SPECIFICATIONS FOR CONSTRUCTION OF

YOUTH CHALLENGE ACADEMY (YCA)
B1786 AND B1787 RAILING REPLACEMENT, PHASE 1
STATE OF HAWAI`I
DEPARTMENT OF DEFENSE
JOB NO. CA-1605-C

FOR THE: STATE OF HAWAI`I, DEPARTMENT OF DEFENSE
ENGINEERING OFFICE

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BID FINAL
_____, 2017

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SECTION 01100 - PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Youth Challenge Academy, B1786 and B1787 Railing Replacement, Phase 1, Honolulu, Hawaii.

B. The Work includes
   1. Selective demolition.
   2. Concrete rehabilitation.
   3. Structural aluminum
   4. Metal fabrications.

C. Perform operations and furnish equipment, fixtures, appliances, tools, materials, related items and labor necessary to execute, complete and deliver the Work as required by the Contract Documents.

D. The Division and Sections into which these specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to work specified within each section.

E. Contractor shall not alter the Drawings and Specification. If an error or discrepancy is found, notify the Project Manager.

F. Specifying of interface and coordination in the various specification sections is provided for information and convenience only. These requirements in the various sections shall complement the requirements of this Section.

1.02 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated and include incomplete sentences. Omission of words or phrases such as “the Contractor shall”, “as shown on the drawings”, “a”, “an”, and “the” are intentional. Omitted words and phrases shall be provided by inference to form complete sentences. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the Work.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
   a. The words “shall”, “shall be”, or “shall comply with”, depending on the context, are implied where a colon (:) is used within a sentence or phrase.

3. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research’s “Encyclopedia of Associations” or in Columbia Books’ “National Trade & Professional Associations of the U.S.”.

B. Terms
1. Directed: Terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean directed by Project Manager, requested by Project Manager, and similar phrases.

2. Indicated: The term “indicated” refers to graphic representations, notes, or schedules on drawings or to other paragraphs or schedules in specifications and similar requirements in the Contract Documents. Terms such as “shown”, “noted”, “scheduled”, and “specified” are used to help the user locate the reference.

3. Furnish: The term “furnish” means to supply and deliver to project site, ready for unloading, unpacking, assembly, and similar operations.

4. Install: The term “install” describes operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

5. Provide: The terms “provide” or “provides” means to furnish and install, complete and ready for the intended use.

6. Installer: An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-Subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

7. Submit: Terms such as “submit”, “furnish”, “provide”, and “prepare” and similar phrases in the context of a submittal, means to submit to the Project Manager.

C. Industry Standards
1. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract

Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

2. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

3. Conflicting Requirements: If compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Project Manager for a decision before proceeding.

D. All make, model, manufacturer, and products called for are assumed to be followed by "or approved equal or better", unless otherwise stated.

1.03 WORK SEQUENCE

A. The Work shall be conducted in two (2) phases.
   1. Phase 1: Remove and reconstruct railing and concrete repairs at Building 1786 corridor walk deck and Makai end walk deck between Building 1786 and 1787.

   2. Phase 2: Remove and reconstruct railing and concrete repairs at Building 1787 corridor walk deck and Mauka end walk deck between Building 1786 and 1787. Do not start Phase 2 work until Phase 1 has been substantial completed and approved by the Project Manager.

1.04 USE OF PREMISES AND WORK RESTRICTIONS

A. Contractor's use of premises is restricted as follows:
   1. Construction Times and Schedule:
      a. Construction work is to start during the cadets break (14 DEC 2017- 12 JAN 2018). If the replacement of the railing cannot be completed during that period, Contractor is responsible with no additional cost to the State to install plywood barrier allowing work on the railings while the building is in use.

   2. Site Access and Parking:
      a. Parking: Parking for the Contractor's employees (or Subcontractors) will be limited to the areas designated by the Project Manager. Do not use parking stalls in regularly designated parking zones within the Facility grounds. Unauthorized vehicles parked in marked stalls and in any area outside of the designated project construction site will be subject to towing at the Contractor's expense.

      b. Maintain access to the Loading area through Project Contract Limits.

      c. No driving or parking on lawn or other planted areas unless authorized by Project Manager.

   3. Sanitation:
      a. Contractor shall provide Sani Toi Chemi Toi for all construction personnel.

4. Noise and Dust Control:
    a. In adjacent locations surrounding the project site, noise, dust and other disrupting activities, resulting from construction operations, are detrimental to the conduct of the Facility activities. Therefore, Contractor shall monitor its construction activities. Exercise precaution when using equipment and machinery to keep the noise and dust levels to a minimum.

    b. To reduce loud disruptive noise levels, ensure mufflers and other devices are provided on equipment, internal combustion engines and compressors.

    c. Schedule construction activities that create excessive noise and dust problems, such as concrete coring, drilling, hammering, trenching, and demolition, for the weekends, holidays or non-business hours. Overtime costs for the Contractor's employees and work force are the Contractor's responsibility.

    d. The Project Manager will require any construction activity that produces excessiveness of noise and dust to be performed during non-business hours. The Project Manager shall make the final determination. Overtime costs for the Contractor's employees and work force are the Contractor's responsibility.

5. Contractor Conduct:
    a. Smoking, including use of electronic smoking devices, is not allowed within the project site.

    b. Contractor and all subcontractors shall restrict all interaction with YCD cadets except in the case of emergency or communication for ensuring safety at or near the project site.

6. Other Conditions:
    a. Contractor shall supply a trash bin or bins as required for construction debris. Contractor to ensure bin(s) are emptied no less than once per week.

    b. Operate machinery and equipment with discretion and with minimum interference to driveways and walkways. Do not leave machinery and equipment unattended on roads and driveways.

    c. A storage area for materials, supplies, equipment will be designated during the Pre-Construction meeting. The State of Hawaii, Department of Defense will not be held responsible for damaged or missing items held on site.

    d. Keep access roads to the project site free of dirt and debris. Provide, erect and maintain lights, barriers, signs, etc. when working on facility roads, driveways and walkways to protect pedestrians and moped/bicycle riders. Obey facility traffic and safety regulations.

1.05 WORK UNDER OTHER CONTRACTS

A. Separate Contracts: The State may have other ongoing projects on site.

B. Cooperate fully with separate Contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.06 FUTURE WORK

A. It is not anticipated the State will award a future contract that depends on the Work under this contract.

1.07 SOLID WASTE REPORTS

A. Submit solid waste reports for the duration of the project. The reports shall address:
   1. Diverted Waste (i.e. waste that does not go into the landfill)
   2. Recycled Waste
   3. Landfill Waste
   4. Recovered Waste (i.e. freon from AC equipment and refrigerator).

B. Submit legible copies of dump ticket receipt from vendor, showing the tonnage of waste. If waste products are combined together with other projects, the contractor shall provide a breakdown per project.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

B. The description of alternates is not intended to give a detailed description of all additional or deductive work required by the alternate item(s), as only the principal features of such additional or deductive work are listed.

C. Should any one or all of the alternates become a part of the contract, the cost of all additional or deductive work required by the alternate item(s), even though not specifically mentioned herein, are included in the lump sum bid price.

1.02 DEFINITIONS

A. Alternate: An amount proposed by Bidders (Offerors) and stated on the Bid Form for certain work defined herein that may be added to or deducted from the Total Lump Sum Bid Price amount if State decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Total Lump Sum Bid Price.

1.03 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into the Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. Additive Alternate No. 1: Remove and reconstruct railing, concrete repair and all related work by walk deck at Makai end between Building 1786 and 1787.

B. Additive Alternate No. 2: Reconstruct railing, concrete repair and all related work by walk deck at Mauka end between Building 1786 and 1787.

END OF SECTION

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General project coordination procedures.

   2. Project meetings.

1.02 PERFORMANCE AND COORDINATION

A. Contractor is in charge of the Work within the Project Contract Limits, and shall direct and schedule the Work. Include general supervision, management and control of the Work of this project, in addition to other areas more specifically noted throughout the Specifications. Final responsibility for performance, interface, and completion of the Work and the Project is the Contractor's.

B. The Contractor is responsible for jobsite Administration. Provide a competent superintendent on the job and provide an adequate staff to execute the Work. In addition, all workers shall dress appropriately and conduct themselves properly at all times. Loud abusive behavior, sexual harassment and misconduct will not be tolerated. Workers found in violation of the above shall be removed from the job site as directed by the Project Manager.

C. The State will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the Prime Contractor in matters pertaining to other trades employed on the job.

D. Coordination: Provide project interface and coordination to properly and accurately bring together the several parts, components, systems, and assemblies as required to complete the Work pursuant to the GENERAL CONDITIONS and SPECIAL CONDITIONS.
   1. Provide interface and coordination of all trades, crafts and subcontracts. Ensure and make correct and accurate connections of abutting, adjoining, overlapping, and related work. Provide anchors, fasteners, accessories, appurtenances, and incidental items needed to complete the Work, fully, and correctly in accordance with the Contract Documents.

   2. Provide additional structural components, bracing, blocking, miscellaneous metal, backing, anchors, fasteners, and installation accessories required to properly anchor, fasten, or attach material, equipment, hardware, systems and assemblies to the structure.

   3. Provide excavation, backfilling, trenching and drilling for trades to install their work.

4. Provide concrete foundations, pads, supports, bases, and grouting for trades as needed to install their work.

5. Provide caulking, sealing, and flashing as required to waterproof the building complete and as required to insulate the building thermally and acoustically. Include sealing, flashing, and related work as required to prevent moisture intrusion, air infiltration, and light leakage.

6. Equipment, appliances, fixtures, and systems requiring plumbing and mechanical services, rough-in, and connections, or other utilities and services shall be provided with such services, rough-in, and final connections.

7. Equipment, appliances, fixtures, hardware, and systems requiring electrical services shall be provided with such electrical services, including outlets, switches, overload protection, interlocks, panelboard space, disconnects, circuit breakers, and connections.

8. Materials, equipment, component parts, accessories, incidental items, connections, and services required to complete the Work which are not provided by Subcontractors shall be provided by the Contractor.

9. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1.03 COOPERATION WITH OTHER CONTRACTORS

A. The State reserves the right at any time to contract for or otherwise perform other or additional work within the Project Contract Limits. The Contractor of this project shall to the extent ordered by the Project Manager, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by the State or other Contractors.

1.04 COORDINATION WITH OTHER PRIME CONTRACTORS

A. Multiple prime Contractors performing work under separate agreements with the State may be present near the project location, adjacent to and abutting the Project Contract Limits. This Contractor shall coordinate activities, sequence of work, protective barriers and any and all areas of work interfacing with other Prime Contractor's work. Contractor shall provide a continuity of finishes, walks, landscape, etc. at abutting Contract Limits so no additional work will be required. Any damage to other Prime Contractor's Work committed by this Contractor (or its Subcontractor) shall be repaired promptly at no additional cost to the State.

B. Coordinate Subcontractors and keep them informed of any work from the other Projects that may affect the site or the Subcontractor's work. If the Contractor has any questions regarding its coordination responsibilities or needs clarification as to the impact in scheduling of its work and the work of other projects, this Contractor shall notify the Project Manager in writing.

C. Subject to approval by the Project Manager, this Contractor shall amend and schedule its work and operations to minimize disruptions to the work and operations of other projects.
   1. Relocate or remove and replace temporary barriers, fencing supports or bracing to allow work by others to proceed unimpeded. Do not remove required barriers supporting work until specified time or as approved by the Project Manager. This does not relieve the Contractor of the responsibility of proper coordination of the work. If directed by the Project Manager, leave in place any temporary barriers.

   2. Coordinate work that abuts or overlaps work of the other projects with the Project Manager and other Prime Contractors to mutual agreement so that work is 100 percent complete with continuity of all materials, systems and finishes.

   3. When directed by the Project Manager, provide access into the construction zone to allow the other project's Contractor(s) to perform their Work and work that must be interfaced.

   4. Contractor shall adjust and coordinate its Work and operations as required by the other projects as part of the Work of this contract without additional cost or delay to the State.

   5. When directed by the Project Manager provide a combined Contractor's construction schedule.

D. Other Contracts: If known, they are listed in SECTION 01100 - PROJECT REQUIREMENTS.

1.05 COORDINATION WITH USER

A. Contractor shall coordinate roof work that will impact the maintenance shop operations with the Maintenance Supervisor.

1.06 SUBMITTALS

A. Photo Documentation: Prior to the start of jobsite work, the Contractor shall photo document the existing conditions at the site and file with the Project Manager one complete set of documents.

1.07 PROJECT MEETINGS AND TRAINING

A. General: Schedule and conduct meetings and conferences as directed by the Project Manager at the **Contractor's** field office, unless otherwise indicated.
   1. Attendees: Inform participants and others involved, Contracting Officer, Project Manager and individuals whose presence is required, of date and time of each meeting. Notify Project Manager of scheduled meeting dates and times.

   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Contractor record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Project Manager, within 7 days of the meeting.

B. Preconstruction Conference: Project Manager shall schedule a preconstruction conference before the start of construction, at a time convenient to the Project Manager, a Project start date will be established in the conference. Conference will be held at the Project site or another convenient location. The Project Manager shall conduct the meeting to review responsibilities and personnel assignments.
   1. Attendees: Project Manager, Contracting Officer Representative, and design consultants; Facility Users; Contractor and its superintendent; major Subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.

      b. Phasing.

      c. Critical work sequencing and coordination.

      d. Designation of responsible personnel.

      e. Use of the premises.

      f. Responsibility for temporary facilities and controls.

      g. Parking availability.

      h. Office, work, and storage areas.

      i. Equipment deliveries and priorities.

      j. First aid.

      k. Security.

      l. Progress cleaning.

      m. Working hours.

C. Progress Meetings: Conduct progress meetings at monthly or other intervals as determined by the Project Manager. Coordinate dates of meetings with preparation of payment requests.
   1. Attendees: In addition to Project Manager, each Contractor, Subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be

represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

   b. Review present and future needs of each entity present, including the following:
      1) Outstanding Requests for information (clarification).

      2) Interface requirements.

      3) Sequence of operations.

      4) Status of outstanding submittals.

      5) Deliveries.

      6) Off-site fabrication.

      7) Access.

      8) Site utilization.

      9) Temporary facilities and controls.

      10) Work hours.

      11) Hazards and risks.

      12) Progress cleaning.

      13) Quality and work standards.

      14) Force Account work.

      15) Change Orders and Change Proposals.

      16) Documentation of information for payment requests.

   c. Corrective Action Plan: Contractor shall provide a plan of corrective action for any item which is delayed or expected to be delayed, then that item impacts the contractual dates.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Contractor's Construction Schedule.
   2. Submittals Schedule.
   3. Schedule of Prices.
   4. Payment request.

B. Related Sections include the following:
   1. SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION for preparing a combined Contractor's Construction Schedule.
   2. SECTION 01330 - SUBMITTAL PROCEDURES for submitting schedules and reports.

1.02 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path and control the total length of the project. They must start and finish on the planned early start and finish times.
   2. Predecessor activity is an activity that must be completed before a given activity can be started.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of project.

