01 SUMMARY

A. This specification describes the patching or overlay of interior and/or exterior horizontal surfaces with a polymer- modified, portland cement mortar/concrete.

1.02 QUALITY ASSURANCE

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (7°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 SUBMITTALS

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

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1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. SikaTop 122 Plus, as manufactured by Sika Corporation, is considered to conform to the requirements of this specification.

2.02 MATERIALS

- A. Polymer-modified Portland cement mortar:
 - 1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
 - a. pH: 4.5-6.5
 - b. Film Forming Temperature: 73°F max.
 - c. Tear Strength: 950-psi min.
 - d. Elongation at Break: 500% min.
 - e. Particle Size: less than 0.1 micron
 - 2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
 - 3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
 - 4. The materials shall be non-combustible, both before and after cure.
 - 5. The materials shall be supplied in a factory-proportioned unit.
 - 6. The polymer-modified, portland cement mortar must be placeable from 1/8-in. to 1-in. in depth per lift for horizontal applications.
- B. To prepare a polymer-modified portland cement concrete: aggregate shall conform to ASTM C-33. The factory- proportioned unit shall be extended with 42-lb. max. of a 3/8 in. (No.8 distribution per ASTM C-33, Table II) clean, well-graded, saturated surface dry aggregate, having low absorption and high density. Aggregate must be approved for use by the Engineer.

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2.03 PERFORMANCE CRITERIA

- A. Typical Properties of the mixed polymer-modified, portland cement mortar:
 - 1. Working Time: Approximately 30 minutes
 - 2. Finishing Time: 50-120 minutes
 - 3. Color: concrete gray when mixed
- B. Typical Properties of the cured polymer-modified, portland cement mortar:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 3000 psi min. (20.7 MPa)
 - b. 7 day: 5500 psi min. (37.9 MPa)
 - c. 28 day: 7000 psi min. (48.3 MPa)
 - 2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)
 - 3. Splitting Tensile Strength (ASTM C-496) @ 28 days 750 psi (5.2 MPa)
 - 4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
 - 5. The portland cement mortar shall not produce a vapor barrier.
 - 6. Density(wet mix): 136 lbs. / cu. ft. (2.18 kg/l)
 - 7. Permeability (AASHTO T-277 @ 28 days Approximately 500 Coulombs)

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

PART 3 – EXECUTION

- 3.01 SURFACE PREPARATION
 - A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare the concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8" in depth.
 - B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika Armatec 110 EpoCem as directed by manufacturer. (See Spec Component SC-201-0699)

3.02 MIXING AND APPLICATION

- A. Mechanically mix in appropriate sized mortar mixer or with a Sika jiffy paddle and low speed (400-600 rpm) drill. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix if a more loose consistency is desired. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 30 minutes. Do not retemper material.
- B. Mixing of the polymer-modified portland cement <u>concrete</u>: Pour all (1-gallon) of Component A into the mixing container. Add Component B while continuing to mix. Add correct amount of the pre-approved coarse aggregate, and continue mixing to a uniform consistency. Mixing time should be 3 minutes maximum.
- C. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat (See Spec Component SC-200). After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 1-inch shall be repaired with polymer-modified portland cement mortar. In areas where the depth of the repair is greater than 1 inch, the repair shall be made with polymer-modified portland cement concrete.
- D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

*Pretesting of curing compound is recommended.

E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

3.05 CLEANING

- A. The uncured polymer-modified portland cement mortar can be cleaned from tools with water. The cured polymer modified portland cement mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.



- 1. Substrate shall be clean, sound and lattinance-free prior to repairing.
- 2. Pre-soak the substrate to provide saturated surface dry (SSD) condition prior to applying repair material.
- 3. Apply scrub coat of the repair material to the prepared substrate.
- 4. While scrub coat is wet place SikaTop 122 *Plus*, filling the entire cavity. Strike off and finish as required. Wet cure and protect as per the technical data sheet.

SC-025 SikaTop[®] 122 Plus Hand-applied Repair



Note:

- 1. If repair area is too large to fill while scrub coat is still wet, use Sika Armatec 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)
- 2. If reinforcing steel is located within the repair location refer to Spec Component SC-201
- 3. For applications greater than 1" in depth, add 3/8" coarse aggregate in accordance to the technical data sheet.



Note:

- 1. If repair area is too large to fill while scrub coat is still wet, use Sika Armatec 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)
- 2. If reinforcing steel is located within the repair location refer to Spec Component SC-201
- 3. For applications greater than 1" in depth, add 3/8" coarse aggregate in accordance to the technical data sheet.

section 04 05 13 vertical overhead repair mortar

PART 1 GENERAL

- 1.01 SUMMARY
 - A. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work and coordinate overlapping Work.

1.02 SYSTEM DESCRIPTION

A. This specification describes the patching of interior and/or exterior vertical and overhead surfaces with a rapid setting portland cement mortar.

1.03 RELATED SECTIONS

- A. Masonry Mortaring Section 04 05 13
- 1.04 REFERENCES
 - A. The following standards are applicable to this section:
 - 1. ASTM C-109 Compressive Strength
 - 2. ASTM C-1583 Direct Pull-Off Bond Strength
 - 3. ASTM C-469 Modulus of Elasticity
 - 4. ASTM C-157 Modified per ASTM C-928 Shrinkage
 - 5. ASTM C-293 Flexural Strength
- 1.05 QUALITY ASSURANCE
 - A. <u>Manufacturing qualifications:</u> The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
 - B. <u>Contractor qualifications:</u> Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have receiveed product training by a manufacturer's representative.
 - C. Store and apply materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Safety Data Sheets (SDS0 for complete handling recommendations.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer
- 1.07 JOB CONDITIONS
 - A. <u>Environmental Conditions</u>: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (4°C) and rising.
 - B. <u>Protection:</u> Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.
- 1.08 SUBMITTALS
 - A. Submit two copies of manufacturer's literature, to include: Product Data Sheets (PDS), and appropriate Safety Data Sheets (SDS).
 - B. Submit copy of Certificate of Approved Contractor status by manufacturer.

1.09 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

- 2.01 MANUFACTURER
 - A. SikaQuick®-VOH, as manufactured by Sika® Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

- A. Vertical Overhead repair mortar shall be SikaQuick®-VOH, fast setting, cementitious repair mortar manufactured by Sika® Corporation.
- B. The material shall be high build mortar made with a specialty cement blend.
- C. The material shall be a one-component repair materal manufactured by Sika Corporation .

2.03 Performance Criteria

Typical Properties of the mixed polymer-modified, portland cement mortar:

Yield	0.44 ft ³ per bag
Color	Concrete gray
Mixing Ratio	6-6.5 pts (2.8-3.1 L) per bag
Application Thickness	Min 1/8" (3 mm) Max 3 " (76 mm)
Application Temp	> 45 °F (7 °C)
Working Time	~ 15 minutes
Compressive Strength (ASTM C-109)	3 hours > 1,500 psi (10.3 MPa) 1 day > 3,000 psi (20.7 MPa) 28 days - 5,500 psi (37.9 MPa)
Flexural Strength (ASTM C-293)	1 day - 400 psi (2.8 MPa) 7 day - 600 psi (4.1 MPa) 28 day - 1,000 psi (6.9 MPa)
Bond Strength (ASTM C-1583)	> 250 psi (1.7 MPa) Substrate failure
Slant Shear Strength (ASTM C-882 modified*)	28 days - 2,000 psi (13.8 MPa)
Shrinkage @ 28 days (ASTM C-157 Modified per ASTM C-928)	< 0.05%
Modulus of Elasticity in Compression (ASTM C- 469)	2.2x10 ⁶ psi (15.2 GPa)

Note: Tests above were performed with the material and curing conditions @ $71^{\circ}F - 75^{\circ}F$ and 45 - 55% relative humidity.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare concrete substrate to obtain a surface profile of $\pm 1/16''$ (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8'' in depth.
- B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika® Armatec® 110 EpoCem as per the Product Data Sheet (PDS).

