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1. GENERAL

The following sections generally describe the removal project. Note that this scope of work does not include asbestos containing materials or universal waste and miscellaneous waste.

1.1. Scope of Work

The scope of work involves the removal of materials with lead containing surfaces (LCSs) prior to renovation or demolition activities that would disturb these LCSs. LCSs have been summarized in Table 1 below. These surfaces were identified during the Lead-Based Paint inspection completed by National Econ Corporation (NEC), under NEC Project #:15-1836 and dated December 2, 2015.

It is noted that lead-containing paint/glaze should be removed prior to demolition to minimize the quantity of lead containing waste.

Table 1 – Positive Lead Results Summary

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>ROOM/AREA</th>
<th>COMPONENT</th>
<th>SUBSTRATE</th>
<th>COLOR</th>
<th>CONDITION</th>
<th>CLC</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement Level</td>
<td>B13 (Weight Room Storage)</td>
<td>Wall</td>
<td>Ceramic Tile</td>
<td>Blue</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>150 SF</td>
</tr>
<tr>
<td>Basement Level</td>
<td>B14 (Women’s RR)</td>
<td>Wall</td>
<td>Ceramic Tile</td>
<td>Pink</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>60 SF</td>
</tr>
<tr>
<td>Ground Level</td>
<td>Exterior</td>
<td>Wall</td>
<td>Ceramic Tile</td>
<td>Black</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>120 SF</td>
</tr>
<tr>
<td>Second Level</td>
<td>205 &amp; 206 (Toilet &amp; Shower)</td>
<td>Wall</td>
<td>Ceramic Tile</td>
<td>Blue</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>400 SF</td>
</tr>
<tr>
<td>Third Level</td>
<td>304 &amp; 305 Unisex Restrooms</td>
<td>Wall</td>
<td>Ceramic Tile</td>
<td>Pink &amp; Blue</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>400 SF</td>
</tr>
<tr>
<td>Fourth Floor</td>
<td>404 Women’s Restroom</td>
<td>Walls</td>
<td>Ceramic Tile</td>
<td>Pink</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>200 SF</td>
</tr>
<tr>
<td>Fourth Floor</td>
<td>405 Men’s Restroom</td>
<td>Walls</td>
<td>Ceramic Tile</td>
<td>Blue</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>200 SF</td>
</tr>
<tr>
<td>Fifth Floor</td>
<td>504 Women’s Restroom</td>
<td>Walls</td>
<td>Ceramic Tile</td>
<td>Blue</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>200 SF</td>
</tr>
<tr>
<td>Fifth Floor</td>
<td>505 Men’s Restroom</td>
<td>Walls</td>
<td>Ceramic Tile</td>
<td>Pink</td>
<td>Good</td>
<td>&gt;9.9</td>
<td>200 SF</td>
</tr>
</tbody>
</table>

NOTE: The above table only includes readings indicating the presence of “Lead-Based Paint” (LBP) to be present. All other paints and coatings must be considered to contain some amount of lead and appropriate work practices, training and procedures apply when impacting them. Any ceramic tile not specifically identified in the lead inspection report associated with this project, or not referenced above shall be treated as LBP for the purposes of this project.

The quantities for positive surfaces are the Contractor's responsibility to quantify as part of the Contractor's due diligence, and prior to initiating demolition activities.
Specific contractor responsibilities include, but are not limited to the following:

- The Contractor is responsible for the protection and decontamination of fixtures and equipment remaining in the work area, prior to, and after removal.

- The Contractor shall furnish all labor, materials, services, insurance, equipment, and decontamination facilities to carry out the removal and disposal of all LCS identified in these specifications that are to be impacted by the demolition activities.

- Areas of intact LCS that become poorly adhered (not intact) during the course of demolition activities shall be removed by the Contractor.

- Work shall be performed in accordance with all applicable regulations, codes, ordinances, and standards of governing authorities having jurisdiction and the requirements specified herein. Where applicable state or local standards are more stringent than federal standards, the Removal Contractor shall adhere to the most stringent standards.

- The Contractor shall extend full cooperation to Rio Hondo College and/or its Representatives in all matters involving the use of Rio Hondo College facilities. At no time shall the Contractor cause or allow there to be caused conditions that may cause risk or hazard to the general public or conditions that might impair safe use of the facility. The use of the facility's electricity, water or like utilities by the Contractor shall be coordinated through Rio Hondo College and/or its Representatives.

- The Contractor shall submit a time-line schedule, not date specific, to Rio Hondo College and/or its Representatives for integration into the overall project schedule and coordinate the work with that of all other trades. Phasing and scheduling of this project will be at the discretion of Rio Hondo College and/or its Representatives and shall not proceed in any area without the express consent of Rio Hondo College and/or its Representatives. The Contractor shall be available within 24 hour notice for additional work or rework if after acceptance of the work it is found that full removal was not achieved from the initial work effort as determined by Rio Hondo College and/or its Representatives.

1.2. Applicability

- As defined by Title 17, California Code of Regulations (CCR), Division 1, Chapter 8, Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards, "lead-based paint" means paint, other surface coatings, or items that contain an amount of lead equal to, or in excess of 1.0 milligram per square centimeter (mg/cm²) or more than 0.5 percent by weight (%/wt). Note that the action level for a LCS, as used in the survey and this specification, was 0.7 mg/cm² in accordance with the County of Los Angeles action level for a lead bearing substance (LBS). For the purposes of this specification, LCS refers to LBP, LBS, and other potential lead-containing materials, including, but not limited to, ceramic tile and porcelain bathroom fixtures.
1.3. Removal Contractor Qualifications and Responsibilities

Rio Hondo College and/or its Representatives requests that documentation be provided for all aspects of the work at the bid opening detailing the firm's qualifications on the following criteria:

- California Contractors License, granted by the California Contractors State License Board.
- All workers assigned to this project shall have been trained in accordance with California Construction Safety Orders, 1532.1 Lead-Related Construction.
- The onsite supervisor shall hold "Lead-Related Construction Supervisor" certification granted by the California Department of Public Health (CDPH).

1.3.1. Document Review

The Contractor shall examine all Drawings and all other sections of the specifications for requirements affecting the work of this section. Questions on interpretations, omissions, and methods should be referred to Rio Hondo College and/or its Representatives.

1.3.2. Notifications/Approvals

The Contractor shall make all applicable (in proper and timely fashion) and necessary notifications to relevant federal, state, and local authorities and shall obtain and comply with the provisions of all permits or applications required by the work specified, as well as make all submittals required under those auspices. The Contractor shall indemnify Rio Hondo College and its Representatives, from, and pay for all claims resulting from failure to adhere to these provisions. The costs for all permits, applications, and the like, are to be assumed by the Contractor.

1.3.3. Fees, Permits, and Licenses

- The Contractor shall pay all licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing the performance of the job specified in this Specification. The Contractor shall be solely responsible for costs, damages, or losses resulting from any infringement of these patent rights or copyrights. The Contractor shall hold Rio Hondo College and/or its Representatives harmless from any costs, damages, and losses resulting from any infringement of these rights or copyrights. If the Contract Specification requests the use of any product, design, invention, or process
that requires a licensing fee or royalty fee for use in the performance of the job, the Contractor shall be responsible for the fee or royalty and shall disclose the existence of such rights.

- The Contractor shall be responsible for costs for all licensing requirements and notification requirements and all other fees related to the ability of the Removal Contractor to perform the work in this section.

- The Contractor shall be responsible for securing all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

1.4. Definitions

- "Contractor" shall refer to the contractor responsible for lead-related construction, or any disturbance of LCSs, presumed LCSs, or any other leaded material.

- "Consultant" shall refer to an independent, third-party retained by Rio Hondo College and/or its Representatives to provide consultation and supervision services for lead-related construction activities.

- High-efficiency particulate air (HEPA) filter shall refer to a filter capable of filtering out mono-dispersive particles of 0.3 micron from a body of air at 99.97 percent efficiency or greater.

- "Project" shall refer to any lead-related construction to be carried out as part of the facility demolition.

1.5. Removal Contractor Submittals

The following sections describe the minimum required Contractor submittals.

1.5.1. Project Specific Work Plan

The Removal Contractor shall prepare and submit a detailed job specific plan of the work procedures to be used in the removal of materials containing lead at least two weeks prior to the start of work. A generalized, "boiler-plate" type of plan will not be accepted.

- The plan shall be prepared and signed by the Contractor and Contractor's Competent Person.

- The sequencing of the work.

- The timing and projected completion of the work.

- The plan shall also include interface of trades involved in the construction, sequencing of lead-related work, disposal plan, type of wetting agent and removal encapsulants to be used, respirators, protective equipment,
pressure differential monitoring devices, and a detailed description of the method to be employed in order to control pollution.

- The procedures to contain, package and remove the waste from the work area and the procedures and locations of the disposal of hazardous and non-hazardous waste.

- A personal air sampling plan to include air sampling training and strategy, sampling locations, projected number of samples, and frequency, methodology, and duration of sampling.

- A safety precautions plan may include special precautions taken by the Contractor in performing their respective tasks, safety equipment to be worn by employees, frequency of safety meetings, and all other relevant functions to be performed by the Contractor, to ensure a safe workplace.

- Proposed respiratory protection program for employees throughout all phases of the job, including make, model, and National Institute for Occupational Safety and Health (NIOSH) approval numbers of respirators to be used.

- Written description, for Rio Hondo College and/or its Representatives review and acceptance of all proposed procedures, methods, or equipment to be used that differ from the contract specifications, including manufacturers specifications on any equipment not specified for use by this Section; in all instances, the Contractor must comply with all applicable federal, state, and local regulations.

- The name and address of the Contractor's personal air monitoring and waste disposal lead testing laboratory(ies) including certification(s) of Environmental Lead Proficiency Analytical Testing (ELPAT) accreditation for heavy metal analysis, listing of relevant experience in air and debris lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

- Name, address, and identification (ID) number of the proposed construction debris site.

- Name, address, and ID number of hazardous disposal site. Documents must be submitted from these sites proving they are licensed to accept such waste and will accept such waste.

- Copy of Abatement Plan as specified in Title 17, Division 1, Chapter 8, Section 36100(b).

- Any other data that enhances this work plan. Innovative ideas and/or technology are encouraged.
1.5.2. Other Submittals

The following items will be requested by Rio Hondo College and/or its Representatives, either prior to or during lead-related construction activities:

- Copies of all notifications, permits, applications, licenses and similar documentation required by federal, state, or local regulations, including, but not limited to, CDPH Form 8551 (do not submit), Cal-OSHA Notification, and equipment licensing and certification from the local environmental regulatory agency. Copies of the notification(s) shall be given to Rio Hondo College and/or its Representatives a minimum of one week prior to the beginning of work.

- Copies of medical records, indicating that each individual has been medically cleared, via blood lead level testing, to perform work involving lead, or a notarized statement by the examining medical doctor that such examinations took place within the past 12 months for each employee to be used on the project.

- Copies of the records of a successful respirator fit testing performed by a qualified individual within the previous 12 months, for each employee to be used on this project with the employee's name on each record. NOTE: In the event employees are hired after the project start date, the Contractor shall supply the proper documentation as required at least 24 hours in advance of their start.

- List of all supervisors and workers intended to be assigned to the project and copies of CDPH Lead-Related Construction Certifications.

- Safety Data Sheets (SDS) for all materials and chemicals to be used on the project.

- Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.

- Map number and evidence that the Contractor has contracted with a hauler/disposal facility must be presented at the pre-construction meeting.

- Cal-OSHA Lead Compliance Program, Title 8, Section 1532.1.

- Cal-OSHA Respiratory Protection Program, Title 8, Section 5144.

- Cal-OSHA Injury and Illness Prevention Program, Title 8, Section 3203.

- Copies of manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill’s authorized representative.

- A copy of the entry-exit logbook.
- All personal monitoring results.
- All waste characterization test results.

1.5.3. Substitution of Materials and/or Methods

- Any substitution in materials or methods to those specified shall be approved by Rio Hondo College and/or its Representatives prior to use. Any requests for substitution shall be provided in writing to Rio Hondo College and/or its Representatives. The request shall clearly state the rationale for the substitution. The Contractor shall submit to Rio Hondo College and/or its Representatives product data and samples of all materials to be considered as an alternate.

- Product data shall consist of manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts illustrations, Safety Data Sheets (SDSs) and other standard descriptive data. Submittal data shall be clearly marked to identify pertinent materials, products or models and show performance characteristics and capacities. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product or material with integrally related parts and attachment devices.

- No work shall begin, which requires submittal for approval, until Rio Hondo College and/or its Representatives has "approved" or "approved as noted" the submittal.

1.6. Codes and Standards

All work shall conform to the standards set by applicable federal, state, and local laws, regulations, ordinances, and guidelines in such form in which they exist at the time of the work on the contract and as may be required by subsequent regulations.

While many of the following standards were written for residential housing, it has become standard industry practice to apply the following standards to schools, commercial buildings and industrial settings. The following is a partial list:

- The Contractor shall comply with the requirements of the California General Industry Safety and Health Standards, and the Safety and Health Regulations for Construction, Title 8, CCR, including, but not limited to the following sections:
  
  o Section 5144: Respiratory Protection
  o Section 2405.4: Electrical
  o Section 1637, 1640, 1658: Scaffolding
  o Section 1513: Housekeeping
  o Section 5194: Hazard Communication
The Contractor shall comply with the United States Environmental Protection Agency (EPA) Regulations pertaining to handling and disposal of lead-containing materials, as well as the State of California and any local agencies, which have delegated responsibility for the administration and enforcement of federal regulations.

- 22 CCR, Section 66261
- 10 Code of Federal Regulations (CFR), Part 261

The Contractor shall comply with all requirements for disposal in an EPA-approved disposal site.

The Contractor shall comply with California Title 17, Section 8.

CDPH Certification of Lead-Related Construction Activities and work practices.
• The following may also apply to this project:
  o 24 CFR Parts 35, 36, 37: United States Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards and Housing
  o American Society for Testing Materials (ASTM)
  o American National Standards Institute (ANSI)
  o ANSI Z228.2-8: Practices

• In addition to any detailed requirements of the Specification, the Contractor shall at his own cost and expense comply with all laws, ordinances, rules, regulations, and guidelines of federal, state, regional, and local authorities regarding handling and storing of lead waste material.

• All regulations by the above and other governing agencies in their most current version are applicable throughout this project. Where there is a conflict between this Specification and the cited federal, state, or local regulations or guidelines, the more restrictive or stringent requirements shall prevail. This Section refers to many requirements found in these references, but in no way is it intended to cite or reiterate all provisions therein or elsewhere. It is the Contractor's responsibility to know, understand, and abide by all such regulations, guidelines, and common practices.

2. PROTECTIVE PROCEDURES

The following sections describe the minimum required protective procedures for the LCS work.

2.1. Worker Protection Requirements

The following sections describe the minimum required worker protections.

2.1.1. Biological Monitoring

The Contractor will provide Rio Hondo College and/or its Representatives with copies of the biological monitoring required under the "Lead in Construction Standard," Title 8 CCR1532.1.

2.1.2. Training Requirements

All workers and supervisors shall have completed a CDPH approved training course provided by an accredited training provider and be able to provide copies of their updated certification while working at the site.

2.1.3. Supervision

The Contractor shall provide one site CDPH Supervisor whose responsibilities include coordination, safety, security, and execution of all phases of the lead removal project. The Supervisor shall not be used as a lead removal worker, and
shall be assigned full time to the project. The Supervisor shall be fully qualified in all aspects of lead removal practices and procedures, as well as training in relevant federal, state, and local regulatory requirements, procedures and standards, supervisory techniques, reading and interpreting lead inspection reports, and proper disposal procedures.

The Contractor shall ensure that all workers are familiar with all aspects of proper removal practices during the performance of the work, i.e., workers are trained and prepared to do a good and careful job, and to protect themselves and present building occupants.

2.1.4. Personal Protective Equipment (PPE)

- Personal protection, in the form of disposable coveralls and NIOSH-approved respirators, is required for all workers, supervisors, and authorized visitors entering the work area during the removal and cleaning operations.

- Each worker shall be supplied with disposable suits every day.

- Under no circumstances will anyone entering the removal area be allowed to reuse a contaminated suit. In addition to disposable suits for the workers, the Removal Contractor shall also supply suits for Rio Hondo College and/or its Representatives, Consultant, and other personnel who are authorized to inspect the worksite. Disposable suits, such as TYVEK™ suits, and other PPE must be donned prior to entering work area. A clean area will be provided for workers to put on suits and other PPE and to store their street clothes.

- Work clothes shall consist of disposable full-body suits, head covers, gloves with cuffs extending outside the sleeves of the protective suit, boot or shoe covers, and other protection as needed. Hard hats shall be worn, as required.

- Eye protection to personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.

- Goggles with side shields will be worn when working with a material that may splash or fragment, or if protective eye wear is specified on the SDS for that product.

2.1.5. Respirators

- The Contractor shall supply workers and supervisory personnel with NIOSH-approved respirators and HEPA filters. Respiratory protection shall be implemented for all work performed by the Removal Contractor under this Section. The respirators shall be sanitized and maintained according to the manufacturer's specifications. Disposable respirators shall not be considered acceptable under any circumstances. The Contractor will maintain on site a sufficient supply of HEPA filters to
allow workers and supervisory personnel to change contaminated filters per manufacturer's recommendations or when breathing resistance is encountered. The Contractor is solely responsible for means and methods used and for compliance with applicable regulations.

- Additional respiratory protection by supplemental filters, such as organic vapor cartridges, may be needed when handling some coating products. Consult the SDS and obtain the proper filters as necessary.

- Respirators shall be individually assigned to removal workers for their exclusive use. All respiratory protection shall be provided to workers in accordance with the approved respiratory protection program, which includes all items in the Cal-OSHA Respiratory Protection Program Title 8, Section 5144. A copy of this program shall be kept at the worksite, and shall be posted in the clean area.

- Workers must perform negative and positive pressure fit tests each time a respirator is put on, whenever the respirator design so permits.

- Powered air purifying respirators shall be tested for adequate flow as specified by the manufacturer.

- Workers shall be given a qualitative fit test in accordance with procedures detailed in OSHA 29 CFR 1910.134, Qualitative Fit Test Protocols, for all respirators to be used on this removal project. An appropriately administered quantitative fit test may be substituted for the qualitative fit test.

- If a question exists as to the proper selection of respirators, the Contractor may consult Cal-OSHA information.

- Upon leaving the active work area, cartridges must be removed and respirators wet wiped or cleaned in a disinfectant solution and clean water rinsed.

- Clean respirators should be stored in plastic bags when not in use.

- The Contractor's Competent Person shall inspect respirators daily for broken, missing, or damaged parts.

- The Contractor shall comply with all Cal-OSHA and/or other applicable requirements of worker medical examinations for approval to wear respiratory protection, and shall submit documentation of such approval to Rio Hondo College and/or its Representatives.

2.2. Personal Air Sampling

The following sections describe the minimum required personal air sampling for the removal.
2.2.1. General

The Contractor is required to perform the personal air sampling activities. The results of such sampling shall be posted, provided to individual workers, and submitted to Rio Hondo College and/or its Representatives as described herein.

2.2.2. Sampling

Samples shall be collected for the duration of the work shift. Personal air samples need not be collected every day after the first day if working conditions remain unchanged, but must be collected every time there is a change in the removal operation, either in terms of the location or the type of work. Sampling will be used to determine eight-hour time weighted averages. The Contractor is responsible for personal air sampling.

2.2.3. Sampling Results

Air sampling results shall be transmitted to Rio Hondo College and/or its Representatives and individual workers in written form no more than 48 hours after the completion of a sampling cycle. The reporting document shall list each sample's sampling time and date, personnel monitored, flow rate, sample duration, sample yield, cassette size, and analysts' name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in micrograms per cubic meter.

2.2.4. Testing Laboratory

The Contractor's testing lab shall be ELPAT accredited for heavy metals. The Contractor shall submit for Rio Hondo College and/or its Representatives review and acceptance the name and address of the laboratory, certification(s) of ELPAT accreditation for heavy metal analysis.

2.2.5. Air Monitoring Frequency

The air monitoring frequency for Contractor operations will be established in accordance with the requirements set forth in Title 8, Section 1532.1

3. EXECUTION

The following sections describe the minimum expected materials, equipment, and procedures for execution of the removal.

3.1. Materials and Equipment

The work of this Section includes the furnishing of labor, materials, tools, equipment, services and incidentals necessary to complete all LCS removal activities in accordance with the plans and specifications. These plans and specifications are intended to describe, and provide for a finished and complete piece of work; work which is described by any portion of these documents shall be complete in every detail and in accordance with
established trade practice, notwithstanding whether or not every item or detail necessarily involved is particularly mentioned.

3.2. Approvals and Inspections

All temporary facilities, work procedures, equipment, materials, services, and agreements must strictly adhere to and meet this Section along with EPA, OSHA, NIOSH, HUD regulations, recommendations, and guidelines, as well as any other federal, state, and local regulations. Where there exists an overlap of these regulations and guidelines, the most stringent one applies. All work performed by the Contractor is further subject to approval of Rio Hondo College and/or its Representatives.

3.3. Work Area Set Up

The following sections describe the minimum requirements for the work area.

3.3.1. Site Safety

The Contractor is responsible for all safety at the work site. This includes, but is not limited to electrical, mechanical (tool), fire, and personnel protective safety. Safety requirements are, for the most part, common sense and sound business practice; however, the Contractor is advised that federal, state, and local regulations exist that govern safety on the work site. Therefore, in addition to the following, the Contractor is responsible for adhering to the most stringent requirements in affect by any of the following entities or these Specifications.

A primary concern in this type of work is to ensure that adequate exits exist in the event of an emergency and conversely, that adequate entrances exist for emergency personnel. The nature of this work may require sealing entrances and the extensive use of 6 millimeter (mil) polyethylene sheeting; however, the Contractor should never permanently seal (e.g., nail, bolt, hard cover) any potential escape exits and should take extra care to clearly identify potential exits and inform the workers.

3.3.2. Signage

Prior to the preparation of a building for removal, the Contractor shall place warning signs immediately outside all entrances and exits to the building, warning that LCS removal work is being conducted in the vicinity. The signs shall be in English and Spanish, and be at least 20 inches by 14 inches with bold lettering, not smaller than 2 inches tall, and read:

WARNING:
LEAD PAINT REMOVAL HAZARD
UNAUTHORIZED ENTRY PROHIBITED
NO SMOKING, EATING OR DRINKING ALLOWED IN THE WORK AREA
3.4. Work Procedures

In order to avoid possible exposure to dangerous levels of lead and to prevent possible contamination of areas outside the demarcated work area, work shall follow the general guidelines listed below:

3.4.1. Personal Protective Equipment

All persons leaving the work area must remove their PPE (except respirators) before leaving. Suits shall be removed "inside out" to minimize the dispersal of lead dust.

3.4.2. Equipment

All equipment used by the workers inside the work area shall be either left in the work area or thoroughly decontaminated before being removed from the area. Extra work clothing (in addition to the disposable suits supplied by the Contractor) shall be left in the clean area until the completion of work in that area. The clean area shall be cleaned of all visible debris and disposable materials daily.

3.4.3. Prohibited Activities

Under no circumstances shall workers or supervisory personnel eat, drink, smoke, chew gum, chew tobacco, or remove their respirators in the work area. To do so shall be grounds for Rio Hondo College and/or its Representatives to stop all removal operations. Only in the case of life threatening emergency shall workers or supervisory personnel be allowed to remove their protective respirators while in the work area. In this situation, respirators are to be removed for as short of duration as possible.

3.4.4. Footwear

As with additional clothing, all footwear shall be left inside the clean area until the completion of the job and then shall be HEPA vacuumed or discarded as contaminated waste.

3.4.5. Shock Hazards

- The Contractor is responsible for using safe procedures to avoid electrical hazards. Power will be shut off and checked before work begins when an electrical hazard exists.

- All extension cords and power tools used within the work area shall be attached to Ground Fault Circuit Interrupters.

3.5. Notifications

The Contractor is responsible for notifying all officials as indicated by federal, state, or local law.
3.6. **Access to Work Areas**

Rio Hondo College and/or its Representatives will provide specific access as required during the project to the Contractor and personnel assigned to the project. The Contractor will be responsible for the security of each and every work area or portion thereof involved in the removal project. It will also be the Contractor's responsibility to allow only authorized personnel into the work area, and to secure all assigned entrances and exits at the end of the workday so as to prevent unauthorized entry.

The Contractor shall maintain a bound log book in which any person entering or leaving the lead removal work area must sign and enter the dates and times of entry and departure.

Use of waste containers onsite shall be controlled under the following requirements:

- Location of waste containers onsite shall be coordinated with Rio Hondo College and/or its Representatives.

- The waste containers shall be solid enclosed containers, lined with two layers of 6-mil polyethylene sheeting locked and secured at all times, when not in immediate use.