C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either the Department or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Schedule of Prices: A statement furnished by Contractor allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Payment requests.

1.03 SUBMITTALS

A. Required Submittals: Submit 8 sets of the list of the required submittals, by Specification Section, within 15 days after award of the contract or upon earlier written instructions from the Project Manager. A general listing is provided under SECTION 01330 - SUBMITTAL PROCEDURES.
   1. The listing shall indicate and include the following:
      a. The number of copies required for submittal.
      b. Planned submittal date.
      c. Approval date required by the Contractor.
      d. A space where the "date of submittal" can be inserted.
      e. A space where the "date of approval" can be inserted.
      f. A space where an "action code" can be inserted.

B. Construction Schedule: Submit 7 sets of the Construction Schedule for review within 15 days after the award of the contract or upon earlier written instructions from the Project Manager.

C. Schedule of Prices: Submit 3 sets of the Schedule of Prices integrated with the Construction Schedule for review within 15 days after the award of the contract or upon earlier written instructions from the Project Manager.
   1. Use the Department's forms for Payment requests.

D. Payment request: Submit the payment request at earliest possible date and no sooner than the last day of the month after all payroll affidavits, updated submittal registers, and schedules have been submitted.

1.04 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate Contractors.

B. Construction Schedule: Coordinate Contractor's Construction Schedule with the Schedule of Prices, Submittals Schedule, loaded monthly event activity, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.

   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

C. Schedule of Prices: Coordinate preparation of the schedule with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Prices with other required administrative forms and schedules, including the following:
    a. The payment request and the Construction Progress Report continuation sheet for the event cost estimate per time period.
    b. Submittals Schedule.

PART 2 - PRODUCTS

2.01 SUBMITTALS SCHEDULE

A. Comply with the GENERAL CONDITIONS "SHOP DRAWINGS AND OTHER SUBMITTALS" Article. Furnish required submittals specified in this Section and in the Technical Sections. Submittals include one or more of the following: shop drawings, color samples, material samples, technical data, material safety data information, schedules of materials, schedules of operations, guarantees, certifications, operating and maintenance manuals, and field posted as-built drawings.

B. Preparation: Furnish a schedule of submittals per Project Manager.
    1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Prices, and Contractor's Construction Schedule.

    2. The schedule shall accommodate a minimum of 21 calendar days for the State's review, as applicable for the Island the project is located.

    3. Prepare and submit an updated list to the Project Manager at monthly intervals or as directed by the Project Manager. The listing shall reflect all approvals received since the last update.

2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE - PERT CHART CRITICAL PATH METHOD (CPM)

A. The construction schedule shall address the entire project, to the extent required by the Contract Documents, and shall show an expedient and practical execution of work. If requested by the Project Manager, the Contractor shall participate in a preliminary meeting to discuss the proposed schedule and requirements prior to submitting the schedule.

B. The Construction Schedule shall indicate the following:
    1. Elements of the Project in detail time scaled by month or by week, and a project summary.

    2. The order and interdependence of activities and the sequence in which the work is to be accomplished.

    3. How the start of a given activity is dependent upon the completion of preceding activities and how its completion restricts the start of following activities.

    4. The submittal and approval of shop drawings, samples, procurement of critical materials and equipment, receipt of materials with estimated costs of major items for which payment will be requested in advance of installation,

fabrication of special materials and equipment, and their installation and testing.

5. Activities of the State that have an effect on the progress schedule, such as the required delivery dates for State furnished materials and equipment and other similar items.

6. Provide a separate report with the following:
   a. The description of the activity.
   b. The duration of time in calendar days.
   c. For each activity indicate the early start date.
   d. For each activity indicate the early finish date.
   e. For each activity indicate the late start date.
   f. For each activity indicate the late finish date.
   g. Total float time.
   h. Cost of event.
   i. Contract-required dates for completion of all or parts of the Work.
   j. Events are to be used on “Monthly Progress Report” for monthly payment request.

C. Upon completion of the Project Manager’s review, the Contractor shall amend the schedule to reflect the comments. If necessary, the Contractor shall participate in a meeting with the Project Manager to discuss the proposed schedule and changes required. Submit the revised schedule for review within 7 calendar days after receipt of the comments.

D. Use the reviewed schedule for planning, organizing and directing the work, for reporting progress, and for requesting payment for the work completed. Unless providing an update, do not make changes to the reviewed schedule without the Project Manager’s approval.

E. Should changes to the schedule be desired, submit a request in writing to the Project Manager and indicate the reasons for the proposed change. If the changes are major, the Project Manager may require the Contractor to revise and resubmit the schedule at no additional cost to the State. Contractor shall mitigate the impact of all changes by readjusting the sequence of activities, duration of time, or resources utilizing available float.
   1. A change is major if, in the opinion of the Project Manager, the change affects the substantial completion date or other contractual and milestone dates.

   2. Minor changes are those that only affect activities with adequate float time.

F. Once the schedule is reviewed by the Project Manager, the Contractor shall submit 6 sets of the revised schedule within 14 calendar days.

G. Throughout the duration of the project, the Project Manager may require more detailed breakdowns of activities, logic, and schedule submittals from the Contractor.

H. Updated Schedules: Submit at monthly intervals or as directed by the Project Manager. The schedule shall reflect all changes occurring since the last update including the following:
   1. Activities started and completed during the previous period.

   2. The estimated duration to complete each activity that was started but not completed.

   3. Percentage of cost payable for each activity.

   4. Modifications and pending proposed changes.

   5. Narrative report describing current and anticipated problem areas or delaying factors with their impact together with an explanation of corrective actions taken or proposed.

I. Failure on the part of the Contractor to submit updated schedules may be grounds for the Project Manager to withhold progress payments for items noted on the schedule.

J. Contractor shall prosecute the work according to the CPM Schedule. The Project Manager shall rely on the reviewed Contractor's CPM Schedule and regular updates for planning and coordination. The Project Manager's review of the Contractor's CPM Construction Schedule does not relieve the Contractor of its obligation to complete the work within the allotted contract time. Nor does the review grant, reject or in any other way act on the Contractor's request for adjustments to complete remaining contract work, or for claims of additional compensation. These requests shall be processed in accordance with other relevant provisions of the contract.

K. If the Project Manager issues a field order or change order or other directive that affects the sequence or duration of work activities noted on the construction progress schedule, the Contractor shall promptly update the schedule. To accomplish this update, add, delete or revise the work activities noted or change the logic in the schedule to show the Contractor's plan to incorporate the change into the flow of work. All change orders and time extension requests that affect the construction schedule shall be evaluated based on their impact on the approved Construction Schedule.

L. If the current work is behind schedule or projected to be behind schedule, such as negative float on a critical activity or inability to meet the Contract Completion Date, the Project Manager may require the Contractor, at the Contractor's cost, to take remedial measures to get the project back on schedule. This may require increasing the work force, working overtime and weekends, air freighting materials, or other similar actions.

M. If at any time the Project Manager determines that any critical activity has fallen behind the CPM schedule by 15 calendar days or more, the Contractor shall submit a remedial plan to recapture the lost scheduled time. Include a revised schedule. Furnish the remedial plan no later than 7 calendar days from Project Manager's notification.

N. If an accelerated schedule is proposed, refer to GENERAL CONDITIONS Section 7.22 “CONSTRUCTION SCHEDULE”.

2.03 SCHEDULE OF PRICES

A. Furnish a schedule of prices per Project Manager.

B. Provide a breakdown of the Contract Sum in enough detail to facilitate developing and the continued evaluation of Payment requests. Provide several line items for principal subcontract amounts, or for materials or equipment purchased or fabricated and stored, but not yet installed, where appropriate. Round amounts to nearest whole dollar; total shall equal the Contract Price.

C. Each item in the Schedule of Prices and Payment request shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

2.04 PAYMENT REQUEST

A. Use the Schedule of Prices as the Monthly Construction Progress Report. Each Payment Request shall be consistent with previous requests and payments. The Project Manager shall determine the appropriateness of each payment request item.

B. Payment Request Times: The date for each progress request is the last day of each month. The period covered by each Payment Request starts on the first day of the month or following the end of the preceding period and ends on the last day of the month.

C. Updating: Update the schedule of prices listed in the Payment request when Change Orders or Contract Modifications result in a change in the Contract Price.

D. Provide a separate line item for each part of the Work where Payment request may include materials or equipment purchased or fabricated and stored, but not yet installed.

E. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

F. Provide separate line items for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

G. No payment will be made until the following are submitted each month:
   1. Monthly Estimate, 7 copies.
   2. Monthly Progress Report, 7 copies.
   3. Statement of Contract Time, 7 copies.
   4. Updated Submittal Register, 1 copy.
   5. Updated Progress Schedule, 1 copy.
   6. All Daily Reports, 1 copy.
   7. All Payroll Affidavits for work done, 1 copy.

H. Retainage: The Department will withhold retainage in compliance with the GENERAL CONDITIONS.

I. Transmittal: Submit the signed original and 6 copies of each Payment request for processing.

2.05 CONTRACTOR DAILY PROGRESS REPORTS

A. The General Contractor and all Subcontractors shall keep a daily report of report events.

B. The form of the Contractor Daily Progress Report shall be as directed by the Project Manager.

C. Submit copies of the previous week's reports on Monday morning at 10:00 a.m.

D. Submit copies of the reports with the monthly payment request for the whole period since the last payment request submittal.

E. Deliver the reports in hard copy, by e-mail, or web based construction management as directed by the Project Manager.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Comply with the GENERAL CONDITIONS “Shop Drawings and Other Submittals” section and “Material Samples” section.

B. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

C. Related Sections include the following:
   1. SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION for submitting schedules and reports, including Contractor’s Construction Schedule and the Submittals Schedule.

   2. SECTION 01770 - CLOSEOUT PROCEDURES for submitting warranties, project record documents and operation and maintenance manuals.

1.02 SUBMITTAL PROCEDURES

A. Coordinate Work and Submittals: Contractor shall certify the submittals were reviewed and coordinated.

B. Submittal Certification: Provide in MS Word when submitting electronically. Project Manager will provide an electronic copy of the Submittal Certification. Provide a reproduction (or stamp) of the “Submittal Certification” and furnish the required information with all submittals. Include the certification on:
   1. The title sheet of each shop drawing, or on

   2. The cover sheet of submittals in 8-1/2 inch x 11-inch format, or on

   3. One face of a cardstock tag (minimum size 3-inch x 6-inch) tied to each sample. On the sample tag, identify the sample to ensure sample can be matched to the tag if accidentally separated. The opposite face of the tag will be used by the Project Manager to receive, review, log stamp and include comments.

C. Variances: The Contractor shall request approval for a variance. Clearly note any proposed deviations or variances from the Specifications, Drawings, and other Contract Documents on the submittal and also in a separately written letter accompanying the submittal.

D. Submittal Certification Form (stamp or digital)

CONTRACTOR'S NAME: _____

PROJECT: _____

JOB NO: _____

As the General Contractor, we checked this submittal and we certify it is correct, complete, and in compliance with Contract Drawings and Specifications. All affected Contractors and suppliers are aware of, and will integrate this submittal into their own work.

SUBMITTAL NUMBER _____ DATE RECEIVED _____

REVISION NUMBER _____ DATE RECEIVED _____

SPECIFICATION SECTION NUMBER /PARAGRAPH NUMBER _____

DRAWING NUMBER _____

SUBCONTRACTOR'S NAME _____

SUPPLIER'S NAME _____

MANUFACTURER'S NAME _____

NOTE: DEVIATIONS FROM THE CONTRACT DOCUMENTS ARE PROPOSED AS FOLLOWS (Indicate "NONE" if there are no deviations)

_____

_____

_____

_____

CERTIFIED BY	

Note: Form can be combined with Design Consultant's Review stamp. This is available from the Project Manager.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SUBMITTAL REGISTER AND TRANSMITTAL FORM

A. Contractor shall use submittal register and transmittal forms as directed by the Project Manager.

B. The listing of required submittals within this Section is provided for the Contractor's convenience. Review the specification technical sections and prepare a comprehensive listing of required submittals. Furnish submittals to the Project Manager for review.

C. Contractor shall separate each submittal item by listing all submittals in the following groups with the items in each group sequentially listed by the specification section they come from:
   1. Administrative
   2. Data
   3. Tests
   4. Closing

D. Contractor shall separate all different types of data as separate line items all with the column requirements.

E. Contractor shall send monthly updates and reconciled copies electronically to the Project Manager and the Design Consultant in MS Word or MS Excel or other format as accepted by the Project Manager.

Section No. – Title	Shop Drawings & Diagrams	Samples	Certificates (Material, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-Built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
01310 – Project Management and Coordination											■			■		
01320 – Construction Progress Documenta-tion											■			■		
01330 – Submittal Procedures			■											■		
01500 – Temporary Facilities and Controls							■							■		
01700 – Execution Requirements														■		
01770 – Closeout Procedures	■								■				■	■	■	
02070 – Selective Demolition											■			■		
03013 – Concrete Rehabilitation				■										■		

Section No. – Title	Shop Drawings & Diagrams	Samples	Certificates (Material, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-Built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
05140 – Structural Aluminum	■		■	■			■									
05500 – Metal Fabrications	■	■		■												

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

B. Temporary utilities include but are not limited to, the following:
   1. Water service and distribution.
   2. Sanitary facilities, including toilets, wash facilities, and drinking water facilities.
   3. Ventilation.
   4. Electric power service.
   5. Lighting.
   6. Telephone service.

C. Support facilities include, but are not limited to, the following:
   1. Storage and fabrication sheds.
   2. Trash, refuse disposal.
   3. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities and measures include, but are not limited to, the following:
   1. Environmental protection.
   2. Warning signs, and lights.
   3. Pest control.
   4. Security enclosure and lockup.
   5. Temporary enclosures.

E. Related Sections: Refer to Divisions 2 through 16 for other temporary requirements including ventilation, humidity requirements and products in those Sections.

1.02 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to the State and shall be included in the Contract Price. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
   1. Other Contractors with agreements with the State working within the contract limits.
   2. Occupants of Project.
   3. Testing agencies.
   4. Project Manager and personnel of authorities having jurisdiction.

1.03 SUBMITTALS

A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

B. Landfill Disposal Receipts: Submit copies of receipts issued by a landfill facility. Include receipts with Contractor Daily Progress Report

1.04 QUALITY ASSURANCE

A. Standards: Comply with UBC Chapter 33, “Site Work, Demolition and Construction”, ANSI A10.6, NECA’s “Temporary Electrical Facilities”, and NFPA 241, "Construction, Alteration, and Demolition Operations".
   1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
   2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70, “National Electrical Code”.
      a. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
   1. Keep temporary services and facilities clean and neat.
   2. Relocate temporary services and facilities as required by progress of the Work.

1.06 PREPARATION AND PROTECTION

A. Protection of Property: Continually maintain adequate protection of the Work from damage and protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, material, utility systems located at and adjoining the job site. Repair, replace or pay the expense to repair damages resulting from Contractor’s fault or negligence.