3.02 MIXING AND APPLICATION

- A. Mechanically mix in appropriate sized mortar mixer or with a Sika jiffy paddle and low speed (400-600 rpm) drill. Pour approximately 5 pints of water into the mixing container. Add the powder while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add up to another ½ pint of water to mix if a greater flow is desired. Should smaller quantities be needed, be sure the proper water/powder ratio is maintained and that the dry material is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 30 minutes. Do not retemper material.
- B. Mixing of the rapid-setting portland cement concrete: Pour 6 to 6-1/2 pints of water into the mixing container. Add the powder while continuing to mix. Add correct amount of the pre-approved coarse aggregate, and continue mixing to a uniform consistency. Mixing time should be 3 minutes maximum.
- C. <u>Placement Procedure:</u> At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against the edge of the repair, working toward the center. After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with a trowel for a smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 2" over head and 3" vertical shall be repaired with one lift of the rapid setting portland cement mortar. Areas that exceed these depths must be repaired with multiple lifts.
- D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a waterbased* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28 day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.
 *Pretesting of curing compound is recommended.
- E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed Product Data Sheet (PDS) and literature.

3.03 CLEANING

- A. The uncured material can be cleaned from tools with water. The cured cement mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

section 07 90 00 joint sealers elastomeric and non-elastomeric sealant

- Part 1 General
- 1.01 SUMMARY
 - A. This specification describes the sealing of joints and cracks with a onecomponent, gun-grade, elastomeric polyurethane sealant.

1.02 QUALITY ASSURANCE

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.
- 1.03 DELIVERY, STORAGE, AND HANDLING
 - A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
 - B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
 - C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified coating.
- 1.05 SUBMITTALS
 - A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).
- 1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS
 - A. Sikaflex-1a, as manufactured by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071 is considered to conform to the requirements of this specification.

2.02 MATERIALS

- A. Polyurethane sealant:
 - 1. The joint sealant shall be a one-component, gun grade, polyurethane-base material. It shall be applicable in horizontal, vertical, and overhead joints. The sealant shall cure under the influence of atmospheric moisture to form an elastomeric substance.
- B. Any primers, as required, recommended by the manufacturer of the specified product, approved by the engineer.
- C. Backer rod or bond breaker tape, as approved by the engineer.

2.03 PERFORMANCE CRITERIA

- A. Properties of the uncured polyurethane sealant:
 - 1. Initial Cure (Tack-Free Time): TT-S-00230C - 4 hours Final Cure 4 – 7 days
 - 2. Consistency: non-sag
 - 3. Color: 7 architectural standard colors
- B. Properties of the cured polyurethane sealant:
 - 1. Tensile Properties (ASTM D-412) at 21 days
 - a. Tensile Stress: 175-psi min.(1.37 MPa)
 - b. Elongation at Break: 550%
 - c. Modulus of Elasticity 25% 35 psi (0.24 MPa) 50% 60 psi (0.41 MPa) 100% 85 psi (0.59 MPa)
 - 2. Shore A Hardness (ASTM D-2240) at 21 days: 40+/- 5
 - 3. Tear Strength (ASTM D-624) at 21 days: 55 lb./in.

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joint sealers elastomeric and non-elastomeric sealant

- 4. Adhesion in Peel (TT-S-00230C, ASTM C 794)
 - a. Concrete: 20-lb. min. 0% Adhesion Loss
 - b. Aluminum: 20-lb. min. 0% Adhesion Loss
 - c. Glass: 20-lb. min. 0% Adhesion Loss
- 5. Service Range: -40° to 170°F (-40° to 77 ° C)
- 6. The sealant shall conform to Federal Specification TT-S-00230C, Type II, Class A.
- 7. The sealant shall conform to ASTM C-920, Type S, Grade NS, Class 35.
- 8. The sealant must comply with ANSI Standard 61(NSF Approval) for use in contact with potable water.
- 9. The sealant shall be non-staining.

Note: Tests were performed with material and curing conditions at $71^{\circ}-75^{\circ}F$ and 45-55% relative humidity. Part 3 - Execution

3.01 SURFACE PREPARATION

A. The joint and adjacent substrate must be clean, dry, sound and free of surface contaminants. Remove all traces of the old sealant, dust, laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, i.e. – sandblasting, etc., as approved by the engineer. Blow joint free of dust using compressed air line equipped with an oil trap.

3.02 MIXING AND APPLICATION

- A. Joints:
 - 1. Placement Procedure: Prime substrate as required based upon the recommendations of the manufacturer of the specified product, when field testing indicates need, and when the joints will be subject to immersion after cure, as approved by the Engineer.
 - 2. Install approved backer rod or bond breaker tape in all joints subject to thermal movement to prevent three- sided bonding and to set the depth of the sealant at a maximum of 1/2 in., measured at the center point of the joint width. Approval of the backer rod or bond breaker tape shall be made by the engineer.
 - 3. Joints shall be masked to prevent discoloration or application on unwanted areas, as directed by the engineer. If masking tape is used, it shall not be removed before tooling, yet must be removed before the initial cure of the sealant. Do not apply the masking tape until just prior to the sealant application.

- 4. Install sealant into the prepared joints when the joint is at the midpoint of its expansion and contraction cycle. Place the nozzle of the gun, either hand, air, or electric powered, into the bottom of the joint and fill entire joint. Keep the tip of the nozzle in the sealant; continue with a steady flow of sealant preceeding the nozzle to avoid air entrapment. Avoid overlapping the sealant to eliminate the entrapment of air. Tool as required to properly fill the joint.
- 5. Adhere to all limitations and cautions for the polyurethane sealant as stated in the manufacturer's printed literature.
- B. Cracks:
 - 1. For best performance sealant should be gunned into crack to a minimum of a 1/4" in depth. Place the nozzle of the gun, either hand, air or electric powered, into the bottom of the crack and fill entire crack. Keep the tip of the nozzle in the sealant. Continue with a steady flow of sealant preceeding the nozzle to avoid air entrapment.
 - 2. Avoid overlapping the sealant to eliminate the entrapment of air. Tool as required to properly
 - 3. Adhere to all limitations and cautions for the polyurethane sealant as stated in the manufacturer's printed literature.

3.01 CLEANING

- A. The uncured polyurethane sealant can be cleaned with an approved solvent. The cured polyurethane sealant can only be removed mechanically
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.
SC-069 Sikaflex $^{ extsf{R}}$ -1a Crack Filler Figure 1 - Surface Seal

- 1. Surface seal cracks up to a ¼" wide by gunning Sikaflex-1a into crack.
- 2. Tool as required to properly fill crack.
 - Note:

Prior to applying any coating, allow sealant to cure for 7 days.



Figure 2 - Notch & Seal

- 1. Gun **Sikaflex-1a** into prepared crack to a minimum depth of ¹/₄".
- 2. Tool as required to properly fill crack.



Sealant

SC-069 Sikaflex[®]-1a Expansion Joint Filler



- 1. Install appropriate backer material to prevent three-sided adhesion and to control sealant depth.
- 2. Sikaflex-1a should be gunned into joint at mid-point of designed expansion and contraction cycle.
- 3. Tool as required to properly fill joints.
- Note: Sikaflex-1a is designed for all types of joints where sealant will not exceed $\frac{1}{2}$ " in depth. Proper joint design is 2:1 width to depth ratio

section 09 83 00 elastomeric coatings

PART 1 - GENERAL

1.01 SUMMARY

A. This specification describes the coating of substrates with an elastomeric, crack bridging, anti-carbonation, protective coating.