- The Contractor shall comply with all federal, state, and local regulations and ordinances regarding lead waste storage.

- The Contractor, Supervisor, or Worker will not allow anyone access to the building unless they have successfully completed a training program, and are wearing a properly fitted respirator, unless stated otherwise by Rio Hondo College and/or its Representatives.
3.7. Containment

The Contractor shall establish "containment" as specified in tables 8.1, 8.2, and 8.3 of the HUD guidelines, as applicable, and as per the following:

Table 2 - Interior Worksite Preparation (not including windows)

<table>
<thead>
<tr>
<th>Description</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Application (Hazard Control)</td>
<td>Not applicable to this project</td>
<td>Any interim control or abatement method disturbing between 2 and 10 s.f. of painted surfaces per room</td>
<td>Same as Level 2</td>
<td>Any interim control or abatement method disturbing more than 10 s.f. per room.</td>
</tr>
<tr>
<td>Containment and Barrier System</td>
<td>Not applicable to this project</td>
<td>Two layers of plastic on entire floor. Plastic sheet with primitive airlock flap on all doorways. Door secured from the inside of the work area need not be sealed. Children should not have access to plastic sheeting (suffocation hazard)</td>
<td>Two layers of plastic on entire floor. Plastic sheet with primitive airlock flap on all doorways to work areas. Doors secured from the inside need not be sealed. Overnight barrier should be locked or firmly secured.</td>
<td>Two layers of plastic on entire floor. If the entire unit is being cleaned, treated and cleared, individual doorways need not be sealed. If only a few rooms are being treated, seal those doorways with primitive airlock flaps to avoid having to clean the entire building. Doors secured from the inside need not be sealed.</td>
</tr>
<tr>
<td>Warning Signs</td>
<td>Not applicable to this project</td>
<td>Required at entry to room but not on building (unless exterior work is also under way)</td>
<td>Posted at main and secondary entry ways sue to occupants not present to answer the door.</td>
<td>Posted at building exterior near main and secondary entry ways.</td>
</tr>
<tr>
<td>Ventilation System</td>
<td>Not applicable to this project</td>
<td>Turned off and all vents in room sealed with plastic sheeting. Negative pressure zones (with negative air machines) are not required unless large supplies of fresh air must be admitted into the work area to control exposure to other hazardous substances (VOC’s, vapors, etc.)</td>
<td>Same as Level 2</td>
<td>Same as Level 2</td>
</tr>
<tr>
<td>Furniture</td>
<td>Not applicable to this project</td>
<td>Remove from work area. Large items that can’t be moved may be sealed with a single layer of plastic sheeting and left in the work area.</td>
<td>Same as Level 2</td>
<td>Same as Level 2</td>
</tr>
<tr>
<td>Clean-up (see Section 4 for details)</td>
<td>Not applicable to this project</td>
<td>HEPA vacuum, Wet wash, HEPA vacuum all surfaces in the room. Also wet wash and HEPA vacuum floor in adjacent areas used as pathways. Do not store debris inside the building overnight. Use a secure locked area.</td>
<td>Remove the top layer of plastic from the floor and dispose. Keep bottom layer of plastic on floor for use the next day. HEPA vacuum, wet wash and HEPA Vacuum all surfaces in the room. Also wet wash and HEPA vacuum floor in adjacent areas used as pathways. Do not store debris inside the building overnight. Use a secure locked area.</td>
<td>Full HEPA Vacuum, wet wash and HEPA vacuum cycle as detailed in Section 4.</td>
</tr>
<tr>
<td>Dust Sampling</td>
<td>Not applicable to this project</td>
<td>Clearance only</td>
<td>One sample collected outside every few jobs, plus clearance.</td>
<td>Clearance only</td>
</tr>
<tr>
<td>Description</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Typical Application (Hazard Control)</strong></td>
<td>Any interim control or abatement method disturbing more than 10 s.f. of exterior painted surfaces per building. Also includes soil control work.</td>
<td>Any interim control or abatement method disturbing 10 to 50 s.f. of exterior surfaces per building. Also includes soil control work.</td>
<td>Any interim control or abatement method disturbing more than 50 s.f. of exterior surfaces per building. Also includes soil control work.</td>
<td></td>
</tr>
<tr>
<td>Containment and Barrier System</td>
<td>One layer of plastic on ground 10' beyond the perimeter of working surfaces. Do not anchor ladder feet on top of plastic (puncture plastic or anchor ladders securely to the ground). For all other exterior plastic surfaces, protect plastic with boards to prevent punctures from falling debris, nails, etc. as necessary. Raise edges of plastic to create a basin to collect contaminated runoff in the event of precipitation. Secure plastic to side of building with tape or other anchoring system (no gaps between plastic and building). Weight all plastic sheets with 2&quot;x4&quot; boards or similar objects. Keep all windows within 20' of working surfaces closed, including windows of adjacent structures.</td>
<td>Same as Level 1</td>
<td>Same as Level 1</td>
<td></td>
</tr>
<tr>
<td>Signs</td>
<td>Post Warning signs on the building at 20' perimeter around the building. Less distance is acceptable if the next building or sidewalk is less than 20' away.</td>
<td>Same as Level 1</td>
<td>Same as Level 1</td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td>Do not conduct work if wind speeds are greater than 20 miles per hour. Work must stop and cleanup occur prior to rain.</td>
<td>Same as Level 1</td>
<td>Same as Level 1</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Erect temporary fencing or barrier tape at 20' perimeter around working surfaces (less distance is acceptable if the next building or sidewalk is less than 20' away). If entryway is within 10' of working surfaces, require use of alternate entryway. If practical, install vertical containment to prevent exposure. Use a locked dumpster, covered truck or locked room to store debris prior to disposal.</td>
<td>Same as Level 1</td>
<td>Same as Level 1</td>
<td></td>
</tr>
<tr>
<td>Cleanup (Section 4)</td>
<td>Do not leave debris or plastic out overnight if work is not completed. Keep all debris secured until disposal.</td>
<td>Same as Level 1</td>
<td>Same as Level 1</td>
<td></td>
</tr>
</tbody>
</table>
### Table 4 – Window Treatment or Replacement Worksite Preparation

<table>
<thead>
<tr>
<th>Appropriate Applications</th>
<th>Any Window Treatment or Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Containment and Barrier System</td>
<td>One layer of plastic sheeting on the ground/floor extending 5' beyond the perimeter of the window being treated/replaced. Two layers of plastic taped to interior wall if working on the window from the exterior, if working inside, tape two layers of plastic to the exterior wall. If working from inside, implement a minimum Interior Worksite Preparation Level 2. Children can’t be present in an interior room where plastic sheeting is located due to suffocation hazard. Do not anchor ladder feet to plastic (puncture plastic and anchors ladders securely to the ground). For all other exterior plastic surfaces, protect plastic with boards to prevent puncture from falling debris, nails, etc., as necessary. Secure plastic to side of building with tape or other anchoring system (no gaps between plastic and building). Weight all plastic sheeting down with 2”x4” boards or similar objects. All windows in an adjacent building within 20’ must be kept closed.</td>
</tr>
</tbody>
</table>

| Signs | Post warning signs on the building at 20’ perimeter around the building (or less if distance next to the building or sidewalk is less than 20’). If window is being removed from the inside, no exterior sign is necessary. |

| Security | Erect temporary fencing or barrier tape at 20’ perimeter around working surfaces (less distance is acceptable if the next building or sidewalk is less than 20’ away). Use a locked dumpster, covered truck or locked room to store debris prior to disposal. |

| Weather | Do not conduct work if wind speeds are greater than 20 miles per hour. Work must stop and cleanup occur prior to rain, or work from inside only. |

| Cleaning | If working from the inside, HEPA vacuum, wet wash, HEPA vacuum all interior surfaces within 10’ of work area in all directions. If working from the exterior, no cleaning of the interior is needed, unless the containment is breached. Similarly, no cleaning is needed on the exterior if all work is done on the interior and the containment is not breached. If containment is breached, then cleaning on both sides of the window is warranted. No debris or plastic should be left out overnight if work is not completed. All debris must be kept secure until disposal. |

#### 3.7.1. Decontamination Unit

At a minimum, the Contractor shall construct a two-stage decontamination unit. This unit shall be connected to the removal area for the decontamination of workers contaminated with lead. The decontamination unit shall consist of an equipment room, dirty room, and wash area in series. The Contractor shall ensure that employees enter and exit the work area through this unit.

- The decontamination unit shall be constructed with 6-millimeter polyethylene sheeting on floors, walls, and ceiling. Doors through this unit shall be constructed as described in Table 2.

#### 3.7.2. Clean Area

The Contractor shall select a clean area outside the removal area for the workers to change into protective equipment. This area shall contain hand washing facilities, clean cloths, storage for a HEPA vacuum, and respirator storage space. Contaminated equipment or personnel shall not be permitted in this area. The floors and walls of this area shall be covered with 6-mil polyethylene sheeting.

#### 3.7.3. Removal Area

The Contractor shall remove any furniture, or other movable objects. All debris gathered during this clean up shall be disposed of properly.
3.8. Removal Procedures

The following sections describe the minimum requirements for the removal activities.

3.8.1. Overview

The information contained in this Section indicates specific removal procedures for designated components and general removal procedures for non-specific components. The actual components to be removed are included in Table 1.

3.8.2. Workmanship

All LCS removal activities shall be conducted in a professional workman-like manner. The Contractor must realize that any removal procedure may cause damage to the substrate and/or adjacent surface if performed improperly; therefore, strict work controls are required.

3.8.3. Approval

The Contractor must receive prior approval from Rio Hondo College and/or its Representatives before using any materials or equipment. No methods involving open flame, wire brushing, or dry scraping alone, or with the aid of flammable solvent or abrasive compound, or solvents containing methylene chloride, shall be used in removing paint.

3.8.4. Disposal

All leaded materials, residues, debris, or soil contaminated as a result of removal, must be treated and/or disposed of in accordance with regulations and guidelines of EPA, state and local regulations and ordinances, and all other applicable agencies.

- All such materials shall be wrapped in 6-mil plastic sheeting with all edges and seams sealed or placed in 6-mil plastic bags with the top of the bags twisted so as to form a loop. The loop shall then be sealed. The bags of residue/debris shall then be further containerized in an additional 6-mil plastic bag.

- The sealing process shall include the use of a waterproof tape of sufficient strength so as to maintain the integrity of the seal.

- All components shall have all nails and/or other hardware flattened or removed prior to disposal.

- The residue/debris shall be lightly misted prior to placement for disposal.

- The residue/debris shall be carefully handled so as to prevent rupture, or in any way diminishing container integrity.
• All wastewater shall be collected and tested prior to disposal. The Removal Contractor shall consider filtering the water through a 5-micron filter prior to testing.

3.8.5. Material and Equipment

The work of this Section, without limiting the generality thereof, includes the furnishing of labor, materials, tools, equipment, services, and incidentals necessary to complete lead-related removal in accordance with the Plans and Specifications that are intended to describe, and provide for, a finished piece of work; what is called for by any portion of these documents shall be complete in every detail, notwithstanding whether or not every item necessarily involved is particularly mentioned.

• Polyethylene sheeting (minimum thickness of 6-mil),

• Plastic bags (minimum thickness of 6-mil),

• Waterproof tape,

• Lead Warning Signs (as required),

• Flexible duct for ventilation units (if required),

• Spray adhesive (fire retardant),

• Personal Protective Equipment (NIOSH approved respirators, eyewash stations),

• Ventilation units and exhaust fans,

• HEPA vacuums,

• Polyethylene sealer (concrete compatible),

• Lead specific cleaner,

• Fire extinguishers,

• Portable eye washes,

• All products required to perform removal as specified,

• Other materials, tools, and equipment necessary for lead-containing surface removal,

• SDS for all products used (kept on site at all times).
3.8.6 Responsibilities and Supervision

The Contractor will be required to use specific removal methodologies during the course of the work. It will be the responsibility of the contractor to abide by all of the worker protection and safety specifications as outlined. The Contractor will be required to provide electrical service sufficient for the equipment to be used during removal. Plumbing shall also be provided by the Contractor so that adequate services are available for washing down the areas after removal and for personal hygiene. The Contractor will be required to have an on-site Removal Supervisor during all phases of removal and will be required to have all employees trained that perform the actual work.

3.8.7 Component Removal Procedures

In the Project Specific Work Plan, the Contractor shall list which building components presented in Table 1 will be removed prior to building demolition. Generalities of removal are detailed in Tables 2 through 4, and below. For building components to be removed prior to building demolition, the Contractor shall adhere to the following work practices.

- All resulting bundles of "containers" of removed components and/or debris shall be carefully handled to reduce the potential of ripping, bursting, or otherwise diminishing the integrity of the bundle or "container."

- Care must be taken so that leaded materials are neither burned, made to become dusty, nor result in further exposure to workers, occupants, students, or observers.

- Care shall be taken to avoid damage to adjacent areas during the removal of components to be replaced. The Contractor shall run a utility knife around the edge (score) of the removal substrate and the adjacent (non-removed) substrate to cut any bonding between the substrates and thereby eliminate damage.

- If components to be removed contain gross areas of loose or peeling paint, these areas shall be wet scraped or HEPA vacuum prior to removal. The paint chips shall be contained either in the HEPA vacuum or in a separate 6-mil polyethylene bag. Temporary encapsulant expressly for this purpose is also acceptable.

- Components that are removed for replacement shall be wrapped and stored for disposal, or disposed of in accordance with the applicable codes and requirements of this Section.
3.8.8. **Paint Film Stabilization**

Any areas of paint removal will be stabilized. In the Project Specific Work Plan, the Contractor shall list which building components presented in Table 1 will be stabilized. Removal of LBP that is firmly adhered to the substrate is not required unless it may become loosely adhered during demolition activities. Generalities of removal are detailed in Table 1, and below. For building components to be stabilized prior to building demolition, the Contractor shall adhere to the following work practices:

- **Paint Removal**
  - Wet Scraping: remove all loose, flaking and deteriorated paint by wet scraping. Continually mist surface with water during scraping.
  - Wet Sanding: prepare finish surfaces by wet sanding, feather edges lightly. Keep surface wet while sanding.

- **Surface Cleaning**
  - Dust and chips: HEPA vacuum surface after drying.
  - Chemically treat surface if necessary for good paint adhesion. Follow manufacturer's printed instructions for system used.
  - Test surface for pH. Remove mold with a 1 to 10 percent bleach solution. Provide appropriate eye, skin, and respiratory protection during mold decontamination procedures. Remove waxes with ammonia and water. Degrease surfaces with suitable cleaner. Rinse thoroughly following cleaning.

4. **CLEANING, INSPECTIONS, AND CLEARANCE**

The following sections describe the minimum cleaning, inspections, and clearance requirements.

4.1. **End of Day Cleaning**

At least thirty minutes prior to the end of each workday, the lead work area must be cleaned of all debris. Under no circumstances will lead clean-up be permitted when active LCS removal work is proceeding. All interior surfaces in the work area shall be cleaned of dust and debris. Such cleaning shall include a thorough HEPA vacuuming of all affected surfaces, as determined by Rio Hondo College and/or its Representatives. Additionally, such cleanings may require the use of a lead-specific cleaner. All waste materials generated during this daily clean-up shall be disposed of as hazardous waste, unless analytical testing proves otherwise.
4.2. **Equipment Cleaning**

Non-disposable equipment, such as power and hand tools, generators, and vehicles shall be cleaned prior to removal from unit undergoing removal at the site. All equipment shall be cleaned by HEPA vacuuming and wet washing with a lead-specific cleaner.

4.3. **High-Efficiency Particulate Air Vacuum**

The Contractor will obtain training in the use of the HEPA vacuum from the manufacturer prior to use and submit evidence of this training to Rio Hondo College and/or its Representatives. The Contractor shall obtain HEPA vacuum attachments, such as various size brushes, crevice tools, and angular tools to be used for varied applications and service the HEPA vacuum routinely to assure proper operation. Caution shall be used any time the HEPA vacuum is opened for filter replacement or debris removal. Operators shall wear a full set of protective clothing and equipment, including respirators, when using the HEPA vacuuming equipment or removing/replacing used filters.

4.4. **Preliminary Clean-Up**

Upon completion of the LCS removal and a satisfactory visual inspection by Rio Hondo College and/or its Representatives in a given work area, a preliminary clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the work area. The polyethylene sheeting shall first be sprayed or misted with water for dust control, the resulting removal debris removed, and then the sheeting shall be folded in upon itself.

4.4.1. **Large Debris**

Large debris from demolition shall be wrapped in polyethylene sheeting at least 6 millimeters thick, sealed with heavy duty duct tape, and stored until proper disposal.

4.4.2. **Small Debris**

Prior to picking up or collecting small debris, the surfaces of this debris will be sprayed with a fine mist of water. The debris will be picked up, collected and placed into a single plastic bag, at least 6-mil thick. The bags shall not be overloaded, shall be securely sealed, and shall be stored in the designated area until disposal. Dry sweeping is not permitted in the work area; wet sweeping is required.

4.4.3. **Sheeting**

Removal of surfaces 6-mil polyethylene sheeting shall begin from upper levels. Removal of ground polyethylene sheeting shall begin at the corners and folded into the middle to contain the dust or residue. All collected polyethylene sheeting shall be placed in 6-mil polyethylene bags for proper disposal as described in this specification.
4.4.4 High-Efficiency Particulate Air Vacuuming

Once the 6-mil polyethylene sheeting is removed from the work area, cleaning shall begin with a thorough HEPA vacuuming of all surfaces, starting at the ceilings, proceeding down the walls and including window, door, and door trim and floor. The floor shall be vacuumed last, beginning at the farthest corners from the entrance to the work area. HEPA vacuuming shall again be performed as noted above, after the following wet wash.

4.4.5 Wet Wash

The Contractor shall next wet wash or mop the same surfaces with a lead-specific cleaner and allow surfaces to dry. Then a second HEPA vacuuming of the surfaces will be performed by the Contractor, as described above. By the conclusion of the cleaning phase, all visible dust and debris shall have been completely removed.

4.4.6 Hygiene, Cleaning Equipment and Supplies

Special attention shall be given to personal hygiene and the cleaning of supplies and/or equipment. All mop heads, sponges and rags shall be replaced or changed daily, at a minimum. Rags, mop heads or sponges may be reused if the Contractor has them cleaned via a washing system specially equipped with HEPA filtration.

4.4.7 Detergents

The Contractor shall prepare and use detergents specifically designed for lead removal work. The manufacturer's recommended coverage will be followed. Detergent solutions should be replaced as needed.

The wastewater from the cleanup shall be contained and disposed of according to all applicable federal, state, county and local regulations and guidelines. Wastewater will be placed in a 55 gallon sealed drum, and characterized by laboratory analysis, for correct disposal options prior to removal from the site. In no instance shall wastewater be disposed in storm sewers (e.g., yard inlet or street drain) or sanitary sewers (e.g., toilet, sink, or any other household/residential/commercial type drain system). Wastewater will be mobilized off site by the Removal Contractor.

4.5 Visual Inspections and Clearance

In addition to various daily inspections of the lead work area and removal practices, at Rio Hondo College and/or its Representatives discretion, up to three inspections during the work may be performed, one during each phase of removal. Each inspection phase will be requested by the Contractor and be performed by Rio Hondo College and/or its Representatives. The work being inspected must meet Rio Hondo College and/or its Representatives satisfaction before work may begin for the next phase of work. Failure on the part of the Contractor to obtain the approval before proceeding to the next scheduled phase is regarded as a violation of these Section(s). In the event of this occurring, Rio Hondo College and/or its Representatives will request work to be stopped and Rio Hondo College and/or its Representatives will be contacted to intervene. The three inspections are as follows:
4.5.1. Work Area Preparation Completed

The Contractor shall have all pre-removal preparations of the work area complete, seek and review approval from the Consultant to proceed.

4.5.2. Post Removal Inspection

The Contractor shall have completed removal and final clean-up of all visible debris, and perform final cleaning techniques of wet washing and HEPA vacuuming. If the area does not pass a visual inspection, the Contractor shall re-clean the area.

5. DISPOSAL OF WASTE MATERIAL

The following sections describe the minimum waste disposal requirements.

5.1. Caution Note for Removal Contractors

All materials, whether hazardous or non-hazardous, shall be disposed in accordance with all laws and the provisions of this section and all applicable federal, state, county or local regulations and guidelines. It shall be the sole responsibility of the Contractor to assure compliance with all laws and regulations relating to this disposal.

5.2. General Applicability

The Contractor shall contact the regional EPA, state, and local authorities to determine LCS debris disposal requirements.

The requirements of Resource Conservation and Recovery Act (RCRA) shall be complied with as well as California solid waste plan requirements. During removal, the Contractor shall not leave debris on the property, incinerate debris, dump waste by the road or in an unauthorized dumpster, or introduce lead-contaminated water into storm or sanitary sewers.

5.3. Hazardous Waste Tests

In order to determine whether the wastes are classified as non-hazardous solid or hazardous waste as defined under the RCRA, the Contractor will sample and perform the Total Threshold Limit Concentration (TTLC), and if necessary, based on TTLC level, the Waste Extraction Test (WET), and Toxicity Characteristic Leaching Procedure (TCLP) will be performed. Representative sampling, performed by the Contractor under the supervision of Rio Hondo College and/or its Representatives, shall be required of all material to be disposed.

If any of these samples are above the TCLP regulatory limits, the Contractor shall dispose of all of that type of material as hazardous waste.

- The Contractor shall further meet the requirements of the State of California, as per Title 22, CCR 66261 and other related regulations. This will include, if applicable, other waste testing, such as TTLC and Soluble Threshold Limit Concentration.
• All costs associated with disposal of all of the above materials as non-hazardous waste (general demolition) and hazardous waste shall be included in the Contractor's Base Bid Price.

• The Contractor shall submit written manifest to Rio Hondo College and/or its Representatives prior to removing any waste from site and shall submit complete manifest to Rio Hondo College and/or its Representatives after waste is disposed of classification, the following documents are made applicable and part of this Section: 40 CFR 241, -257, -261, -262, and 49 CFR 172, -173, -178, and -179, Department of Transportation (DOT) Regulations.

5.4. Disposal Requirements

The following materials will be disposed of by the Contractor as hazardous waste in accordance with this section. All costs associated with the disposal of these materials as hazardous waste shall be included in the Contractor's Base Bid Price.

• All paint chips and paint chip debris.

• Lead-containing materials exceeding TTLC, WET and TCLP regulatory requirements.

The following materials, individually and at a minimum, shall be tested by the Contractor and results made available to Rio Hondo College and/or its Representatives, to determine whether or not they are to be considered hazardous. All costs associated with the testing and proper disposal of the below mentioned materials shall be included in the Contractor's Base Bid Price.

• Wastewater used to decontaminate.

• Rags, sponges, mops, HEPA filters, respirator cartridges, and other materials used for removal and clean-up and containment.

• Other LCS removal derived waste.

5.5. Disposal of Non-Hazardous Contaminated Solid Waste

The following procedures shall be followed for the disposal of all non-hazardous materials.

• The Contractor shall place all non-hazardous contaminated materials in 6-mil polyethylene bags that are airtight and puncture resistant. Pieces of wood or other types of substrates that do not fit into plastic bags shall be wrapped and labeled "DANGER, LEAD DUST."

• The Contractor shall place all disposable cleaning materials, such as sponges, mop heads, filters, disposable clothing in 6-mil plastic bags and seal.

• The Contractor shall clean surfaces and equipment and bag large debris. The Contractor shall then remove plastic sheeting and tape from covered surfaces. Prior to removing the plastic sheeting, the Contractor shall lightly mist the sheeting in order to keep dust down and fold inward to form tight bundles to bag for disposal.
The Contractor shall place all plastic sheeting in 6-mil thick plastic bags and seal. Any bags shall be labeled "DANGER, LEAD DUST."

- The Contractor shall bag and seal vacuum bags and filters in 6-mil thick plastic bags.

- The Contractor shall place all contaminated clothing or work area clothing used during removal, in 6-mil thick plastic bags for disposal prior to leaving the work area.

- The Contractor shall contain and properly dispose of all liquid waste, including lead-dust-contaminated wastewater.

- The Contractor shall HEPA vacuum the exterior of all liquid waste containers, prior to removing the waste containers from the work area, and wet wipe the containers to ensure that there is no residual contamination. Containers shall then be moved out of the work area into the designated storage area.

- The Contractor shall ensure that all waste is transported in covered vehicles to a landfill, or lined landfill, if available, in accordance with applicable DOT and EPA Regulations.

- The Contractor shall submit to Rio Hondo College and/or its Representatives for approval, the waste transfer procedure and route, and shall comply with all EPA and DOT regulations concerning hazardous and non-hazardous waste removal and transportation.

5.6. Disposal of Hazardous Waste

The following procedures shall be followed for disposal of all material as hazardous waste:

- The Contractor and Transporting Contractor will be required to comply with the RCRA and with all applicable state and local regulations.