B. Before starting work to be applied to previously erected constructions, make a thorough and complete investigation of the recipient surfaces and determine their suitability to receive required additional construction and finishes. Make any repair that is required to properly prepare surfaces, and coordinate the Work to provide a suitable surface to receive following Work.

C. Commencing work by any trade implies acceptance of existing conditions and surfaces as satisfactory for the application of subsequent work, and full responsibility for finished results and assumption of warranty obligations under the Contract.

D. Protect existing (including interiors) work to prevent damage by vandals or the elements. Provide temporary protection. Use curtains, barricades, or other appropriate methods. Take positive measures to prevent breakage of glass and damage to plastic, aluminum and other finishes.

E. Repairs and Replacements: Promptly replace and repair damages to the approval of the Project Manager. Additional time required to secure replacements and to make repairs does not justify a time extension.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Project Manager. Provide materials suitable for use intended.

B. Tarpaulins: Fire resistive labeled with flame spread rating of 15 or less.

C. Water: Potable.

2.02 EQUIPMENT

A. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA recommended classes for exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

B. Self Contained Combination Toilet and Urinal Units: Single occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. One quarter of, or at least one unit(s) shall contain a handwash sink with potable water storage.

C. Drinking Water Fixtures: Drinking water fountains or containerized, tap dispenser, bottled water drinking water units, or water cooler dispensing water at 45 - 55 degree F available at project site including paper cup supply.

D. Electrical Outlets: Properly configured, NEMA polarized outlets to prevent insertion of 110 to 120 V plugs into higher voltage outlets; equipped with ground fault circuit interrupters, reset button, and pilot light.

E. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125 V ac, 20 A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service where directed by the Project Manager. Where utility

company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, the Department, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked in services.

B. Water Service: Make arrangements with the utility company for temporary use of water, and pay for all expenses. However, at the option of the Contractor, a temporary tap into the facility's existing water system is allowed, subject to the following conditions:

1. Comply with the Department of Health's and County water provider's requirements when tapping into the existing water system.
2. Reasonable amounts of water will be available without charge.
3. Meter the tapped line and prior to water use, notify the Project Manager to observe an initial meter reading.
4. Contractor to take monthly readings and report usage amount to Project Manager. If the Project Manager determines that the water usage is beyond a "reasonable" amount, the State will bill the Contractor for excess usage at the current NAVFAC water and associated sewer rates.
5. Upon completion of the project and just prior to removal of the water meter, notify the Project Manager to observe a final meter reading.
6. Should the Contractor at any time fail to comply with any or all of the above conditions, the Department may terminate the use of water. The Contractor shall remove the hookup within 48 hours of notification of such termination.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
2. Toilets: Install self contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
    a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
4. Locate toilets and drinking water fixtures so personnel need not walk more than 2 stories vertically or 200-feet horizontally to facilities.

D. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

E. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnecting means, automatic ground fault interrupters, and main distribution switchgear. Use of State facilities electrical power services will be permitted as long as equipment is maintained in a condition acceptable to the Project Manager.

F. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment. Protect wiring, in conduits or other, measures when exposed to possible damage or traffic areas.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

3.03 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Locate storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access or where shown on Contract Drawings or as directed by the Project Manager.
   2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.

B. Project Sign and Temporary Sign(s):
   1. Provide and install signs as listed. Sign designs are attached to Part 3 of this Section:
      a. Warning Sign
   2. Install signs where directed by the Project Manager or where indicated to inform public and persons seeking entrance to the Project. Do not permit installation of unauthorized signs.
   3. Provide temporary signs to provide directional information to constructional personnel and visitors.
   4. Construct signs with durable materials, properly supported or mounted, and visible.

C. Trash, Refuse Disposal:
   1. Department of Health – Illegal Dumping Notice. See attachment to Part 3 of this section.
      a. This Notice to be printed out on 8.5x11” paper.
      b. This Notice to be posted at the job site field office and/or in locations visible to all contractors, subcontractors, suppliers, vendors, etc. throughout the duration of the project.
   2. Illegal Dumping of solid waste could subject the Contractor to fines and could lead to felony prosecution in accordance with Chapter 342H, HRS. For more information, see the following web site: http://www.hawaii.gov/health/environmental/waste/sw/pdf/Illdump.pdf
   3. Provide waste collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste.
   4. Do not burn debris or waste materials on the project site.

5. Do not bury debris or waste material on the project site unless specifically allowed elsewhere in these specifications as backfill material.
6. Haul unusable debris and waste material to an appropriate off site dump area.
    a. Water down debris and waste materials during loading operations or provide other measures to prevent dust or other airborne contaminants.
    b. Vacuum, wet mop, or damp sweep when cleaning rubbish and fines which can become airborne from floors or other paved areas. Do not dry sweep.
    c. Use enclosed chutes or containers to conveying debris from above the ground floor level.
7. Clean up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean up shall coincide with rubbish producing events.

D. Janitorial Services: Provide janitorial services on a weekly basis for the first aid stations, toilets, wash facilities, lunchrooms, and similar areas.

3.04 ENVIRONMENTAL CONTROLS

A. General: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Dust Control:
1. Prevent dust from becoming airborne at all times including non working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60.1 Air Pollution Control.
2. Contractor is responsible for and shall determine the method of dust control. Subject to the Contractor's choice, the use of water or environmentally friendly chemicals may be used over surfaces that create airborne dust.
3. Contractor is responsible for all damage claims due to their negligence to control dust.

C. Noise Control
1. Keep noise within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 Community Noise Control. Obtain and pay for the Community Noise Permit when construction equipment or other devices emit noise at levels exceeding the allowable limits.
2. Ensure mufflers and other devises are provided on equipment, internal combustion engines and compressors to reduce loud disruptive noise levels and maintain equipment to reduce noise to acceptable levels.
3. Unless specified elsewhere, do not start construction equipment that meet allowable noise limits prior to 6:45 A.M. or equipment exceeding allowable noise levels prior to 7:00 A.M.

D. Pest Control: Before demolition and excavation work begins, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest control service to perform extermination and control procedures at regular intervals so Project will be free

of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

3.05 VIOLATION OF ENVIRONMENTAL PROVISIONS

A. Violations of any of the above environmental control requirements or any other pollution control requirements; which may also be specified in the other Specifications sections, shall be resolved under the SUSPENSION and CORRECTIVE WORK Section of the GENERAL CONDITIONS.

3.06 ENCLOSURES

A. Security Enclosure and Lockup:
   1. Install substantial temporary enclosure around partially completed areas of construction.
   2. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

B. Temporary Enclosures:
   1. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   2. Where cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

C. Opening Protection
   1. Vertical Openings: Close openings with plywood or similar materials.
   2. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load bearing, wood framed construction.
   3. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire retardant treated material for framing and main sheathing.

3.07 TEMPORARY FIRE PROTECTION

A. Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
   1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
      a. Class ABC dry chemical extinguishers or a combination of extinguishers of NFPA recommended classes for exposures.
      b. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
   2. Store combustible materials in containers in fire safe locations.
   3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire exposure areas.
   4. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.
   5. Develop and supervise an overall fire prevention and first aid fire protection program for personnel at Project site. Review needs with local fire department

and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.08 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by heat temperatures and similar elements.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. The Department reserves the right to take possession of Project identification signs.

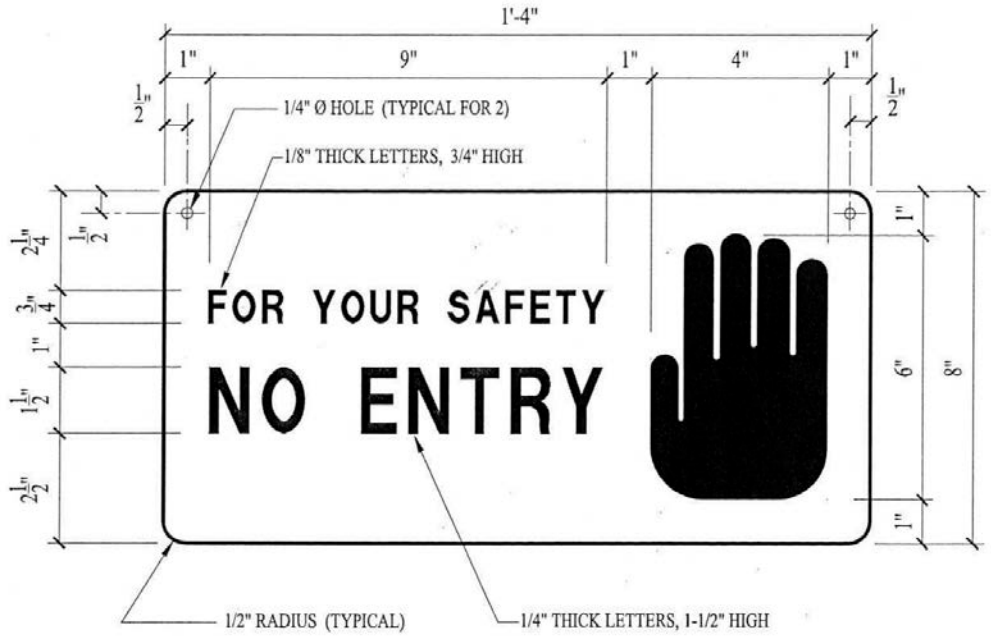
3.09 ATTACHMENTS

A. Warning Sign: Requirements for Warning Sign.

B. Department of Health – Illegal Dumping Notice

END OF SECTION

REQUIREMENTS FOR WARNING SIGN



1. General Requirements: Furnish all labor, materials and equipments necessary to construct and install warning signs as specified hereinafter.
2. Materials
    a. Backing: Backing shall be 6061-T6 aluminum 0.032-inch minimum thickness.
    b. Paint: Paint shall be satin finish, exterior grade or factory baked enamel or a combination thereof.
3. Colors: Signs shall have white background. Remaining items shall be similar to Rust-Oleum Federal Safety Red.
4. Requirements for Warning Sign: Message configuration and dimensions shall be in accordance with the attached illustration.
5. Installation
    a. Signs shall be located at 50-foot intervals around roped off work area or at all entrances in the case of interior work.
    b. Signs shall be attached to the rope barrier, rope barrier supports, individual sign supports or buildings. Do not use nails to attach signs to building(s).
6. Clean-up: Remove all signs upon completion of project. Repair any damages caused by sign mounting and removal.

DEPARTMENT OF HEALTH
ILLEGAL DUMPING NOTICE

The law requires you to dispose solid waste only at recycling or disposal facilities permitted by the Department of Health.

"Solid waste" includes municipal refuse, construction and demolition waste, household waste, tires, car batteries, derelict vehicles, green wastes, furniture, and appliances.

Illegal dumping of solid waste or allowing illegal disposal of solid waste on your property even if contractual or other arrangements are made could subject you to fines from $10,000 to $25,000 per occurrence and could lead to felony prosecution in accordance with Chapter 342H, HRS.

Contact the Department of Health, Solid Waste Section at 586-4226 to report illegal dumping activities or if you have further questions.

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including the following:
   1. Construction layout. Field engineering and surveying.
   2. General installation of products.
   3. Progress cleaning.
   4. Starting and adjusting.
   5. Protection of installed construction.
   6. Correction of the Work.

B. Related Sections
   1. SECTION 01770 - CLOSEOUT PROCEDURES.

1.02 SUBMITTALS

A. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.03 NOTIFICATION

A. Contact the Project Manager and the Project Manager at least 3 working days prior to starting any onsite work.

1.04 PROJECT AND SITE CONDITIONS

A. Project Contract Limits (Contract Zone Limits) indicate only in general the limits of the work involved. Perform necessary and incidental work, which may fall outside of these demarcation lines. Confine construction activities within the Project Contract Limits and do not spread equipment and materials indiscriminately about the area.

B. Disruption of Utility Services: Prearrange work related to the temporary disconnection of electrical and other utility systems with the Project Manager and the Project Manager. Unless a longer notification period is required elsewhere in the Contract Documents, notify the Project Manager at least 15 days in advance of any interruption of existing utility service. Time and duration of interruptions are subject to the Project Manager's approval. Keep the utility interruptions and duration to a minimum so as not to cause inconvenience or hardship to the facility. If temporary electrical or other utility systems hook-up is required, provide the necessary services. Pay for temporary services as part of the contract, unless specifically noted otherwise.

C. Contractor's Operations - Provide means and methods to execute the Work and minimize interruption or interference to the facility's operations. Rearrange the

construction schedule when construction activities result in interruptions that hamper the operations of the facilities.

D. Maintain safe passageway to and from the facility's occupied buildings, rooms and other occupied spaces for the using agency personnel and the public at all times.

E. Contractor, Subcontractor(s) and their employees will not be allowed to park in zones assigned to Users or facility personnel. Subject to availability, the Project Manager may designate areas outside of the Contract Zone Limits to be used by the Contractor. Restore any lawn area damaged by construction activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINING THE SITE

A. Contractor and Subcontractors are expected to visit the site and make due allowances for difficulties and contingencies to be encountered. Compare contract documents with work in place. Become familiar, with existing conditions, the conditions to be encountered in performing the Work, and the requirements of the drawings and specifications.

B. Verify construction lines, grades, dimensions and elevations indicated on the drawings before any clearing, excavation or construction begins. Bring any discrepancy to the attention of the Project Manager, and make any change in accordance with the Project Manager instruction.

C. Obtain all field measurements required for the accurate fabrication and installation of the Work included in this Contract. Verify governing dimensions and examine adjoining work on which the Contractor or Subcontractor's work is in any way dependent. Submit differences discovered during the verification work to the Project Manager for interpretations before proceeding with the associated work. Exact measurements are the Contractor's responsibility.

D. Furnish or obtain templates, patterns, and setting instructions as required for the installation of all Work. Verify dimensions in the field.

E. Contractor shall accept the site and the existing building(s) in the condition that exists at the time access is granted to begin the Work. Verify existing conditions and dimensions shown and other dimensions not indicated but necessary to accomplish the Work.

F. Locate all general reference points and take action to prevent their destruction. Lay out work and be responsible for lines, elevations and measurements and the work executed. Exercise precautions to verify figures and conditions shown on drawings before layout of work.

3.02 SITE UTILITIES AND TONING

A. Cooperate, coordinate and schedule work to maintain construction progress, and accommodate the operations and work of the owners of underground or overhead utility lines or other property in removing or altering the lines or providing new services.

B. Contact all the various utility companies before the start of the work to ascertain any existing utilities and to develop a full understanding of the utility requirements with respect to this Project. Furnish the Project Manager with evidence that the utility companies were contacted.

C. Should the Contractor discover the existence and location of utilities in the contract drawings are not correct, do not disturb the utilities and immediately notify the Project Manager.

D. Do not disturb or modify any utilities encountered, whether shown or not on the Contract Drawings, unless otherwise instructed in the drawings and specifications or as directed by the Project Manager. Repair and restore to pre-damaged condition any utilities or any other property damaged by construction activities.