1.02 QUALITY ASSURANCE

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (7°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.
- 1.05 SUBMITTALS

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- B. Sikagard 550W Elastocolor, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.
- C. Sikagard Elastic Base Coat (Smooth & Textured), as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.
- D. Sikagard 552W Primer or SikaLatex R, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

2.02 MATERIALS

- A. Elastomeric Acrylic Coating:
 - 1. Product shall be 100% Acrylic Emulsion with the following properties:
 - a. Water vapor permeable
 - b. Can bridge dynamically moving cracks
 - c. Crack bridging properties maintained at low temperatures
 - d. The material shall be resistant to dirt pick-up and mildew
- B. Elastomeric Acrylic Smooth & Textured Base Coating:
 - 1. Product shall be 100% Acrylic Emulsion with the following properties:
 - a. Water vapor permeable
 - b. Can bridge dynamically moving cracks
 - c. Crack bridging properties maintained at low temperatures
- C. Adhesion Promoter / Surface Conditione

- 1. Product shall be a water-based, acrylic primer with the following properties:
 - a. Solids content 12.5% -20% by volume
 - b. Recoat time 4 24 hours

2.03 PERFORMANCE CRITERIA

- A. Properties of the elastomeric Sikagard 550W Elastocolor acrylic coating:
 - 1. Pot Life: indefinite
 - 2. Tack Free Time 6 Hours @ 73°F, 50% Relative Humidity. Final Cure < 24 Hours
 - 3. Carbon Dioxide Diffusion: μCO_2 214,000 Carbon Dioxide Diffusion Resistance at 16 mils (400 microns) SdCO₂ = 299 ft. (equivalent air thickness) i.e. Approx. 9-in
 - 4. Water Vapor Diffusion: μ H₂O 2,146 Water Vapor Diffusion Resistance at 16 mils SdH₂O = 2.6 ft. (0.8m) (equivalent air thickness)
 - 5. Moisture Vapor permeability (ASTM E96) 14.5 perms
 - 6. Tensile Properties (ASTM D-412 Modified)
 7 day-Tensile strength 190 psi (1.3 MPa) Elongation at break 820% 340% @ 0°F (-18°C)
 - 7. Crack Bridging (at 16 mils = 400 microns DFT
 - a. Static (at -4°F/-20°C) 30 mils (0.75mm)
 - b. Dynamic>1000 cycles (at -4°F/-20°C) 12 mils (0.30mm)
 - 8. Resistance to wind driven rain (TT-C-555B): No passage of water through coating
 - 9. Weathering (ASTM G-23) 10,000 hours excellent, no chalking or cracking.
 - 10. Solids Content: by weight 62% by volume 55%
 - 11. Flame Spread and Smoke Development (ASTM E-84-94) Flame Spread 5 Smoke Development 5 Class Rating A

Note: Tests above were performed with the material and curing conditions @ $71^{\circ}F$ – $75^{\circ}F$ and 45-55% relative humidity.

B. Colors:

- 1. Finish colors shall be selected from the manufacturer's standard line.
- 2. A maximum of three (3) colors may be chosen for the body of the building, specific colors and locations to be issued by the Architect during the construction period.
 - a. Finish graphics' colors are not included in the total above; up to an additional five (5) colors may be required for the finish graphics.

PART 3 – EXECUTION

- 3.01 SURFACE PREPARATION
 - A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings and fall within CSP1 to CSP3.

3.02 MIXING AND APPLICATION

- A. Mixing: Stir materials to ensure uniformity using a low speed (400-600 rpm) drill and paddle. To minimize color variation, blend two batches of material. (boxing)
- B. Crack detail: Recommended application temperatures 40° 100°F (4°-38°)
 - Small defects and cracks (non-structural): Cracks 10 20 mils. Apply Surface Filler "Brush Grade" generously over the center of the cracks. Feather material to zero over a two-inch wide area. Allow a minimum 24 hours to cure before overcoating.
 - Large defects and cracks (non-structural): Cracks >20mils. Rout to 1/4-in wide by 1/4-in. deep. Blow out cut with oil-free compressed air. Fill slot with Surface Filler "Knife Grade" allowing for a small crest to remain. This will compensate for any shrinkage that might occur. NOTE: Sikaflex-1a,-2c, or -15LM, polyurethane sealant may be used in place of Knife Grade Surface Filler. Allow 24 hours-minimum cure before over coating.
- C. Coating Application: Apply by brush, roller, or spray over entire area moving in one direction. A minimum of two coats are required. Each coat should be applied at a rate not to exceed 100 sq. ft. per gallon. Total dry film thickness shall be a minimum 8 10 dry mils per coat. Allow a minimum of 2 hours prior to re-coating.
- When applying the coating, never stop the application until the entire surface has been coated. Always stop application at an edge, corner, or joint. Never let a previously coated film dry; always coat into a wet film. Always apply the coating at a 45° angle to an edge, corner, or joint.
- E. If substrate has been previously coated and presents a "chalky" condition, apply 1 coat of Sikagard 552W or SikaLatex R, primer/surface conditioner by brush, roller, or spray at a rate not to exceed 300 sq. ft. per gallon.

elastomeric coatings 09 83 00 -4 F. Adhere to all limitations and cautions for the elastomeric acrylic coating in the manufacturers printed literature.

3.03 CLEANING

- A. The uncured elastomeric acrylic coating can be cleaned from tools with water. The cured elastomeric acrylic coating can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-058

$\mathsf{Sikagard}^{\texttt{R}}$

550W Elastocolor, Anti- Carbonation Crack-bridging Coating



Concrete Restoration Systems by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071

PART 1 - GENERAL

- 1.01 SUMMARY
 - A. Section Includes
 - 1. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - a. Concrete
 - b. Steel
 - c. Portland Cement Plaster
 - d. Concrete Masonry Units
 - B. Related Sections
 - 1. 07 90 00 Joint Sealants
 - 2. 09 83 00 Elastomeric Coatings
- 1.02 REFERENCES
 - A. CCR, Title 24, Part 11, 5,504.4.3 Paints and Coatings
- 1.03 DEFINITIONS
 - A. Blocking: Two painted surfaces sticking together such as a painted door sticking to a painted jamb.
 - B. Bio-Pruf: Biostabilizing additive, to protect products from premature microbial degradation.
 - C. EG: Ethylene Glycol. Ethylene glycol is listed as a hazardous air pollutant (HAP) by the U.S. EPA.
 - D. EPR: Environmental Performance Rating. Master Painters Institute (MPI) formula that relates to VOC, Performance of Category, Gloss and Appropriate specified use. Higher values equate to greater eco-efficiency.
 - E. MPI: Master Painters Institute. Organization that establishes architectural paint standards and quality assurance programs in North America. www.paintinfo.com.
 - F. PDCA: Painting & Decorating Contractors of America. www.pdca.org.
 - G. RAVOC: Reactivity adjusted VOC. "Reactivity" means the ability of a VOC to promote ozone formation
 - H. SSPC: The Society for Protective Coatings publishes Scopes of SSPC Surface Preparation Standards and Specifications. www.sspc.org.
- 1.04 SUBMITTALS
 - A. Product Data
 - 1. Submit product data for each type of product. Include preparation requirements and application instructions.
 - b. Samples
 - 1. Submit samples for initial selection
 - 2. Submit samples for verification that in each color and gloss topcoat.
 - a. Submit samples on rigid backing, no smaller than $7'' \ge 10''$ or larger than $8.5'' \ge 11''$
 - b. Label each sample for project, architect, contractor, paint color name and number, and paint brand
 - D. Quality Assurance/Control Submittals
 - 1. Design data, Test Reports, Certificates, Manufactures' Instructions, Manufactures' Field Reports, Qualification Statements

- a. Printed statement of VOC Content
- b. Documentation indicating the paints and coatings meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. VOC Content: Products shall comply with VOC limits of SCAQMD and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 50 g/L.
 - 3. Primers, Sealers, and Undercoaters: 100 g/L.
 - 4. Rust Preventative Coatings: 100 g/L.
 - 5. Floor Coatings: 50 g/L.
 - 6. Shellacs, Clear: 730 g/L.
 - 7. Shellacs, Pigmented: 550 g/L.
 - 2. Colorants: The use of colorants containing hazardous chemicals, such as ethylene glycol, is prohibited.
- B. Mock-ups
 - 1. Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under verification sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 2. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - c. Final approval of color selections will be based on mockups.
 - 1. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 DELIVERY, STORAGE, AND HANDLING

Α.