- The Contractor shall comply with all EPA regulations.

- The Contractor shall be prepared for disposal as follows:
  - Packaged and sealed in containers approved under 49 CFR 173, -178, and -199.
  - Containers shall be numbered to correspond to the seal number, labeled with the type of materials, date it was filled and sealed, seal number, and weight of sealed container in addition to the information required under 49 CFR 172.
  - A log shall be prepared at time of filling, identifying each numbered container and the information from above. A copy of this log shall be turned over to Rio Hondo College and/or its Representatives within three working days after the containers are filled.
- Name, location, and telephone number of the disposal site used. A copy of the sites state and locally issued license, and a signed agreement that they will accept the hazardous lead waste, shall be provided to Rio Hondo College and/or its Representatives.

- Name, address, and telephone number of any waste subcontractors used. Provide copies of licenses and signed agreements to Rio Hondo College and/or its Representatives.

- Submit copies of the Hazardous Waste Manifest as required by these specifications.

- Waste Transportation: All hazardous waste shall be transported by a certified hazardous waste transporter. The Contractor shall require the certified hazardous waste transporter to follow RCRA and DOT regulations.

- Prior to the removal of any hazardous waste, the below listed information must be received in writing by Rio Hondo College and/or its Representatives for their review and approval. Once approval is received by the Contractor from Rio Hondo College and/or its Representatives, the waste may be transported as required.

  - Quantity of Hazardous Waste.
  - Type of Waste Materials.
  - Method of Containerizing Waste or Waste Treatment and appropriate licensing, certification and regulatory approvals.
  - Proposed Waste Hauler and Disposal Route.
  - Proposed Waste Disposal Site or Landfill.

- Receipts from the Waste Hauler and waste disposal site or landfill must be received and approved by Rio Hondo College and/or its Representatives as per regulation.

5.7. Storage Requirements

Any item found to be hazardous, by way of testing, shall be kept in a secured area or lockable and DOT-approved container that is inaccessible to all persons other than removal personnel. All hazardous waste shall be labeled "Hazardous Waste" and a date that the Removal Contractor began to collect waste in that container. All hazardous and non-hazardous waste shall be kept in totally and completely separate containers. Until TCLP testing proves an item to be non-hazardous, all items shall be considered hazardous and stored in a secured area or lockable container.

5.8. Regulations

The Contractor will be required to comply with the RCRA and/or any other applicable federal, state, or county law, regulation and/or guidelines, whichever is most stringent.
5.9. Emergencies Procedures

The Contractor shall keep and properly maintain a suitable fire extinguisher(s) on site; have an immediate means of communication with a regulatory agency in the event of an emergency; keep a list of phone numbers of regulatory agencies on site, make sure all employees know how to deal with all types of accidents, make one person who is always on site the emergency coordinator to ensure that emergency procedures are carried out in the event an emergency arises; and keep and maintain a "right to know" manual that is in an easily accessible location and in an area that is known to all employees.
HAZARDOUS BUILDING MATERIALS
RIO HONDO COLLEGE
“L” TOWER
ASBESTOS ABATEMENT
SPECIFICATIONS

3600 WORKMAN MILL ROAD
WHITTIER, CA 90601

PREPARED FOR:
RIO HONDO COLLEGE
3600 WORKMAN MILL ROAD
WHITTIER, CA 90601

PREPARED BY:
NATIONAL ECON CORPORATION
1899 S. SANTA CRUZ STREET
ANAHEIM, CA 92805

AUGUST 30, 2016
Project No. 16-1228
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1. **SCOPE OF WORK**

The scope of work for the abatement project will involve the abatement of asbestos-containing materials (ACMs), asbestos-containing construction materials (ACCMs), and assumed ACMs that may be disturbed in association with upcoming renovation or demolition activities for the “L” Tower Seismic and Code Upgrades Project. The ACMs, ACCMs, and Assumed ACMs were identified in an Asbestos Inspection conducted by National Econ Corporation (NEC), under NEC Project #:15-1836 and dated December 2, 2015. The findings of that inspection in regard to materials containing asbestos are presented below in Table 1. The materials noted in the table below are expected to be either completely abated or impacted as part of the project and will require compliance with SCAQMD procedures and notifications.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>NESHAP CATEGOY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fireproofing (See Note 1 Below)</td>
<td>B10C-Corridor B10E-Passage</td>
<td>Chrysotile</td>
<td>5</td>
<td>RACM</td>
<td>YES</td>
<td>2,500 SQ. FT.</td>
</tr>
<tr>
<td>Thermal System Insulation (TSI) Fittings (All Diameters) (See Note 2 Below)</td>
<td>B10A-Electrical B11-Print Shop B13-Weight Room Tunnel</td>
<td>Chrysotile</td>
<td>3</td>
<td>RACM</td>
<td>YES</td>
<td>20-24 LN. FT.</td>
</tr>
<tr>
<td>Joint Compound (On Concrete) (See Note 2 Below)</td>
<td>Utility Space Shaft (At B10A-Elec. Rm.)</td>
<td>Chrysotile</td>
<td>2</td>
<td>II</td>
<td>NO</td>
<td>10 SQ. FT.</td>
</tr>
<tr>
<td>Joint Compound (On Drywall)</td>
<td>B10A-Electrical</td>
<td>Chrysotile</td>
<td>2</td>
<td>II</td>
<td>NO</td>
<td>3,250 SQ. FT</td>
</tr>
<tr>
<td>Plaster Acoustic Spray-On (Ceiling)</td>
<td>B13-Lobby</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>310 SQ. FT</td>
</tr>
<tr>
<td>12” Floor Tile &amp; Mastic (Multiple Layers)</td>
<td>Elevator #1</td>
<td>Chrysotile</td>
<td>&lt;1-2</td>
<td>I &amp; II</td>
<td>NO</td>
<td>35 SQ. FT</td>
</tr>
<tr>
<td>Yellow Resilient Flooring (Linoleum w/Backing)</td>
<td>Elevator #3</td>
<td>Chrysotile</td>
<td>30</td>
<td>RACM</td>
<td>YES</td>
<td>30 SQ. FT</td>
</tr>
</tbody>
</table>

**NOTE 1**: Fireproofing is in the above ceiling spaces of B10C-Corridor and B10E-Passage and is intermixed with plaster overspray which cannot be differentiated. It must be assumed all wall cavities, mechanical systems, pipe systems, concrete, etc. above these two spaces are contaminated with this material. It should also be assumed the above ceiling space and corridor side walls of B10D-Men’s Restroom and B14-Women’s Restroom are contaminated with this material.

**NOTE 2**: Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes are located in the above ceiling spaces in the areas listed. It is possible additional fittings are located in walls or the vertical pipe shaft located adjacent to the B10A-Electrical Room. These areas were not accessible at the time of the inspection. Any TSI mudded fittings found in these areas must be assumed to contain asbestos until testing can be performed.

**NOTE 3**: Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.
# Table 1 – Positive Asbestos Survey Results (Continued)

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>Exterior Ceiling Chases</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>1,600 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td>Elevator #1 Shaft Wall</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Alcove at Room 104 Ceiling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Note 2 Below)</td>
<td>Utility Space Shaft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elevator #1, #3, and Associated Shafts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 2:** Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes may be present in walls or the vertical pipe shaft located adjacent to Elevator #3. This area was not accessible at the time of the inspection. Any TSI mudded fittings found in this area must be assumed to contain asbestos until testing can be performed.

**NOTE 3:** Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>200-Vestibule L200-Lobby N. Exterior Overhang North &amp; South Locker Areas</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>1,500 SQ. FT.</td>
</tr>
<tr>
<td>(See Note 2 Below)</td>
<td>Utility Space Shaft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Note 3 Below)</td>
<td>Elevator #1, #3, and Associated Shafts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 2:** Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes may be present in walls or the vertical pipe shaft located adjacent to Elevator #3. This area was not accessible at the time of the inspection. Any TSI mudded fittings found in this area must be assumed to contain asbestos until testing can be performed.

**NOTE 3:** Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.
### Table 1 – Positive Asbestos Survey Results (Continued)

#### THIRD LEVEL

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>300-Vestibule L300-Lobby</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>1,800 SQ. FT.</td>
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<tr>
<td></td>
<td>302A-Passage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>302B-Staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>302C-Office Hallway Small Locker Room</td>
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</tr>
<tr>
<td>(See Note 2 Below)</td>
<td>Utility Space Shaft</td>
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<tr>
<td>(See Note 3 Below)</td>
<td>Elevator #1, #3, and Associated Shafts</td>
<td></td>
<td></td>
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</tbody>
</table>

**NOTE 2:** Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes may be present in walls or the vertical pipe shaft located adjacent to Elevator #3. This area was not accessible at the time of the inspection. Any TSI mudded fittings found in this area must be assumed to contain asbestos until testing can be performed.

**NOTE 3:** Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.

#### FOURTH LEVEL

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>400-Vestibule L400-Lobby</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>800 SQ. FT.</td>
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<tr>
<td></td>
<td>Office Entry Area S of L400-Lobby</td>
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<td></td>
<td>404&amp;405-M&amp;W RR’s Entry Hallways</td>
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<tr>
<td></td>
<td>406-Office</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9” Floor Tile (Tan) &amp; Mastic</td>
<td>400-Vestibule Kitchenette</td>
<td>Chrysotile</td>
<td>4</td>
<td>I &amp; II</td>
<td>NO</td>
<td>360 SQ. FT.</td>
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<td>Kitchenette Closet</td>
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<tr>
<td>9” Floor Tile (Tan) &amp; Mastic</td>
<td>L400-Lobby</td>
<td>Chrysotile</td>
<td>4</td>
<td>I &amp; II</td>
<td>NO</td>
<td>2,000 SQ. FT.</td>
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<tr>
<td>(Covered W/Carpet)</td>
<td>400C-Office &amp; Entry Area,</td>
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<td>Receptionist Area &amp; Storage Rm.</td>
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<td>403-Institutional Research &amp;</td>
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<td>404&amp;405-M&amp;W RR’s Entry Hallways</td>
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<tr>
<td></td>
<td>406-Office</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Office W. of Kitchenette</td>
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</tr>
<tr>
<td>12” Vinyl Floor Tile &amp; Mastic</td>
<td>401-Office</td>
<td>Chrysotile</td>
<td>&lt;1-4</td>
<td>I &amp; II</td>
<td>NO</td>
<td>1,000 SQ. FT.</td>
</tr>
<tr>
<td>(Covered W/Carpet)</td>
<td>401-Receptionist</td>
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<td>L402-Conference</td>
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<td>3 Offices N. of Conference Room</td>
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<tr>
<td>MATERIAL</td>
<td>LOCATION</td>
<td>ASBESTOS</td>
<td>%</td>
<td>CATEGORY</td>
<td>FRIABLE</td>
<td>ESTIMATED FOOTAGE</td>
</tr>
<tr>
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<td>---</td>
<td>----------</td>
<td>---------</td>
<td>------------------</td>
</tr>
<tr>
<td>12” Vinyl Floor Tile (Gray) &amp; Mastic</td>
<td>Nursing Lab &amp; Storage Room L408 Classroom &amp; Storage Room All Hallways Office West of Elevator #3</td>
<td>Chrysotile</td>
<td>&lt;1-4</td>
<td>I &amp; II</td>
<td>NO</td>
<td>4,500 SQ. FT.</td>
</tr>
<tr>
<td>(See Note 2 Below)</td>
<td>Utility Space Shaft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Note 3 Below)</td>
<td>Elevator #1, #3, and Associated Shafts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 2:** Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes may be present in walls or the vertical pipe shaft located adjacent to Elevator #3. This area was not accessible at the time of the inspection. Any TSI mudded fittings found in this area must be assumed to contain asbestos until testing can be performed.

**NOTE 3:** Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.
Table 1 – Positive Asbestos Survey Results (Continued)

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>500-Vestibule L500-Lobby Hallway S of L500-Lobby Passage at Elevator #3 L502A-Office Room Adjacent to L502A-Office Faculty Offices Common Area</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>1,400 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl Floor Tile Mastic (Covered W/Carpet)</td>
<td>503-Office 504&amp;505-M&amp;W RR’s Entry Hallways</td>
<td>Chrysotile</td>
<td>2</td>
<td>II</td>
<td>NO</td>
<td>240 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl Floor Tile &amp; Mastic (Covered W/Carpet)</td>
<td>L500-Lobby 501B-Office 501C-Office 501D-Office Reading Lab</td>
<td>Chrysotile</td>
<td>2-5</td>
<td>I &amp; II</td>
<td>NO</td>
<td>1,300 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Note 2 Below)</td>
<td>Utility Space Shaft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See Note 3 Below)</td>
<td>Elevator #1, #3, and Associated Shafts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 2:** Thermal System Insulation (TSI) fittings (elbows, T’s, etc.) on pipes may be present in walls or the vertical pipe shaft located adjacent to Elevator #3. This area was not accessible at the time of the inspection. Any TSI mudded fittings found in this area must be assumed to contain asbestos until testing can be performed.

**NOTE 3:** Elevator #1, #3, and associated shafts were not accessible at the time of the inspection on any level. Any materials found in these locations which are not bare concrete, wood or metal must be assumed to contain asbestos until testing can be performed.
Table 1 – Positive Asbestos Survey Results (Continued)

### PENTHOUSE LEVEL

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fireproofing (On Metal Decking)</td>
<td>Fan Room Roof Deck Above 604-Server Room</td>
<td>Chrysotile</td>
<td>7</td>
<td>RACM</td>
<td>YES</td>
<td>1,500 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td>Above 603-Elevator Machine Room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand Plaster (On Walls)</td>
<td>Fan Room</td>
<td>Chrysotile</td>
<td>&lt;1</td>
<td>II</td>
<td>NO</td>
<td>3,000 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td>Fan Room Entry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Elevator Machine Rm. 603-Elevator Machine Rm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>604-Server Room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EXTERIOR

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>LOCATION</th>
<th>ASBESTOS</th>
<th>%</th>
<th>CATEGORY</th>
<th>FRIABLE</th>
<th>ESTIMATED FOOTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stucco (See Note 4 Below)</td>
<td>Exterior Walls of Penthouse</td>
<td>Chrysotile</td>
<td>&lt;1</td>
<td>II</td>
<td>NO</td>
<td>1,000 SQ. FT.</td>
</tr>
<tr>
<td>Plaster Acoustic Spray-On</td>
<td>Stairs #1 Ceiling</td>
<td>Chrysotile</td>
<td>&lt;1-3</td>
<td>II</td>
<td>NO</td>
<td>800 SQ. FT.</td>
</tr>
<tr>
<td></td>
<td>Roof Overhang West End of Penthouse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 4:** Initial Stucco sample results indicated <1% asbestos present and is acceptable for determining waste category. However, the initial PLM results were not subsequently confirmed by point counting method and are therefore classified for the purposes of this project as Category II material.

The quantities provided in Table 1 above are estimates only and may not reflect the actual “Scope of Work” to be performed within the limits of the contract for this project. It is the Contractor's responsibility to quantify materials that are to be impacted by the scheduled demolition/renovation activities (as outlined in the construction contract documents) prior to bid submittals, as part of the Contractor's due diligence.

Specific contractor responsibilities include, but are not limited to the following:

- The Contractor is responsible for the protection and decontamination of fixtures and equipment remaining in the work area, prior to, and after abatement.

- The Contractor shall furnish all labor, materials, services, insurance, equipment, and decontamination facilities to carry out the complete removal and disposal of all ACMs and ACCMs, including assumed ACMs identified in these specifications that are impacted by the demolition activities.

- Work shall be performed in accordance with all applicable regulations, codes, ordinances, and standards of governing authorities having jurisdiction and the requirements specified herein. Where applicable state or local standards are more stringent than federal standards, the Contractor shall adhere to the most stringent standards.
In addition, the Contractor shall furnish all labor, material, supervision, construction tools, and equipment necessary to perform the following work:

- Removal of all identified ACMs, ACCMs, and assumed ACMs prior to renovation or demolition activities. The Abatement Contractor shall verify quantities and locations as part of the Contractor's due diligence.

- Provision and maintenance of environmental and occupational safety protective measures, equipment, and procedures at the work site, including appropriate engineering controls.

- Cleaning of the work site to completely remove all visually apparent asbestos and reduce airborne asbestos fiber concentrations.

- If, in the course of removal of ACMs and ACCMs from the site, the Contractor discovers additional suspected ACMs or presumed asbestos containing materials (PACMs) other than those described in the survey report, plans, and/or specifications, the Contractor shall notify the Owner’s Representative in writing, and after receiving approval, the Contractor will remove and dispose of such item(s).

- Utilities will be made available to the contractor including water and 110 volt/220 volt power.

- No other contractors will be working within the buildings regulated areas during abatement/removal activities.

- The Abatement Contractor shall obtain all necessary permits from the Rio Hondo College, the SCAQMD, and any other authorities having jurisdiction as it relates to the described abatement activities.

- Packaging, transport, and disposal of all asbestos to a disposal site approved by the applicable federal, state, and local authorities shall be the sole responsibility of the Contractor, including any certifications or statements of non-friability required by the landfill.

- Cooperation with the Owner’s Representative with regards to air monitoring and observation of procedures.

1.1. Definitions

- "Aggressive method" means removal or disturbance of building material by sampling, abrading, grinding, or method that breaks, crumbles, or disintegrates intact ACM.

- "Amended water" means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

- "Area sampling" means sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.
"Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, actinolite, and any of these materials that has been chemically treated and/or altered. "Asbestos" includes PACM.

"ACM" means asbestos-containing material; any material containing more than 1 percent asbestos (>1.0 percent).

"ACCM" means asbestos-containing construction material; any material containing more than 0.1 percent (>0.1 percent) asbestos.

"Authorized person" means any person authorized by the employer and required by work duties to be present in regulated areas.

"Class I asbestos work" means activities involving the removal of thermal system insulation (TSI) and surfacing ACM and PACM.

"Class II asbestos work" means activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile, and sheeting, roofing and siding shingles, and construction mastics.

"Class III asbestos work" means repair and maintenance operations where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.

"Class IV asbestos work" means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

"Clean room" means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

"Closely resemble" means the major workplace conditions, which have contributed to the levels of historic asbestos exposure, are no more protective than the conditions of the current workplace.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. In addition, for Class I and Class II work, one who is specially trained in a training course, which meets the criteria of the United States Environmental Protection Agency (EPA) model accreditation Plan 40 Code of Federal Regulations (CFR) 763 for project designer or supervisor, or its equivalent.

"Consultant" shall be the independent, third-party retained by Rio Hondo College and/or its Representatives to provide consultation and supervision services for asbestos abatement activities.
• "Critical barrier" means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

• "Decontamination area" means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

• "Demolition" means the wrecking or taking out of load-supporting structural member and any related razing, removing, or stripping of building materials.

• "Disturbance" means contact that releases fibers from ACM, ACCM, Assumed and/or PACM or debris containing ACM, ACCM, Assumed and/or PACM. This term includes activities that disrupt the matrix of ACM, ACCM, Assumed and/or PACM, render ACM, ACCM, Assumed and/or PACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM, ACCM, Assumed and/or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM, ACCM, Assumed and/or PACM so disturbed exceed the amount that can be contained in one glove bag or waste bag, which shall not exceed 60 inches in length and width.

• "Employee exposure" means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

• "Encapsulants" means specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

  o Removal Encapsulant (can be used as a wetting agent).

  o Bridging Encapsulant (used to provide a tough, durable surface coating to ACM).

  o Penetrating Encapsulant (used to penetrate the ACM and/or ACCM encapsulating all asbestos fibers and prevent fiber release due to routine mechanical damage).

  o Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which ACM and/or ACCM has been removed).

• "Equipment room (change room)" means a contaminated room located within the decontaminated area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

• "Fiber" means a particulate form of asbestos, 5 micrometers or longer, with a length to diameter ratio of at least 3 to 1.
• "Glovebag" means an impervious plastic bag-like enclosure that can be affixed around ACM, ACCM or PACM, with glove-like appendages through which materials and tools can be handled.

• "High-efficiency particulate air (HEPA) filter" means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometer in diameter.

• "Homogenous area" means an area of surfacing material or TSI that is uniform in color, texture, and date of installation.

• "Industrial hygienist" means a professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

• "Intact" means that ACM and/or ACCM has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.

• "Modification" means a changed or altered procedure, material, or component of a control system that replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a "modification."

• "Negative initial exposure assessment" means a demonstration by the employer that complies with the criteria in Title 8 California Code of Regulations (CCR) 1529, subsection (f)(2)(c), that employee exposure during an operation is expected to be consistently below the Permissible Exposure Limit (PEL).

• "Presumed Asbestos-Containing Material" means TSI and surfacing material found in buildings constructed no later than 1980. The designation of material as "PACM" may be rebutted pursuant to Title 8 CCR 1529, subsection (k)(4).

• "Project Designer" means a person who has successfully completed the initial training requirements and maintained annual refreshers for the abatement project designer established by 40 United States Code Section 763.90(g).

• "Regulated area" means an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the PEL.

• "Removal" means all operations where ACM, ACCM, Assumed and/or PACM are taken out or stripped from structures or substrates.

• "Renovation" means the modifying of an existing structure, or portion thereof.
• "Repair" means overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM, ACCM and/or PACM attached to structures or substrates.

• "Surfacing material" means material that is sprayed, troweled-on, or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

• "Surfacing ACM" means surfacing material, which contains more than 1 percent (>1.0 percent) asbestos.

• "Surfactant" means a chemical wetting agent added to water to improve penetration, thus reducing the amount of water required for a given operation or area, and enhancing the effect of the water in reducing fiber release.

• "TSI (thermal system insulation)" means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

1.2. Notifications

Notification of asbestos abatement activities shall be provided by the Contractor as required and in accordance with all applicable federal, state, and local agencies prior to the start of abatement activities.

1.3. Quantity Takeoff

All ACM and ACCM quantities shall be determined by the bidder and no claim for additional cost will be accepted by Rio Hondo College or its Representatives as a result of quantities of ACMs and ACCMs to be removed except for ACMs and ACCMs not previously discovered and disclosed in these specifications. Newly discovered ACMs and ACCMs will be brought to the attention of the Owner’s Representative prior to scheduled abatement/removal.

1.4. Regulatory Compliance

All work shall be performed in compliance with pertinent laws, rules, and regulations existing at the time of the work, including but not limited to:


• Safety and Health Standards for the Construction Industry, 29 CFR Part 1926.

• The Occupational Safety and Health Standards for Asbestos, 29 CFR Parts 1910.1001 and 1926.1101.

• The EPA National Emission Standard for Hazardous Air Pollutants, National Emission Standard for Asbestos, Title 40 CFR Part 61(a) and (m).

CCR, Title 8, Section 1529, Asbestos in Construction.


South Coast Air Quality Management District, Rule 1403.

All applicable state, local regulations, and ordinances, including any regulations regarding State and/or local licenses or certificates.

Where applicable state or local regulations are more stringent than OSHA requirements or the requirements referenced herein, the Contractor shall adhere to the more stringent regulations. The Contractor warrants that he is familiar with the codes and requirements applicable to asbestos abatement work and shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work. If the Contractor observes that the Specifications or plans are at variance therewith, he shall give written notice to Rio Hondo College and/or its Representatives describing such variances. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without written notice to Rio Hondo College and/or its Representatives, the Contractor shall bear all costs arising therefrom. The Contractor's particular attention is directed to the applicable California Occupational Safety and Health Administration (Cal-OSHA) regulations found in CCR Title 8, Section 1529 and the necessity of complying with the regulations in the progress of his work. Failure or omission on the part of the Contractor, or any of its representatives, either to discover or to bring to the attention of Rio Hondo College and/or its Representatives any deviation from, omission from, or noncompliance with the requirements for asbestos abatement shall not be used by the Contractor as defense for failure on its part to fulfill such requirements.

2. CONTRACTOR SUBMITTALS

The following sections describe the minimum expected Contractor submittals.

2.1. Manufacturer's Product Data

- HEPA-Filtered Negative Air Equipment (including SCAQMD registration)
- HEPA-Filtered Vacuum Equipment
- Respirators
- Pressure Differential Monitor
- Surfactants
2.2. Plan for Removal of Asbestos

The Abatement Contractor shall prepare and submit a detailed job specific plan of the work procedures to be used in the removal of materials containing asbestos at least two weeks prior to the start of work. A generalized, "boiler-plate" type of plan will not be accepted.