E. Transfer to “Field Posted As-Built” drawings the location(s) and depth(s) of new and existing utilities that differ from the Contract Drawings. Locate by azimuth and distance and depth(s) from fixed referenced points.

F. Toning: Prior to the start of grading, or excavation or trenching work verify and confirm the presence, location and depth of existing underground utility lines in the area affected by the project, by “toning” or by other appropriate means acceptable to the Project Manager. The intent of this advanced toning is to afford the Project Manager an opportunity to identify utility lines that may or may not be shown on the drawings and issue a directive to address the existing conditions.
   1. Perform toning using instruments specifically developed and designed for the detection of underground pipes and cable utilities.

   2. Notify the Project Manager 48 hours in advance before toning operations. Provide information on the proposed toning method and other pertinent information.

G. Recording Toning Information: Upon completion of the toning operation, submit drawings that show the location and approximate depth of the existing and newly discovered utility lines. Identify the type of utility lines. Also, identify where utility lines indicated on the drawings are not shown in their approximate location or where new utility lines are found or pointed out in the field.

H. After ascertaining the exact location and depth of utilities within the project area, mark and protect the locations.
   1. Acquaint personnel working near utilities with the type, size, location, depth of the utilities, and the consequences that might result from disturbances.

2. Do not start trenching or start similar operations until reasonable and appropriate precautions to protect the utilities are taken.

I. For newly identified utility lines, if directed by the Project Manager, manually excavate within 2-feet of the utility line to avoid damage. Under this directive, manual excavation is considered additional work.

J. Existing Irrigation Systems: Where work is located in areas with existing irrigation systems, Contractor shall test the existing systems and document all deficiencies prior to any work that may damage the existing systems.

3.03 FIELD MEASUREMENTS

A. Take field measurements to fit and install the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Submit a Request For Information (RFI) immediately upon discovery of the need for clarification of the Contract Documents. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.04 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to existing conditions. If discrepancies are discovered, notify the Project Manager promptly.

3.05 FIELD ENGINEERING

A. Reference Points: Locate existing permanent or temporary benchmarks, control points and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without the Project Manager's approval. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to the Project Manager before proceeding.

   2. Replace lost or destroyed permanent benchmarks and control points promptly. Base all replacements on the original survey control points.

3.06 INSTALLATION

A. Install materials, items, fixtures required by the various Divisions and Sections of the Specifications in accordance with Contract Documents, by workers specially trained and skilled in performance of the particular type of work, to meet guarantee and regulatory agency requirements. Should the drawings or specifications be void of installation requirements, install the materials, items, and fixtures in accordance with the manufacturer's current specifications, recommendations, instructions and directions.

3.07 CUTTING AND PATCHING

A. Oversee cutting and patching of concrete, masonry, structural members and other materials where indicated on drawings and as required by job conditions. Unless noted elsewhere in the contract documents, do not cut or patch existing or new structural members without previously notifying the Project Manager.

B. Provide patch materials and workmanship of equal quality to that indicated on the drawings or specified for new work.

3.08 CLEANING

A. General: Clean the Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

   2. Do not hold waste more than 7 days unless approved otherwise by the Project Manager.

   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.

   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use only cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

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

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.09 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions to provide proper temperature and relative humidity conditions.

3.11 CORRECTION OF THE WORK

A. Repair or replace defective construction. Restore damaged substrates and finishes. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair defective components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01715 - EXISTING CONDITIONS - ASBESTOS / LEAD / HAZARDOUS MATERIAL SURVEY

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the results of the State's survey for Asbestos, Lead and / or other hazardous materials and is provided for the Contractor's information.

1.02 ASBESTOS

A. The structure or structures to be renovated or modified under this contract were surveyed for the presence of asbestos containing building materials (ACBM), using AHERA requirements. A copy of the survey report is included in this Section.
   1. The report is included, even when no ACBM was found, for the Contractor's information. Review the attached report for the basis on which the negative ACBM finding was made. Contractor may perform further surveys at its own expense, if ACBM not shown in the report(s) is suspected in the areas of the building(s) in which work will be performed. If ACBM is found, notify the Project Manager immediately. The State will reimburse the Contractor for the testing cost if ACBM is found.

   2. If there is ACBM outside of the areas in which work will be performed, this ACBM shall not be disturbed in any way.

B. If applicable, notify employees, Subcontractors and all other persons engaged on the project of the presence of asbestos in the existing buildings in accordance with the requirements of OSHA 29 CFR 1926, Asbestos.

1.03 LEAD CONTAINING PAINT

A. Inform employees, Subcontractors and all other persons engaged in the project that lead containing paints (LCP) may be present in the existing building(s) and at the job site. Follow the requirements of OSHA 29 CFR 1926.62, Lead.

B. Review the attached lead testing data which identify locations LCP was found. Lead testing was for design purposes only, and the results do not satisfy any of the requirements of OSHA 29 CFR 1926.62.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SURVEY

A. Limited Inspection Report for Asbestos and Lead-Based Paint, attached 23 pages, dated February 2017. Prepared by EnviroQuest, Inc.

END OF SECTION

LIMITED INSPECTION REPORT FOR ASBESTOS AND LEAD-BASED PAINT

Youth Challenge Academy
Buildings 1786 and 1787 Railing Replacement

Prepared for:

Lou Chan & Associates, Inc.
725 Kapiolani Boulevard, Suite C-207
Honolulu, Hawaii 96813

Prepared by:

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea, Hawaii 96701
808.486.5881
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February 2017

ENVIROQUEST Project 10638

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1.0 INTRODUCTION

ENVIROQUEST, INC. (EQI) was retained by Lou Chan & Associates, Inc. to perform a limited hazardous material inspection of Buildings 1786 and 1787 hallway and railings at the Youth Challenge Academy, located at 91-1001 Shangrila Street, Kapolei, Hawaii. The inspection was conducted on February 8, 2017.

The objective of the inspection was to determine the location of asbestos-containing materials (ACM) and lead-based paints (LBP), which maybe impacted by the renovation work. The reference drawing is included in Appendix 4.

The listed areas were included in our inspection:

- Buildings 1786 and 1787
  - 2nd and 3rd level - hallway

2.0 ASBESTOS

Fifteen samples were collected from suspect asbestos-containing materials.

2.1 Methodology

Prior to sampling, EQI visually surveyed the project area for suspect ACM and homogeneous areas (areas that have uniform color, texture, and appearance.) Suspect materials were divided into three United States Environmental Protection Agency (USEPA) categories:

- Surfacing Materials (sprayed or troweled-on materials)
- Thermal Systems Insulations (materials generally applied to various mechanical systems)
- Miscellaneous Materials (any materials which do not fit in the above categories)

Sampling methodology generally followed the procedures presented in USEPA 40 CFR 763 Asbestos and Hawaii Department of Health (HDOH), Hawaii Administrative Rules (HAR) Titles 11-501 *Asbestos Requirements* and 11-502 *Asbestos Containing Materials in Schools*.

While sampling locations were selected randomly to represent homogenous materials, sampling was confined to materials which were readily accessible and did not involve the destruction of physical barriers.

2.2 Results

Samples were submitted to Forensic Analytical Laboratories in Rancho Dominguez, California. The samples were analyzed by polarized-light microscopy (PLM), using EPA Method 600/R-93-116, Visual Area Estimation.

Forensic Analytical is accredited for bulk asbestos analysis through successful participation in the US Department of Commerce, National Institute of Standards and Technologies (NIST), National Voluntary Laboratory Accreditation Program (NVLAP). The laboratory is currently registered to provide asbestos laboratory services under HDOH 11-504 *Asbestos Abatement Certification Program.*

Based on the laboratory analytical report, no asbestos was identified in the samples. The National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR 61 Part M, defines asbestos containing materials as those which contain greater than 1% asbestos. In accordance with NESHAP requirements, samples consisting of distinct layers of materials were analyzed and reported separately by the laboratory. A homogenous material summary is presented in Table 1. The laboratory analytical report and chain of custody form are located in Appendix 1.

TABLE 1
HOMOGENEOUS MATERIAL SUMMARY
YOUTH CHALLENGE ACADEMY
BUILDINGS 1786 AND 1787 RAILING REPLACEMENTS

Homogenous Material	ACM[1] (Y/N)	Location	Sample ID	Friable (Y/N)	Est Qty (ACM) (ft^2)	Condition[2]	Photo No.
Gray caulking	N	2nd and 3rd level hallway – floor expansion joint sealant	106380208-01A 106380208-01B 106380208-01C	N	-	D	3
Concrete	N	2nd and 3rd level hallway – floor and deck	106380208-02A 106380208-02B 106380208-02C	N	-	D	4
White caulking	N	2nd and 3rd level hallway – exterior window louver and floor sealant	106380208-03A 106380208-03B 106380208-03C	N	-	G	5
Black non skid paper and tan mastic	N	2nd and 3rd level hallway – staircase landing and steps, adjacent to the units entry door	106380208-04A 106380208-04B 106380208-04C	N	-	D	6
Brown/gray concrete filler	N	2nd and 3rd level hallway – railing base plate patch filler	106380208-05A 106380208-05B 106380208-05C	N	-	D	7

1. ACM=>1% asbestos content
2. Good (G); Damaged (D) <10% distributed or 25% localized; Significant Damage (SD), >10% distributed or 25% localized

3.0 LEAD

Five paint chip sample were collected from painted or coated materials.

3.1 Methodology

Prior to sampling, EQI visually surveyed the project area for painted or coated building surfaces. Sampling methodology generally followed the procedures presented in the U.S. Department of Housing and Urban Development's document *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* and USEPA 40 CFR 745 *Lead; Requirements for Lead-based Paint Activities in Target Housing and Child Occupied Facilities; Final Rule.*

The paint chip samples were collected using a hand chisel and then placed into individual plastic bags which were sealed and labeled. The samples were then placed into another sealed bag for storage. Sampling equipment was cleaned between each sampling to avoid cross-contamination between samples.

Samples were submitted to Forensic Analytical in Rancho Dominguez, California. The samples were analyzed in accordance with EPA Method 3050B/7420 Lead, Atomic Absorption, Direct Aspiration. Forensic Analytical is accredited for lead analysis through successful participation in the American Industrial Hygiene Association's (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP).

3.2 Results

Based on the laboratory analytical results the paint did not have lead concentrations exceeding the EPA guidelines for lead in paint. EPA defines lead-based paint as paint or other coatings containing lead in equal to, or in excess of, 0.5% lead by weight.

Lead at concentrations below the EPA guideline was identified. Paint with lead concentrations below 0.5% by weight is identified as lead-containing paint (LCP). Prior to the disturbance of any paints, the contractor's employees disturbing the painted material must be informed that it contains lead and must have received training under Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 *Lead*. If any untested paints are disturbed, they should be assumed to contain lead.

A homogeneous paint summary is presented in Table 2. The laboratory analytical report and chain of custody form are included in Appendix 2. Photographs are presented in Appendix 3.

TABLE 2
HOMOGENOUS PAINT SUMMARY
YOUTH CHALLENGE ACADEMY
BUILDINGS 1786 AND 1787 RAILING REPLACEMENTS

Paint Color	Int/Ext	LBP_1 (Y/N)	LCP_2 (Y/N)	Paint Sample Location	Sample ID	$Condition_{3,4}$	Photo No.
Beige	Ext	N	Y	2nd and 3rd level hallway – concrete post and deck	10638-01P	Intact	8
Beige over tan	Ext	N	N	2nd and 3rd level hallway – exterior CMU wall of buildings 1786 and 1787, staircase CMU (upper portion)	10638-02P	Intact	9
Blue over maroon and beige	Ext	N	Y	2nd and 3rd level hallway – staircase concrete stair landing and steps	10638-03P	Intact	10
Yellow	Ext	N	N	2nd and 3rd level hallway – staircase stair steps metal threshold	10638-04P	Intact	11
Tan over maroon	Ext	N	Y	2nd and 3rd level hallway – staircase CMU wall (lower portion)	10638-05P	Intact	12

1. LBP = >0.5% lead by weight
2. LCP = >laboratory detection limit but <0.5%
3. Exterior: Intact – Entire surface is intact; Fair - ≤ 10ft²; Poor - >10 ft²
4. Interior: Intact – Entire surface is intact; Fair - ≤ 2ft² or ≤ 10%; Poor - >2 ft² or >10%

4.0 SUMMARY

4.1 Asbestos-Containing Materials

Asbestos-containing was not identified in this inspection.

4.2 Lead-Based Paint

Lead-based paint was not identified in this inspection. However, lead at concentrations below the EPA guideline of 0.5% lead by weight was detected in various paint/coating (see Table 2). The contractor's employees removing or disturbing the painted material must be informed that it contains lead and must have received training under Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 *Lead*. If any other untested paints are disturbed, they should be assumed to contain lead.

5.0 LIMITATIONS

The information set forth is based solely on the agreed upon scope of services, on personal observation, laboratory data, and information provided by Lou Chan & Associates, Inc.

Although this inspection provides information on the relative presence or absence of asbestos-containing materials and lead-based paint, it should not be construed as a final statement that all hazardous materials have been identified.

Given the often obscure and elusive nature of hazardous materials, it is never possible to absolutely dismiss the possibility of additional hazardous materials. EnviroQuest, Inc. expressly disclaims any and all liability, representations, expressed or implied, contained in, or for omission from this report, or any other written or oral communication which might be interpreted as establishing the total extent of all liability present at the subject property.

Our services have been performed with usual thoroughness and competence of the consulting profession, in accordance with the standard of professional services at this time. No other warranty or representation, either expressed or implied is included or intended.

Any questions regarding our work and this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned. EQI greatly appreciates this opportunity to assist you with your industrial hygiene needs. We look forward to working with you again in the future.

Jesus Sacramento
Industrial Hygienist
HIASB-0173

Jim Cardenas
Industrial Hygienist
HIASB-0175

Asbestos
Laboratory Analytical Report

Appendix 1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

EnviroQuest, Inc.
Steve Tanaka
98-029 Hekaha Street
Suite 21
Aiea, HI 96701

Client ID: 7104
Report Number: B234630
Date Received: 02/09/17
Date Analyzed: 02/14/17
Date Printed: 02/14/17
First Reported: 02/14/17

Job ID/Site: 10638; Youth Challenge Academy Buildings 1786 and 1787 Railing Replacements
Date(s) Collected: 02/08/2017

FALI Job ID: 7104
Total Samples Submitted: 15
Total Samples Analyzed: 15

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
106380208-01A	51042229						
Layer: Grey Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-01B	51042230						
Layer: Grey Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-01C	51042231						
Layer: Grey Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-02A	51042232						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-02B	51042233						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-02C	51042234						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-03A	51042235						
Layer: White Putty			**ND**				
Layer: Paint			**ND**				
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

2959 Pacific Commerce Drive, Rancho Dominguez, CA 90221 / Telephone: (310) 763-2374 (888) 813-9417 / Fax: (310) 763-8684

Client Name: EnviroQuest, Inc.