- Storage and Protection
 - 1. Store materials not in use in tightly covered containers in wellventilated areas with ambient temperatures continuously maintained at not less than 45 deg. F or more than 120 deg. F.
 - 2. Maintain containers in clean condition, free of foreign materials and residue.
 - 3. Remove rags and waste from storage areas daily.
- C. Waste Management and Disposal

1.07 PROJECT CONDITIONS

- A. Project Environmental Requirements
 - 1. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 105 deg F.
 - Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 - Painting contractor should follow proper painting practices and exercise judgment based on his or her experience and project specific conditions as to when to proceed.

1.08 MAINTENANCE

- A. Extra Materials
 - 1. Furnish extra materials from the same product run that match products installed and the are packaged with protective covering for storage and identified with labels describing content.
 - a. Paint 5% but not less than 5 gal of each material and color applied.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS
 - A. Non-Solvent Based Paint
 - 1. Dunn-Edwards Corporation, 4885 E. 52nd Place, Los Angeles, CA 90058, or Equal.
 - 2. Vista Paint Corporation, 2020 E. Orangethorpe Ave., Suite 210, Fullerton, CA 92831
 - B. Solvent Based Paints
 - 1. Carboline, 2150 Schuetz Road, St. Louis, MO 63146, or Equal.

2.02 MATERIALS

- A. Colors: As selected by architect from manufacturer's full range as well as any custom color matching
- B. Block Fillers
 - 1. (Dunn-Edwards) Smooth Blocfil Select
 - 2. (Vista) 100% Acrylic Block Filler (Premium Plus)
- C. Primers/Sealers
 - 1. Primer, Alkali Resistant
 - a. (Dunn-Edwards) Ultra-Grip Premium
 - b. (Vista) Uniprime 4000 (Premium Plus)
 - Cementitious Sealer, Graffiti Control
 - a. See Section 07 19 00 Water Repellents
- D. Metal Primers

2.

- 1. Primer, Alkyd, Anti-Corrosive for Metal
 - a. (Dunn-Edwards) Ultra-Grip Premium
 - b. (Vista) Metal Pro Primer 4800 (Premium Plus)
- 2. Surface-Tolerant Epoxy Mastic
- a. (Carboline) Carbogard 890 VOC
- F. Water-Based Paints
 - 1. Acrylic Enamel, Latex, Exterior Flat/Velvet/Eggshell/Low-Sheen
 - a. (Dunn-Edwards) Spartashield
 - b. (Vista) Weather Master
- G. Solvent-Based Paints
 - 1. Aliphatic Polyurethane, Satin
 - exterior painting

09 91 13 - 3

(Carboline) Carbothane 133 MC

2.03 SOURCE QUALITY CONTROL

- A. Tests, Inspection
 - 1. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - a. Owner may engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at project site. Samples will be identified, sealed, and certified by testing agency.
 - b. Testing agency will perform tests for compliance with product requirements.
 - c. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will comply with requirements to use compatible products and systems as described in this specification. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

2.04 COLORS

- A. Paint colors for use in the project shall be selected and issued by the Architect during construction. A maximum of three (3) separate colors may be selected for use.
- PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions
 - 1. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 2. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Masonry (Clay and CMU): 12 percent.
 - c. Wood: 15 percent.
 - d. Gypsum Board: 12 percent.
 - e. Plaster: 12 percent.
 - 3. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
 - 4. Plaster Substrates: Verify that plaster is fully cured, including pH testing to determine that alkalinity is within limits established by the manufacturer.
 - 5. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
 - 6. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
 - 7. Proceed with coating application only after unsatisfactory conditions have been corrected.

- a. Application of coating indicates acceptance of surfaces and conditions.
- 3.02 PREPARATION
 - A. Surface Preparation
 - 1. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
 - 2. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surfaceapplied protection before surface preparation and painting.
 - a. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 3. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - a. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
 - 4. Concrete Substrates (Where specifically indicated on drawings)
 - a. Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions, including pH testing to determine that alkalinity is within limits established by the manufacturer.
 - 5. Masonry Substrates (Where specifically indicated on drawings)
 - a. Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
 - 6. Steel Substrates:
 - a. Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 1, "Solvent Cleaning."
 - 2. SSPC-SP 2, "Hand Tool Cleaning."
 - 3. SSPC-SP 3, "Power Tool Cleaning."
 - 4. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 5. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
 - 7. Shop-Primed Steel Substrates:
 - a. Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
 - 8. Galvanized-Metal Substrates (Where specifically indicated on drawings)
 - a. Remove grease and oil residue from galvanized sheet metal fabricated from coil stock to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
 - Aluminum Substrates (Where specifically indicated on drawings)
 a. Remove loose surface oxidation.
 - 10. Wood Substrates:

- a. Scrape and clean knots, and apply coat of knot sealer before applying primer.
- b. Sand surfaces that will be exposed to view, and dust off.
- c. Prime edges, ends, faces, undersides, and backsides of wood.
- d. After priming, fill holes and imperfections in the finish surfaces
- with putty or plastic wood filler. Sand smooth when dried. Cotton or Canvas Insulation Covering Substrates
- a. Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.03 APPLICATION

11.

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Block Fillers: Provide block fill as scheduled to conform to the following PDCA Standard P12-05:
 - 1. Level 3 Premium Fill: One or multiple coats of high performance block filler manufactured to be applied at a high dry film build. Block filler shall be back-rolled to eliminate voids and reduce the majority of the masonry profile depth.
- F. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - exterior painting

- b. Uninsulated metal piping.
- c. Uninsulated plastic piping.
- d. Pipe hangers and supports.
- e. Metal conduit.
- f. Plastic conduit.
- g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- h. Other items as directed by Architect.
- 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.04 REPAIR/RESTORATION

A. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.05 CLEANING

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.06 PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- 3.07 SCHEDULES

Β.

- A. Steel (Exposed Structural Steel)
 - 1. 1st Coat Exposed Strutural Steel Primer, See Section 09 97 13 Steel Coatings
 - 2. 2nd Coat Acrylic Enamel, Latex, Exterior Low-Sheen
 - 3. 3rd Coat Acrylic Enamel, Latex, Exterior Low-Sheen
 - Steel (Miscellaneous Steel Fabrications)
 - 1. 1st Coat Metal Primer, (Primer, Alkyad, Anti-Corrosive for Metal)
 - 2. 2nd Coat Acrylic Enamel, Latex, Exterior Low-Sheen
 - 3. 3rd Coat Acrylic Enamel, Latex, Exterior Low-Sheen
- C. Steel (Hollow Metal Doors and Frames)
 - 1. 1st Coat Metal Primer, (Primer, Alkyad, Anti-Corrosive for Metal)
 - 2. 2nd Coat Acrylic Enamel, Latex, Exterior Semi-Gloss
 - 3. 3rd Coat Acrylic Enamel, Latex, Exterior Semi-Gloss
- D. Steel (Site Gates)
 - 1. 1st Coat Metal Primer, (Surface-Tolerant Epoxy Mastic)
 - 2. 2nd Coat Acrylic Enamel, Latex, Exterior Satin
 - 3. 3rd Coat Acrylic Enamel, Latex, Exterior Satin
- E. Concrete Unit Masonry
 - 1. See Section 07 19 00 Water Repellents
- F. Cast-In Place Concrete
 - 1. See Section 07 19 00 Water Repellents

END OF SECTION

section 09 96 23 graffiti resistant coatings

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements to furnish and install anti-graffiti coatings on finish surfaces, as specified herein and as indicated on the construction drawings.

1.02 RELATED SECTIONS

- A. 03 30 00: Cast in Place Concrete
- B. 04 22 00: Concrete Masonry Units
- C. 05 50 00: Metal Fabrications

Comply with VOC requirements per CAL-EPA.