- The plan shall be prepared and signed by the Contractor and Contractor's Competent Person.
- The plan shall include a sketch showing the location, size, and details of asbestos control areas, location and details of the change rooms, layout of change rooms, layout and location of waste container pass out airlock system, and locations of HEPA-filtered negative air equipment, if applicable.
- The plan shall also include interface of trades involved in the construction, sequencing of asbestos-related work, disposal plan, type of wetting agent and removal encapsulants to be used, respirators, protective equipment, pressure differential monitoring devices, and a detailed description of the method to be employed in order to control pollution.
- The plan shall include copies of emergency, security, and contingency plans as follows:
  - A plan to provide emergency and fire evacuation for removing workers from the work zone. A copy of this plan shall be filed with the local fire and/or ambulance unit.
  - A plan for maintaining the security of the work zone. The security plan shall provide a means of preventing accidental or unauthorized entry.
  - A contingency plan addressing emergencies, equipment failures, and barrier failure. This plan shall include telephone numbers of representatives of the Contractor to be contacted in emergencies.
- The plan shall be approved by Rio Hondo College and/or its Representatives prior to the start of asbestos abatement work.
- Prior to beginning work, Rio Hondo College and/or its Representatives and Contractor shall meet to discuss in detail the asbestos plan, including work procedures and safety precautions.

2.3. Administrative and Contractor Closeout Submittals

The following sections describe the minimum expected Contractor closeout submittals.

2.3.1. Notification of Equipment Rental
If rental equipment is to be used during asbestos handling and disposal, written notification concerning the intended use of the equipment will be furnished to the rental agency, with a copy to Rio Hondo College and/or its Representatives.

2.3.2. Landfill Delivery Records

Within two weeks after delivery of ACM to the landfill, submit detailed delivery tickets and hazardous waste manifests, prepared, signed, and dated by an agent of the landfill, certifying the amount of materials delivered to the landfill.

2.3.3. Waste Disposal Site Approval

Submit the recommended waste disposal site to Rio Hondo College and/or its Representatives for approval prior to the start of the project. Submit written evidence to Rio Hondo College and/or its Representatives prior to disposal, that the waste disposal site is approved for asbestos disposal by the EPA and other applicable authorities. At job completion, these records shall be inserted into the job binder and transmitted to Rio Hondo College and/or its Representatives.

2.3.4. Personnel Training Certificates

Prior to the start of ACM and/or ACCM abatement or assumed ACM/ACCM removal activities, the Contractor shall submit to Rio Hondo College and/or its Representatives a declaration certifying that all of the Contractor's employees have been adequately trained in accordance with CCR Title 8, Section 1529. The Contractor shall also submit proof that all personnel who will be permitted to enter contaminated work areas have been adequately trained in accordance with CCR Title 8, Section 1529 for certification as an Asbestos Worker or Supervisor for Class I and II asbestos abatement projects.

2.3.5. Medical Examination and Certification

Prior to the start of ACM and/or ACCM abatement or assumed ACM/ACCM removal activities, the Contractor shall submit proof that all personnel who will be permitted to enter contaminated work areas have had medical examinations in accordance with CCR Title 8, Section 1529 and 29 CFR 1910.134. In addition, the Contractor shall provide a written certification signed by a licensed physician that all workers and supervisors have met or exceeded all of the medical prerequisites listed herein and in CCR Title 8, Section 1529 and 29 CFR 1910.134.

2.3.6. Testing Laboratory

The Contractor shall submit:

- The name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate state license and/or permits;
• Certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited; and

• Persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry and have successfully participated in the laboratory in the Proficiency Analytical Testing Program.

2.3.7. Personal Air Sampling Results

The Contractor shall have performed complete fiber counting for personal air sampling and provide results to Rio Hondo College and/or its Representatives for review within 48 hours of sample collection. The Contractor will notify Rio Hondo College and/or its Representatives immediately of any airborne levels of asbestos fibers in excess of the PEL.

2.3.8. Pressure Differential Recordings

If used, the Contractor shall review and report the pressure differential recordings within 24 hours from the end of each work day, and immediately report to Rio Hondo College and/or its Representatives variance in the minimum permissible pressure differential (0.02 inch water column, relative to adjacent, unsealed areas) that could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background, whichever is greater.

2.3.9. Asbestos Disposal Quantity Report

The Contractor shall review and report to Rio Hondo College and/or its Representatives, within 24 hours from the end of each work day, the amount of ACM removed during the previous day.

2.3.10. Contractor Licensing Board Asbestos Certification

Submit a copy of the Contractor's California State Contractor's Licensing Board Asbestos Certification in accordance with the California Business and Professional Code, Section 7058.5, to Rio Hondo College and/or its Representatives.

2.3.11. Contractor Class C Asbestos Removal License

Submit proof that the Contractor possesses a current California Class C Asbestos Removal License to Rio Hondo College and/or its Representatives.

2.3.12. Hazardous Waste Hauler License and EPA Transporter's Number

Submit proof that the Contractor's Hazardous Waste Hauler possesses a current Hazardous Waste Hauler License and EPA Transporter's Number to Rio Hondo College and/or its Representatives.
2.3.13. At Job Completion

At completion of abatement in each regulated area, the Contractor will notify Rio Hondo College and/or its Representatives for clearance inspection and if necessary, clearance air sampling. At the completion of the project the Contractor shall transmit the job binder to Rio Hondo College and/or its Representatives within one week of completion. Contents shall be as described in this section plus any additional items as designated by Rio Hondo College and/or its Representatives.

2.4. Quality Assurance

- Where the methods or procedures are specified, they shall constitute the minimum measures and shall in no way relieve the Contractor of sole responsibility for the means, measures, methods, techniques, sequences, or safety measures in connection with the work.

- The removal of asbestos shall be supervised by a licensed supervisor who has experience in this field of construction and can furnish a record of satisfactory performance on at least three projects for work of comparable type and size.

- Subcontractor qualifications shall be the same in form and quantity as required for the Contractor.

3. PRODUCTS

Products to be supplied by the Contractor, include, but are not limited to, the following.

- **Polyethylene**: Polyethylene sheeting in various sizes to minimize the frequency of joints.

- **Tape**: Glass fiber or other tape capable of sealing joints of adjacent plastic sheets and for attachment of plastic sheeting to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions.

- **Surfactant (Wetting Agent)**: Shall consist of materials that are non-toxic and non-irritating to skin and eye, and non-carcinogenic. The wetting agent shall consist of 50 percent polyoxyethylene or polyglycoester and 50 percent polyoxyethylene ether, or the equivalent. Wetting agents shall be applied by means of an airless sprayer or equivalent.

- **Encapsulant**: Shall conform to EPA requirements, and shall contain no toxic or hazardous substances and no solvents.

- **Impermeable Containers**: Air- and water-tight, suitable to receive and retain any asbestos-containing or contaminated materials until disposal time at an approved site and labeled in accordance with applicable Cal-OSHA regulations (CCR Title 8, Section 1529). Two types of impermeable containers shall be used:
  - 6-millimeter (mil) plastic bags.
  - Metal or fiber drums with tightly fitting lids.
4. EXECUTION

The following sections describe the minimum expected materials, equipment, and procedures for execution of the abatement.

4.1. Material Handling

- Deliver materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

- Store materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damages or contamination.

- Removal of all ACMs and/or ACCMs and assumed ACMs/ACCMs from the premises. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards.

4.2. Equipment

The following sections describe the minimum required equipment for the abatement.

4.2.1. Respirators

The Contractor shall provide workers with personally issued and marked respiratory equipment approved by National Institute for Occupational Safety and Health (NIOSH) and meeting the specifications of Cal-OSHA. This respiratory equipment shall be suitable for the asbestos exposure level in the work area according to CCR Title 8, Section 1529(i). The Contractor shall provide disposable HEPA (P100) cartridges as required, with sufficient replacement cartridges.

4.2.2. Personal Protective Equipment

The Contractor shall provide workers, Rio Hondo College and/or its Representatives, and authorized visitors with sets of protective disposable clothing, head covers, gloves, eye protection, and foot covers of sizes to properly fit individual workers and visitors whenever they are required to enter the work area. The contractor shall also provide access and use of the Contractor's change room and provide a minimum of four sets of personal protective equipment (PPE) per day for visitors and sufficient sets as required for workers and Rio Hondo College and/or its Representatives. The PPE, both new and used, shall remain the property of the Contractor.
4.2.3. **Change Rooms**

Provide a temporary unit with a separate equipment room, decontamination locker room, and a clean locker room for personnel required to wear whole body protective clothing.

- Separate each room from the others and from the control area by airlocks.
- Provide two separate lockers for each asbestos worker, one in each locker room.
- Keep street clothing and street shoes in the clean locker.
- Vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators in the equipment room. Seal clothing in impermeable bags or containers for disposal.
- Do not remove disposable protective clothing from the decontamination locker room without bagging.
- Remove work clothing in the decontamination locker room.
- Tag and bag cloth work clothes for laundering and keep work shoes in the decontamination locker room.
- Do not wear work clothing between home and work.
- Provide showers with both hot and cold water feeding a common discharge line.
- Locate showers between the decontamination locker room and the clean locker room, and require employees to shower before changing into street clothes.
- Shower wastewater shall be handled and disposed as ACM or shall be filtered through a final filter of at least 0.5 micron particle size collection capability before disposal into the sanitary sewer system.
- Handle and dispose of wastewater filters as ACM.
- Clean asbestos-contaminated work clothing in accordance with CCR Title 8, Section 1529 or use disposable clothing.
- Change rooms shall be physically attached to the work area wherever feasible and required.
4.2.4. **Eye Protection**

Furnish goggles for personnel engaged in asbestos operation when a full-face respirator is not being used.

4.2.5. **Caution Signs and Labels**

Provide caution signs printed in English and Spanish at approaches to asbestos work areas. Locate signs at such distance that personnel may read the sign and take the necessary precautions before entering the work area. Provide caution labels printed in English and Spanish. Affix labels to friable asbestos materials, scrap, waste, debris, sealed impermeable bags, asbestos waste drums, and other asbestos containing products. Caution signs and labels shall conform to the requirements defined in CCR Title 8, Section 1529.

4.2.6. **Fire Extinguisher**

A minimum of one 4A/60BC dry chemical extinguisher shall be maintained at each of the following locations:

- At each electrical panel.
- At each corner of the work area.
- Within 5 feet of the external entry to the shower room from the work area.
- Within 5 feet of the external entry to the shower room from the "clean room."

4.3. **Tools and HEPA-Filtered Negative Air System**

Where a negative pressure enclosure is used, the Contractor shall provide a HEPA-filtered negative air system in accordance with American National Standards Institute Z9.2 and as specified herein.

4.3.1. **HEPA-Filtered Negative Air System**

Where a negative pressure enclosure is used, the Contractor shall provide a HEPA-filtered negative air system in each work area.

- Provide HEPA-filtered negative air equipment designed for a minimum of one work area air change every 15 minutes and additional air change flow rate sufficient to maintain a minimum pressure differential of minus 0.02 inches of water column relative to adjacent, unsealed areas.

- The HEPA-filtered negative air system shall be operated continuously, 24 hours per day, until the asbestos control area enclosure is removed. The Contractor is responsible for providing all necessary manpower.
and/or equipment including but not limited to emergency power, security, and fire watch to ensure 24-hour operation.

- Replace filters as required to maintain the efficiency of the system.
- The building heating, ventilation, and air conditioning system shall not be used as the HEPA-filtered negative air system for the work area.

4.3.2. Additional Ventilation Units

The Contractor shall provide additional units to the site in accordance with these Specifications for use inside the containment in the event engineering controls are not effective in controlling the fiber count below the PEL during the removal process. The unit(s) shall be placed inside the containment as additional filtration in a manner to move the air away from the worker's breathing zones and towards the exhaust unit(s).

4.3.3. Backup Ventilation Units

The Contractor shall provide at a minimum one additional HEPA-filtered negative air system unit for up to every ten units on the site as a replacement in case a ventilation unit fails to operate properly. These backup units must be stored on site during the entire project duration.

4.3.4. Filters

Filters on vacuums and exhaust equipment shall be absolute HEPA-filters and Underwriters Laboratories 586 labeled.

4.3.5. Negative Pressure Differential Monitor

- The Contractor shall provide a manometer-type or magnehelic-type negative pressure differential monitor with minor scale divisions of 0.02 inches of water and accuracy within plus or minus 1 percent.
- The Contractor will calibrate the manometer as recommended by the manufacturer.
- The Contractor shall furnish recorded readings of the pressure differential between locations in the work area and adjacent unsealed areas at the beginning of each workday and every two working hours thereafter.
- The Contractor will collect pressure differential readings at several points inside the work area, including the furthest point from the HEPA-filtered negative air equipment.
4.4. **Worker Protection**

The following sections describe the minimum required worker protection for the abatement.

4.4.1. **Abatement Contractor Responsibility**

Prior to commencement of work, all workers shall be instructed and shall be knowledgeable in the appropriate procedures of personal protection and asbestos removal.

The Contractor shall be solely responsible for enforcing worker protection requirements.

4.4.2. **Reporting Unusual Events**

When an event of unusual and significant nature occurs at the site, Contractor shall prepare and submit a special report listing chain of events, persons participating, responses, and similar pertinent information. When such events are known or predictable in advance, advise Rio Hondo College and/or its Representatives at the earliest possible date. Unusual events would include breaches of containment.

4.4.3. **Reporting Accidents**

If a significant accident occurs at the site or anywhere else work is in progress, the Contractor shall prepare and submit appropriate reports to Rio Hondo College and/or its Representatives. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained.

4.5. **General Work Area Requirements**

The following sections describe the minimum requirements for personnel within the work area.

4.5.1. **Respirators**

- Workers shall always wear a respirator properly fitted on the face while in the work area.

- Workers wearing tight-fitting face pieces shall be clean-shaven to the extent that the hair does not interfere with the sealing surface of the respirator. This must be documented by a standard respirator fit test.

- The Contractor shall instruct and train workers in proper respirator use.
4.5.2. Clothing

Workers shall wear disposable, full-body coveralls and disposable head covers and foot-wear suitable for asbestos work in the work area.

4.6. Decontamination Unit Requirements

At all work areas, the Contractor shall set up a change room, shower, and equipment room outside the work area. Where feasible and required, the change room, shower, and equipment room will be attached to the work area. All workers without exception shall:

- Remove and properly store street clothes in the change room and put on new disposable coveralls, head covers, footwear, and cleaned respirator before entering the work area.

- Remove the disposable coveralls, head covers, and footwear in the equipment room and dispose them in an appropriate asbestos waste container. Still wearing their respirators, workers shall proceed to the showers and remove their respirators while showering with soap and tempered water. Wetted HEPA respirator cartridges shall be disposed of in appropriate asbestos containers.

- This procedure shall be followed each time a worker leaves the work area.

- Workers shall not eat, drink, smoke, or chew gum or tobacco in the work area.

- The Contractor shall also provide disposable coveralls, head covering, and footwear to Rio Hondo College and/or its Representatives.

- All persons entering the work area shall wear an approved respirator and disposable coveralls, head covering, and footwear.

4.7. Personal Air Monitoring

Daily personal air monitoring shall be conducted by the Contractor in order to determine the airborne concentrations of asbestos to which workers may be exposed. Copies of the analytical results for the daily personal air monitoring shall be submitted to Rio Hondo College and/or its Representatives within 48 hours of sample collection.

4.8. Sign-In/Sign-Out Log & Daily Activity Report

- The Contractor shall maintain a sign-in/sign-out log in the immediate vicinity of the change room of any decontamination area. This log shall be maintained from the time the first activity is performed involving the disturbance of ACM and/or ACCM until acceptance of the final air test results. All persons entering the work area, including the Contractor's workers, Rio Hondo College and/or its Representatives, shall be required to sign in and out each time upon entering and leaving the work area. All persons shall indicate name, time, company or agency represented, and reason for entering the work area.
• The Contractor shall maintain a daily activity report describing work performed, materials and methods used, inspection(s) made, test(s) taken, and any unusual conditions or problems.

• Except for Rio Hondo College and/or its Representatives inspectors having jurisdiction, no visitors shall be allowed in any work area, except as authorized by Rio Hondo College and/or its Representatives.

4.9. Housekeeping

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by their employees. Bags of asbestos material and other waste material shall be removed immediately at the completion of work. Maintain surfaces of the work area free of debris and keep waste from being distributed outside of the immediate work area.

4.9.1. Removal of Asbestos Waste Containers

The Contractor shall provide a waste container removal system. Asbestos waste containers shall not be removed through the change rooms. The waste container removal system shall consist of a wash-down station inside the work area, a washroom, and a waste container holding area. Provide airlocks between each area and an airlock with access to outside the work area from the holding areas. Provide caution signs as specified herein for asbestos work areas. The waste container removal system shall be a temporary unit constructed to prevent the escape of asbestos fibers from the area. The system shall be physically attached to the work area. Personnel entering the waste container removal system shall wear PPE. The system shall not be used to enter or exit the work area. Access to outside the waste container removal system shall be sealed except during the removal of asbestos waste containers. Perform cleanup of the waste container removal system as specified herein for enclosed work areas. Do not remove the waste container removal system enclosure and caution signs prior to receipt of the Consultant's clearance sample results. All asbestos waste containers shall be removed from the work area daily.

4.9.2. Procedure for Disposal of Asbestos

Do not remove any ACMs from the site without approval from Rio Hondo College and/or its Representatives. Procedure for hauling and disposal of asbestos waste shall comply with 40 CFR 61, Subpart M and CCR Title 22.

4.10. Work Area Preparation

The following sections describe the minimum requirements for abatement work area preparation.

4.10.1. Warning Signs

The Contractor will provide Warning Signs meeting regulatory requirements at each visual and physical barrier.
4.10.2. Critical Barriers

Where appropriate, the Contractor shall seal all openings with two layers of 6-mil minimum polyethylene as a containment barrier to prevent leakage of air into the outside environment or other portions of the building. Individually seal ventilation openings in walls (supply and exhaust), wall-mounted fixtures, doorways, windows, convectors, and other wall and floor openings into the work area with adhesive tape alone or with two layers of polyethylene sheeting at least 6-mil (true), taped securely in place with adhesive tape.

4.10.3. Pre-Cleaning

- The Contractor shall pre-clean movable objects to be salvaged for Rio Hondo College within the proposed work areas using HEPA vacuum equipment or wet cleaning methods as appropriate. The Contractor shall move such items to storage or other area as directed by Rio Hondo College and/or its Representatives.

- The Contractor shall pre-clean immovable objects such as mechanical and electrical equipment and fixtures within the proposed work area using HEPA vacuuming equipment or wet cleaning methods as appropriate.

- Prior to placing plastic sheeting, clean the work area(s) and immediately adjacent areas physically connected to abatement areas using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust such as broom sweeping or vacuuming with non-HEPA equipped vacuum cleaners.

4.10.4. Containment

Where necessary, the Contractor will contain work areas with two layers of 4-mil plastic sheeting on walls and ceilings, and two layers of 6-mil plastic sheeting on floors, or as otherwise directed in writing by Rio Hondo College and/or its Representatives.

4.10.5. Decontamination Unit

The Contractor shall construct worker and waste container/equipment decontamination units in compliance with EPA guidelines. Provide sufficient numbers of lockers in change or "clean" rooms or worker's clothing with one locker reserved for Rio Hondo College and/or its Representatives personnel.

4.10.6. Emergency Exits

The Contractor shall establish emergency exits and procedures for the work area, satisfactory to fire officials and provide fire extinguishers as required.
4.10.7. Work Area Maintenance

The Contractor shall ensure that barriers and plastic enclosures remain effectively sealed and taped. Inadvertent tears in plastic shall be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by 6 inches on all sides.

If, during performance of abatement work, suspect ACM and/or ACCM is observed outside of abatement enclosures, or if damage occurs to the enclosure barrier(s), work shall stop immediately upon discovery, appropriate repairs will be made (by the Contractor), and all such debris will be collected using appropriate vacuums and wet methods.

5. ASBESTOS REMOVAL

The following sections describe the minimum requirements for the asbestos removal.

5.1. General Work Area Requirements

In a work area, the Contractor shall:

- Remove and dispose of all ACMs, ACCMs, Assumed ACMs and PACMs in accordance with the methods and procedures outlined in CCR Title 8, Section 1529.
- All asbestos removal shall be supervised by a competent person.
- Where appropriate, enclose work areas under differential air pressure for the duration of the asbestos removal and subsequent cleaning phases and until all removal areas have been air-tested and found to be in compliance with the specified final air quality clearance level detailed in Section 6.2 of these specifications.
- Perform appropriate cleaning using HEPA vacuum or wet cleaning methods of all areas physically connected to areas receiving asbestos removal.
- Dispose of all contaminated or otherwise removed materials and wastes in sealed and labeled containers in an approved sanitary landfill.
- Never use high-pressure water streams to remove any type of ACM and/or ACCM.
- After removal, all surfaces shall be wet-cleaned and HEPA vacuumed to remove residual accumulated material. After cleaning, surfaces shall appear free of visible material.
- Prior to the removal of the plastic sheeting from the wall, apply approved sealant on all concrete or wood substrates, structural steel, and piping surfaces from which the material was removed and to plastic sheeting prior to its removal.
Following related repair work remove any remaining floor and wall plastic, including seals on openings, and dismantle worker waste container/equipment decontamination areas and leave all areas clean.

Eating, smoking, or applying cosmetics shall not be permitted in the work areas.

5.2. Removal of OSHA Class I Materials

Removal of Class I OSHA materials including paper heating, ventilation, and air-conditioning equipment boot wrapping is anticipated for this project. The contractor shall remove the Class I OSHA materials in accordance with appropriate federal, state, and local regulations. The Contractor is responsible for processing any permits with the SCAQMD.

Should the Contractor choose to use mechanical methods or other means that would or could potentially render a non-friable material friable, the Contractor shall adhere to the work practices for Class I OSHA materials in accordance with appropriate federal, state, and local regulations. The Abatement Contractor is responsible for processing any permits with the SCAQMD, for the removal of materials via mechanical methods or other means that could potentially render a non-friable material friable.

5.2.1. Negative Pressure Enclosure System

Where necessary, the Contractor shall remove OSHA Class I Materials within a NPE system, as described below.

- A NPE will be used for the removal of friable ACMs within building(s).
- At least four air exchanges per hour shall be maintained by the NPE.
- Before beginning work within the enclosure and at the beginning of each shift, the NPE shall be inspected for breaches and smoke-tested for leaks by Rio Hondo College and/or its Representatives. Any leaks detected will be sealed by the Contractor. The NPE shall be re-tested after any repairs have been performed.
- Electrical circuits in the enclosure shall be deactivated and locked out. Temporary power and portable lighting sources will be provided from outside the work area; insure safe installation (including using ground fault circuit interrupters of temporary power sources and equipment by compliance with all applicable electrical code requirements and Federal, state and local requirements.
- Thoroughly wet ACM and/or ACCM prior to removal to satisfaction of Rio Hondo College and/or its Representatives. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant, applied with airless spray equipment.
- Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels. Apply mist with airless spray equipment.
5.2.2. Glovebags

As an alternative, the Contractor can remove OSHA Class I Materials within glovebags, as described below.

- At least two persons shall perform the removal for each glovebag or glovebag in operation.
- Check pipe or duct where the work will be performed. Wrap damaged (broken lagging, hanging, etc.) pipe in two layers of 6-mil plastic and "candy-stripe" with adhesive tape.
- Place a drop cloth on surfaces beneath the pipe insulation to be removed.
- Place one layer of adhesive tape around undamaged pipe at each end where the glovebag will be attached. If the pipe insulation is not ACM or ACCM, remove pipe insulation approximately 3 inches on either side of the point of attachment. Then, proceed with the attachment of the glove bag directly to the pipe.
- Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about 2 inches longer than the pipe diameter).
- Place necessary tools into pouch located inside glovebag.
- Seal glovebag.
- Request that Rio Hondo College and/or its Representatives perform a smoke tube test. If leaks are found, tape close using adhesive tape and re-test.
- Insert wand from garden sprayer through water sleeve. Adhesive tape water sleeve tightly around the wand to prevent leakage. Attach HEPA vacuum hose to the glovebag and seal.
- Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping.
- Rinse tools with water inside the bag and place back into pouch.
- Using scrub brush, rags and water, scrub and wipe down the exposed pipe.
- Remove the water wand. Turn on the vacuum only briefly to collapse the bag.
- Remove the vacuum nozzle, twist water sleeve closed and seal with adhesive tape.
• From outside the bag, pull the tool pouch away from the bag. Place adhesive tape over twisted portion and then cut the tool bag from the glovebag, cutting through the twisted-taped section. Contaminated tools may then be placed directly into next glovebag without cleaning.

• Alternatively, the tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste.

• With removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glovebag from the pipe.

• Slip a 6-mil disposal bag over the glovebag (still attached to the pipe). Remove tape or cut bag and open the top of the glovebag and fold it down into disposal bag.

• HEPA vacuum the drop cloth and place into disposal bag.

• If a removal encapsulant is used, test to insure it will neither leave a residue that will impede visual inspection nor become gummy during cleaning.

• Seal exposed ends of remaining pipe insulation.

• Remove disposable suits and place these into bag with waste.

• Collapse the bag with a HEPA vacuum, twist top of bag, seal with at least three wraps of adhesive tape, bend over and seal again with at least three wraps of adhesive tape.