Report Number: B234630
Date Printed: 02/14/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
106380208-03B	51042236						
Layer: White Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-03C	51042237						
Layer: White Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-04A	51042238						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Clear Mastic with Debris			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-04B	51042239						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Clear Mastic with Debris			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-04C	51042240						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Clear Mastic with Debris			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-05A	51042241						
Layer: Brown Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-05B	51042242						
Layer: Brown Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
106380208-05C	51042243						
Layer: Brown Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B234630

Client Name: EnviroQuest, Inc. **Date Printed:** 02/14/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tiffani Ludd, Laboratory Supervisor, Rancho Dominguez Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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EnviroQuest

PLM DATA SHEET

Project No.: 10638 Project Name: Youth Challenge Academy
Buildings 1786 and 1787 Railing Replacements
Date: 02/08/17
Page: 1 of 2

Material Description: GRAY CAULKING — Friable / Non-friable / Asb. Type

Sample No.	Location	% Asb.
10638020 8 - 01A	SECOND & THIRD LEVEL	
- 01B	Hallway; Floor expansion joint sealant	
- 01C		

CONDITION: % Damaged: % Localized: % Distributed: Total Material Quantity:

Surfacing Material	TSI	Misc.
☐ Sig. Damage	☐ Sig. Damage	☐ Sig. Damage
☐ Damaged — % Crumbling -	☐ Damaged — % Gouge/Punct -	☑ Damaged — % Crumbling -
☐ Good Cond. — % Delaminating -	☐ Good Cond. — % Crushed -	☐ Good Cond. — % Delaminating -
— % H_2O/Gouges -	— % H_2O Stains -	— % H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☑ Minimal Damage

Material Description: CONCRETE FLOOR — Friable / Non-friable / Asb. Type

Sample No.	Location	% Asb.
10638020 8 - 02A	2nd & 3RD LEVEL	
- 02B	Hallway floor	
- 02C		

CONDITION: % Damaged: % Localized: % Distributed: Total Material Quantity:

Surfacing Material	TSI	Misc.
☐ Sig. Damage	☐ Sig. Damage	☐ Sig. Damage
☐ Damaged — % Crumbling -	☐ Damaged — % Gouge/Punct -	☑ Damaged — % Crumbling -
☐ Good Cond. — % Delaminating -	☐ Good Cond. — % Crushed -	☐ Good Cond. — % Delaminating -
— % H_2O/Gouges -	— % H_2O Stains -	— % H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☑ Minimal Damage

Sampled By: JESUS SACRAMENTO
JIM CARDENAS
DOH Cert No:HIASB -0173/ 0175

Delivered to Lab By:

Relinquished By/Date/Time: 02/08/17

Relinquished By/Date/Time: 02/09/17 Received FE 10:15 AM

Relinquished By/Date/Time:

Relinquished By/Date/Time:

TURNAROUND TIME: ☐ < 12 Hours ☐ 24 Hours ☒ 3 Days ☐ 5 Days ☐ _____

Surfacing	<1,000 ft² = 3 Samples	1,000 – 5,000 ft² = 5 Samples	>5,000 ft² = 7 Samples
TSI	Minimum of 3 Samples (Run) UNLESS	<6 In. or ft² = 1 Sample	Minimum of 3 Samples (Elbow & 'T')
Misc.	Minimum of 3 Samples (*Hawaii*)		

Surfacing	Sig. Damage = > *10% Dist. or 25% Local*	Damaged = < *10% Dist. or 25% Local*	*Good = Very Limited Damage*
TSI	Sig. Damage = *10% Missing Jacket OR > 10% Dist. or 25% Local*	Damaged = < *10% Missing Jacket OR < 10% Dist. or 25% Local*	Good = *Very Limited Damage*
Misc	Sig. Damage = > *10% Dist. or 25% Local*	Damaged = < *10% Dist. or 25% Local*	*Good = Very Limited Damage*

98-029 Hekaha Street, Suite 21, Aiea, HI 96701 Phone: (808) 486-5881 Fax: (808) 486-5889 E-mail: eqi@enviroquestinc.com

EnviroQuest

PLM DATA SHEET

Project No.: 10638 Project Name: Youth Challenge Academy
Buildings 1786 and 1787 Railing Replacement

Date: 02/08/17
Page: 2 of 2

Material Description: WHITE CAULKING

Sample No.	Location	% Asb.	Friable / Non-friable Asb. Type
10638 0208-03A	2nd & 3RD LEVEL Hallway; Window Cover & floor sealant		
-03B			
-03C			

CONDITION: % Damaged: Surfacing Material — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges -
% Localized: TSI — Sig. Damage, Damaged, Good Cond.; % Gouge/Punct - % Crushed - % H_2O Stains -
% Distributed: Total Material Quantity: Misc. — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges-

Contact Potential	High	Moderate	Low
Vibration Potential	High	Moderate	Low
Air Erosion	High	Moderate	Low
OVERALL POTENTIAL RATING	Significant Damage	Damage	Minimal Damage

Material Description: BLACK NON-SKID FLOOR STRIP (Black Sand paper) tan adhesive

Sample No.	Location	% Asb.	Friable / Non-friable Asb. Type
10638 0208-04A	2nd & 3RD LEVEL Hallway adjacent to entry doors and Stairwell steps & landing		
-04B			
-04C			

CONDITION: % Damaged: Surfacing Material — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges -
% Localized: TSI — Sig. Damage, Damaged, Good Cond.; % Gouge/Punct - % Crushed - % H_2O Stains -
% Distributed: Total Material Quantity: Misc. — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges-

Contact Potential	High	Moderate	Low
Vibration Potential	High	Moderate	Low
Air Erosion	High	Moderate	Low
OVERALL POTENTIAL RATING	Significant Damage	Damage	Minimal Damage

Material Description: BROWN/tan Marble/concrete filler

Sample No.	Location	% Asb.	Friable / Non-friable Asb. Type
	BROWN/gray concrete FILLER		
10638 0208-05A	2nd & 3RD LEVEL Hallway; aluminum railing post base plate patch filler		
-05B			
-05C			

CONDITION: % Damaged: Surfacing Material — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges -
% Localized: TSI — Sig. Damage, Damaged, Good Cond.; % Gouge/Punct - % Crushed - % H_2O Stains -
% Distributed: Total Material Quantity: Misc. — Sig. Damage, Damaged, Good Cond.; % Crumbling - % Delaminating - % H_2O/Gouges-

Contact Potential	High	Moderate	Low
Vibration Potential	High	Moderate	Low
Air Erosion	High	Moderate	Low
OVERALL POTENTIAL RATING	Significant Damage	Damage	Minimal Damage

98-029 Hekaha Street, Suite 21, Aiea, HI 96701 Phone: (808) 486-5881 Fax: (808) 486-5889 E-mail: eqi@enviroquestinc.com

Lead
Laboratory Analytical Report

Appendix 2

EnviroQuest, Inc.

Forensic Analytical LABORATORIES

Metals Analysis of Paints

EnviroQuest, Inc.
Steve Tanaka
98-029 Hekaha Street
Suite 21
Aiea, HI 96701

Client ID: 7104
Report Number: M181546
Date Received: 02/09/17
Date Analyzed: 02/14/17
Date Printed: 02/14/17
First Reported: 02/14/17

Job ID / Site: 10638; Youth Challenge Academy Buildings 1786 and 1787 Railing Replacement
Date(s) Collected: 02/08/17

FALI Job ID: 7104
Total Samples Submitted: 5
Total Samples Analyzed: 5

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
10638-01P	LM137254	Pb	0.014	wt%	0.006	EPA 3050B/7000B
10638-02P	LM137255	Pb	< 0.006	wt%	0.006	EPA 3050B/7000B
10638-03P	LM137256	Pb	0.12	wt%	0.006	EPA 3050B/7000B
10638-04P	LM137257	Pb	< 0.009	wt%	0.009	EPA 3050B/7000B
10638-05P	LM137258	Pb	0.080	wt%	0.008	EPA 3050B/7000B

* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Beatriz Hinojosa, Laboratory Supervisor, Rancho Dominguez Laboratory

2959 Pacific Commerce Drive, Rancho Dominguez, CA 90221 / Telephone: (310) 763-2374 (888) 813-9417 / Fax: (310) 763-8684

Youth Challenge Academy (YCA)
B1786 And B1787 Railing Replacement, Phase 1
Job No. CA-1605-C

Existing Conditions – Asbestos/Lead
Hazardous Material Survey
01715 - 19

EnviroQuest

MISCELLANEOUS BULK DATA SHEET

Project Name: YOUTH CHALLENGE ACADEMY
BUILDINGS 1786 AND 1787 RAILING REPLACEMENT
Location:

Page: 1/1
Date: 02/08/17
Project No.: 10638

Turnaround Time: ☐<12 Hrs ☐24 Hrs ☐48 Hrs ☒3 Days ☐5 Days ☐Other:

Analysis:
☐TCLP Lead
☐TCLP RCRA 8
☒Total Lead
☐Micro ID (spore)
☐
☐

Sampling Media:
☒Bulk ☐Tape ☐Wipe
☐Soil ☐Vacuum ☐
☐Swab ☐Water ☐

	Sample #	Building	Int/ Ext	Flr.	Room	Component	Substrate	Color	% of Waste Stream	Area / Vol	Result
1	10638-01P	1786&1787 2nd & 3RD LEVEL; Hallway	EXT			post & decking	Concrete	BEIGE			
2	10638-02P	1786/1787 2nd & 3RD LEVEL; adjacent to Hallway	EXT			wall	CMU	BEIGE/Tan			
3	10638-03P	1786/1787 2nd & 3RD LEVEL; staircase landing & steps	EXT			FLOOR	Concrete	Blue/maroon/beige			
4	10638-04P	1786/1787 2nd & 3RD LEVEL; staircase stair step threshold	EXT				metal	Yellow			
5	10638-05P	1786/1787 2nd & 3RD LEVEL; staircase CMU wall				wall	CMU	Tan/maroon			
6											
7											

Sampled By: JESUS SACRAMENTO / J. Cardenas	Relinquished By/Date/Time: 02/08/17	Relinquished By/Date/Time	Analyzed By
Delivered to Lab By:	Received By/Date/Time: 02/09/17 10:15am	Received By/Date/Time	Date Analyzed

SEND ALL CORRESPONDENCE TO: _____ ☐FAX: 808.486.5889 ☐E-mail: eqi@enviroquestinc.com

Photographs

Appendix 3

Photo 1: Buildings 1786 and 1787.

Photo 2: Buildings 1786 and 1787.
2nd and 3rd level hallway.

Photo 3: Hallway – floor expansion joint sealant.
Non asbestos-containing gray caulking.

Photo 4: Hallway – concrete floor and deck.
Non asbestos-containing concrete.

Photo 5: Hallway – floor and window louver sealant.
Non asbestos-containing white caulking.

Photo 6: Hallway – adjacent to unit entry door.
Non asbestos-containing black non skid paper and tan mastic.

EnviroQuest

PHOTOGRAPHIC LOG

YOUTH CHALLENGE ACADEMY – BUILDINGS 1786 AND 1787
HALLWAY RAILING REPLACEMENT

Photo 7: Hallway – aluminum post.
Non asbestos-containing brown/gray concrete filler.

Photo 8: Hallway – concrete post, beams and deck.
Lead-containing beige paint.

Photo 9: Hallway – adjacent exterior CMU wall.
Non lead-containing beige over brown paint.

Photo 10: Staircase concrete steps and landing.
Lead-containing blue over maroon paint.

Photo 11: Staircase metal threshold.
Non lead-containing yellow paint.

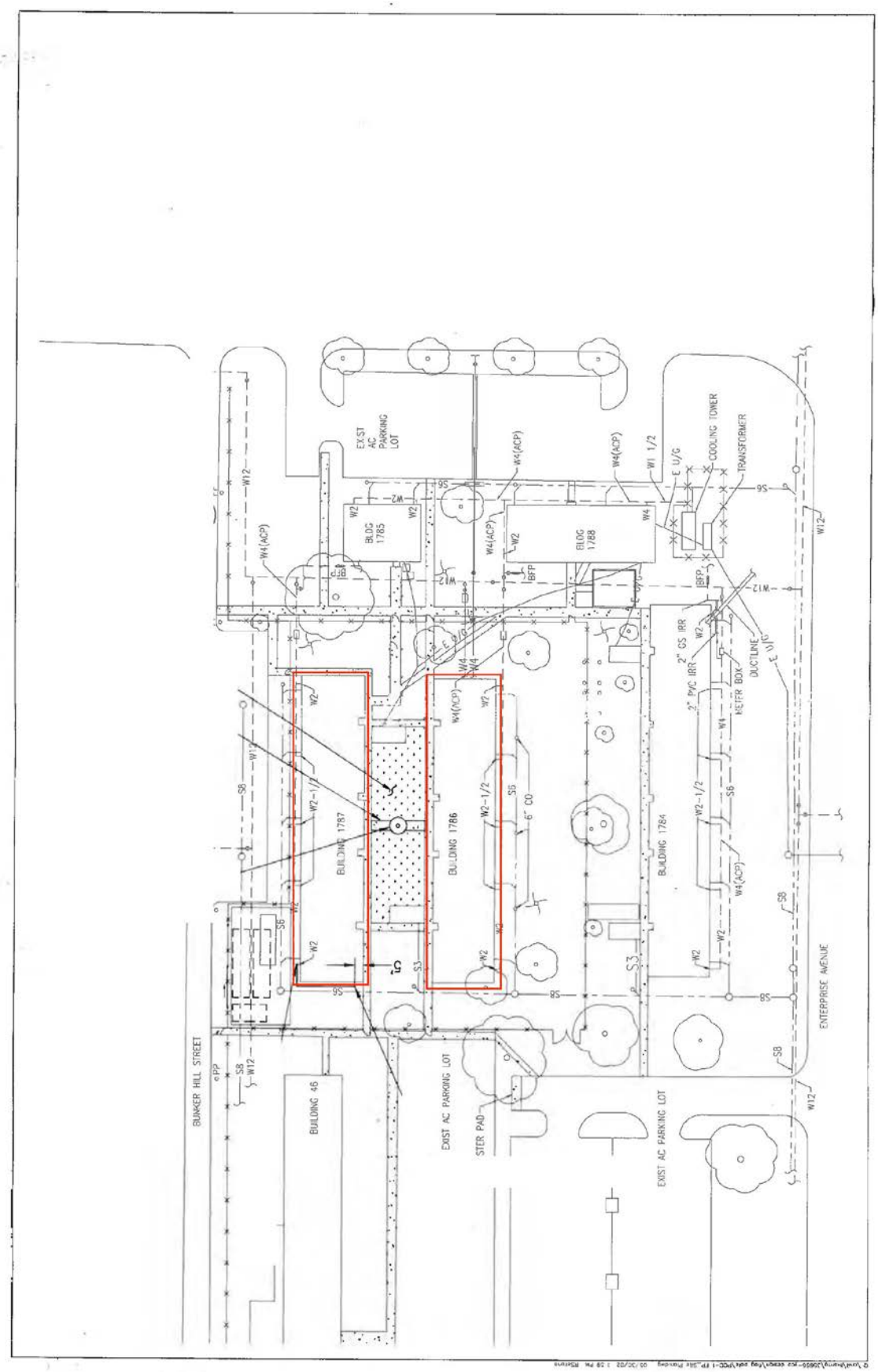
Photo 12: Staircase CMU wall lower portion.
Lead-containing tan over maroon paint.