- 1.03 SUBMITTALS
 - A. Product Data:
 - 1. In accordance with the provisions of Section 01 33 00, submit complete manufacturer's literature and specifications. Include complete lists of materials proposed for use, giving the manufacturer's name, product numbers, and product information sheets for each specified item.
 - B. Samples:
 - 1. When specified system requires that the graffiti resistant coating be applied over a paint color, submit sample of system showing each coat. The Architect will use this sample to approve color.
 - C. Application and Safety:
 - 1. Submit the manufacturer's recommended methods of installation, including limitations, safety and environmental cautions, material safety data sheets, and application rates.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Use products by manufacturers regularly engaged in manufacturing of this product and with a history of at least three successful applications within the last 3 years.
 - 2. Use skilled workers who are thoroughly trained and experienced and who are completely familiar with the specified requirements and methods.
- B. Regulatory Requirements:

- 1. Comply with applicable codes and regulations. All products must comply with current VOC requirements for the air quality management district where application takes place. Where those requirements conflict with this Specification, comply with the more stringent provisions.
- C. Field Samples:
 - 1. Apply the system as specified in a designated area in accordance with Section 01 66 00. This will serve as an indication that applicator can provide acceptable results and will be used as the standard for the rest of the work.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Acceptance at Site:
 - 1. Material shall be delivered to Project in original containers, completely sealed and bearing name of coating contained therein.
- B. Storage and Protection:
 - 1. Use all means necessary to protect the materials of this section before, during, and after installation.

1.06 PROJECT/SITE CONDITIONS

- A. Project Conditions:
 - 1. Do not apply coatings when surface temperature is more than 90° F in the shade, or when the relative humidity is more than 70 percent. Do not apply coating when adverse weather conditions are imminent.

PART 2 – PRODUCTS

- 2.01 GRAFFITI RESISTANT COATING
 - A. Graffiti resistant coating shall be a clear, non-sacrificial graffiti resistant coating which provides protection for exterior vertical surfaces from permanent graffiti staining and damage caused by spray paint and marking pens. Coating shall be suitable for application to painted and unpainted surfaces including masonry, concrete, metals, and EIFS. Product shall be of type such that recoating with the underlying paint is possible without removal of the graffiti resistant coating. Product shall be a coating that dries clear, non-yellowing, with a low luster.
 - 1. Graffiti resistant coating shall be compatible with all sealers, finishes, or other coatings that occur on surfaces to receive graffiti resistant coatings.
 - B. Acceptable Product: VandlGuard Non-Sacrificial Graffiti Coating (Three Coats) by Rainguard International, Corona del Mar CA (949) 515-8800.
 - C. Mock Up: Contractor shall provide a mock-up on concealed masonry and concrete surfaces, for review and approval by the Architect and the Owner.

D. Graffiti Remover: Rainguard Vandl Clean Super graffiti remover or other product as recommended by the manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 - 1. Prior to the commencement of the work of this section, examine the installed work of other trades and verify that all such work is complete or properly corrected to the points where this installation may properly commence. Commencement of work will indicate that applicator has accepted the conditions.
 - 2. Verify compatibility with block and concrete sealer or other primers.

3.02 PREPARATION

- A. Protection:
 - 1. Protect and cover finished work and materials of all other trades that may be affected by work of this section during coating application. Protect all surrounding vegetation and adjacent areas from overspray.
- B. Surface Preparation:
 - 1. Substrates to receive sealers or primers prior to graffiti resistant coatings must be cleaned of all dirt, bondbreakers, and all other foreign materials which will adversely affect the required appearance of the finished product.
 - 2. Power wash all surfaces in accordance with manufacturer's recommendations.
 - 3. Surface preparation per SSPC Society for Protective Coatings, Surface Preparation Standards (SSPC-SP).

3.03 APPLICATION

- A. General:
 - 1. Apply primers, paints, and coatings in strict accordance with the manufacturer's recommendations as accepted by the Architect or Landscape Architect.
 - 2. The number of coats specified is the minimum that will be applied. Apply additional coats when undercoats, stains, or other conditions show through final paint coat, until paint film is of uniform color and appearance.
 - 3. When additional coats of the graffiti resistant coating are required, allow no more than 48 hours between coats.

- a. Apply a total dry film thickness of not less than 1.2 mils for primers and paint finishes and not less than 1.5 mils for graffiti resistant coatings.
- B. Location
 - 1. Apply Anti-Graffiti Coatings to all exposed Concrete Masonry Unit locations on site.
 - 2. Apply Anti-Graffiti Coatings to all cast-in-place concrete site, seat and planter walls on site.
 - 3. Install on exterior surfaces under eight feet, including building exterior walls. Continue coating to logical break such as a control joint of top of wall over eight feet.

3.04 CLEANING, TOUCH-UP, AND REFINISHING

- A. General:
 - 1. Carefully remove all platters, spots, and blemishes caused by work of this section.
 - 2. Upon completion of the work, remove all rubbish, cans, and accumulated materials. All areas must be left in a clean and orderly condition.
 - 3. Runs, sags, misses, holidays, stains, and other defects in the coated surfaces, including inadequate coverage and mil thickness will be satisfactorily touched-up or refinished.
- B. Removal of Graffiti:
 - 1. Gramover Graffiti Remover, a water soluble solvent, or manufacturer's recommended remover
- C. Curing of Polyurethane Enamels:
 - 1. Seven to ten days curing time required in order for coating to resist graffiti.

END OF SECTION

April 31, 2020

El Camino High School Gymnasium

Water Intrusion Assessment, Destructive Testing & Water Testing Report

400 Rancho Del Oro Oceanside, California 92057



Prepared for:

Oceanside Unified School District 2111 Mission Avenue Oceanside, California 92058

Job #20-6311.01



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1



Summary of Findings

Allana Buick and Bers, Inc. (ABBAE) is pleased to present Oceanside Unified School District with our Water Intrusion Assessment, Destructive Testing & Water Testing Report for the Gymnasium at El Camino High School in Oceanside, California. ABBAE was retained to perform a visual assessment, destructive testing and water testing to identify the ongoing source of moisture intrusion at the Gymnasium building.

ABBAE previously performed and documented a visual assessment of the Gymnasium building and determined that the roof was not the source of moisture intrusion and recommended further testing be performed on the exterior concrete wall assembly.

The Gymnasium is located 400 Rancho Del Oro, Oceanside, CA and constructed approximately in 1971. The 40foot tall gymnasium building is a single-story multi-purpose building with upper and lower level roof levels. The roof assemblies were recently replaced on both the upper and lower level roofs with a PVC single ply roofing membrane. Mechanical/HVAC work is currently underway.



Satellite View of Gym Building

2



Destructive Testing Summary:

As outlined in destructive testing protocol document, Southwest construction services personnel performed destructive testing of various components of the new Sarnafil PVC single roof membrane system and flashings to observe for possible evidence of moisture intrusion.

Under our direction, two, 24"x24" roof test cuts were performed on the North wall of the upper roof. We are noting the new Sarnafil PVC roof system was installed over an existing built-up roof with a coverboard adhered with low rise foam adhesive over a gypsum deck. The perimeter field membrane securement Sarnastop bar was horizontally placed and fasteners were only secured into the gypsum material. Our observations regarding the roofing assembly are later described in this report.

During the course of our observations performed on the interior and with the assistance of Southwest construction services personnel we observed that the roof substrate consists of gypsum decking approximately 4.5" thickness and noted to have "chicken wire" reinforcement below DT location #1 which exhibited corrosion of the original "chicken wire". A section of rebar was corroded at DT location #2. We noted some minor moisture between the Sarnafil membrane and the original hot applied asphalt which was not scraped off. The roof cuts were repaired by the roofing contractor of record (Sylvester Roofing) to maintain the roofing warranty. See Appendix B & C for additional information regarding our water and destructive testing results.

Water Testing Summary:

ABBAE conducted water testing at four (4) locations at the concrete wall structures comprising the perimeter of the upper gymnasium roof. The following Table notes locations and results observed during spray testing;

Test #	Description	Water Intrusion
1	Upper roof - Northwest corner at upper portion of the concrete column to beam interface –	Water intrusion observed. Leakage was observed on the interior at a horizontal crack/joint.
2	Upper roof - Southwest corner at upper portion of the concrete column to beam interface	Water Intrusion observed. Slight leak was observed on the interior at the intersection between the roof and the wall.
3	Upper roof - Southeast corner on lower portion of the concrete column	No leaks observed
4	Upper roof – South (middle of wall) at lower portion of the concrete column	No leaks observed

Spray Testing Table: See Appendix C for more detailed information.