5.3. Removal of OSHA Class II Materials

The following sections describe the minimum requirements for the Class II materials removal.

5.3.1. Flooring Materials

The Contractor is responsible for the removal/abatement of any of the identified flooring materials, per the construction bid documents. The Contractor shall demonstrate to the Consultant that the flooring materials do not extend underneath any of the fixtures, cabinets, or other permanent items, in each room, where removal/abatement of asbestos-containing flooring materials is scheduled to occur.

The Contractor shall adhere to the following additional work practices regarding the removal of vinyl flooring tile and/or mastic:

• Flooring material and/or associated mastics shall be removed with hand tools and, to the extent feasible, substantially intact.
• Flooring material and/or associated mastics removal operations involving the use of mechanized work methods, including motorized floor buffers and mechanical chipping, shall be conducted using Class I work methods.

• Low-odor, solvent-based mastic removers may be used to remove ACM and/or ACCM mastics, provided the waste generated is managed in accordance with applicable state and federal regulations. Use of solvent-based mastic removers will be followed by a suitable rinse (as per manufacturer's recommendations) to remove any residual mastic remover.

5.3.2. Roofing Materials (NOT APPLICABLE TO THIS PROJECT)

Asbestos containing roof materials are planned for removal prior to demolition. The Contractor shall adhere to the following additional work practices regarding the removal of roofing materials:

• Roofing materials shall be removed with hand tools, and to the extent feasible, substantially intact.

• Roofing materials shall not be dropped or thrown to the ground. The materials shall bagged up on the roofing area, and carried down through the interior of the building to the appropriate asbestos storage dumpster.

• The Contractor will spray areas of roofing material thoroughly with amended water, using spray equipment recommended by the surfactant manufacturer and capable of providing a "mist" application to reduce the chance of release of fibers. Spray the roofing material repeatedly during the abatement work process to maintain wet conditions, but do not use excessive amounts of water that results in ponding or leakage into the building.

• While materials that have been removed remain on the roof, the materials shall either be kept wet, placed in an impermeable waste container, or wrapped in plastic sheeting.

5.3.3. Window Putty/Glazing (NOT APPLICABLE TO THIS PROJECT)

The Contractor is responsible for the removal/abatement of the window putty/glazing, per the construction bid documents.

The Contractor shall adhere to the following additional work practices regarding the removal of window putty/glazing:

• Fencing with privacy screening will need to be set up on the south and east portions of the building to separate work locations and public walkway.

• Scaffolding should be utilized for access to perform work, if necessary.
5.4. Removal of Asbestos-Containing Construction Materials

The Contractor shall adhere to the following additional work practices during the removal of ACCMs, in accordance with CCR, Title 8, Section 1529, Asbestos in Construction.

- The Contractor shall constantly apply amended water or equivalent to the ACCM, for the duration of removal.
- No visible dust or other airborne particulate matter will be generated during removal activities.
- The Contractor will place the removed ACCMs in the waste disposal container(s) as soon as practicable, but no later than the end of the work shift. The removed ACCMs will be disposed of in leak-tight containers.
- The Worker Protection measures and General Work Area Requirements described in Sections 4.4 and 4.5 will apply during the removal of ACCMs.
- The Work Area Preparation measures, as described in Section 4.10.1 - Warning Signs, are required during the removal of ACCMs. It is recommended that a disposable drop cloth be used during removal activities. If a drop cloth is used, the drop cloth will be disposed of with the removed materials as soon as practicable, but no later than the end of the work shift.

6. CLOSURE

The following sections describe the minimum closure requirements for the abatement activities.

6.1. Waste Labeling

- ACM should be placed in labeled, leak-tight containers and/or wrapping. The labels for friable ACMs shall contain all information as specified by the Occupational Safety and Health Standards of the Department of Labor, under 1926.1101(k)(2)(iii) and Title 8, Section 5229, and any local regulations.
- For temporary storage on site, ACMs shall be stored in a secured area. The area shall be demarcated with Asbestos Warning Signs. Rio Hondo College and/or its Representatives will assist the Contractor, as necessary, in specifying secured area locations.
6.2. Clearance

- Work areas and all other decontaminated areas and cleaned areas shall be considered clean when:
  - The work area passes a visual inspection by Rio Hondo College and/or its Representatives and, when performed;
  - Air testing performed by Rio Hondo College and/or its Representatives, complies with the EPA recommended re-occupancy level of 0.01 fibers per cubic centimeter, when analyzed by Phase Contrast Microscopy (PCM).
- PCM analysis will be conducted in accordance with NIOSH Method No. 7400.
- Areas that do not comply with the standard of cleaning for final clearance shall continue to be cleaned by and at the Contractor's expense until the specified standard is achieved as evidenced by results of air sampling tests by the Consultant. The costs of all follow-up tests necessitated by the failure of the air tests to meet the cleaning criteria shall be borne by the Contractor. Follow-up testing shall occur within the time allotted for gross removal or all costs to Rio Hondo College and/or its Representatives, attributable to delayed occupancy or usage, shall be borne by the Contractor.
- When the clearance is achieved, as indicated above, and an inspection determines that the area has been visually decontaminated, the decontamination enclosure systems shall be removed, the area thoroughly wet cleaned, and materials from the equipment room and shower disposed of as contaminated waste. The remaining barriers between contaminated and clean areas and all seals on openings into the work area and fixtures shall be removed and disposed of as contaminated waste.

6.3. Tear Down

All plastic sheeting, tape, cleaning material, clothing, and all other disposable material used in the asbestos removal operation or items used in the work area shall be packed into sealable 6-mil plastic bags. These bags must be marked with labels as required by Cal-OSHA in CCR Title 8, Section 1529.
Rio Hondo Community College District

L-Tower Seismic and Code Upgrades

PROJECT LABOR AGREEMENT
RIO HONDO COMMUNITY COLLEGE DISTRICT

NEW FACILITIES, MAJOR RENOVATIONS, AND FACILITIES REHABILITATION

PROJECT LABOR AGREEMENT

March 8, 2005
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**ATTACHMENT**  
A  LETTER OF ASSENT

**ATTACHMENT**  
B  DEFINITION OF DISTRICT
RIO HONDO COMMUNITY COLLEGE DISTRICT
NEW FACILITIES AND MAJOR RENOVATIONS AND FACILITIES REHABILITATION PROJECT
LABOR AGREEMENT

This Project Labor Agreement (hereinafter, "Agreement") is entered into this 8th day of March, 2005, by and between the Rio Hondo Community College District, its successors or assigns, (hereinafter "District") and the Los Angeles/Orange Counties Building and Construction Trades Council (hereinafter "Council"), and the signatory Craft Unions (hereinafter, together with the Council, collectively, the "Union" or "Unions"). This Agreement establishes the labor relations Policies and Procedures for the District, the contractors awarded contracts for Project Work and for the craft persons employed by the contractors and represented by the Unions while engaged in the Project Work defined in Section 2.2.

It is understood by the Parties to this Agreement that if this Agreement is acceptable to the District, it will become the policy of the District for the Project Work to be contracted exclusively to contractors who agree to execute and be bound by the terms of this Agreement, directly or through the Letter of Assent (Attachment A), and to require each of its subcontractors, of whatever tier, to become bound. The District shall include, directly or by incorporation by reference, the requirements of this Agreement in the advertisement of and/or specifications for each and every contract for Project Work to be awarded by the District.

It is further understood that the District shall actively administer and enforce the obligations of this Agreement to ensure that the benefits envisioned from it flow to all signatory parties, the contractors and craftpersons working under it, and the residents and taxpayers of the District. The District shall designate a Project Labor Agreement Administrator (PLA Administrator), to monitor compliance with this Agreement; assist, as the authorized representative of the District, in developing and implementing the programs referenced herein, all of which or critical to fulfilling the intent and purposes of the Parties and this Agreement; and to otherwise implement and administer the Agreement. For such purposes, each contractor recognizes and appoints the Project Labor Coordinator, its successors or assigns, as its agent; and together with District and the Unions, the PLA Administrator shall be considered a "negotiating party" of this Agreement.

The term “Project Work” as used in this Agreement includes all construction work undertaken on behalf of The Rio Hondo Community College District as specifically defined in Section 2.2. Such a construction may include construction of new facilities and infrastructure components and/or the renovation or rehabilitation of existing facilities, and such other work as the District may designate for coverage prior to the termination of the Agreement, all of which shall constitute “the Project”.

The term “Contractor” as used in this Agreement includes any contractor to whom the District awards a construction contract for Project Work, and also to subcontractors of whatever tier utilized by such contractors for Project Work. The term “Contractor” includes any individual, firm, partnership, or corporation, or combination
thereof, including joint ventures, which have entered into a contract with the District with respect to the Project Work, or with another contractor as a subcontractor for Project Work.

The term "Labor/Management Apprenticeship Program" as used in this Agreement shall be defined as an apprenticeship program jointly administered by representatives of labor and construction organizations and certified by the State of California.

The term "Local Businesses" as used in this Agreement shall be defined as those businesses having either their principal office within the District (as the District is defined in "Attachment B"), or a functioning office within the District and actively engaged in their principal line(s) of business within the District on the date this Agreement was entered into, or for six months prior to the award of covered work.

The Union and all contractors agree to abide by the terms and conditions of this Agreement and that this Agreement represents the complete understanding of the parties. No contractor is or will be required to sign or otherwise become a party to any other collective bargaining agreement with a signatory union as a condition of performing work within the scope of this Agreement. No practice, understanding or agreement between a contractor and a Union party which is not specifically set forth in this Agreement shall be binding on any third party contractor or union on Project Work unless endorsed in writing by the PLA Administrator.

The Parties agree that this Agreement will be made available to, and will fully apply to, any successful bidder for Project Work, without regard to whether that successful bidder performs work at other sites on either a union or non-union basis. This Agreement shall not apply to any work of any contractor other than that on Project Work specifically covered by this Agreement.

The use of masculine or feminine gender or titles in this Agreement should be construed as including both genders and not as gender limitations unless the Agreement clearly requires a different construction. Further, the use of Article titles and or Section headings are for information only, and carry no legal significance.

ARTICLE 1

INTENT AND PURPOSE

Section 1.1  Background. The Project is intended to increase the educational opportunities and raise student achievement by the improvement of academic learning facilities and health and safety conditions on the District's campus through development of campus facilities for students, faculty and staff, including but not limited to the construction and/or major renovations and rehabilitation, furnishing and equipping of class rooms, laboratory, libraries and related facilities, the improvement of the infrastructure on the campus and the development of the District's properties to relieve overcrowding on campus. With this Agreement, the parties have established a framework for fair wages, hours and working conditions through which these goals may be achieved and which will
permit the utilization of the most modern, efficient and effective procedures for construction, assure a sufficient supply of skilled craftpersons, and reduce or eliminate the causes of disruptions or interference with Project Work.

It is critical to the citizens of the District, the taxpayers, the administration, faculty and students of the District and the state of California that the Project be completed in as timely and economical manner as possible; that the Project provide employment opportunities for residents of the District, as well as opportunities for students and graduates of Rio Hondo Community College to enter the construction industry through pre-apprenticeship and apprenticeship programs sponsored by parties to this Agreement, and increase business opportunities for all local businesses; and that this Agreement facilitate the achievement of these goals.

Finally, it is the purpose and intent of the parties to this Agreement to make every cooperative effort to achieve the timely, safe and economical construction of the facilities designated as the Project, to provide the opportunities and programs for the District's residents and local businesses to participate in the Project, and to enforce compliance with the established prevailing wages, benefits and working conditions affecting the craft workers employed on the Project.

Section 1.2 Identification and Retention of Skilled Labor and Employment of District Residents. The construction, rehabilitation, and renovation work scheduled to be performed over the next five years will require large numbers of craft personnel and other supporting workers. It is therefore the explicit understanding and intention of the parties to this Agreement to use the opportunities provided by the extensive amount of work to be covered by this Agreement to identify and promote, through cooperative efforts, programs and procedures (which may include, for example, programs to prepare persons for entrance into formal Labor/Management Apprenticeship Programs or outreach programs to the community describing opportunities available as a result of the Project), for involvement of District residents in the construction industry, assist them in entering the construction trades, and through utilization of the Labor/Management Apprenticeship Programs, provide training opportunities for those residents and students and graduates of Rio Hondo Community College wishing to pursue a career in construction. Further, with assistance of the PLA Administrator, the District, the contractors and the Unions, will work together to develop and implement promptly procedures for the identification of craft needs, the scheduling of work to facilitate the utilization of available craft workers, and the securing of services of craft workers in sufficient numbers to meet the high demand of the Project Work to be undertaken.

Section 1.3 Encouragement of Local Businesses. The Project will provide many opportunities for local businesses to participate as contractors or suppliers, and the parties agree that they will cooperate with all efforts of the District, the PLA Administrator, and any other organizations retained by the District for the purpose of encouraging and assisting the participation of District businesses in Project Work. Each party agrees that it shall employ demonstrable efforts to encourage participation in an effort to achieve such goals. This may include, for example, participation in outreach programs, education and assistance to businesses not familiar with working on a
public works projects, and the encouragement of local residents to participate in Project Work through programs 
and procedures jointly developed to prepare and encourage local residents for participation in Labor/Management 
Apprenticeship Programs and employment on the Project through the referral programs sponsored and/or supported 
by the parties to this Agreement.

Section 1.4 Project Cooperation. The construction to take place under this Agreement involves 
unique and special circumstances which dictate the need for the parties to develop specific procedures to promote 
high quality, rapid and uninterrupted construction methods and practices. The smooth operation and successful and 
timely completion of the work is vitally important to the residents of the District. The parties therefore agree that 
maximum cooperation among all parties involved is required; and that, with multiple contractors and crafts 
performing Project Work on multiple sites of over an extended period of time, it is essential that all parties work in a 
spirit of harmony and cooperation and with an overriding commitment to maintain the continuity of Project Work.

Section 1.5 Workers' Compensation Carve-out. The parties recognize the potential which the Project 
may provide for the implementation of a cost effective workers' compensation system as permitted by revised 
California Labor Code Section 3201.5, and it is understood that the District is in an ongoing review of the value of 
such a program. Should the District request, the Union parties agree to meet and negotiate in good faith with 
representatives of the District for the development, and subsequent implementation, of an effective program for the 
delivery of workers' compensation benefits and medical coverage as permitted by the Code through improved 
dispute resolution and medical care procedures.

Section 1.6 Peaceful Resolution of All Disputes. In recognition of the special needs of the Project 
and to maintain a spirit of harmony, labor-management peace and stability during the term of the Project Labor 
Agreement, the parties agree to establish effective and binding methods for the settlement of all misunderstandings, 
disputes and grievances; and in recognition of such methods and procedures, the unions agree not to engage in any 
strike, slowdowns, or interruption or disruption of Project Work, and the contractors agree not to engage in any 
lockout.

ARTICLE 2

SCOPE OF THE AGREEMENT

Section 2.1 General. This Agreement shall apply and is limited to all new construction, rehabilitation 
and/or renovation work for the development of the District's facilities and infrastructure components that have been 
designated by the District for inclusion in the Project, as specifically described in Section 2.2, and performed by 
those contractor(s) of whatever tier that have contracts awarded for such work more than thirty days after the 
effective date of this Agreement.
Section 2.2 Specific Facilities and Construction/Renovation/Rehabilitation Programs contained in the Project. The Project is defined and limited to all new construction, rehabilitation and renovation work as described below (which shall include, when an integral part of the Project, demolition and/or site clearing and hazard abatement work):

(a) Perimeter road;
(b) Central utility plant;
(c) Parking structures;
(d) Fire science building completion;
(e) Learning research center (library);
(f) Administrative of Justice Center and related buildings, including parking facilities;
(g) Physical education buildings;
(h) Technology upgrading and remodeling;
(i) Student services building;
(j) Astro-physics laboratory; and
(k) Multi-media facilities.

It is understood by the parties of the District may at any time, and at its sole discretion, determine to add the construction, renovation and/or remodeling of facilities and infrastructure components to the Project under this Agreement which are not currently proposed, or to modify or not to build any one or more of the particular segments proposed to be covered.

Section 2.3 Exclusions. Items specifically excluded from the Scope of this Agreement include the following:

(a) Work of non-manual employees, including but not limited to superintendents; supervisors; staff engineers; quality control and quality assurance personnel; time keepers, mail carriers, clerks, officer workers, messengers, guards, safety personnel, emergency medical and first aid technicians, and other professional, engineering, administrative, supervisory and management employees;

(b) Equipment and machinery owned or controlled and operated by the District;

(c) All off-site manufacture and handling or materials, equipment or machinery; provided, however, that lay down or storage areas for equipment or material and manufacturing (prefabrication) sites, dedicated solely to the Project or Project Work, and the movement of materials or goods between locations on a Project site are within the scope of this Agreement;

(d) All employees of the District, PLA Administrator, design teams (including, but not limited to architects, engineers, and master planners), and any other consultants for the District (including, but not limited to program or project managers and construction managers and their employees where not engaged in Project Work) and their sub-
consultants, and other employees of professional service organizations, not performing manual labor within the scope of this Agreement; provided, however, that it is understood and agreed that Building/Construction Inspectors and Field Soils and Material Testers (inspectors) as defined in the State of California wage determination for that craft are covered under the PLA when employed by a construction contractor and engaged on the Project site in Project related work. Nothing in this section will be construed to include inspectors certified by the Department of State Architects within the scope of this Agreement;

(e) Any work performed on or near or leading to or into a site of Project Work and undertaken by state, county, or other governmental bodies, or their agents or contractors, or by public utilities, or their contractors; and/or by the District, or its contractors, for work for which is not within the scope of this Agreement;

(f) Off-site maintenance of leased equipment and on-site supervision of such work;

(g) Work by employees of a manufacturer or vendor necessary to maintain such manufacturer's or vendor's warranties or guaranty;

(h) Non-construction support services contracted by the District, District Consultants, Project Labor Administrator, or a contractor in connection with this Project;

(i) All work by employees of the District or its contractors involving general maintenance and/or repair and or cleaning work, except as specifically covered by this Agreement; and

(j) Laboratory work for testing.

Section 2.4 Awarding of Contracts.

(a) The District and/or the contractors, as appropriate, have the absolute right to award contracts or subcontracts on this Project to any contractor notwithstanding the existence or non-existence of any agreements between such contractor and any Union parties, provided only that such contractor is willing, ready and able to execute and comply with this Project Labor Agreement should such contractor be awarded work covered by this Agreement.

(b) It is agreed that all contractors and subcontractors of whatever tier, who have been awarded contracts for work covered by this Agreement, shall be required to accept and be bound by the terms and conditions of this Project Labor Agreement, and shall evidence their acceptance by the execution of the Agreement or of the Letter of Assent as set forth in Attachment A hereto, prior to the commencement of work. No contractor or subcontractor shall commence Project Work without having first provided a copy of the Agreement or Letter of Assent as

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executed by it to the PLA Administrator and to the Council 48 hours before the commencement of Project Work, or with 48 hours after the award of the Project Work to that contractor (or subcontractor), whichever occurs later.

Section 2.5 Coverage Exception. The parties agree and understand that this Agreement shall not apply to any work that would otherwise be covered Project Work when a governmental agency or granting authority partially or fully funding such Project Work determines that it will not provide this funding if such Project Work is covered by this Agreement; or a law regulation, proposition or measure prohibits such coverage or the use by the District or for its benefit, of particular funds, if such coverage exists. The District agrees that it will make every effort with any such governmental agency or granting authority to permit the implementation of this Agreement with regard to Project Work that the agency or authority may be partially or fully funding.

Section 2.6 Schedule A’s.

(a) The provisions of this Agreement, including the Schedule A’s, which are the local collective bargaining agreements of the signatory unions having jurisdiction over the work on the Project, as such may be changed from time-to-time consistent with Section 21.3, and which are incorporated herein by reference, shall apply to the work covered by this Agreement, notwithstanding the provisions of any other local, area and/or national agreement which may conflict with or differ from the terms of this Agreement, provided, however, that such does not apply to work performed under the National Cooling Tower Agreement, the National Stack Agreement, the National Transit Division (NTD), or within the jurisdiction of the International Union of Elevators Constructors, except that Articles 7, 8, and 10 shall apply to such work. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall apply. Where a subject is covered by a provision of a Schedule A and not covered by this Agreement, the provision of the Schedule A shall prevail. Any dispute as to the applicable source between this Agreement and any Schedule A for determining the wages, hours of working conditions of employees on this Project shall be resolved under the procedures established in Article 10.

(b) It is understood that this Agreement, together with the referenced Schedule A’s, constitutes a self-contained, stand-alone agreement and by virtue of having become bound to this Project Labor Agreement, a contractor will not be obligated to sign any other local, and/or national collective bargaining agreement as a condition of performing work within the scope of this Agreement; provided, however, that the contractor may be required to sign uniformly applied, non-discriminatory Participation Agreement at the request of the trustees or administrator of a trust fund established pursuant to Section 302 of the Labor Management Relations Act and to which such contractor is bound to make a contribution under this Agreement as a result of his employment of persons working within the craft for which the trust fund provides coverage; but provided further, however, that the contractor shall have no obligation to execute a Participation Agreement that binds, or attempt to bind the contractor beyond the terms and conditions of this Agreement and/or expand the contractor’s obligation to make contributions
pursuant thereto. It shall be the responsibility of the prime contractor to have each of its subcontractors of whatever tier sign the documents with the appropriate craft union funds prior to the subcontractor beginning Project Work.

Section 2.7 Binding Signatories Only. This Agreement shall be binding only on the signatory parties hereto, and shall not apply to the parents, affiliates, subsidiaries, or other ventures of any such party.

Section 2.8 Other District Work. This Agreement shall be limited to the construction work within the Scope of this Agreement including, specifically, site preparation and related demolition work, and the construction, rehabilitation and renovation work on the new or existing facilities and infrastructure components included in Section 2.2 above. Nothing contained herein shall be interpreted to prohibit, restrict or interfere with the performance of any other operating, work or function not covered by this Agreement which may be performed by District employees or contracted for by the District for its own account on its property or in and around a Project site.

Section 2.9 Separate Liability. It is understood that the liability of the contractor(s) and the liability of the separate unions under this Agreement shall be several and not joint. The Unions agree that this Agreement does not have the effect of creating any joint employment status between or among the District or PLA Administrator and/or any contractor or consultant.

Section 2.10 Completed Project Work. As areas of covered work are accepted by the District, this Agreement shall have not further force or effect on such items or areas except where the contractor is directed by the District or its representatives to engage in repairs, modification, check-out and/or warranty functions required by its contract(s) with the District.

ARTICLE 3

UNION RECOGNITION AND EMPLOYMENT

Section 3.1 Recognition. The contractor recognizes the Council and the signatory local Unions as the exclusive bargaining representative for the construction employees engaged in Project Work. Such recognition does not extend beyond the period when the employee is engaged in Project Work.

Section 3.2 Contractor Selection of Employees. The contractor shall have the right to determine the competency of all employees, the number of employees required, the duties of such employees within their craft jurisdiction, and shall have the sole responsibility for selecting employees to be laid off, consistent with Sections 3.10 and 4.3, below. The contractor shall also have the right to reject any applicant referred by a Union for any reason, subject to any reporting pay required by Section 6.6; provided, however, that such right is exercised in good faith and not for the purpose of avoiding the contractor's commitment to employ qualified workers through the procedures endorsed in this Agreement.
Section 3.3  Referral Procedures.

(a) For signatory unions now having a job referral system contained in a Schedule A, the contractor agrees to comply with such system and it shall be used exclusively by such contractor, except as modified by this Agreement. Such job referral system will be operated in a nondiscriminatory manner and in full compliance with federal, state, and local laws and regulations which require equal and non-discriminatory employment opportunities. All hiring procedures, including related practices affecting apprenticeship, shall be operated so as to consider the goals of the District to encourage employment of District residents (those residing within the area defined and described in Attachment B), and utilization of Local Businesses on the Project, and to facilitate the ability of all contractors to meet their employment needs.

(b) The local unions will exert their best efforts to recruit and refer sufficient numbers of skilled craft workers to fulfill the labor requirement of the contractor, including specific employment obligations to which the contractor may be legally and/or contractually obligated; and to refer apprentices as requested to develop a larger, skilled workforce. The local Unions will work with their affiliated regional and national unions, and jointly with the PLA Administrator and any others designated by the District, to identify and refer competent crafts persons as needed for Project Work, and to identify residents of the District for entrance into Labor/Management Apprenticeship Programs, or for participation in other identified programs and procedures to assist individuals in qualifying and becoming eligible for such apprenticeship programs, all maintained to increase the available supply of skilled craft personnel for Project Work and future construction, renovation and rehabilitation work to be undertaken by the District.

(c) The Union shall not knowingly refer an employee currently employed by a contractor on a Project Work to any other employer.