EnviroQuest

PHOTOGRAPHIC LOG

YOUTH CHALLENGE ACADEMY – BUILDINGS 1786 AND 1787
HALLWAY RAILING REPLACEMENT

Appendix 4


EXIST AC PARKING LOT
BLDG 1785
BLDG 1788
COOLING TOWER
TRANSFORMER
E U/G
2" GS IRR
2" PVC IRR
METER BOX
DUCTLINE
BUILDING 1787
BUILDING 1786
BUILDING 1784
BUILDING 46
BUNKER HILL STREET
ENTERPRISE AVENUE
EXIST AC PARKING LOT
STER PAD
6" CO

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including the following:
   1. Project Record Documents.
   2. Warranties.
   3. Instruction for the State's personnel.

B. Related documents include the following:
   1. SECTION 01700 - EXECUTION REQUIREMENTS.

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting a Final Inspection to determine Substantial Completion, complete the following items in addition to requirements of Article 7 of the GENERAL CONDITIONS.
   1. Advise the Project Manager of pending insurance changeover requirements.
   2. Submit specific warranties, final certifications, and similar documents.
   3. Obtain and submit occupancy permits, operating certificates, and similar releases and access to services and utilities, unless waived by the Project Manager.
   4. Arrange to deliver tools, spare parts, extra materials, and similar items to a location designated by the Project Manager. Label with manufacturer's name and model number where applicable.
   5. Make final changeover of permanent locks and deliver keys to the Project Manager. Advise the State's personnel of changeover in security provisions.
   6. Complete startup testing of systems.
   7. Submit test, adjust, and balance records.
   8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   9. Advise the Project Manager of changeover in other utilities.
   10. Submit changeover information related to the State's occupancy, use, operation, and maintenance.
   11. Complete final cleaning requirements, including touch up painting.
   12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.03 FINAL COMPLETION

A. Preliminary Procedures: Within 10 days from the Project Acceptance Date, complete the following items in addition to requirements of GENERAL CONDITIONS Article 7 PROSECUTION AND PROGRESS:
   1. Instruct the State's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

1.04 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit 2 copies of any updated and action taken list. In addition to requirements of GENERAL CONDITIONS Article 7 PROSECUTION AND PROGRESS, include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

   3. Include the following information at the top of each page:
      a. Project Name and Title.
      b. DOD Job No.
      c. Date and page number.
      d. Name of Contractor.

1.05 PROJECT RECORD DOCUMENTS AND REQUIREMENTS

A. General:
   1. Definition: "Project Record Documents", including Record Drawings, shall fulfill the requirements of "Field-Posted As-Built Drawings" listed in the GENERAL CONDITIONS.

   2. Do not use Project Record Documents for daily construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Project Manager's reference during normal working hours. Maintain these documents as specified in paragraph entitled "Record Drawings" hereinafter.

   3. The Designer, under contract with the State, will update the drawings to show all addendum, PCD, and sketch changes. The Project Manager will transmit these drawings (mylar or vellum) to the Contractor who will make all "red-line" corrections to these drawings to record the changes depicted on the Contractor's Field Posted Record ("As-Builts") by accepted drafting practices as approved by the Project Manager.

   4. Where the recorded changes depicted on the Contractor's Field Posted Record ("As-Builts") are in the form of shop drawings, the Contractor shall provide those shop drawings on mylar or vellum sheets in the same material and size as the drawings transmitted to the Contractor. The new drawing

sheets shall be titled and numbered to conform to the construction drawings and clearly indicate what information they supercede in the actual construction drawings. For example a new drawing that replaces drawing M-3, could be numbered M3a.

5. The Contractor shall bring to the attention of the Project Manager any discrepancy between the changes made by the Designer and those depicted on addendum, PCD, and sketch changes. The Project Manager will resolve any conflicts.

6. Submit final Record Documents (Field Posted Record Drawings) within 10 days after the Final Inspection Date but no later than the Contract Completion Date, unless the GENERAL CONDITIONS require an earlier submittal date.

7. The Contractor shall guarantee the accuracy of its final Record Documents. The State will hold the Contractor liable for costs the State incurs as a result of inaccuracies in the Contractor's Record Documents.

8. Prepare and submit construction photographs and electronic files, damage or settlement surveys, property surveys, and similar final record information as required by the Project Manager.

9. Deliver tools, spare parts, extra materials, and similar items to a location designated by the Project Manager. Label with manufacturer's name and model number where applicable.

10. Submit pest-control final inspection report and warranty.

B. Record Drawings:
   1. Maintain a duplicate full-size set of Field Posted Record ("As-Builts") Drawings at the job site. Clearly and accurately record all deviations from alignments, elevations and dimensions, which are stipulated on the drawings and for changes directed by the Project Manager that deviate from the drawings.

   2. Record changes immediately after they are constructed in place and where applicable, refer to the authorizing document (Field Order, Change Order, or Contract Supplement). Use red pencil to record changes. Make Field Posted Record Drawings available to the Project Manager at any time so that its clarity and accuracy can be monitored.
      a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
      b. Accurately record information in an understandable drawing technique.
      c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
      d. Mark the contract drawings or the shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on contract drawings.
      e. Mark important additional information that was either shown schematically or omitted from original Drawings.

f. Locate concealed building utilities by dimension from bench marks or permanent structures. Locate site utilities by dimensions, azimuth and lengths from bench marks or permanent structures.
g. Note field order numbers, Change Order numbers, Contract Modification numbers, Alternate numbers, post-construction drawing numbers (PCD) and similar identification (RFI numbers) where applicable.
h. The Contractor shall initial each deviation and each revision marking.

3. Use the final updated Contract Drawing set plus applicable shop drawings for making the final Field Posted Record Drawings submittal.

4. Certify drawing accuracy and completeness. Label and sign the record drawings.

5. Label the title sheet and on all sheets in the margin space to the right of the sheet number, written from the bottom upward, with the title "FIELD POSTED RECORD DRAWINGS" and certification information as shown below. Provide a signature line and company name line for each subcontractor that will also certify the respective drawing. Adjust size to fit margin space.

   FIELD POSTED RECORD DRAWINGS Certified By: _____ Date: _____
   [Contractor's Company Name]

6. Revise the Drawing Index and label the set "FIELD POSTED RECORD DRAWINGS". Include the label "A COMPLETE SET CONTAINS [_____] SHEETS" in the margin at the bottom right corner of each sheet. Quantify the total number of sheets comprising the set.

7. If the Project Manager determines a drawing does not accurately record a deviation or omits relevant information, the State will correct any FIELD POSTED RECORD DRAWINGS sheet. Contractor will be charged for the State's cost to correct the error or omission.

8. Use the final Field Posted Record Drawings sheets to create one electronic version of the set. The set shall be recorded in Adobe Acrobat PDF (Portable Document Format). Create a single indexed, bookmarked PDF file of the entire set of drawings and record on the CD. Submit one set of the final Field Posted Record Drawings sheets and the complete electronic CD set(s).

1.06 WARRANTIES

A. Submittal Time: Submit written manufacturer's warranties at request of the Project Manager for designated portions of the Work where commencement of warranties other than Project Acceptance date is indicated.

B. Partial Occupancy: Submit properly executed manufacturer's warranties within 45 days of completion of designated portions of the Work that are completed and occupied or used by the State during construction period by separate agreement with Contractor.

C. Organize manufacturer's warranty documents into an orderly sequence based on the table of contents of the Specifications.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 inch x 11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer and prime contractor.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project Name and Title, DOD Job Number, and name of Contractor.

4. Use the final submittal of the warranties to create an electronic Adobe Acrobat PDF (Portable Document Format) version of the bound warranty documents files. Each sheet shall be separately scanned, at 600 DPI or better into a PDF file, indexed and recorded on a recordable compact disc (CD).

D. Provide 2 sets of manufacturer's warranties that exceed one year and one CD as part of the closing document submittals.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 FINAL AND PROGRESSIVE CLEANING

A. General: Provide final and progressive cleaning for each phase of work prior to starting the next phase. In addition to requirements of Article 7 of the GENERAL CONDITIONS conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions unless noted otherwise. Complete the following cleaning operations before requesting final inspection for entire Project or for a portion of Project:
   1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits resulting from construction activities.

3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

4. Remove tools, construction equipment, machinery, and surplus material from Project site.

5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

6. Remove debris and surface dust from limited access spaces, including: roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

7. Sweep concrete floors broom clean in unoccupied spaces.

8. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass surfaces, taking care not to scratch surfaces.

9. Remove labels that are not permanent.

10. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    a. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.

11. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

12. Replace parts subject to unusual operating conditions.

13. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

14. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the State's property. Do not discharge volatile, harmful, or dangerous materials into drainage and sewer systems or onto State property. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02070 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Selective demolition includes, but is not limited to selective removal and subsequent disposal of all materials indicated to be removed.

B. The extent of selective demolition is indicated on Drawings.

1.02 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain State's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.03 SUBMITTALS

A. Submit in accordance with Section 01330 – SUBMITTAL PROCEDURES.

B. Proposed Dust-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.

C. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.

   2. Interruption of utility services.

   3. Coordination for shutoff, capping, and continuation of utility services.

D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI Al0.6 and NFPA 241.

C. Predemolition Conference: Conduct conference at Project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be selectively demolished.

   2. Review structural load limitations of existing structure.

   3. Review and finalize selective demolition schedule and verify availability of

materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

1.05 PROJECT CONDITIONS

A. Condition of Structure: The State assumes no responsibility for actual condition of items or portions of structure to be removed.

B. Storage or sale of removed items or materials on-site will not be permitted.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Project Manager.

3.02 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the State and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the State and to authorities having jurisdiction.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
   1. State will arrange to shut off indicated utilities when requested by Contractor.

   2. Arrange to shut off indicated utilities with utility companies.

   3. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.

   4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.03 PREPARATION

A. Pest Control: Employ a certified, licensed exterminator to treat building and to control rodents and vermin before and during selective demolition operations.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from State and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

   2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.

   3. Protect existing site improvements, appurtenances, and landscaping to remain.

   4. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

   3. Protect walls, ceilings, floors, other existing finish work, equipment, tools, furnishing, etc. that are to remain or that are exposed during selective demolition operations.

D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

3.04 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.05 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically, as required by engineered shoring sequence.

   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

   5. Maintain adequate ventilation when using cutting torches.

   6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

   7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

   8. Dispose of demolished items and materials promptly.

   9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Project Manager, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

C. All materials resulting from removal work shall become the property of the Contractor and shall be removed from the limits of the State property. Noncombustible and combustible materials shall be disposed of outside the limits of State controlled land at the Contractor's expense at an acceptable solid waste disposal site. The Contractor is encouraged to recycle materials to maximum extent possible to avoid disposal at a landfill.

3.06 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Where damage has occurred to finished concrete or stucco finishes designated to remain, repair to paint ready.

C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off State's property and legally dispose of them.

END OF SECTION

SECTION 03013 CONCRETE REHABILITATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes work associated with repairs to delaminated and spalled concrete and cracked concrete. Design intent is for repairs to be blended with existing adjacent work to minimize difference in appearance between new repair and existing finish.

1.02 REFERENCES

A. The latest publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the designation only.

1. American Concrete Institute (ACI):

    a. ACI 301 - Specifications of Structural Concrete

    b. ACI 302.1R - Guide for Concrete Floor and Slab Construction

    c. ACI 304.2R - Placing Concrete by Pumping Methods

    d. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete

    e. ACI 318 - Building Code Requirements for Structural Concrete and Commentary

    f. ACI 347R - Guide for Concrete Formwork

    g. ACI 503R - Use of Epoxy Compounds with Concrete

2. American Society for Testing and Materials (ASTM):

    a. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

    b. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens)

    c. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar

    d. ASTM C150 - Standard Specification for Portland Cement

    e. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete

    f. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

    g. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field

h. ASTM C33 - Standard Specification for Concrete Aggregates

i. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

j. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete

k. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals

l. ASTM C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

3. American Welding Society (AWS):

a. AWS D1.1 - Structural Welding Code - Steel

b. AWS D1.4 - Structural Welding Code - Reinforcing Steel

1.03 SUBMITTALS

A. Product Data: Submit Manufacturer's data including installation instructions for the following:

1. Bonding Adhesives

2. Epoxy Coating for Rebar

3. Flexible Cementitious Reinforcing Steel Coating

4. Patching Mortar

5. Corrosion Inhibitor Admixture

6. Polymer-Modified Concrete and Mortar

7. Materials for curing concrete

8. Concrete Sealer

9. Epoxy Grout Penetrating Healer/Sealer

B. Design Data: Job Mix Formula: Submit, at least 15 days before concrete repair work commences, a job-mix formula for each type of patching mortar and polymer modified concrete and mortar. Identify the proposed source and proportions of all ingredients in the mix.

C. Manufacturer's Instructions: Submit descriptive information on the mixing and application equipment.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Reinforcement and accessories shall be stored off the ground on platforms, skids or other supports to avoid excessive rusting.

B. Protect materials from contaminants such as grease, oil and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

C. Inspect materials delivered to site for damage, unload and store with a minimum of handling. Deliver epoxy resin components and aggregate materials in original sealed containers and store in dry covered areas at temperatures below 90 degrees F. Remove from job site unused mixed materials which have reached end of working or pot life.

1.05 WEATHER LIMITATIONS

A. Follow manufacturer's instructions for weather conditions and temperature ranges.

1.06 PROTECTION

A. Prevent dust, dirt and debris generated by the work from blowing off and away from the work area or contaminating the surrounding areas.

B. Provide barricades and protective devices required to protect the public, on-site improvements and personnel from dust and hazards of repair work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. High strength Patching Mortar: A high strength, factory blended patching material combined with a polymer type admixture, corrosion inhibitor admixture, super-plasticizing admixture and water. The polymer type admixture shall be added at a ratio of at least 1 part polymer admixture to one to three parts of water (by volume) in accordance with manufacturer's recommendations. In addition, the ratio of polymer solids to cement weight shall not be less than 10%. Repair mortar shall be Verticoat Supreme as manufactured by The Euclid Chemical Company, or approved equal.