Visual Observations:

During the course of our water testing, ABBAE observed the following typical deficient conditions which contribute to water/moisture intrusion into the building structure components, to include;

- 1. Cracks in the columns
- 2. Blistered wall coatings on both the roof and exterior wall faces
- 3. Voids in the concrete surface
- 4. Poorly sealed horizontal penetration
- 5. Lack of sheet metal coping at top of walls



Recommendations:

Building Wall Assembly:

Based on our visual assessment of building conditions, limited destructive testing and water testing, ABBAE is recommending that the following corrective repairs be performed to correct the observed deteriorated condition of the wall coatings and underlying substrates. These repairs will address water intrusion travelling through cracks, gradual seepage and saturation through the concrete voids and penetrations, and other noted deficient conditions. These recommendations will encompass a complete repair and application of a protective elastomeric coating system to the exterior concrete wall substrates to mitigate the moisture intrusion.

Preliminary scope of repair work:

- 1. Scrape off and remove existing deteriorating and delaminating wall coatings down to the bare concrete substrate.
- 2. Surface roughening and grinding of the concrete wall surface to ensure proper coating adhesion.
- 3. Concrete patching to fill voids, rock pockets and bug holes. Sika SikaQuick VOH.
- 4. Rout out "V" groove along cracks and lift joints in concrete wall substrates, and apply a urethane sealant flush to surface of wall. Sika SikaFlex 1a.
- 5. Chip away all deteriorated layers of sealant and patching materials at light stanchion posts, and reseal with a urethane sealant. Sika SikaFlex 1a.
- 6. Apply a concrete mortar patching material along top of parapet and step ledge to provide positive sloping and a smooth acceptable substrate for protective elastomeric coating. Sika SikaTop 122 Plus.
- 7. Replace missing and or deteriorated electrical junction box covers, with new weathertight coverplates.
- 8. Application of a quality protective elastomeric acrylic coating system. Net 2 gallons per square, yielding approx. 22-24 dft. Sika SikaGard 550W Elastocolor.
 - > Alternate manufacturer, National Coatings Renu Wall.
 - a. Complete manufacturers required preparation work,
 - b. Apply a primer as required by manufacturer. Sika SikaGard 552 Primer W
 - c. Top of Stepped Wall and Ledge: Apply a polyester reinforced coating system over new sloping bed along the top stepped walls to provide long term waterproofing.
 - 1) Apply base coat elastomeric, 1 gallon per square, over concrete sloping beds and vertical step.
 - 2) Embed a layer of polyester reinforcing fabric into base coat.
 - 3) Apply top coat elastomeric, 1 gallon per square, over and encapsulating polyester reinforcing fabric.
 - d. Apply primary protective elastomeric coating system over vertical wall substrates and top of wall areas addressed in item 8.c above.
 - 1) Apply base coat elastomeric, 1 gallon per square, over all concrete wall substrates.
 - 2) Apply top coat elastomeric, 1 gallon per square, over base coat on all wall substrates.

Roofing Assembly:

Based on our review of the roofing installation we believe there are roof repairs that need to be performed to help ensure the roof performs over its intended serviceable life. Prior to providing repair recommendations further study of the contracted scope of work and construction contract would need to be performed. At the very minimum the newly installed coping and membrane terminations will need to be removed to properly apply and terminate a new wall coating system. Other repair considerations:

- 1) Review Manufacturers Technical Inspection Punchlist and perform any noted corrective actions.
- 2) Apply PVC membrane repair patches to noted puncture damages.





- 3) Remove coping metal and install a saddle flashing/connection to exterior corner of coping to wall substrate.
 - a. To avoid visual metal corner saddle, ABBAE is recommending a Sika reinforced liquid flashing (PMMA) saddle be installed at exterior wall parapet to face of wall. This reinforced coating can be covered over easily with new protective wall coating system.
- 4) Removal and reinstallation of the Upper Roof perimeter field membrane securement.
 - a. The existing perimeter field termination is a SarnaStop Bar mechanically fastened into deck at perimeter of wall. However, the existing structural deck is a gypsum deck and the fasteners are not gripping/attached or have pull-out values.
 - b. ABBAE is recommending that the perimeter fastening be placed 1" up onto vertical concrete wall substrate and new PVC membrane stripped over top.
 - c. Based on visual moisture observed between the existing BUR roof system and the overlay PVC roof system, ABBAE is recommending that one-way vents be installed to allow any trapped moisture to dissipate.

Background

Southwest Construction services reported that water Intrusion issues have been an on-going problem for a long period of time at this Gymnasium/Multi-use building during rain events. The intensity and extent of leakage has increased over the past few years. The leak locations areas are occurring at roof substrate to wall intersections and through concrete wall assembly, with observed active water leaks along the entire length of the north wall, south wall and various section of the east and west walls, where underside of roof substrate visibly exposes efflorescence, systemic moisture presence and the evidence of mildew.

The majority of active water intrusion areas are located around the building perimeter beneath the roof to wall intersections. These upper wall areas are exhibiting efflorescence and leaks at the vertical to horizontal transitions, and at stress cracks in the walls and at expansion joints between the concrete walls. (See photos #13 - #38). Although some of the leaks are observable as visible flows of water, we are noting that most of the water intrusion appears to be a gradual saturation of the concrete which results in efflorescence and formation of mildew.

During the course of destructive testing, moisture was observed beneath the newly installed single ply roof and atop of the gypsum roof deck substrate, and has trapped moisture in between the roof membranes. The new single ply roof was installed on the gymnasium roof substrate as an attempt to stop the reported moisture intrusion. It was observed that the roofing contractor did not completely remove the BUR roof system installed over the gypsum deck substrate and has encapsulated moisture. (See APPENDIX B). Additionally, it was noted in the previous assessment letter that the single ply roofing system was not the source water intrusion, but because the single ply roofing system was applied over a substrate with moisture present, the new roof will need roof vents installed as a part of the repair recommendations.

Observations:

Interior Wall Observations:

During the course of the visual assessment, destructive testing and water testing, numerous and extensive deficient conditions related to the building envelope components were observed. These conditions were noted in the general areas being reviewed for water intrusion, but are also pervasive throughout the entire Gymnasium building. The deficiencies exhibited long-term deterioration of the paint coating systems, which are approaching forty-nine years old, and have exceeded their design life expectancies. This system has been repaired on numerous occasions with varying materials, which are also in varying stages of failure.

Not all of the deficient conditions are directly related to the water intrusion but still need to be addressed as they can lead to further deterioration of the building components. Based on the conditions observed and age of the paint coating systems, it is being recommended to remove and replace all of the paint coating systems directly related to the building components and install a new comprehensive elastomeric paint system from perimeter walls, especially

5



on the top of the concrete bond beam areas. The information that follows and that is contained in the appendices regarding destructive testing will serve to support this recommendation.

Below are some typical representative interior leak areas identified to be investigated and observed for the typical construction and deficiencies observed during the Destructive Testing phase / Water Testing assessments; (see photos 1-12).



Figure 1: Gymnasium - North Wall: Interior locations of staining mildew and efflorescence.



Photos 1 & 2: Gymnasium – North Wall: Approximately 15' west of ridge. Interior water staining, mildew and efflorescence. In photo #2 the water staining noted running down inside of the wall.



Photos 3 & 4: Gymnasium – North Wall: Approximately 5' west of ridge. Interior water staining, mildew and efflorescence. Mildew on wall does not wipe clean and is growing with-in the concrete and bleeding through wall paint.

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Photos 5 & 6: Gymnasium – North Wall: (Interior) Close up view of horizontal concrete lift joint with water intrusion, 7' from the finished elevation and 25' west of ridge. Photos #5 and #6 show blistering paint and wall coatings delaminating from wall.



Photos 7 & 8: Gymnasium – North Wall: (Interior) Close up view of horizontal concrete lift joint with water intrusion, 7' from the finished elevation and 25' west of ridge. Photo #7 show blistering paint with observed moisture present at time of assessment. Photo #8 shows 4"x4" angle steel trim piece at wall to ceiling intersection with evidence of corrosion bleeding through the fresh paint.