Section 3.4  Non-Discrimination in Referral, Employment, and Contracting. The Unions and contractors agree that they will not discriminate against any employee or applicant for employment on the basis of race, color, religion, gender, national origin, age, union status, sexual orientation, marital status or disability.

Section 3.5  Employment of District Residents.

(a) In recognition of the District's mission to serve its residents, the Unions and contractors agree that, to the extent allowed by law, and as long as they possess the requisite skills and qualifications, residents of the District shall be first referred for Project Work, including journeyperson, apprentice, or other positions which may be established under a Schedule A and covered by the applicable prevailing wage for utilization on Project Work, until at least 30 percent of the positions for Project Work for a particular contractor (including the contractor's "core workforce"), by craft, have been filled with District residents, and only if at least 30 percent of the covered positions for any one
contractor, by individual craft, are filled by District residents, or such individuals are not available, may others be referred to that contractor for Project Work in that craft.

(b) The PLA Administrator shall work with the Unions and contractors in the administration of this local residency preference; and the contractors and Unions shall cooperate by maintaining adequate records to demonstrate to the PLA Administrator that such preferences have been pursued. As part of this process, and in order to facilitate the contract administration procedures, as well as appropriate benefit fund coverage, all contractors shall require their "core work force" and any other persons employed other than through the referral process, to register with the appropriate hiring hall, if any.

Section 3.6 Core Employees. The Parties recognize and support the District's commitment to provide opportunities for all businesses to participate on the Project. In furtherance of this commitment, the Parties agree that a contractor that is not a party to a current collective bargaining agreement with a signatory union shall have the opportunity to employ its experienced core employees on this Project, and that, therefore,

(a) A specialty or sub-contractor may directly employ, as needed, first, a member of its core work force, then an employee through a referral from the appropriate union hiring hall, then a second core employee, then a second employee through the referral system, and so on until a maximum of five core employees are employed, after which all further employment shall be pursuant to the referral provisions of this article. On layoff, the reverse process shall be followed if and when the workforce is to be reduced below 10.

(b) A general and/or multi-trade contractor (not engaged exclusively in specialty work) may first employ his core workforce prior to utilizing the referral procedures.

(c) A contractor's core workforce is comprised of those employees:

(i) whose names appeared on the contractor's active payroll for fifty of the one hundred working days before award of Project Work to the contractor.

(ii) who possess any license required by state or federal law for the Project Work to be performed;

(iii) who have the ability to safely perform the basic functions of the applicable trade; and

(iv) who are residents of Los Angeles or Orange Counties on the effective date of this Agreement, or have been residents of these Counties for the one hundred working days prior to the award of Project Work to the contractor.
(d) A contractor desiring to use its core employees on the Project must identify them at the time it receives the Notice to Proceed, and provide proof of their eligibility to the PLA Administrator, who shall provide such proof to the Council at its request. For proof of employment eligibility, quarterly tax records or payroll records normally maintained by the contractor (or officially recognized substitutes) shall be utilized; and for residency, proof is demonstrated by a drivers’ license, voter registration, postal address, utility statements, or other official acknowledgments.

Section 3.7 Time for Referral. If any Union’s referral system does not fulfill the requirements for specific classifications of covered employees (including residency standards) requested by any contractor within forty-eight (48) hours (excluding Saturdays, Sundays and holidays), that contractor may use employment sources other than the union registration and referral services, and may employ applicants meeting such standards from any other available source. The contractor should promptly inform the Union of any applicants hired from other sources, and such applicants shall register with the appropriate hiring hall, if any.

Section 3.8 Lack of Referral Procedure. If a signatory local Union does not have a job referral system as set forth in Section 3.3 above, the contractors shall give the Union equal opportunity to refer applicants. The contractors shall notify the union of employees so hired, as set forth in Section 3.5.

Section 3.9 Union Membership. No employee covered by this Agreement shall be required to join any union as a condition of being employed, or remaining employed, for the completion of Project Work; provided, however, that any employee who is a member of the referring union at the time of referral shall maintain that membership in good standing while employed under this Agreement. All employees shall, however, be required to comply with the union security provisions of the applicable Schedule A for the period during which they are performing on-site Project Work to the extent, as permitted by law, of rendering payment of the applicable monthly working dues and any non-initiation or application fees uniformly required of members in the Union.

Section 3.10 Individual Seniority. Except as provided in Section 4.3, individual seniority shall not be recognized or applied to employees working on the Project; provided, however, that group and/or classification seniority in a Union’s Schedule A as of the effective date of this Agreement shall be recognized for purposes of layoffs.

Section 3.11 Foremen. The selection and number of craft foremen and/or general foreman shall be the responsibility of the contractor. All foremen shall take orders exclusively from the designated contractor representatives. Craft foremen shall be designated as working foremen at the request of the contractors.
ARTICLE 4

UNION ACCESS AND STEWARDS

Section 4.1  Access to Project Sites. Authorized representatives of the Union shall have access to
Project Work, provided that they do not interfere with the work of employees and further provided that such
representatives fully comply with posted visitor, security and safety rules, including checking/signing in with the
representative of the Program Manager on site and with the appropriate construction manager, if present on the site,
prior entering into the Project construction area(s).

Section 4.2  Stewards.

(a)     As part of the referral process of Article 3, above, each signatory local Union shall have the right to
designate a working journey person as a steward for each shift, and shall notify the contractor in the writing of the
identity of the designated steward or stewards prior to the assumption of such person’s duties as steward. Such
designated steward or stewards shall not exercise any supervisory functions. There will be no non-working
stewards. Stewards will receive the regular rate of pay for their respective craft.

(b)     In addition to his/her work as an employee, the steward shall have the right to receive, but not to solicit,
complaints or grievances and to discuss and assist in the adjustment of the same with the employee’s appropriate
supervisor. Each steward should be concerned only with the employees of the steward’s contractor and, if
applicable, subcontractor(s), and not with the employees of any other contractor. The contractor will not
discriminate against the steward in the proper performance of his/her union duties.

(c)     When a contractor has multiple, non-contiguous work locations at one site, the contractor may request and
the union shall appoint such additional working stewards as the contractor may request to provide independent
coverage of one or more such locations. In such cases, a steward may not service more than one work location
without the approval of the contractor.

(d)     The stewards shall not have the right to determine when overtime shall be worked or who shall work
overtime.

Section 4.3  Steward Layoff/Discharge. The involved contractor agrees to notify the appropriate
Union twenty-four (24) hours before the layoff of a steward, except in the case of disciplinary discharge for just
cause. If the steward is protected against such layoff by the provisions of the applicable Schedule A, such
provisions shall be recognized when the steward possesses the necessary qualifications to perform the remaining
work. In any case in which the steward is discharged or disciplined for just cause, the appropriate Union will be
notified immediately by the contractor, and such discharge or discipline shall not become final (subject to any later filed grievance) until twenty-four (24) hours after such notice have been given.

Section 4.4 Employees on Non-Project Work. On work where the personnel of the District may be working in close proximity to the construction activities covered by this Agreement, the Union agrees that the Union representatives, stewards, and individual workers will not interfere with the District personnel, or with personnel employed by the any other employer not a party to this Agreement.

ARTICLE 5
WAGES AND BENEFITS

Section 5.1 Wages. All employees covered by this Agreement shall be classified in accordance with work performed and paid the hourly wage rates for those classifications in compliance with the applicable prevailing wage rate determination established pursuant to the California Labor Code by the Department of Industrial Relations. If a prevailing rate increases under state law, the contractor shall pay that rate as of its effective date under the law. If the prevailing wage laws are repealed during the term of this Agreement, the contractor shall pay the wage rates established under the Schedule A’s, except as otherwise provided in this Agreement.

Section 5.2 Benefits.

(a) Contractors shall pay contributions to the established employee benefit funds in the amounts designated in the appropriate Schedule A, and make all employee-authorized deductions in the amounts designated in the appropriate Schedule A, for all covered employees. The negotiating parties further agree that, unless otherwise mandated by the applicable prevailing wage determination, only such bona fide benefits as accrue to the direct benefit of the employees (such as pension and annuity, health and welfare, vacation, apprenticeship and training funds, etc.) shall be included in this requirement and required to be paid on the Project. Such contributions for each benefit shall not exceed the amounts specified for such in the applicable prevailing wage determination. Contractors directly signatory to one or more of the Schedule A’s are required to make all contributions set forth in those Schedule A’s without reference to the forgoing. Bona fide jointly-trusteed benefit plans or authorized employee deductions programs established or negotiated under the applicable Schedule A or by the parties to this Agreement during the life of this Agreement may be added, subject to the limitations upon such negotiated changes contained in Section 21.3, and provided that the contributions do not exceed the amounts set forth in the applicable prevailing wage determination.

(b) The contractor adopts and agrees to be bound by the written terms of the applicable, legally established, trust agreement(s) specifying the detailed basis on which payments are to be made into, and benefits paid out of such trust funds for its employees. The contractor authorized the parties to such trust funds to appoint trustees and
successors trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the contractor.

(c) Each contractor and subcontractor is required to certify to the PLA Administrator that it has paid all benefit contributions due and owing to the appropriate Trust(s) prior to the receipt of its final payment and/or retention. Further, upon timely notification by a Union to the PLA Administrator, the PLA Administrator shall work with any prime contractor or subcontractor who is delinquent in payments to assure that proper benefit contributions are made, to the extent of requesting the District or the prime contractor to withhold payments otherwise due such contractor, until such contributions and/or compensation have been made or otherwise guaranteed by such contractor.

Section 5.3 Wage Premiums. Wage premiums, including but not limited to pay based on height of work, hazard pay, scaffold pay and special skills shall not be applicable to work under this Agreement, except to the extent provided for in any applicable prevailing wage determination.

Section 5.4 Compliance with Prevailing Wage Laws. The parties agree that the PLA Administrator shall monitor the compliance by all contractors and subcontractors with all applicable federal and state prevailing wage laws and regulations. All complaints regarding possible prevailing wage violations shall be referred to the PLA Administrator for processing, investigation and resolution, and if not resolved within thirty calendar days, may be referred by any party to the state labor commissioner.

ARTICLE 6

HOURS OF WORK, OVERTIME, SHIFTS AND HOLIDAYS

Section 6.1 Hours of Work. Eight (8) hours per day between the hours of 6:00 a.m. and 5:30 p.m., plus one-half (½) hour unpaid lunch approximately mid-way through the shift, shall constitute the standard work day. Forty (40) hours per week shall constitute a regular week’s work. The work week will start on Sunday and conclude on Saturday. The foregoing provisions of this Article are applicable unless otherwise provided in the applicable prevailing wage determination, or unless changes are permitted by law and such are agreed upon by the parties. Nothing herein shall be construed as guaranteeing any employee eight (8) hours per day or forty (40) hours per week, or a Monday through Friday standard work schedule.

Section 6.2 Place of Work. Employees shall be at their place of work (as designated by the contractor), at the starting time and shall remain at their place of work, performing their assigned functions, until quitting time. The place of work is defined as the gang or tool box or equipment at the employee’s assigned work location or the place where the foreman gives instructions. The parties reaffirm their policy of a fair day’s work for
a fair day's wage. There shall be no pay for time not worked unless the employee is otherwise engaged at the direction of the contractor.

**Section 6.3 Overtime.** Overtime shall be paid in accordance with the requirements of the applicable prevailing wage determination. There shall be no restriction on the contractor's scheduling of overtime or the nondiscriminatory designation of employees who will work overtime. There shall be no pyramiding of overtime (payment of more than one form of overtime compensation for the same hour) under any circumstances.

**Section 6.4 Shifts and Alternate Work Schedules.**

(a) Alternate starting and quitting time and/or shift work may be performed at the option of the contractor upon three (3) day's prior notice to the affected union(s), unless a shorter notice period is provided for in the applicable Schedule A and shall continue for a prior of not less that five (5) working days, Saturdays and Sundays, if worked, may be used for establishing the five (5) day minimum work shift. If two shifts are worked, each shall consist of eight (8) hours of continuous work exclusive of a one half (½) hour non-paid lunch period, for 8 hours pay. The last shift shall start on or before 6:00 p.m. The first shift starting at or after 6:00 a.m. is designated as the first shift, with the second shift following.

(b) Because of operational necessities, the second shift may, at the District's direction, be scheduled without the preceding shift having been worked; or that there otherwise be a restructuring of normal work schedules. Such changes should not adversely affect the wages or premium payments otherwise due the employees pursuant to other provisions of this Agreement and/or the applicable prevailing wage determination. Except in an emergency, or when specified in the District’s bid specification, the contractor should give the affected Union(s) at least three (3) days notice of such scheduling changes.

**Section 6.5 Holidays.** Recognized holidays on this Project shall be those set forth and governed by the prevailing wage determination(s) applicable to this Project, unless or until such may be, and are, revised by mutual agreement of the negotiating parties to this Agreement.

**Section 6.6 Show-up Pay.** Show-up Pay shall be provided as required by the applicable prevailing wage determination(s). Employees receiving show-up pay will be required to remain at the Project site and available for work for such time as they receive pay, unless released early by the principal supervisor of the contractor or his/her designated represented. Each employee shall furnish his/her contractor with his/her current address, telephone number and shall promptly report any changes to the contractor.

**Section 6.7 "Brassing".** The contractor may utilize “brassing” (or similar system) to check employees in and out. Each employee must check himself/herself in and out. The contractor will provide adequate facilities for checking in and out in an expeditious manner.
Section 6.8  Meal Periods. The contractor will schedule a meal period of no more than one-half hour duration at the work location at approximately mid-point of the schedule shift; provided, however, that the contractor may, for efficiency of the operation, establish a schedule which coordinates the meal periods of two or more crafts. An employee may be required to work through his meal period because of an emergency or a threat to life or property, or for such other reason as are in the applicable Schedule A, and if he is so required, he shall be compensated in the manner established in the applicable Schedule A.

Section 6.9  Make-up Days. To the extent permitted by the applicable prevailing wage determination, when an employee has been prevented from working for reasons beyond the control of the employer, including, but not limited to inclement weather or other natural causes, during the regularly scheduled work week, a make-up day may be worked on a non-regularly scheduled work day for which an employee shall receive eight (8) hours pay at the straight time rate of pay or any premium rate required for such hours under the prevailing wage law.

ARTICLE 7
WORK STOOPAGES AND LOCK-OUTS

Section 7.1  No Work Stoppages or Disruptive Activity. The Council and the Unions signatory hereto, agree that neither they, nor each of them, nor their respective officers or agents or representatives, or employees they represent shall incite or encourage, condone or participate in any strike, walk-out, slow-down, picketing, observing picket lines or other activity of any nature or kind whatsoever, for any cause or dispute whatsoever with respect to or any way related to Project Work, or which interferes with or otherwise disrupts Project Work, or with respect to or related to the District or contractors or subcontractors, including, but not limited to, economic strikes, unfair labor practice strikes, safety strikes sympathy strikes and jurisdictional strikes whether or not the underlying dispute is arbitrable. Any such actions by the Council, or Unions, or their members, agents representatives or the employees they represent shall constitute a violation of this Agreement. The Council and the Union shall take all steps necessary to obtain compliance with this Article and neither should be held liable for conduct for which it is not responsible.

Section 7.2  Employee Violations. The contractor may discharge any employee in violation Section 7.1 above and any such employee will not be eligible for rehire under this Agreement.

Section 7.3  Standing to Enforce. The District, the PLA Administrator, or any contractor affected by an alleged violation of Section 7.1 shall have standing and the right to enforce the obligations established therein.

Section 7.4  Expiration Schedule A's. All employees shall continue to work and to perform all their obligations with respect to Project Work despite the expiration of any Schedule A Agreement. Any renegotiated Schedule A shall be implemented on Project Work pursuant to Section 21.3.
Section 7.5 No Lockouts. Contractors shall not cause, incite encourage, condone or participate in any lock-out employees with respect to Project Work during the term of this Agreement. The term "lock-out" refers only to a contractor's exclusion of employees in order to secure collective bargaining advantage, and does not refer to the discharge, termination or layoff of employees by the contractor for any reason in the exercise of rights pursuant to any provisions of this Agreement, or any other agreement, nor does "lock-out" include the District's decision to stop suspend or discontinue any Project Work or any portion thereof for any reason.

Section 7.6 Best Efforts to End Violations.

(a) If a contractor contends that there is any violation of this Article, Section 8.3, or the provisions of Section 21.4, it shall notify, in writing, the Executive Secretary of the Council, the Senior Executive of the involved Union(s) and the PLA Administrator. The Executive Secretary and the leadership of the involved Union(s) will immediately instruct, order and use their best efforts to cause the cessation of any violation of the relevant Article.

(b) If the Union contends that any contractor has violated this Article, it will notify that the contractor and the PLA Administrator, setting forth the facts which the Union contends violate the Agreement, at least twenty-four (24) hours prior to invoking the procedures of Section 7.7. The PLA Administrator shall promptly order the involved contractor(s) to cease any violation of the Article.

Section 7.7 Expedited Enforcement Procedure. Any party, including the District, who the parties agree is a party to the Agreement for purposes of this Article and an intended beneficiary of this Article, or the PLA Administrator, may institute the following procedures, in lieu of or in addition to any other action at law or equity, when breach of Section 7.1 or 7.5, above, or Section 8.3 or Section 21.4, is alleged.

(a) The party invoking this procedure shall notify John Kagle, who has been selected by the negotiating parties, and whom the parties agree shall be the permanent arbitrator under this procedure. If the permanent arbitrator is unavailable at any time, the party invoking this procedure shall notify one of the alternates selected by the negotiating parties, Howard S. Block or Joseph Gentile, in that order on an alternating basis. Notice to the arbitrator shall be by the most expeditious means available, with notices to the parties alleged to be in violation, and to the Council if it is a union alleged to be in violation. For purposes of this Article, written notice may be given by telegram, facsimile, hand delivery or overnight mail and will be deemed effective upon receipt.

(b) Upon receipt of said notice, the arbitrator named above or his/her alternate shall sit and hold a hearing within twenty-four (24) hours if it is contended that the violation still exists, but not sooner than twenty-four (24) hours after notice has been dispatched to the Executive Secretary and the Senior Official(s) as required by Section 7.6, as above.
(c) The arbitrator shall notify the parties of the place and time chosen for this hearing. Said hearing shall be completed in one session, which, with appropriate recesses at the arbitrator's discretion, shall not exceed 24 hours unless otherwise agreed upon by all parties. A failure of any party or parties to attend said hearings shall not delay the hearing of evidence or issuance of any award by the arbitrator.

(d) The sole issue at the hearing shall be whether or not a violation of Sections 7.1 or 7.5 above, of Section 8.3, or Section 21.4, has in fact occurred. The arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation, or to award damages (except for damages as set forth in 7.8 below) which issue is reserved for court proceedings, if any. The award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without an opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The arbitrator may order cessation of the violation of the Article and other appropriate relief, and such Award shall be served on all parties by hand or registered mail upon issuance.

(e) Such award shall be final and binding on all parties and may be enforced by any court of competent jurisdiction upon the filing of this Agreement and all other relevant documents referred to herein above in the following manner. Written notice of the filing of such enforcement proceedings shall be given to the other party. In any judicial proceeding to obtain a temporary order enforcing the arbitrator's Award as issued under Section 7(d), above, all parties waive the right to a hearing and agree that such proceedings may be ex-parte. Such agreement does not waive any party's right to participate in a hearing for final order of enforcement. The court's order or orders enforcing the arbitrator's award shall be served on all parties by hand or by delivery to their address as shown on their LM-2 Report (for Union), as shown on their business contract for work under this Agreement (for a contractor), and to the representing Union (for any employee), by certified mail by the party or parties first alleging the violation, or other process of service legally recognized in the court's jurisdiction.

(f) Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance hereto are hereby waived by the parties to whom they accrue.

(g) The fees and expenses of the arbitrator shall be equally divided between the party or parties initiating this procedure and the respondent party or parties.

(h) The PLA Administrator is a party and interest in all proceedings arising under this Article, and Articles 8 and 10, and shall be sent contemporaneous copies of all notifications required by these Articles, and, at its option, may participate as a full party in any proceeding initiated under these Articles.
Section 7.8 Liquidated Damages.

(a) If the Arbitrator determines in accordance with Section 7.7 above that a work stoppage has occurred, the respondent Union(s) shall, within eight (8) hours of receipt of the award, direct all the employees they represent on the Project to immediately return to work. If the craft(s) involved do not return the work by the beginning of the next regularly scheduled shift following such eight (8) hour period after receipt of the arbitrator’s award, and the respondent Union(s) have not complied with their obligations to immediately instruct, order and use their best efforts to cause a cessation of the violation and return the employees they represent to work, then the non-complying respondent Union(s) shall each pay a sum as liquidated damages to the District, and each will pay an additional sum per shift, as set forth in (c), below, for each shift thereafter on which the craft(s) has not returned to work:

(b) If the arbitrator determines in accordance with Section 7.7 above that a lock-out has occurred, the respondent contractor(s) shall, within eight (8) hours after receipt of the award, return all the affected employees to work on the Project, or otherwise correct the violation found by the arbitrator. If the respondent contractor(s) do not take such action by the beginning of the next regularly scheduled shift following the eight (8) hour period, each non-complying respondent contractor shall pay or give as liquidated damages, to the affected Union(s) (to be apportioned among the affected employees and the benefit funds to which contributions are made on their behalf, as designated by the arbitrator) and each shall pay an additional sum per shift, as set forth in (c), below, for each shift thereafter in which compliance by the respondent contractor(s) has not been completed.

(c) The arbitrator shall retain jurisdiction to determine compliance with this Section and to establish the appropriate sum of liquidated damages, which shall not be less than $1,000 (one thousand dollars), nor no more than $5,000.00 (five thousand dollars) per shift for each non-complying entity.

ARTICLE 8

WORK ASSIGNMENTS AND JURISDICTIONAL DISPUTES

Section 8.1 Assignments of Work. The assignment of work will be solely the responsibility of the contractor performing the work involved; and such work assignments will be in accordance with the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the “Plan”) currently in effect, or any successor plan.

Section 8.2 The Plan. All Jurisdictional disputes between or among Building and Construction Trades Unions party to this Agreement, shall be settled and adjusted according to the Plan, or any other plan or method of procedures that may be adopted in the future by the Building and Construction Trades Department. Decisions rendered shall be final, binding and conclusive on the contractors and Union parties to this Agreement.
Section 8.3  **No Work Disruption Over Jurisdiction.** All jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage, disruption, or slow down of any nature and the contractor's assignments shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge.

Section 8.4  **Pre-Job Conference.** As provided in Article 16, each contractor shall participate in a pre-job conference with the appropriate affected Union(s) prior to commencing work.

Section 8.5  **Resolution of Jurisdictional Disputes.** If any actual or threatened strike, sympathy strike work stoppage, slow down, picketing, hand-billing or otherwise advising the public that a labor dispute exists, or any other interference with the progress of Project Work by reason of a jurisdictional dispute or disputes, the parties shall exhaust the expedited procedures set forth in the Plan, if such procedures are in the Plan then currently in effect, or otherwise as in Article 7 above.

**ARTICLE 9**

**MANAGEMENT RIGHTS**

Section 9.1  **Contractor and District Rights.** The contractors and the District have the sole and exclusive right and authority to oversee and manage construction operations on Project Work without any limitations unless expressly limited by a specific provision of this Agreement. In addition to the following and other rights of the contractors enumerated in this Agreement, the contractors expressly reserve their management rights and all the rights conferred upon them by law. The contractors' rights include, but are not limited to, the right to:

(a) Plan, direct and control operations of all work;

(b) Hire, promote, transfer and layoff their own employees as deemed appropriate to satisfy work and/or skill requirements;

(c) Promulgate and require all employees to observe reasonable job rules and security and safety regulations;

(d) Discharge, suspend or discipline their own employees for just cause;

(e) Utilize, work methods, procedures or techniques, and select, use and install any types or kinds of materials, apparatus or equipment, regardless of source of manufacture or construction; assign and schedule work at their discretion, unless specifically disapproved by the District or its authorized representative; and
(f) Assign overtime, determine when it will be worked and the number and identity of employees engaged in such work, subject to such provisions in the applicable Schedule A's requiring such assignments be equalized or otherwise made in a non-discriminatory manner.