1. High Strength, Factory Blended Patching Materials: A fast-setting cementitious waterproof material (containing no gypsum) designed specifically for repairing concrete with the following minimum properties:

   a. Compressive Strength (ASTM C109)

      (i) 1 Day: 2,500 psi

      (ii) 28 Days: 6,000 psi

   b. Tensile Strength (ASTM C496)

      (i) 28 Day: 500 psi

c. Flexural Strength (ASTM C293)

(i) 28 Days: 1,400 psi

d. Chlorine Permeability

(i) 7 Days: 1,000 Coulombs

2. Polymer Type Admixture: An acrylic latex bonding admixture classified as non-reemulsifiable by the American Concrete Institute and shall be specifically designed for use as an additive for Portland cement mixes to improve adhesion, water resistance, and mechanical properties. The manufacturers' test data shall show that shear bond, tensile, compressive and flexural strengths of admixture modified cement mixes are at least 50 percent greater than unmodified cement mixes. Material shall be as recommended by manufacturer for use in areas subject to tidal wave action.

3. Super-Plasticizing Admixture: High-range water-reducing liquid admixture, ASTM C494/C494M, Type F or G.

4. Water: Water shall be fresh, clean, and potable.

B. Polymer Modified Concrete: Polymer modified concrete shall be a mixture of cement, fine aggregate, coarse aggregate, polymer type admixture conforming to ASTM C1059, Type II, corrosion inhibitor admixture, super-plasticizing admixture, and water. The polymer type admixture shall be added at a ratio of at least 1 part polymer admixture to one to three parts of water (by volume) in accordance with manufacturer’s recommendations. In addition, the ratio of polymer solids to cement weight shall not be less than 10%. Polymer modified mortar shall be similar to polymer modified concrete, except that no coarse aggregate or super-plasticizing admixture is used.

1. Cement: ASTM C150, Type I or II.

2. Aggregate:

a. Fine aggregate: ASTM C144

b. Coarse Aggregate: ASTM C33, 3/8-inch maximum size.

3. Polymer Type Admixture: An acrylic latex bonding admixture classified as non re-emulsifiable by the American Concrete Institute and shall be specifically designed for use as an additive for Portland cement mixes to improve adhesion, water resistance, and mechanical properties. The manufacturers’ test data shall show that shear bond, tensile, compressive and flexural strengths of admixture modified cement mixes are at least 50 percent greater than unmodified cement mixes. Material shall be as recommended by manufacturer for use in areas subject to tidal wave action.

4. Corrosion Inhibitor Admixture: A 30 percent calcium nitrite bsed corrosion inhibitor conforming to ASTM C494/C494M, Type C admixture, such as "DCI-S," shall be added at the rate of 5.5 gallons per cubic yard.

5. Super-plasticizing Admixture: High-range water-reducing liquid admixture, ASTM C494/C494M, Type F or G.

6. Water: Water shall be fresh, clean and potable.

C. Bonding Agent: Bonding agent shall be a 3-component, solvent free, moisture tolerant, epoxy-modified, cementitious product formulated as a bonding agent, meeting or exceeding the following criteria:

1. Compressive Strength (ASTM C109)

a. 3 Days: 4,000 psi

b. 28 Days: 8,000 psi

2. Flexural Strength (ASTM C348)

a. 28 Days: 1,250 psi

3. Splitting Tensile Strength (ASTM C496)

a. 28 Days: 600 psi

4. Bond Strength (ASTM C882): 14 days moist cure, plastic concrete to harden concrete:

a. Wet on wet: 2,800 psi

b. 24 hour open time: 2,600 psi

D. Concrete Penetrating, Corrosion Inhibiting, Impregnation Coating: Anti-corrosive coating for repaired concrete surfaces shall be a penetrating, corrosion inhibiting, impregnation coating for hardened concrete meeting or exceeding the following criteria:

1. Composition: Water Based

2. Viscosity: 15 cp

3. Appearance: Pale yellow or clear

4. Minimum Depth of Penetration: 3 inches in 28 days

5. VOC Content (EPA Method 24): 0 grams/liter

6. Flash Point: None (Water based)

7. Density: 1.3 (9.4 lbs/gal)

8. pH (acidity): 11 (+/- 1)

E. Epoxy

1. Epoxy for Coating of Rebar: 2-component, 100% solid, moisture-tolerant, structural epoxy conforming to ASTM C881.

2. Epoxy for Anchorage: 2-component, 100% solid, moisture-tolerant, high-modulus structural epoxy conforming to ASTM C881, Type IV, Grade 2/3 as required, Class C.

3. Epoxy for Crack Repairs:

    a. For Injections: 2-component, 100% solid, moisture tolerant, low-viscosity, high-strength, epoxy conforming to ASTM C881, Type IV, Grade 1, Class C.

    b. For Gravity-Feed: 2-component, 100% solid, moisture tolerant, epoxy crack healer/penetrating sealer conforming to ASTM C881, Type I/II, Grade 1, Class C.

F. Reinforcement:

1. Reinforcing Bars: ACI 301 unless otherwise specified. ASTM A706, Grade 60 unless noted otherwise.

G. Materials for Curing Concrete:

1. Impervious Sheeting: ASTM C171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

2. Pervious Sheeting: AASHTO M182

3. Liquid Membrane-Forming Compound: ASTM C309, white-pigmented, Type 2, Class B, free of paraffin or petroleum, compatible with the penetrating, corrosion inhibiting coating.

H. Material for Forms: Provide wood, plywood, steel, or formliner. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects.

1. Plywood: PS 1, B-B concrete form panels or better. Steel form surfaces shall not contain irregularities, dents, or sags.

I. Concrete Sealer: Sealer for repaired concrete surfaces shall be water-based alkylalkyoxysilane, meeting or exceeding the following criteria:

1. Composition: Alkylalkyoxysilane in water

2. Active Alkylalkyoxysilane Content: 40 percent by weight

3. Appearance: White, milky liquid

4. Average Depth of Penetration: 0.24 to 0.26 inches

5. VOC Content (EPA Method 24): less than 350 grams/liter

6. Flash Point: Greater than 150 degrees F

7. Specific Gravity, 25 degrees C: 0.95

8. Density: 7.9 lbs/gal

9. Water Absorption Test: 0.042 percent 48 hours, 1.20 percent 50 days, ASTM C672

10. Resistance to Salt, Acids, and Sunlight: Excellent

11. Scaling Resistance Test: 0 rating "No scaling," ASTM C672

2.02 EQUIPMENT

A. The equipment for blending the epoxy resin and patching materials shall be approved by the QC Manager. A suitable capacity metal or polyethylene container recommended by the epoxy manufacturer shall be used as the mixing vessel for blending the epoxy resin. Mixing shall be accomplished using a power drive (air or spark-proof) propeller type blade except that hand mixing may be used for small batches. Equipment for field mixing of epoxy resin shall be as specified by the epoxy manufacturer.

PART 3 - EXECUTION

3.01 PREPARATION

A. General: Mix the repair materials with or without fillers in strict accordance with the manufacturer's instruction. All applications of the mixed materials shall be performed within the working life or pot life of the patching system. Unused mixed materials which have reached the end of the working or pot life shall be removed from the job site at the Contractor's expense. Field mixing and size of batch shall be determined by the Contractor. Repairing systems shall be provided as indicated and required by this specification.

B. Spalled Areas: Remove loose concrete, oil, dirt, and coatings, from the spalled areas indicated to exposed clean, sound concrete. Inspect the cavity for any remaining defective concrete by tapping with a hammer or steel rod throughout the indicated areas and listening for dull or hollow sounds. In areas where tapping does not produce a solid tone, remove additional concrete until testing produces a solid tone. Use a high frequency chipping hammer or concrete saw to deepen cavity. Saw cut edges of cavity to depths as indicated, at a minimum distance of two inches outside the farthest edge of the spall or as indicated on the drawings. Do not feather edge. Roughen saw cut surfaces by power wire brushing or other acceptable means. Remove residual fines from all surfaces. Remove all rust from reinforcing steel by power wire brushing to expose clean, sound bare metal. Replace damaged reinforcing where indicated. Protect cleaned area from contaminating materials that may affect the bonding of the patching material. Provide a catchment/containment device to catch loose concrete, oil, dirt and coatings from the spalled areas during surface preparation.

C. Epoxy Grout for Cracks: Apply grout to newly exposed concrete free of loose and unsound materials. Prepare surfaces by sandblasting, scarifying or water

blasting. Remove dust, dirt, and loosely bonded material resulting from cleaning. Ensure surfaces are dry before application of epoxy grout.

3.02 MIXING MATERIALS

A. Make batches small enough to assure placement before binder or concrete sets. Mix materials in accordance with manufacturer's instructions.

3.03 PLACEMENT

A. Placing Reinforcement and Miscellaneous Materials:

1. ACI 301. Provide bars, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall not contain rust, scale, oil, grease, clay, and foreign substances that would reduce the bond.

2. Tolerances: Place reinforcement and secure with epoxy coated or noncorrodible chairs, spacers, or metal hangers.

3. Splicing: Weld splice in accordance with AWS D1.4. Lap splices shall be approved prior to use. Do not splice at points of maximum stress. All welded splices shall be cleaned to bare metal.

B. Application of Bonding Agent:

1. Apply by stiff-bristle brush to all reinforcing bars. Totally coat all reinforcing bars including the underside 20 mils thick. Allow coating to dry 2 to 3 hours, then apply a second coat at the same coverage 20 mils thick. Place repair mortar or concrete within 7 days.

2. Apply bonding slurry by stiff-bristle brush 20 mils thick worked well into concrete surfaces to ensure complete coverage of all surface irregularities. Apply repair mortar or concrete wet on wet or up to the manufacturer's recommended open time onto the bonding slurry.

C. Placement of Repair Mortar: Place repair mortar as recommended by the manufacturer. Each intermediate layer shall be cross-scratched for mechanical bonding. All layers for each patch shall be placed on the same day. Use vibratory floats, plates, or hand tampers to consolidate the patching material. Level each layer and screed the final surface. Remove excess patching material on adjacent surfaces before it hardens. Do not feather out onto adjacent surfaces. Upon completion of finishing operations, cure in accordance with the manufacturer's recommendations.

D. Polymer Modified Concrete:

1. Forms: Before concrete placement, coat the contact surfaces of forms and formliner with a nonstaining mineral oil, nonstaining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surface to which adhesive, paint, or other finish material is to be applied.

a. Coating: Formwork for sides of beams and similar parts of the work, that does not support weight of concrete may be removed after 24 hours after

placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained. The 24 hour period may be reduced to 12 hours in compliance with ACI 347R.

b. Removal of Forms: Prevent concrete damage during form removal.

2. Mixing: ASTM C94/C94M and ASTM C685/C685M where applicable. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if air temperature is greater than 85 degrees F.

3. Transporting: Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

4. Placing: Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved and all surfaces have been prepared. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris and water from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of the discharge. Place concrete in one continuous operation.

   a. Vibration: ACI 301. Furnish a spare vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches in depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straight edge. Operate vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators approximately 18 inches apart. Penetrate the previously placed lift with the vibrator when more than one lift is required. Place concrete in 18-inch maximum vertical lifts. External vibrators shall be used on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

   b. Apply bonding agent and anti-corrosion coating as specified.

   c. Pumping Method: ACI 304.2R. Concrete may be conveyed by positive displacement pumps when approved. The concrete mix shall be designed for pumping. The pump shall be the piston or squeeze pressure type. The pipeline shall be steel pipe or heavy duty flexible hose. The inside diameter of the pipe shall be at least three times the maximum size

of the coarse aggregate. The distance to be pumped shall not exceed the limits recommended by the pump manufacturer. The concrete shall be supplied to the pump continuously. When pumping is completed, the concrete remaining in the pipeline shall be ejected without contaminating the concrete in place. After each operation, the equipment shall be thoroughly cleaned, and flushing water shall be wasted outside the forms and away from any storm drains.

d. Hot Weather Concreting: ACI 305R. Provide and maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment (where worksite is remote to water source) to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the used of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

E. Application of Epoxy Coating on Rebar: The entire surface of the rebar shall be coated with epoxy prior to application of the patching material.

F. Application of Penetrating, Corrosion Inhibiting, Impregnation Coating: Coat finished repair areas with penetrating anti-corrosion coating. The area to be coated shall extend a minimum of 12” beyond the repaired area. Apply minimum of two coats by roller or brush. Wait time between coats: 1 hour. Apply to clean, dry concrete surface.

G. Epoxy Grouting of Cracks

1. Pressure Grouting of Cracks: Clean each crack of dust, dirt, loose concrete and unsound material. Insert a valve at both ends of each crack, at the junction of two cracks, and along the length of each crack at 16 to 20 inch intervals. Fill crack between valves with crack surface sealer. After each crack surface sealer has hardened and cured, pump crack sealer into valve at one end of crack. For vertical surfaces start at lowest valve and work upwards. As crack sealer appears at next valve, pinch closed pumping valve and move to next valve and commence pumping. Continue procedure until other end of crack is reached. Avoid delays in pumping operation. After crack sealer has hardened and cured grind valves off flush with concrete surface. Coat areas of valves with crack surface sealer and allow to harden and cure. Cure epoxy materials in accordance with manufacturer’s recommendations.

2. Non-Pressure Grouting of Cracks: Apply epoxy crack healer/penetrating sealr over flat slab surface by flat squeegee or broom. Spread the material over the

roof area and allow to pond over cracks. Let the epoxy penetrate into the cracks and remove excess epoxy with roller leaving no visible surface film.

3.04 SURFACE FINISH OF REPAIRS

A. The surface finish of repaired areas shall match the preapproved mockup repairs.

B. Do not reuse forms if there is any evidence of surface wear or defects that would impair the quality of the surface.

C. Smooth Form Finish: Apply smooth finish to the repair areas to match adjacent existing smooth surface finish. Use a mortar mix consisting of one part Portland cement and two parts well-graded sand passing no. 30 sieve, with water added to give the consistency of thick paint. After the surfaces have been thoroughly wetted and allowed to approach surface dryness, vigorously apply the mortar to the area by clean burlap pads or by cork or wood-floating, to completely fill all surface voids. Scrape off excess grout with a trowel. As soon as it can be accomplished without pulling the mortar from the voids, rub the area with burlap pads having their surface the same sand-cement mix specified above but without mixing water, until all of the visible grout film is removed. Tightly stretch the burlap pads used for this operation around a board to prevent dishing the mortar in the voids. Complete the finish of any area in the same day, and make the limits of a finished area at natural breaks in the surface. Continuously moist cure the surface for 48 hours commencing immediately after finishing operations in each area.

D. Formliner Finish: Apply this type of finish to repair areas to match adjacent existing “fractured fin” finish. Formliners used shall match existing formliner finish of the structure. Secure liner panels in the forms by methods recommended by the manufacturer but not by methods that will permit impressions of nail heads, screw heads, washers, or the like to be imparted to the surface of the concrete. Seal edges of formliner panels to each other to prevent grout leakage. Use sealant that is nonstaining to the surface.

3.05 CURING AND PROTECTION

A. ACI 301 unless otherwise specified. Begin curing immediately following form removal. Protect concrete form injurious action by sun, rain, flowing water, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period.

B. Moist Curing: Provide for the removal of water without erosion or damage to the structure.

1. Ponding or Immersion: Continually immerse the concrete throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete.

2. Fog Spraying or Sprinkling: Provide uniform and continuous application of water throughout the curing period.

3. Pervious Sheeting: Completely cover surface and edges of the concrete with two thicknesses of wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. Sheeting shall be at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the curing period.