Photos 9 & 10: Gymnasium – South Wall: Approximately 15' west of ridge. Observation of water staining and efflorescence permeating through several coats of paint. Paint is standard latex paint.



Photos 11 & 12: Gymnasium – South Wall: Approximately 20' west of ridge. Observation of several layers of paint delaminating and peeling away from the concrete wall. The condition of the paint is poor due to constant water intrusion and permeation through several coats of paint. Paint is standard latex paint.

a



Exterior Wall Observations:



Photos 13: Gymnasium – Overview of West and North Wall: Typical configuration of stepped top of concrete walls and columns. Both the top and lower ledge of concrete wall are poorly sloped, and have rough surface finish with cracks and bug holes.



Photos 14 & 15: North side of building: Photo# 14 the top of concrete bond beam and the typical poor surface condition of the concrete allowing water to permeate through the paint coatings system. Photo #15 (close up view) typical conditions of the concrete wall surface with cracks, rock pockets and bug holes, and unsealed wall coatings system.







Photos 16 & 17: North side of building: Photo # 16 shows the typical condition of the existing paint coating system, which fading and chalking. The paint quality is deteriorating due to ultraviolet rays and high temperature exposure. Photo #17 shows typical paint condition, staining and chalking. Areas of paint have been applied to heavily or multi layered areas without sealing the voids or gaps prior to painting. These conditions are typical through the entire exterior of the building.



Photos 18 & 19: North side of building: Stanchion mounted post for abandoned light fixture. Photo # 18 and Photo# 19 show typical condition of light fixtures penetrations and the deteriorated coating assemblies allowing water intrusion. Photo #19 shows the failing state of the sealant around bottom of stanchion post. (typical at all stanchion posts on building)





Photos 20 & 21: North side of building: Stanchion mounted post for abandoned light fixture area. Photo # 20 shows moss growing on the interior intersection of the concrete ledge due to constant water presence. Photo# 21 shows the typical condition of paint coating failure above the stanchion post area.



Photos 22 & 23: South west side of building: Photo# 22 shows the top of concrete wall ledge that holds water and allows water to penetrate into the concrete through deficient conditions. Photo #23 shows the lack of coatings or chalked, faded, or delaminated paint coating allowing water to penetrate into the concrete wall.





Photos 24 & 25: South west corner of building: Stanchion mounted post for abandoned light fixture. Photo # 24 and Photo# 25 show typical condition of light fixtures and deficiencies in coating assembly allowing water intrusion. The abandoned receptacles allow water to intrude the conduits and travel into other locations on building. Note the light fixture above the building expansion joints are not sealed.



Photos 26 & 27: South west corner of building: Photo# 26 shows the top of concrete bond beam and the stanchion post flange caulking sealant condition allowing water to penetrate underneath the flange. Photo #27 shows the typical conditions of the walls with concrete voids, bug holes and unsealed wall coatings system.





Photos 28 & 29: South west corner of building: Photo# 28 shows the top of the concrete bond beam ledge with the failure of paint coatings, cracked and peeling away from concrete wall. Photo #29 shows the top of the concrete bond beam with date of construction. (05/10/1971)



Photos 30 & 31: West side of building: Photo# 30 shows overview of lighting receptacle box with water inside the receptacle. Photo #31 shows evidence of corrosion on the bottom of photo, due to standing water over long periods of time.





Photos 32 & 33: West side of building: Photo# 32 shows electrical receptacle box 15' south of Photo# 30, with water escaping behind the cover plate. Photo# 33 shows water leakage increasing as the flathead screws are removed from the receptacle box.



Photos 34: West side of building: Photo# 34 shows electrical receptacle box with standing water in the bottom of the receptacle box. (approx. $\frac{3}{4}$ " of standing water)


Roof Assembly Observations:



Photos 35: North Side of building: Unsealed lap on the single ply flashing membrane at wall to coping transition.



Photos 36: North Side of building: Small puncture damages in the single ply roof membrane.



Photos 37: East side of building: Shows electrical line dislocated from its original location and has broken seal of the caulking sealant.

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Photos 38: North side of building: Spray rack in use on water test location #1



Photos 39: North side of building: Interior water intrusion at horizontal seam 15' west of test location.



Photos 40: South side of building: Spray rack in use on water test location #2





Photos 41: North side of building – Interior water intrusion 5' above horizontal seam 15' west of test location. Water bleeding through painted surfaces.



Photos 42: South side of building – Spray rack use on water test location #2



Photos 43: South side of building – Water Intrusion below water test location #2, moisture continued to bleed through the wall an hour after testing procedure.





Photos 44: North side of building – Approximately 10' west of the roof ladder. Paint was noted peeling away from the lower portion of the concrete column. Paint was noted to be chalking and faded. Concrete surface was chalking and appeared not to be primed.

Appendices

Appendix - A: Water Testing & Destructive Testing Site Plan

Appendix - B: Destructive Testing Results Table

Appendix - C: Water Testing Results Table

APPENDIX A - Water Testing & Destructive Testing Locations



Description	Symbols
Water Test Location #1 bond beam)	WT-1
Water Test Location #2 bond beam)	WT-2
Water Test Location #3	WT-3
Water Test Location #4	WT-4
Destructive Test Location #1(24"x24" test cut into single roof and ceiling underneath)	DT-1
Destructive Test Location #2(24"x24" test cut into single roof and ceiling underneath)	DT-2

APPENDIX B – DESTRUCTIVE TESTING RESULTS TABLE

Condition Photos		
Comments/Observations	 Termination bar attached to unadhered paint coatings, instead of prepped concrete surfaces. Caulking sealant should be applied directly to the concrete surface. Photo exhibits mechanical fasteners on top of the wall instead of face mounted. Caulking sealant not properly tooled and not extended to bottom of the 	 coping metal. Termination bar not installed on face of coping metal system. Densdeck coverboard glued directly to parapet wall. Existing paint coatings not removed prior to installation.
Building Components & DT Description	Building Components 1) Parapet to roof deck – Single Ply roofing system 2) Coping metal to concrete column (caulking) 3) Coverboard to concrete parapet interface. DT Description 1) Cut 24"x24" single ply	 ammbrane ammbrane bar <li< td=""></li<>
DT# DT Location -See Appendix A	1 North side of building 10' west of ridge	

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El Camino High School Gymnasium - Destructive Testing Results Table

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Condition Photos		
Comments/Observations	 Turn bar not properly fastened to parapet wall surface. (fasteners installed into gypsum deck) Fasteners partially installed into gypsum substrate and are visible from ceiling (DT location) below. Destructive testing shows single ply roofing is over laid onto BUR (Hot Tar asphalt). Photo also shows clear litmus paper prior to application to the roofing material. Photo depicts 2 part adhesives used in fastening of the coverboard to walls and decking. Photo shows activated litmus paper indicating the presence of moisture between single ply roofing membrane and hot tar roofing system. 	
Building Components & DT Description	Building Components 1) Parapet to roof deck – Single Ply roofing system. 2) Decking coverboard attachment. 2) Decking coverboard attachment. 1) Cut 24"x24" single ply membrane 1) Cut 24"x24" single ply membrane 2) Observe wall termination bar at roof to parapet intersection. 3) Expose roofing membrane type and assembly 4) Determine general condition	
DT Location -See Appendix A	North side of building 10' west of ridge	
DT#	H	

El Camino High School Gymnasium - Destructive Testing Results Table

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APPENDIX B – DESTRUCTIVE TESTING RESULTS TABLE

Condition Photos			
Comments/Observations	 4"x4" angle steel trim for ceiling intersection clearly exhibits rust from previous long-term water intrusions. 	 Photo taken from directly below DT#1 exhibits water staining. Litmus paper not clearly activated due to long term leaking and drying. 	 Overview of the perimeter wall and ceiling intersection, marked up for the subsequent cut of the tectum decking (gypsum)
Building Components & DT Description	Building Components1)Perimeter wall to roof deck& ceiling intersection2)4"X4" angle steelintersection	DT Description1) Cut 24"x24" ceiling tiles2) Remove 4"x4" angle steel3) Remove section of the1ightweight concrete /Tectum deck to expose theconstruction of theintersection.4) Determine general	condition.
DT Location -See Appendix A	North side of building 10' west of ridge (Underneath roof test cut)		
DT#	7		