Section 9.2 Specific District Rights. In addition to the following and other rights of the District enumerated in this Agreement, the District expressly reserves its management rights and all the rights conferred on it by law. The District's rights (and those of the PLA Administrator on its behalf) include, but are not limited to, the right to:

(a) Inspect any construction site or facility or project to ensure that the contractor follows the applicable safety and other work requirement;

(b) Require contractors to establish a different work week or shift schedule for particular employees as required to meet the operational needs of the District and/or Project Work at a particular location(s) or in order to accommodate any difficulties at a Project site where schedules may interfere with District or resident requirements during construction activity;

(c) At its sole option, terminate, delay and/or suspend any and all portions of the covered work at any time; prohibit some or all work on certain days or during certain hours of the day to accommodate the ongoing operations of the District's facilities and/or to mitigate the effect of ongoing Project Work on businesses and residents in the neighborhood of the Project site; and/or require such other operational or schedule changes it deems necessary, in its sole judgment, to effectively maintain its primary mission and remain a good neighbor to those in the area of its facilities. (In order to permit the contractors and unions to make appropriate scheduling plans, the District will provide the PLA Administrator and the affected contractor(s) and union(s) with reasonable notice of any changes it requires pursuant to this section; provided, however, that if notice is not provided in time to advise employees not to report for work, show-up pay shall be due pursuant to the provisions of Section 6.6);

(d) Approve any work methods, procedures and techniques used by contractors whether or not these methods, procedures or techniques are part of industry practices or custom; and

(e) Investigate and process complaints, through its PLA Administrator in the manner set forth in Sections 7 and 10.

Section 9.3 Use of Materials. There should be no limitations or restriction by Union upon a contractor's choice of materials or design, nor, regardless of source or location, upon the full use and utilization, of equipment, machinery, packaging, precast, prefabricated, prefinished, or pre-assembled materials, tools or other labor saving devices, subject to the application of the State Public Contracts and Labor Codes as required by law in
reference to offsite construction. Generally, the onsite installation or application of such items shall be performed by the craft having jurisdiction over such work. The District and its PLA Administrator shall advise all contractors of, and enforce as appropriate, the off-site application of the prevailing wage law as it affects Project Work.

Section 9.4 Special Equipment, Warranties and Guarantees.

(a) It is recognized that certain equipment of highly technical and specialized nature may be installed at Project Work sites. The nature of the equipment, together with the requirements for manufacturer's warranties, may dictate that it be prefabricated, pre-piped and/or pre-wired and that it be installed under the supervision and direction of the District’s and/or manufacturer’s personnel. The Unions agree that such equipment is to be installed without incident.

(b) The parties recognized that the contractor will initiate from time to time the use of new technology, equipment, machinery, tools, and other labor-savings devices and methods of performing Project Work. The Union agrees that they will not restrict the implementation of such devices or work methods. The Unions will accept and will not refuse to handle, install or work with any standardized and/or catalogue parts, assemblies, accessories, prefabricated items, pre-assembled items, partially assembled items, or materials whatever their source of manufacture or construction.

(c) If any disagreement between the contractor and the Unions concerning the methods of implementation or installation of any equipment, or device or item, or method of work, arises, or whether a particular part or pre-assembled item is standardized or catalog part or item, the work will precede as directed by the contractor and the parties shall immediately consult over the matter. If the disagreement is not resolved, the affected Union(s) shall have the right to proceed through the procedures set forth in Article 10.

Section 9.5 No Less Favorable Treatment. The parties expressly agree that Project Work will not receive less favorable treatment than that on any other project which the Unions, contractors and employees work.

ARTICLE 10

SETTLEMENT OF GRIEVANCES AND DISPUTES

Section 10.1 Cooperation and Harmony on Site.

(a) This Agreement is intended to establish and foster continued close cooperation between management and labor. The Council shall assign a representative to this Project for the purpose of assisting the local Unions, and working with the PLA Administrator, together with the contractors, to complete the construction of the Project economically, efficiency, continuously and without any interruption, delays or work stoppages.
(b) The PLA Administrator, the contractors, Unions, and employees collectively and individually, realize the importance to all parties of maintaining continuous and uninterrupted performance Project Work, and agree to resolve disputes in accordance with the grievance provisions set forth in this Article or, as appropriate, those of Articles 7 or 8.

(c) The PLA Administrator shall oversee the processing of grievances under this Article and Articles 7 and 8, including the scheduling and arrangements of facilities for meetings, selection of the arbitrator from the agreed - upon panel to hear the case, and any other administrative matters necessary to facilitate the timely resolution of any dispute; provided, however, it is the responsibility of the principal parties to any pending grievance to insure the time limits and deadlines are met.

Section 10.2 Processing Grievances. Any questions arising out of and during the term of this Agreement involving its interpretation and application, which includes applicable provisions of the Schedule A’s, but not jurisdictional disputes or alleged violations of the Sections 7.1 and 7.4 and similar provisions, shall be considered a grievance and subject to resolution under the following procedures.

Step 1. Employee Grievances. When any employee subject to the provisions of this Agreement feels aggrieved by an alleged violation of this Agreement, the employee shall, through his local union business representative or job steward, within ten (10) working days after the occurrence of the violation, give notice to the work site representative of the involved contractor stating the provisions(s) alleged to have been violated. A business representative of the local Union or the job steward and the work site representative of the involved contractor shall meet and endeavor to adjust the matter within ten (10) working days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grievances party may, within ten (10) working days thereafter, pursue Step 2 of this grievance procedure provided the grievance is reduced to writing, setting forth the relevant information, including a short description thereof, the date on which the alleged violation occurred, and the provision(s) of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 shall be non-precedential except as to the parties directly involved.

Union or Contractor Grievances. Should the Union(s) or any contractor have a dispute with the other party(ies) and, if after conferring within ten (10) working days after the disputing party knew or should have known of the facts or occurrence given rise to the dispute, a settlement is not reached within five (5) working days, the dispute shall be reduced to writing and processed to Step 2 in the same manner as outlined in 1(a) above for the adjustment of an employee complaint.

Step 2. The business manager of the involved local Union or his designee, together with the site representative of the involved contractor, and a representative of the PLA Administrator, shall meet within seven (7) working days of the referral of the dispute to this second step to arrive at a satisfactory settlement thereof. If the
parties fail to reach an agreement, the dispute may be appealed in writing in accordance with the provisions of Step 3 within seven (7) calendar days after the initial meeting at Step 2.

Step 3.

(a) If a grievance shall have been submitted but not resolved under Step 2, either the Union or contractor party may request in writing to the PLA Administrator (with copy(ies) to the other party(ies)) within seven (7) calendar days after the initial Step 2 meeting, that the grievance be submitted to an arbitrator selected from the agreed upon list below, on a rotational basis in the order listed. Those arbitrators are: (1) Howard S. Block; (2) Joseph Gentile; (3) Michael Rappaport. The decision of the arbitrator shall be final and binding on all parties. The fee and expenses of such arbitration's shall be borne equally by the involved contractors(s) and the involved union(s).

(b) Failure of the grieving party to adhere to the time limits established herein shall render the grievance null and void. The time limits established herein may be extended only by written consent of the parties involved at the particular step where the extension is agreed upon. The arbitrators shall have the authority to make decisions only on issues presented and shall not have the authority to change, amend, add to or detract from any of the provisions of this Agreement.

Section 10.3 Limit on Use of Procedures. Procedures contained in this Article shall not be applicable to any alleged violation of Article 7 or 8, with the single exception that any employee discharged for violation of Section 7.2 or Section 8.3 may resort to the procedures of this Article to determine only if he/she was, in fact, engaged in that violation.

Section 10.4 Notice. The PLA Administrator (and the District, in the case of any grievance regarding the Scope of this Agreement), shall be notified by the involved contractor of all actions at Steps 2 and 3, and further, the PLA Administrator shall, upon its own request, be permitted to participate fully as a party in all proceedings at such steps.

ARTICLE 11

REGULATORY COMPLIANCE

Section 11.1 Compliance with All Laws. The Council and all Unions, contractors, subcontractors and their employees shall comply with all applicable federal and state laws, ordinances and regulations, including but limited to, those relating to safety and health, employment and applications for employment. All employees shall comply with the safety regulations established by the District, the PLA Administrator or the contractor. Employees must promptly report any injuries or accidents to a supervisor.
Section 11.2 Monitoring Compliance. The parties agree that the District shall require, and that the PLA Administrator shall monitor, compliance by all contractors and subcontractors with all federal and state laws regulation that, from time to time may apply to Project Work. It shall be the responsibility of the PLA Administrator (on behalf of the District) to investigate or monitor compliance with these various laws and regulations. The Council may recommend to the PLA Administrator and/or the District procedures to encourage and enforce compliance with these laws and regulations.

Section 11.3 Prevailing Wage Compliance. The Council or Union shall refer all complaints regarding any potential prevailing wage violation to the PLA Administrator which shall process, investigate and resolve such complaints, consistent with Section 5.4. The Council or Union, as appropriate, shall be advised in a timely manner with regard to the facts and resolution, if any, of any complaint. It is understood that this Section does not restrict any individual rights as established under the State Labor Code, including the rights of an individual to file a complaint with the State Labor Commissioner.

Section 11.4 Violations of Law. Should there be a finding by a Court or administrative tribunal of competent jurisdiction that a contractor has violated federal and or state law or regulation (including any finding of non-compliance with the California prevailing wage obligations as enforced pursuant to DIR regulations), the District, upon notice to the contractor that it, or its subcontractors, are in such violation, and on the failure of the contractor or subcontractor to remedy such violation promptly, may take such action as is permitted by law or contract to encourage and/or require the contractor and/or the subcontractor to come into compliance. Such action may include, if permitted by contract and or law, removing the contractor or subcontractor from Project work.

ARTICLE 12

SAFETY AND PROTECTION OF PERSON AND PROPERTY

Section 12.1 Safety.

(a) It shall be the responsibility of each contractor to ensure safe working conditions and employee compliance with any safety rules contained herein or established by the District, the PLA Administrator or the contractor. It is understood that employees have an individual obligation to use diligent care to perform their work in a safe manner and to protect themselves and the property of the contractor and the District.

(b) Employees shall be bound by the safety, security and visitor rules established by the contractor, the PLA Administrator and/or the District. These rules will be published and posted. An employee’s failure to satisfy his/her obligations under this section will subject him/her to discipline, up to and including discharge.
(c) The parties agree that the [substance abuse plan to be provided by the Council, subject to review and approval by the District] shall be applicable on the Project site and enforced with regard to all employees of all contractors engaged in project work. Pending approval by the District of such Council-provided plan, each substance abuse plan contained in a Schedule A should be applied, pursuant to its terms, to those employees working under that Schedule A on the Project.

**Section 12.2 Inspection.** The inspection of incoming shipments of equipment, machinery, and construction materials of every kind shall be performed at the discretion of the contractor by individuals of its choice.

**Section 12.3 Suspension of Work for Safety.** A contractor may suspend all or a portion of the job to protect the life and safety of the employees. In such cases, employees shall be compensated only for the actual time worked; provided, however, that where the contractor requests employees to remain at the site and be available for work, the employees will be compensated for stand-by time at their basic hourly rate of pay.

**Section 12.4 Water and Sanitary Facilities.** The contractor shall provide adequate supplies of drinking water and sanitary facilities for all employees as required by state law or regulation.

**ARTICLE 13**

**TRAVEL AND SUBSISTENCE**

Travel expenses, travel time, subsistence allowances and/or zone rates and parking reimbursements shall not be applicable to work under this Agreement, except to the extent provided for in any applicable prevailing wage determination. Parking for employees covered by this Agreement shall be provided by the contractor(s) according to the provision of the Schedule A’s existing on the effective date of this Agreement, and upon presentation of proof of any expense incurred.

**ARTICLE 14**

**APPRENTICES**

**Section 14.1 Importance of Training.** The parties recognize the need to maintain continuing support of the programs designed to develop adequate numbers of competent workers in the construction industry, the obligation to capitalize on the availability of the local work force in the area served by the District and the opportunity to provide employment at fair wages and working conditions on Project Work. To these ends, the parties will facilitate, encourage, and assist local residents to enter and progress in labor/management apprenticeship and/or training programs in the construction industry leading to participation in such apprenticeship programs. The District, PLA Administrator, other District consultants, and the Council, will work cooperatively to identify, or establish and, maintain, effective programs and procedures for persons interested in entering the construction
industry and which will help prepare them for the formal joint labor/management apprenticeship programs maintained by the signatory unions.

Section 14.2 Use of Apprentices.

(a) Apprentices may comprise up to thirty (30) percent of each craft’s work force at any time, unless the standards of the applicable joint apprenticeship committee confirmed by the State Labor Commissioner establish a lower maximum percentage, and where such is the case, the applicable unions should use its best efforts with the committee and, if necessary, the Commissioner to permit up to permit up to thirty percent apprentices on the project. When available and capable of undertaking the tasks involved, forty (40) percent of such apprentice workforce of each craft shall consist of first (1st) year apprentices.

(b) The Unions agree to cooperate with the contractor in furnishing apprentices as requested up to the maximum percentage. The apprentice ratio for each craft shall be in compliance, at a minimum, with the applicable provisions of the Labor Code relating to utilization of apprentices. The District shall encourage such utilization, and, both as to apprentices and the overall supply of experienced workers, the PLA Administrator will work with the Council to assure appropriate and maximum utilization of apprentices and the continuing availability of both apprentices and journey persons.

(c) The parties agree that apprentices will not be dispatched to contractors working under this Agreement unless there is a journeyman or other contractor employee working on the Project where the apprentice is to be employed who is qualified to assist and oversee the apprentice’s progress through the program in which he is participating.

Section 14.3 Joint Subcommittee on Training and Apprenticeship. To carry out the intent and purpose of this Article, a subcommittee of the Labor Management Committee pursuant to Article 17 shall be established, jointly chaired by a designee of the District and a designee of the Council, to oversee the identification and/or effective development of procedures and programs leading to the full utilization of apprenticeship programs, and to work with representatives of each signatory craft’s joint apprenticeship committee ("JAC") and representatives of the Districts to establish appropriate criteria for recognition by such JAC’s of the educational and work experience possessed by District residents toward qualifying for entry or advanced level in the apprenticeship programs under the direction under such JAC’s. Specific emphasis will be placed on coordination of the District’s existing or planned educational programs with the apprenticeship training programs of the signatory unions, and the cooperation of the District and the signatory unions, and the representatives of their joint apprenticeship committees, to encourage Rio Hondo Community College graduates, students and prospective students to participate in such programs and apprenticeship programs, for the improvement of the construction industry. The Subcommittee will meet as necessary at the call of the joint chairs to promptly to facilitate its purposes in an expeditious manner as
soon as this Agreement becomes effective. In addition to the joint chairs, the membership of the committee will consist of at least three representatives of the signatory local Unions and three representatives of contractors' signatory to this Agreement and experienced in overseeing and participating in joint labor management apprenticeship programs (or organizations to which the contractors belong).

ARTICLE 15

WORKING CONDITIONS

Section 15.1 Rest Periods. There will be no non-working times established during working hours except as may be required by applicable state law or regulations. Individual coffee containers will be permitted at the employee's work location..

Section 15.2 Work Rules. The District, the PLA Administrator, and/or relevant contractor shall establish such reasonable work rules as they deem appropriate and not inconsistent with this Agreement. These rules will be posted at the work sites by the contractor and may be amended thereafter as necessary. Failure to observe these rules and regulations by employees may be grounds for discipline up to and including discharge.

Section 15.3 Emergency Use of Tools and Equipment. There should be no restrictions on the emergency use of any tools by any qualified employee or supervisor, or on the use of any tools or equipment for the performance of work within the jurisdiction, provided the employee can safely use the tools and/or equipment involved and in compliance with applicable governmental rules and regulations.

Section 15.4 Access to Rio Hondo Community College Property and Facilities. Recognizing the nature of the work being conducted on the site, employee access by a private automobile may be limited by the District to certain roads and/or parking areas. Further, unless expressly permitted otherwise by the District or its authorized representative, covered employees shall not utilize the public areas of the District's facilities, including without limitation, sanitary and eating facilities.

ARTICLE 16

PRE-JOB CONFERENCES

Consistent with Section 8.4, all work assignments should be disclosed by the contractor at a pre-job conference held in accordance with industry practice. The contractor shall notify the PLA Administrator at least two weeks before starting work under this Agreement, and the PLA Administrator shall coordinate the scheduling of a pre-job conference with the Council, the contractor(s) and the affected union(s). Should there be any formal jurisdictional dispute raised under Article 8, the PLA Administrator shall be promptly notified. At the pre-job, the PLA Administrator shall review the District's employment and contracting programs and goals with the participants.
ARTICLE 17

LABOR/MANAGEMENT AND COOPERATION

Section 17.1 Joint Committee. The parties to this Agreement will form a joint committee consisting of representatives selected by the Council and the PLA Administrator, respectively, to be chaired jointly by a representative of the PLA Administrator and of the Council. The purpose of the Committee shall be to promote harmonious and stable labor management relations on this Project, to ensure effective and constructive communication between labor and management parties, to advance the proficiency of work in the industry, and evaluate and ensure an adequate supply of skilled labor for all Project Work. Representatives of the District may participate upon its request.

Section 17.2 Functions of Joint Committee. The Committee shall meet on a schedule to be determined by the Committee or at the call of the joint chair to discuss the administration of the Agreement, the progress of the Project, general labor management problems that may arise, and any other matters consistent with this Agreement. Substantive grievances or disputes arising under Articles 7, 8 or 10 shall not be reviewed or discussed by this Committee, but shall be processed pursuant to the provisions of the appropriate Article.

The PLA Administrator shall be responsible for the arrangements for the meetings, and the preparation of the agenda topics (with input from the Unions, the contractors and the District). Notice of the date, time and place of meetings, shall be given to the Committee members at least three (3) days prior to the meeting. The District should be notified of the meetings and invited to send a representative(s) to participate.

The PLA Administrator shall prepare quarterly reports on apprentice utilization and the training and employment of District residents, and a schedule of Project work and estimated number of craft workers needed. The Committee, or an appropriate subcommittee, may review such reports and make any recommendations for improvement, if necessary, including increasing the availability of skilled trades, and the employment of local residents or other individuals who should be assisted with appropriate training to qualify for apprenticeship programs.

Section 17.3 Subcommittees. The Committee may form subcommittees to consider and advise the full Committee with regard to safety and health issues affecting the Project and other similar issues affecting the overall Project, including any workers compensation program initiated under this Agreement.

ARTICLE 18

SAVINGS AND SEPARABILITY

Section 18.1 Savings Clause. It is not the intention of the District, the PLA Administrator, or the Union parties to violate any laws governing the subject matter of this Agreement, the parties hereto agree that in the
event any provision of this Agreement is finally held or determined to be illegal or void as being in contravention of any applicable law or regulation, the remainder of the Agreement shall remain in full force and effect unless the part or parts determined to be void are wholly inseparable from the remaining portions of this Agreement. Further, the parties agree that if and when any provision(s) of this Agreement is finally held or determined to be illegal or void by a court of competent jurisdiction, the parties will promptly enter into negotiations concerning the substantive effect of such decision, for the purpose of achieving conformity with the requirements of any applicable laws and the intent of the parties hereto. If the legality of this Agreement is challenged and any form of injunctive relief is granted by any court, suspending temporarily or permanently the implementation of this Agreement, then the parties agree that all Project Work that would otherwise be covered by this Agreement should be continued to be bid and constructed without application of this Agreement so that there is no delay or interference with the ongoing planning, bidding and construction of any Project Work.

Section 18.2 Effect of Injunctions or Other Court Orders. The parties recognize the right of the District to withdraw, at its absolute discretion, the utilization of the Agreement as part of any bid specification should a Court of competent jurisdiction issue any order, or any applicable statute be enacted, which could result, temporarily or permanently in delay of the bidding, awarding and/or construction of the Project. Notwithstanding such an action by the District, or such court order or statutory provision, the parties agree that the Agreement shall remain in full force and the fact on covered Project Work to the maximum extent legally possible.

ARTICLE 19
WAIVER

A waiver of or a failure to assert any provisions of this Agreement by any or all of the parties hereto shall not constitute a waiver of such provision for the future. Any such waiver shall not constitute a modification of the Agreement or change in the terms and conditions of the Agreement and shall not relieve, excuse or release any of the parties from any of their rights, duties or obligations hereunder.

ARTICLE 20
AMENDMENTS

The provisions of this Agreement can be renegotiated, supplemented, rescinded or otherwise altered only by mutual agreement in writing, hereafter signed by the negotiating parties hereto.
ARTICLE 21

DURATION OF THE AGREEMENT

Section 21.1 Duration.

(a) This Agreement shall be effective April 1, 2005, and shall continue in effect until June 30, 2009. All Project work for which bid specifications are issued prior to the latter date shall continue to be covered by this Agreement until the turnover and final acceptance of such work subject to the specifications, pursuant to Section 21.2.

(b) This Agreement may be extended by mutual consent of the District and the signatory unions.

Section 21.2 Turnover and Final Acceptance of Completed Work.

(a) Construction of any phase, portion, section, or segment of Project Work shall be deemed complete when such phase, portion, section or segment has been turned over to the District by the contractor and the District has accepted such phase, portion, section, or segment. As areas and systems of the Project are inspected and construction-tested and/or approved and accepted by the District or third parties with the approval of the District, the Agreement shall have no further force or effect on such items or areas, except when the contractor is directed by the District to engage and repairs or modifications required by its contract(s) with the District.

(b) Notice of each final acceptance received by the contractor will be provided to the Council with the description of what portion, segment, etc. has been accepted. Final acceptance may be subject to a "punch" list, and in such case, the Agreement will continue to apply to each such item on the list until it is completed to the satisfaction of the District and Notice of Acceptance is given by the District or its representative to the contractor. At the request of the Union, complete information describing any "punch" list work, as well as any additional work required of a contractor at the direction of the District pursuant to (a) above, involving otherwise turned-over and completed facilities which have been accepted by the District, will be available from the PLA Administrator.

Section 21.3 Continuation of Schedule A’s. Schedule A’s incorporated as part of this Agreement shall continue in full force and effect, as previously stated, until the contractor and union parties to the collective bargaining agreement(s) which are the basis for such Schedule A’s notify the PLA Administrator of the mutually agreed upon changes in such agreements and their effective date(s).

The parties agree to recognize and implement all applicable changes on their effective dates, except as otherwise provided by this Agreement; provided, however, that any such provisions negotiated in said collective bargaining agreements will not apply to work covered by this Agreement if such provisions are less favorable to the contractor under the Agreement than those uniformly required of contractors for construction work normally
covered by those agreements; nor shall any provision be recognized or applied if it may be construed to apply exclusively or predominately to work covered by this Agreement. Any disagreement between the parties over the incorporation into a Schedule A of any such provision agreed upon in an negotiation of the Local Collective Bargaining Agreement which is the basis for a Schedule A shall be resolved under the procedures established in Article 10.

Section 21.4 No Work Stoppages. The Union agrees that there will be no strikes, work stoppages, sympathy strikes, picketing, slowdowns or any other disruptive activity affecting the Project by any Union involved in the negotiations of the Local Collective Bargaining Agreement and resulting Schedule A’s, nor shall it be any lock-out on this Project of the involved Union(s) during the course of such negotiations.

Section 21.5 Final Termination. Final termination of all obligations, rights, and liabilities, under this Agreement shall occur upon receipt by the Council of a Notice from the District saying that no work remains within the scope of the Agreement; or on June 30, 2009, (except for Project work awarded prior to that date and not yet completed and turned over, or unless there is a mutually agreed upon extension) whichever occurs first.

In witness whereof the parties have caused this Project Labor Agreement for the Rio Hondo Community College District New Facilities, Major Renovations and Facilities Maintenance Projects to be executed as of the date and year above stated.

RIO HONDO COMMUNITY COLLEGE DISTRICT:

By: [Signature]

LOS ANGELES/ORANGE COUNTIES
BUILDING AND CONSTRUCTION TRADES COUNCIL:

By: [Signature]

Executive Secretary
Local Union No. 12
Operating Engineers
International Union of

Passed June 1996

Drug Abuse
Testing Policy Plan

Understanding
Of
Mental Illness
DETECTION
AND
DRUG ABUSE PREVENTION

MEMORANDUM

Understands

General Vice-President
Wm. C., Wisconsin Business Manager

Sincerely,

office or your business representative.

If you have any questions please contact this

conditions have rights as well as obligations.

You are a member working under these

members on a project are not subjected to

Quaysy do subject any member to a test that all

property in Local 1, it is not the intent of this

problem, where does the safety has always been

Subjunctive where has become a national
l. It is understood that the use of liquor and tobacco at work, smoking and other similar activities are prohibited. The following items have been approved by the employer: coffee, tea, milk, water, fruit, vegetables, sandwiches, and other similar items. Any employee who violates these rules will be subject to disciplinary action.

2. Any employee who violates the rules regarding the use of alcohol and other substances will be subject to disciplinary action, including termination of employment.

3. No employee may impair their judgment.

4. Any employee who violates the provisions of this agreement will be subject to disciplinary action, including termination of employment.

The parties recognize the problem which arises from the failure to understand the terms of this agreement. In order to ensure the effective implementation of this agreement, the parties shall cooperate in the enforcement of its provisions.
and constitutional law will be clearly established.

The following procedure shall apply:

5. The Byzantine procedure shall apply.

6. The Byzantine procedure shall apply.

7. To deny employment on the project

or activity shall be considered sufficient grounds

of the agreement being revised or amended with

or in accordance with the provisions of this

and any applicable law thereof.