4. Impervious Sheeting: Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edged and transverse laps to form closed joints. Repair torn or damages sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting, overlap and continuously tape sheeting joints, and introduce sufficient water to soak the entire surface prior to completely enclosing.

C. Liquid Membrane-Forming Compound Curing: Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.

1. Application: Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Respray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

2. Protection of Treated Surfaces: Maintain continuity of the coating for the entire curing period and immediately repair any damage.

D. Curing Periods and Minimum Temperatures: After placing concrete, maintain air temperature adjacent to the concrete at 60 degrees F minimum for the specified time period, or 70 degrees F minimum for a period of 3 days after placing, unless otherwise directed.

1. Additional Curing: Double the required curing period in either one or the average of both 7-day test cylinders indicate less than 90 percent of the strength specified (f'c).

E. Concrete Sealer: After concrete repairs have been cured for a minimum of 14 days, the repaired areas and existing concrete surfaces shall be cleaned to remove all laitance and coated with concrete sealer as specified. Apply sealer with low pressure sprayer in accordance with manufacturer's instructions at rate of 150 to 200 square feet per gallon.

3.06 FIELD QUALITY CONTROL

A. Sampling: As soon as epoxy resins and aggregate materials are available for sampling, obtain by random selection a sample of each batch. Clearly identify samples by designated name, specification number, batch number, project contract number, intended use and quantity involved

B. Testing: At the discretion of the Contracting Officer, samples provided may be tested by the Government for verification. Test samples by an approved laboratory. If samples fails to meet specification requirements after two tests, replace the batch represented by the samples tested and retest.

C. Inspection: Examine material at the job site to determine that it is the material referenced in the report of test results or certificate of compliance. Surface preparations and application procedures will be examined by the Contracting Officer to determine conformance with the requirements specified. Approve each separate operation prior to initiation of subsequent operations.

D. Manufacturer’s Representative: Arrange for manufacturer's technical representative to be on project site to advise installer of proper procedures and precautions for the use of materials and to check installation.

END OF SECTION

SECTION 05140 – STRUCTURAL ALUMINUM FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes work associated with structural aluminum framing.

1.02 REFERENCES

A. The latest publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the designation only.

1. Aluminum Association

a. Aluminum Design Manual

2. American Society for Testing and Materials (ASTM):

a. ASTM B308 Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles

b. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

c. ASTM B429 Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube

3. American Welding Society (AWS):

a. AWS D1.2 Structural Welding Code – Aluminum

1.03 SUBMITTALS

A. Shop Drawings:

1. Complete fabrication and erection plans and procedures giving full information on all aspects of the erection that will affect alignment, plumb and dimensional accuracy of the structure.

2. Connections, including size and spacing of bolts and welds.

3. Indicate profiles, sizes, spacing, and locations of structural members, openings, camber and attachments.

4. Indicate welded connections with AWS welding symbols. Indicate net weld lengths. Include details of welding materials, equipment, sequence and technique to be used.

B. Product Data: Submit Manufacturer’s data including installation instructions for the following:

1. Welding electrodes and rods

2. Non-Shrink Grout

3. Bolts

C. Test Reports:

1. Bolts, Nuts, and Washers

2. Supply the certified manufacturer’s mill reports which clearly show the applicable ASTM mechanical and chemical requirements together with the actual test results for the supplied fasteners.

D. Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Aluminum

2. Bolts, Nuts, and Washers

3. Welding Procedures and Qualifications

1.04 QUALITY ASSURANCE

A. Shop Drawings

1. Fabrication and Erection Drawing Requirements: Submit fabrication drawings for approval prior to fabrication. Fabrication drawings shall not be reproductions of contract drawings. Include complete information for the fabrication and erection of the structure's components, including the location, type, and size of bolts, welds, member sizes and lengths, connection details, blocks, copes, and cuts. Use AWS A2.4 standard welding symbols. Member substitutions of details shown on the contract drawings shall be clearly highlighted on the fabrication drawings. Explain the reasons for any deviations from the contract drawings

B. Certifications

1. Welding Procedures and Qualifications: Welders shall be qualified in accordance with AWS D1.2 for each process, position and joint configuration. Prior to welding, submit certification for each welder stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests. If the qualification date of the welding operator is more than one-year old, the welding operator's qualification certificate shall be accompanied by a current certificate by the welder attesting to the fact that he has been engaged in welding since the date of certification, with no break in welding service greater than 6 months. Conform to all requirements specified in AWS D1.2.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site at such intervals to insure uninterrupted progress of work. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time not to delay work

B. Storage: Store Materials to permit easy access for inspection and identification. Keep members off ground, using pallets, platforms, or other supports. Protect members and packaged materials from corrosion and deterioration. Do not store materials on structure in a manner that might cause distortion or damage to members or support structure.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Structural Aluminum: Aluminum standard structural shapes shall be rolled or extruded, and shall be of ASTM B 308, Alloy 6061-T6.

B. Stainless Steel Fasteners:

1. Bolts: ASTM F593 Grade 316

2. Nuts: ASTM F594 Grade 316

2.02 STRUCTURAL ALUMINUM ACCESSORIES:

A. Welding Electrodes and Rods: AWS D1.2.

B. Non-Shrink Grout: ASTM C 1107, with no ASTM C 827 shrinkage. Grout shall be nonmetallic.

2.03 FABRICATION:

A. Fabrication and assembly shall be done in the shop to the greatest extent possible. Mark and match-mark materials for field assembly. Shop splices of members between field splices will be permitted only where indicated on the Contract Drawings. Splices not indicated require the approval of the Engineer.

1. Post and Tube Columns: Shop Weld a closure plate to top of columns to form a watertight closure.

B. Welded Construction: Comply with AWS code for procedures, appearance, and quality. Weld continuously along the entire area of contact except where tack welding is indicated.

2.04 FINISHES

A. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces as follows:

1. Steel surfaces to be placed in contact with uncoated aluminum shall be painted with one coat of zinc-molybdate, alkyd type primer in accordance with

Federal Specification TT-P-645B, followed by two coats of paint consisting of two pounds of aluminum paste pigment per gallon of varnish. Aluminum paste pigment shall conform to ASTM D 962, Type 2, Class B. Varnish shall conform to Federal Specification TT-V-81G, Type II.

2. Surfaces of stainless steel, aluminized steel, hot-dip zinc-coated steel, or electrogalvanized steel to be placed in contact with aluminum shall not be painted unless otherwise indicated in the contract documents.

3. Aluminum surfaces to be placed in contact with wood, fiberboard, or other porous material; or in contact with concrete or masonry, shall be given one heavy coat of alkali-resistant bituminous paint before installation. Bituminous paint shall conform to Military Specification MIL-P-6883. Paint shall be applied as received from manufacturer without adding thinner. Aluminum embedded in concrete shall be painted in accordance with Subsection 715.02(D).

4. Aluminum surfaces to be embedded in concrete shall be painted with one coat of zinc-molybdate primer in accordance with Federal Specification TT-P-645B. Aluminum shall not be embedded in concrete to which corrosive components such as chlorides have been added if aluminum will be electrically connected to steel.

5. Aluminum shall not be exposed to water that has come in contact with heavy metal, such as copper. Heavy metal shall be painted or coated with plastic; or drainage from the heavy metal shall be diverted away from the aluminum.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verification of Conditions: Examine surfaces to receive aluminum framing for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Before erection, paint contact surfaces between dissimilar materials.

3.02 EXAMINATION

A. Verify that field conditions are acceptable and are ready for erection.

3.03 ERECTION

A. Where members can not be properly assembled due to misfabrication or deformation due to handling or transportation, report the condition to the Contracting Officer with a proposed method of correction for approval. Erect structure to the lines and grades indicated on the Drawings and in accordance with the Shop Drawings.

B. Do not field cut or alter structural members without approval of the Contracting Officer.

C. Bases and Bearing Plates:

1. Setting: Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.

2. Anchor Bolts: Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

3. Grouting: Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's instructions for conditions and type of installation.

3.04 WELDING

A. Welding must be in accordance with AWS D1.2. Grind exposed welds smooth. Provide AWS D1.2 qualified welders, welding operators, and tackers. The Contractor shall develop and submit the Welding Procedure Specifications (WPS) for all welding, including welding done using prequalified procedures. Prequalified procedures may be submitted for information only; however, procedures that are not prequalified shall be submitted for approval.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Contractor to perform field tests, and provide labor, equipment, and incidentals required for testing. The Engineer shall be notified in writing of defective welds, bolts, nuts, and washers within 7 working days of the date of weld inspection.

C. Shop Welds:

1. Visual Inspection: AWS D1.2. Furnish the services of AWS-certified welding inspectors for fabrication and erection inspection and testing and verification inspections. Welding inspectors shall visually inspect and mark welds, including fillet weld end returns.

2. The Contractor shall hire and pay for Special Inspection services.

D. Field Welds:

1. Nondestructive Testing: AWS D1.2. All welds shall be dye penetrant tested in accordance with methods established in ASTM E 165. Allowable defects shall conform to AWS Specification D1.2. In addition to dye penetrant testing, all full penetration weld joints shall be subjected to 100 percent ultrasonic examination. If more than 20 percent of welds made by a welder

contain defects identified by dye penetrant testing, then all welds made by that welder shall be tested by ultrasonic testing, as approved by the Engineer. When all welds made by an individual welder are required to be tested, magnetic particle testing shall be used only in areas inaccessible to ultrasonic testing. Retest defective areas after repair.

END OF SECTION

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Provide all miscellaneous metal fabrication work, including but not limited to, the following:
   1. Aluminum metal railings infill for structural aluminum guards.

   2. Include all anchors, angles, bolts, expansion shields for items in this section only, and other accessories shown in details and/or required for the complete installation of all work.

B. Related Sections include the following:
   1. Section 05140 – STRUCTURAL ALUMINUM: Structural aluminum railing support and guard system.

1.02 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.03 SUBMITTALS

A. Submit in accordance with Section 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer’s Data: Submit manufacturer’s product data for all manufactured products.

C. Shop Drawings: Submit shop drawings for fabrication and erection of metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others. Where materials or fabrications are indicated to comply with certain requirements for design loadings include structural computations, material properties and other information needed for structural analysis.

D. Samples: Submit 3 each samples of the following: Prefinished railing components. Submit a small scale mock-up of railing system with all components including post, a minimum of 2 pickets, top rail and all other components to be used.

1.04 SYSTEM PERFORMANCES

A. General: Engineer systems to withstand structural loads indicated, determine allowable design working stresses of materials based on the following:
   1. For aluminum: AA 30 “Specifications for Aluminum Structures”.

B. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding structural loads required by the current International Building Code as amended and ASTM E 985 but not less than the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections based on testing performed in accordance with ASTM E 894 and ASTM E 935:
   1. Rail of Guards: Coordinate with Structural Drawings.

   2. Infill Area of Guards: 50 pound per linear foot. Capable of withstanding a horizontal concentrated load of 250 pounds applied to 1 square foot at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guard.

1.05 PRODUCT HANDLING

A. Protection: The Contractor shall use all means necessary to protect all materials before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacement: In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the satisfaction of the Project Manager and at no additional cost to the State.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aluminum Bar and Tube: ASTM B 221/B 221M, Alloy 6063-T5, 6063-T6, and 6063-T52.

B. Aluminum Extruded Structural Pipe and Tube: ASTM B 429, Alloy 6063-T5, 6063-T6 and 6063-T52.

C. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

D. Aluminum Castings: ASTM B 26/B 26M, A356-T6.

E. Anchors and Fasteners: Grade 316 Stainless Steel.

F. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

G. Railing and Guardrail System: Railing and guardrail system shall be Jayco Hawaii Series 300 components as listed below or equal by Julius Blum & Co. or Crane Veyor Corp.
   1. Connection Rail: Per Drawings.

   2. Vertical Pickets: Per Drawings.

3. Fasteners: Grade 316 Stainless Steel.

2.02 FABRICATION

A. Workmanship:

1. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.

2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32-inch unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

3. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

4. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

5. Provide weep holes or another means to drain entrapped water in hollow sections of members that are exposed to exterior or to moisture from condensation or other sources. Fill voids below weep level to assure utility of weep holes.

B. Connections: Fabricate railing systems and handrails by connection members with railing manufacturer's standard concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

2.03 METAL FINISHES

A. Aluminum: All exposed aluminum surfaces shall be free of scratches and other blemishes. Provide clear anodized finish conforming to Aluminum Association Standard AA DAF-45, "Designation System for Aluminum Finishes" AA-Ml 2-C22-A42, Architectural Class I, (0.7 mil or greater) for all exposed surfaces.

2.04 ANCHORAGE, FASTENINGS, AND CONNECTIONS

A. Anchorage: Provide anchorage for fastening work securely in place. Sizes, kinds, and spacings of anchors not indicated or specified shall be as necessary for the purpose, as approved.

B. Fastenings: Do not use wood plugs in any material. Use non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, and harmonizing with the material to which fastenings are applied. Conceal fastenings where practicable. Drill and punch to produce clean true lines and surfaces.

C. Threaded Connections: Make threaded connections up tight so that threads are entirely concealed. Make bolted work up tight and nick the threads or bush the stem to prevent loosening. Abutting bars shall be shouldered and headed,

dowelled and pinned. Pass small bars through larger bars and pin. Rivet, bolt, and screw heads shall be flat and countersunk in exposed work and elsewhere as required. Machine removable members and fit and secure by means of screws or bolts of proper size and approved spacing.

D. Anchors and Connecting Members: Cut, fit, and drill as necessary so materials are properly set in place and to permit engaging work to be properly installed.

PART 3 - EXECUTION

3.01 PREPARATION

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages. Coordinate delivery of such items to project site.

3.02 INSTALLATION

A. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

B. Fit exposed connections accurately together to form tight hairline joints. Grind exposed joints smooth.

C. Align rails so that variations from level for horizontal members, parallel for aligned members, and rake for steps, ramps, and sloped members shall not exceed 1/4-inch in 12-feet.

D. False Work: Provide guys, braces and false work for temporary support of parts of the work and remove when work is self-supporting.

E. Top and bottom railings shall be fully welded to the structural aluminum posts.

3.03 MISCELLANEOUS METAL FABRICATIONS

A. The following fabricated assemblies are described in brief outline to indicate, in addition to the drawings, the general design and details desired. Standard products of manufacturers specializing in similar work will be considered insofar as they fulfill the requirements and do not violate governing codes for building and standards of good construction work.
   1. Railings:
      a. General: Fabricate railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of hollow members, post spacings, and anchorage.
      b. Preassemble railing systems in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as

necessary for shipping and handling limitations. Clearly mark units for field assembly and coordinated installation. Use connections that maintain structural value of joined pieces.

c. Fabricate to design, dimensions, and details indicated. Provide members formed of pipe, bar, plates, squares, and tube of sizes indicated, but not less than that required to support design loading.

END OF SECTION