El Camino High School Gymnasium - Destructive Testing Results Table

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Condition Photos		
Comments/Observations	 In progress of removing the lightweight decking material, photo exhibits rusting "chicken wire" clarifying that water intrusion is a long-term issue at this intersection. As seen in photo, rusting chicken wire is embedded 2" into lightweight decking. Close up view of rusted "chicken wire" observed from the test cut. 	 Photo shows turn bar fastener imbedded approximately ½" of gypsum decking. Red arrow shows gypsum remnants on fastener opposed to upper portion of the fastener shank without gypsum remnants. No moisture was present at time of DT phase.
Building Components & DT Description	Building Components 1) Perimeter wall to roof deck & ceiling intersection & ceiling intersection BT Description 2) Cut 24"x24" roof ceiling tiles 3) Remove 4"x4" angle steel 4) Remove section of the lightweight concrete / Tectum deck to expose the construction of the intersection. 5) Determine general condition.	
# DT Location -See Appendix A	North side of building 10' west of ridge	
DT#	. ←	

El Camino High School Gymnasium - Destructive Testing Results Table

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 Turn bar not properly fastened to parapet. (fasteners installed into gypsum) fasteners visible from ceiling DT location, underneath photos to follow Photo shows rusting fastener clarifying long term water intrusion. Densdeck coverboard fastened to parapet wall with adhesive. Existing paint coatings not removed prior to installation. Photo exhibits clear litmus paper, no moisture present at time of DT
Building Components 1) Parapet to roof deck - Single Ply roofing system 2) Single Ply run bar assembly 1) Cut 24"x24" single ply 1) Cut 24"x24" single ply 1) Cut 24"x24" single ply 1) Cut 24"rade 1) Cut 24"rade 2) Observe wall termination bar 3) Expose roofing membrane type and assembly 4) Determine general condition
North east corner of building

April 14, 2020

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El Camino High School Gymnasium - Destructive Testing Results Table

APPENDIX B – DESTRUCTIVE TESTING RESULTS TABLE

Condition Photos		14, 2020
Comments/Observations	 4"x4" angle steel trim for ceiling intersection clearly exhibits rust from previous long-term water intrusions. Photo exhibits rusting "chicken wire" and at rebar embedded approximately 2" into the lightweight decking. No moisture was present at the time of DT. Rusting components clearly show presence of long-term water intrusion. Photo shows turn bar fastener only grabbing approximately ½" of gypsum decking. Red arrow shows gypsum remnants on fastener opposed to upper portion of the fastener shank without gypsum remnants. No moisture present at time of DT. 	Apri
Building Components & DT Description	Building Components 1) Perimeter wall to roof deck ceiling intersection 1) DT Description 1) Cut 24"x24" roof ceiling intersection 1) Cut 24"x24" angle steel ightweight concrete / Tectum deck to expose the construction of the intersection. 4) Determine general condition.	n - Destructive Testing Results Table
DT# DT Location -See Appendix A	2 North east corner of building Point of the indication of the in	El Camino High School Gymnasiun

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Condition Photos	<image/>		1 15, 2020
Comments/Observations	 Photo exhibits water spray rack simulating rain over the top of the concrete column / bond beam. Photo displays technician pointing at the water intrusion area. 10' west of the test location. Blue arrow shows where water entered the building. Red arrow exhibits water test location above. 	 Photo exhibits moisture present after 10 minutes of water testing (interior) 10' west of water test and at the horizontal seam on inside of gym north wall. Horizontal seam is 7' off the ground floor. Water persisted to bleed through the wall through the entire test interval. 	Apri
Building Components & WT Description	Building Components 1) Upper portion of the concrete column / Bond Beam WT Description 1) Spray test the upper concrete column for 45 Min. interval 2) Determine general condition of the perimeter wall after water testing for 45 min. to discover if water is coming in through the concrete columns / ledge at top of wall.		m - Water Testing Results Table
# WT Location-See Appendix A	North side of building 15' west of ridge		El Camino High School Gymnasiu
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 Photo exhibits water intrusion in the form of beads. This location is 5' above the horizontal seam. Water persisted to bleed through walls through the entire 45 test interval and the water test was completed. 	 Photo exhibits additional view of the water intrusion. (horizontal seam) Red arrow shows second water intrusion area above the horizontal seam. (5' above the seam) 	 Photo exhibits water staining traveling from the top of the perimeter wall all the way to finish floor elevation. Water staining is consistent on the entire north wall.
Building Components 1) Upper portion of the concrete column / Bond Beam WT Description 1) Spray test the upper concrete column for 45 Min.	2) Determine general condition of the perimeter wall after water testing for 45 min. to discover if water is coming in through the concrete columns / ledge at top of wall.	
North side of building 15' west of ridge Underneath water testing location		
	1 North side of building 15' Building Components west of ridge 1) Upper portion of the Underneath water testing - Photo exhibits water intrusion in the form of beads. This location is 5' above the horizontal seam. Variation Beam - Water persisted to bleed through walls through the entire 45 test interval and the water test was completed. Mathematical - Station - Photo exhibits water intrusion in the form of beads. This location is 5' above the horizontal seam. Mathematical - Photo exhibits water intrusion in the location - Photo exhibits water intrusion in the form of beads. This location is 5' above the horizontal seam. Mathematical - Photo exhibits water intrusion in the completed. - Photo exhibits water intrusion in the form of beads. This location is 5' above the horizontal seam.	1 North side of building 15' west of ridge concrete column / Bond burdenmeath water testing location 1) Upper portion of the concrete column / Bond location is 5' above the horizontal seam. Water persisted to bled through walls through the entire 45 test interval

April 15, 2020

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El Camino High School Gymnasium - Water Testing Results Table

APPENDIX C – WATER TESTING RESULTS TABLE

Condition Photos			
Comments/Observations	 Photo exhibits water spray rack simulating rain over the top of the concrete column / bond beam. 	 Photo exhibits overall view of water testing location (underneath) 	 Photo exhibits water intrusion from the water test, entering the building at 30 minutes into the test interval. Moisture was noted entering the building after the water test was completed.
Building Components & WT Description	Building Components 1) Upper portion of the concrete column / Bond Beam	 <u>WT Description</u> 1) Spray test the upper concrete column for 45 Min. interval 2) Determine general condition of the perimeter wall after water testing for 45 min. to discover if water is coming in through the concrete columns / ledge at top of wall. 	
WT# WT Location -See Appendix A	South side of building 15' west of ridge		

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El Camino High School Gymnasium - Water Testing Results Table

April 15, 2020

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 Photo exhibits overall view of the corner column being water tested. Photo exhibits interior view of the test location No water intrusions were noted
Building Components 1) Lower portion of the concrete column / Bond Beam MT Description 1) Spray test the lower concrete column for 45 min. interval 2) Determine general condition of the perimeter wall after water testing for 45 min. to discover if water is coming in through the concrete columns / lower half at the parapet column intersection.
South east corner of building

April 15, 2020

El Camino High School Gymnasium - Water Testing Results Table

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Condition Photos		
Comments/Observations	 Photo exhibits overall view of the lower column being water tested. 	• No water Intrusions were noted through the test interval.
Building Components & WT Description	<u>Building Components</u> 1) Lower portion of the concrete column / Bond Beam	 <u>WT Description</u> 1) Spray test the lower concrete column for 45 min. interval 2) Determine general condition of the perimeter wall after water testing for 45 min. to discover if water is coming in through the concrete columns / lower half at the parapet column intersection.
WT# WT Location -See Appendix A	4 South side of building10' east of ridge.	

April 15, 2020

El Camino High School Gymnasium - Water Testing Results Table

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