In the event that the agreement or applicable

law thereof is not in accordance with the

or applicable law thereof, the agreement or

applicable law thereof shall apply.

In the event that the agreement or applicable

law thereof is not in accordance with the

or applicable law thereof, the agreement or

applicable law thereof shall apply.
For the protection of the above procedure and
the individual who bears the initiative

The perpetrator may produce a third party

in the event of contradicting the act

References

In the event of contradicting the act

Custody of Records

Contains documentation Throughout the chain of

Return of Evidence of Sealed Samples

Provided by The National Institute on Drug Abuse.
labor adjustments to replace the damaged property.

shall be monitored and the parties shall enter into

the preliminary hearing for discussion over the

unresolved questions of the preliminary hearing. Any

should be conducted by the ARB. The ARB shall not

the ARB shall not conduct any right of any

The establishment of operation of

labor adjustments procedures set forth in the applicable

shall be subject to the grievance and arbitration

under any of the provisions of this Agreement

Any reference to dispute which may

Furthermore, in the event of a labor adjustment

shall not be required. Under the applicable

provisions set forth in the applicable

shall be determined by the NTEA. The

shall be conducted by the

in order to explain feedback and

consider an educational aspect on Company

business representatives will be allowed to

3. Prior to start of work, the

work on the property

some of the same or the
degree after six or the

progress in time be a condition of

the requirements in the

arbitration. In the

shall be determined by a

improper or employees who do

summarized and the parties will be furnished

procedures in the exceptions set forth in this

unless feedback shall be pursuant to the procedures

improper or employees who do

improper or employees who do
disciplined for seeking such assistance.

12. The Employer shall indemnify and

The Union

agree in writing or any program participants

any action or of the application of this
equality, discrimination, abuse, or neglect that
hold the Employer harmless and any and all

Subsequent occurrence

the indictment of any employee of any
not be used to discriminate, the Employee
be approved upon the request of the Employer.

such records to the Employer shall not

reopened to any person or entity other than

If the Employer shall receive any

Pastoral no

employer shall be subject to all program
employees enrolled in such a program. In
unauthorized the data or information that
participants who the unauthorized that
without the employee's consent.

individual data or information or

shall not be

disciplined for seeking such assistance.

11. The Employer shall indemnify and

is.

for all participants in the

By law, such records shall not be

the Employment without the employee's consent.

and performance

individual data or information or

future, reclassification and job performance

participants who the unauthorized that

participants who the unauthorized that

without the employee's consent.

individual data or information or

unauthorized the data or information that
LOCAL UNION NO. 13
ASSOCIATED GENERAL CONTRACTORS OF CALIFORNIA

Agreed to by the IATSE Local No. 13.

Vice-President
William A. Proul

President
Frank L. Trimm

위원장

UNDERSTANDING
OF
SUBJECT
DELETION

Amphetamine
Barbiturates
Benzo diazepines
Benzodiazepines
Methadone
Morphine
Opiates
Phencyclidine
Propoxyphene
Propoxyphene

NORMAL
GUARDIAN

NIDA specified threshold
Sample reported positive contains the indicated drug or above the current level specified.

GC/MS - Gas Chromatography/Mass Spectrometry

SIGNATORY COUNCILS OR LOCAL UNIONS:

Heat & Frost Insulators Local #5
Brick Layers Local #4
Elevator Constructors Local #18
Gunite Workers Local #636
Iron Workers Local #433
Painters & Allied Trades, D.C. #36
Boilermakers Local #92
I.B.E.W. Local #11
Glaziers Local #636
Iron Workers Local #416
Labores Local #300
Plasterers Local #280
SIGNATURES CONTINUED:

Cement Masons Local #600

Resilient Floors #1247

Roofers & Waterproofing Local #36

Plumbers Local #78

United Association #250

Sprinkler Fitters Local #709

Sheet Metal Workers #105

Operating Engineers Local #12

Operating Engineers Local #12

Tile Layers Local #18

Landscape & Irr. #345
SIGNATURES CONTINUED:

[Signatures]

Operating Engineers Local #12

[Further signatures]

Operating Engineers Local #12
SIGNATURES CONTINUED:

Carpenters Regional Council

Floyd Clay
Southwest Regional Carpenters

Gene Brown
Teamsters Local #986
ATTACHMENT A

LETTER OF ASSENT

To be signed by all Contractors awarded work covered by the Rio Hondo Community College District New Facilities, Major Renovations, and Facilities Rehabilitation Project Labor Agreement. This letter should be executed and submitted prior to the start of work by the contractor, pursuant to Section 2.4 of the Agreement.

[Contractor’s Letterhead]

Project Labor Administrator
c/o Rio Hondo Community College District
3600 Workmen Mill Road
Whittier, CA 90601

Attn:

Re: Rio Hondo Community College District Project Labor

Dear Sir:

This is to confirm that [Name of Company] agrees to be party to and bound by The Rio Hondo Community College District New Facilities, Major Renovations, and Facilities Rehabilitation Project Labor Agreement effective April 1, 2005, as such Agreement may, from time to time, be amended by the negotiating parties or interpreted pursuant to its terms. Such obligation to be a party and bound by this Agreement shall extend all work covered by the Agreement undertaken by this Company on the Project pursuant to [Contract No. or identifying description]. This Company shall require all of its subcontractors of whatever tier to become similarly bound for all work within the scope of the Agreement by signing and furnishing to you an identical Letter of Assent prior to their commencement of work.

Sincerely,

[Name of Construction Company]

By: [ ]
Name and Title of Authorized Executive
### ATTACHMENT B

#### DEFINITION OF DISTRICT

<table>
<thead>
<tr>
<th>City</th>
<th>Zip Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Monte</td>
<td>91731, 91732, 91733,</td>
</tr>
<tr>
<td></td>
<td>91734 *, 91735 (Unique)</td>
</tr>
<tr>
<td>Pico Rivera</td>
<td>90660, 90661 *, 90662 *</td>
</tr>
<tr>
<td></td>
<td>90665 (Unique)</td>
</tr>
<tr>
<td>Santa Fe Springs</td>
<td>90670, 90671</td>
</tr>
<tr>
<td>South El Monte</td>
<td>91733</td>
</tr>
<tr>
<td>Whittier</td>
<td>90601, 90602, 90603,</td>
</tr>
<tr>
<td></td>
<td>90604, 90605, 90606,</td>
</tr>
<tr>
<td></td>
<td>90607 *, 90608 *, 90609 *</td>
</tr>
<tr>
<td></td>
<td>90610 *, 90612 (unique)</td>
</tr>
</tbody>
</table>

* Post Office Boxes Only
REPORT OF
GEOTECHNICAL INVESTIGATION
PROPOSED LIBRARY BUILDING RETROFIT

RIO HONDO COMMUNITY COLLEGE
3600 WORKMAN MILL ROAD
WHITTIER, CALIFORNIA

Prepared for:

RIO HONDO COLLEGE
Whittier, California

June 16, 2015
Project 4953-15-0301
June 16, 2015

Mr. Luis Rojas  
Rio Hondo Program Management Team  
c/o Rio Hondo College  
3600 Workman Mill Road  
Whittier, California 90601-1699

Subject: LETTER OF TRANSMITTAL  
Report of Geotechnical Investigation  
Proposed Library Building Retrofit  
Rio Hondo Community College  
3600 Workman Mill Road  
Whittier, California, 90601  
Amec Foster Wheeler Project 4953-15-0301

Dear Mr. Rojas:

We are pleased to submit the results of our geotechnical investigation for the proposed seismic retrofit of the existing library building (L Tower) at Rio Hondo Community College in Whittier, California. The investigation was performed in general accordance with our proposal dated March 13, 2015.

The scope of the investigation was planned in collaboration with Messrs Gregory Beard and Robert Bender of Westberg+White Architects and with Dr. Said Hilmy with IDS Group, the structural engineer for the project. Mr. Bender has furnished us with the as-built plans of the exiting L Tower to illustrate the building layout. We submitted preliminary recommendations via e-mail on April 7, 2015.

The results of our investigation and design recommendations are presented in this report. Please note that you or your representative should submit copies of this report to the appropriate governmental agencies for their review and approval prior to obtaining a permit.

Correspondence:  
Amec Foster Wheeler  
6001 Rickenbacker Road  
Los Angeles, California 90040  
USA  
Tel +1 (322) 889 5300  
Fax +1 (323) 721-6700
It has been a pleasure to be of professional service to you. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.

Reviewed by:

Larry Hong
Professional Staff Engineer III - Geotechnical

Mark A. Murphy
Associate Geotechnical Engineer
Project Manager

Rosalind Munro
Associate Geologist

(electronically submitted)

Attachments
REPORT OF GEOTECHNICAL INVESTIGATION
PROPOSED LIBRARY BUILDING RETROFIT

RIO HONDO COMMUNITY COLLEGE
3600 WORKMAN MILL ROAD
WHITTIER, CALIFORNIA

Prepared for:

RIO HONDO COLLEGE
Whittier, California

Amec Foster Wheeler
Los Angeles, California

June 16, 2015
Project 4953-15-0301
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Kobe Japan
16.1a through 16.2b

Initial and Matched Response Spectra and Time Histories – Earthquake: 1999
Chi-Chi Taiwan
17.1a through 17.2b

Initial and Matched Response Spectra and Time Histories – Earthquake: 1999
Hector Mine
18.1a through 18.2b

Iwate Japan
19.1a through 19.2b

Tabas Iran
20.1 through 20.4

Magnitude and Distance Deaggregation for 2,475-Year Return Period Hazard
EXECUTIVE SUMMARY

We have completed our geotechnical investigation for the proposed seismic retrofit on the existing L Tower at Rio Hondo Community College in Whittier, California. Our subsurface explorations, engineering analyses, and foundation design recommendations are summarized below.

The proposed retrofit of the L Tower is to consist of adding a braced framing system at each level above grade, new 16-inch thick concrete shear walls and new steel columns at the basement level. All of the reinforcing structural elements will be constructed on the exterior of the building perimeter walls. New pile foundations are planned to be installed to support additional structural loads of up to 1,000 kips imposed on the existing spread footings.

The soil conditions beneath the site were explored by drilling four borings to depths of 51 to 68 feet below the existing grade. In addition to the borings, we performed two Refraction Microtremor (ReMi) surveys adjacent to the existing L Tower in order to obtain seismic wave velocities in the upper soils. The fill soils consisted primarily of sandy silt and were not uniformly well compacted. The natural materials beneath the site consist of Plio-Pleistocene age bedrock of the Fernando Formation. The bedrock consists predominantly of sandy siltstone with occasional sandstone beds and cemented zones. The natural materials are expansive and will shrink and swell with fluctuations in moisture content.

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located beneath or projecting toward the site. In our opinion, the potential for surface rupture at the site due to fault plane displacement propagating to the ground surface during the design life of the project is considered low. Although the site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices. The western portion of the library is underlain by a large, deep-seated Quaternary age landslide that is present on the west facing slope of the campus. Prior investigation by MACTEC, our legacy company, found the landslide to be grossly stable. No shears or clay beds were observed in the borings of our current investigation that could result in local instability. Therefore, the potential for slope instability is considered low. The potential for other geologic hazards such as liquefaction, seismically-induced settlement, tsunamis, inundation, seiches, flooding, and subsidence affecting the site is also considered to be low.

Based on our records, the existing spread footings supporting the L Tower extend into the undisturbed bedrock materials beneath the site. Parameters are provided for analysis of the existing spread footings for resistance of the additional loads occurring as a result of the proposed retrofit. If necessary, existing footings may be enlarged to support additional loads or pile foundations may be used to provide additional resistance of downward and upward loads and to limit differential settlement. New foundations may consist of pile foundations or conventional spread footings established in undisturbed bedrock. Due to the highly expansive nature of the upper materials at the site, new floor slabs, pavement, and exterior concrete walks and slabs on grade will need to be underlain by at least 2 feet...
of relatively non-expansive soil. In cut areas, the exposed materials should be overexcavated to allow for the placement of at least 2 feet of relatively non-expansive soil beneath floor slabs, pavement, and exterior concrete walks and slabs on grade. In fill areas, the upper 2 feet of the new fill beneath floor slabs, pavement, and exterior concrete walks and slabs on grade should consist of relatively non-expansive soil.
1.0 SCOPE

This report provides geotechnical recommendations in support of the proposed seismic retrofit of the existing library building (L Tower) at Rio Hondo Community College in Whittier, California. The general location of the site is shown on Figure 1, Vicinity Map. The location of the existing building, and our exploration borings are shown on Figure 2, Site Geologic Map and Plot Plan.

We previously performed several geotechnical investigations that included explorations near the project site, including for the initial development of the college campus, of which the subject L Tower was a part. The results of these investigations were submitted in the following reports:

- Report of Geotechnical Investigation, Proposed Student Union and Quad Improvements, Rio Hondo College, 3600 Workman Mill Road, Whittier, California (Job No. 4953-09-0591, issued by MACTEC Engineering and Consulting Inc., an Amec Foster Wheeler legacy company), dated May 21, 2009.


- Report of Foundation Investigation, Proposed Rio Hondo Junior College, Workman Mill Road, Los Angeles County, California, for the Rio Hondo Junior College District (Job No. 63728, issued by LeRoy Crandall and Associates, an Amec Foster Wheeler legacy company), dated December 7, 1964.

In addition, we also provided geotechnical inspection and testing services during the original rough grading of the college campus and the construction of the existing L Tower. Our geotechnical inspection and testing services were documented in the following reports:

- Control of Compaction Fills, Proposed Rio Hondo Junior College, Pellissier Ranch, Workman Mill Road, Los Angeles County, California. For the Rio Hondo Junior College District (Job No. 64006, issued by LeRoy Crandall and Associates, an Amec Foster Wheeler legacy company), dated July 16, 1965.


The recommendations in this report were developed in part using geotechnical information from our previous investigations and inspection services.

This investigation was authorized to determine the static physical characteristics of the soils underlying the site and to provide recommendations for analysis of existing foundations and walls below grade, for design of new foundations and walls below grade, for floor slab support, for temporary shoring, and for grading for the project. More specifically, the scope of this investigation included the following:

- Evaluate the subsurface conditions underlying the existing L Tower.
- Perform a geologic-seismic hazards evaluation.
- Provide recommendations for analysis of existing foundations and for design of new foundations, including allowable increases for wind or seismic loads.
- Provide the results of a site-specific ground motion hazard analysis in accordance with the requirements of the 2013 California Building Code (CBC) and ASCE 7-10.
- Provide the results of response spectrum-matched earthquake time histories in accordance with the requirements of the 2013 CBC and ASCE 7-10.
- Provide a determination of the applicable seismic parameters based on the current CBC.
• Provide recommendations for floor slab support.

• Provide recommendations for design of asphalt and portland cement concrete paving.

• Provide recommendations for earthwork, including site preparation, excavation, the placement of required compacted fill, and quality control measures relating to earthwork.

The assessment of general site environmental conditions to determine the presence of contaminants in the soils and groundwater of the site was beyond the scope of this investigation.

Our recommendations are based on the results of our current and previous field explorations, laboratory tests, and appropriate engineering analyses. The results of the current field explorations and laboratory tests, which, together with the data obtained during our previous investigations, form the basis of our recommendations, are presented in Appendix A.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. This report has been prepared for Rio Hondo College and their design consultants to be used solely in the design of the proposed retrofit of the L Tower. This report has not been prepared for use by other parties, and may not contain sufficient information for purpose of other parties or other uses.
2.0 PROJECT DESCRIPTION AND SITE CONDITIONS

The main Rio Hondo Community College campus is located on the top of the west-facing hill slope near the northern edge of the Puente Hills. Situated in between the Administration Building (A Building) and the Business Building (B Building) in the westerly portion of the upper quad, the existing library building (L Tower) is a five-story concrete structure with a one-level subterranean basement that extends 15 feet below the upper quad level. The ground floor elevation of the existing library building is established at Elevation 430, which matches adjacent ground elevations of the upper quad on the north, east, and south sides of the building. The surface grade adjacent to the west side of the building is approximately 10 feet lower (Elevation 420) than the ground floor elevation of the building. The floor elevation of the subterranean level is established at Elevation 415. The L Tower is supported on conventional spread footings originally designed using an allowable bearing value of 10,000 pounds per square foot. The existing spread footings range between 10\(\frac{3}{4}\) and 12 feet wide and extend between 1.0 and 3\(\frac{3}{4}\) feet below the lowest adjacent grade.

The proposed retrofit of the L Tower is to consist of adding a braced framing system at each level above grade, new 16-inch thick concrete shear walls and new steel columns at the basement level. All of the reinforcing structural elements will be constructed on the exterior of the building perimeter walls. New pile foundations are planned to be installed to support additional structural loads of up to 1,000 kips imposed on the existing spread footings.

An existing stairway (Stair No. 9) is located in the northwest corner of the building that extends from the ground surface west of the building at roughly Elevation 420 up to the ground floor level of the building and the level of the upper quad. Currently, Stair No. 9 serves as the main access for foot traffic to travel in between the main college campus and west campus parking lots located at the toe of the hill slope. As part of the project, Stair No. 9 will be demolished and backfilled to match the existing ground floor elevation to create more usable space. The backfill will be retained by a retaining wall and a new floor slab will be constructed at the ground level elevation of the upper quad. A new stair will be constructed near the southeast corner of the building to replace Stair No. 9.
3.0 EXPLORATIONS AND LABORATORY TESTS

The soil conditions beneath the site were explored by drilling four borings to depths of 51 to 68 feet below the existing grade at the locations shown on Figure 2. Data were also available from our previous investigations at and near the site; the locations of our previous relevant borings are also shown on Figure 2. Details of the current explorations and the logs of the borings are presented in Appendix A. Logs of our previous relevant borings are presented in Appendix B. In addition to the borings, we performed two Refraction Microtremor (ReMi) surveys at the locations shown on Figure 2 in order to obtain seismic wave velocities in the upper soils. The results of our ReMi surveys are presented in Appendix C.

Laboratory tests were performed on selected samples obtained from the current borings to aid in the classification of the soils and to determine the pertinent engineering properties of the soils. The following tests were performed:

- Moisture content and dry density determinations.
- Direct shear.
- Consolidation.
- Expansion Index.

All testing was performed in general accordance with applicable ASTM specifications at the time of testing. Details of the current laboratory testing program and test results are presented in Appendix A. In addition, corrosion tests on selected soil samples were performed for us by HDR. The results of the corrosion tests are also included in Appendix A. The results of our previous relevant laboratory testing are presented in Appendix B.
4.0 SOIL CONDITIONS

Fill soils, up to 3 feet thick, were encountered in our borings. The fill soils consisted primarily of sandy silt and were not uniformly well compacted. Although, fill soils were not encountered in the remainder of our current borings, localized fill may be present in between borings, particularly in areas adjacent to the existing basement walls and beneath the existing floor slab of the L Tower.

The natural materials beneath the site consist of Plio-Pleistocene age bedrock of the Fernando Formation. The bedrock consists predominantly of sandy siltstone with occasional sandstone beds and cemented zones. The natural materials are expansive and will shrink and swell with fluctuations in moisture content.

The results of corrosion tests indicate that the on-site materials are corrosive to ferrous metals, non-aggressive to copper, and that the potential for sulfate attack on portland cement concrete is considered negligible. The results of the tests are presented in Appendix A.
5.0 GEOLOGY

5.1 GEOLOGIC SETTING

Regionally, the college campus is in the northern portion of the Peninsular Ranges geomorphic province. This province extends northwesterly from Baja California into the Los Angeles Basin and westerly into the offshore area, including Santa Catalina, Santa Barbara, San Clemente and San Nicolas islands. The northern boundary of the province is the Transverse Ranges along the Malibu, Santa Monica, Hollywood, Raymond, Sierra Madre, and Cucamonga faults. The eastern boundary of the province is the Colorado Desert geomorphic province along the San Jacinto fault system. The Peninsular Range province is characterized by northwest/southeast trending alignments of mountains and hills and intervening basins, reflecting the influence of northwest trending major faults and folds, such as the nearby Whittier fault zone, located approximately 1.8 miles south of the site, controlling the general geologic structural fabric of the region.

The college campus is situated on the northwest flank of the Puente Hills, one of the northwest trending sets of hills of the province. The Puente Hills are composed primarily of Tertiary sedimentary bedrock that has been uplifted, folded, and tilted as a result of regional tectonic deformation related to the Whittier fault and the Puente Hills Blind Thrust fault. The sedimentary bedrock underlying the site has been tilted to the north-northwest and bedding planes dip in that direction. Pleistocene and Holocene age alluvial materials are present in the San Gabriel River valley and San Jose Creek that run southwest along the northwest margin of the Rio Hondo College campus and an unnamed drainage along the southwestern margin of the college campus.

The site in relation to topographic features is depicted in Figure 1, Vicinity Map. Figure 2, Site Geologic Map and Plot Plan, shows the site geology and locations of our current and prior borings. Geologic profile of the site is shown in Figure 3, Geologic Section A-A”. The relationship of the site to the local geologic conditions is depicted in Figure 4, Local Geologic Map. Figure 5, Regional Geologic Map, shows the geology of the general region. The location of major faults and earthquake epicenters in Southern California are shown on the Regional Faults and Seismicity Map, Figure 6.
5.2 GEOLOGIC MATERIALS

The site is primarily underlain by sedimentary bedrock overlain by artificial fill associated with previous grading at the site. The artificial fill ranged in thickness in our borings from 1½ to 2 feet. The artificial fill consists primarily of silt to sandy silt.

The bedrock underlying the college campus is the Plio-Pleistocene age Fernando Formation. It consists of massive to thickly bedded sandy siltstone and silty sandstone with occasional gravel, small cobbles and discontinuous cemented zones. The bedrock was generally uncemented, however it was generally dense/stiff.

Based on our current and prior borings and regional mapping, bedding planes, where present, generally dip between 5 and 40 degrees to the northwest. Although generally massive, occasional discrete clay beds have been encountered in borings on the college campus.

5.3 GROUNDWATER

The majority of the college campus is elevated above the regional groundwater basin. The San Gabriel Valley and Coastal Plain of Los Angeles groundwater basins surround this portion Puente Hills. The bedrock underlying the college campus is considered non-water-bearing and groundwater is not anticipated to be present in significant amounts. According to the California Geological Survey (CGS), the historic high water level on the western edge of the college campus in the alluvium (along Workman Mill Road) was approximately 20 feet below the ground surface (bgs) (California Division of Mines and Geology, 1999). Groundwater was not encountered within the approximately 68 foot depth explored by borings at the site.

5.4 FAULTS

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (previously the California Division of Mines and Geology) for the Alquist-Priolo Earthquake Fault Zoning Program (Bryant and Hart, 2007). By definition, an active fault is one that has had surface displacement within Holocene time
(about the last 11,700 years). A potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years). Inactive faults have not moved in the last 1.6 million years. A list of nearby active faults and the distance in miles between the site and the nearest point on the fault, the maximum magnitude, and the slip rate for the fault is given in Table 1. A similar list for potentially active faults is presented in Table 2. The faults in the vicinity of the site are shown in Figure 6.

**Active Faults**

**Whittier Fault**

The active Whittier fault is located approximately 1.8 miles south of the site. The northwest-trending Whittier fault extends along the south flank of the Puente Hills from the Santa Ana River on the southeast to Whittier Narrows on the northwest. According to Yeats, at Whittier Narrows the Whittier fault turns more northwesterly becoming the East Montebello fault. The main Whittier fault trace is a high-angle reverse fault, with the north side uplifted over the south side at an angle of approximately 70 degrees, although late Quaternary movement has been nearly pure strike slip and total right separation may be around 8 to 9 kilometers (Yeats, 2004). In the Brea-Olinda Oil Field, the Whittier fault displaces Pleistocene age alluvium, and Carbon Canyon Creek is offset in a right lateral sense by the Whittier fault. The CGS considers the Whittier fault to be capable of a Magnitude 6.8 earthquake and estimates an annual slip rate of 2.5 millimeters per year (Cao et al. 2003; Field et al. 2013).

**Raymond Fault**

The Raymond fault located approximately 8 miles north-northwest of the site. The fault is primarily a left-lateral strike-slip fault with a minor component of high-angle reverse offset, placing basement rocks north of the fault over alluvial sediments south of the fault. The Raymond fault has long been recognized as a ground-water barrier in the Pasadena/San Marino area and numerous geomorphic features along its entire length (such as fault scarps, sag ponds, springs, and pressure ridges) attest to the fault's activity during the Holocene epoch. Within the last 36,000 to 41,000 years, five to eight separate earthquake events have been recognized along the Raymond fault (Crook et al., 1987; Weaver and Dolan, 2000). The most recent fault movement, based on radiocarbon ages from materials collected in an excavation exposing the fault, occurred sometime between 2,160 ± 105 and...
1,630 ± 100 years before present (LeRoy Crandall and Associates, 1978; Crook et al., 1987; Weaver and Dolan, 2000). An average slip rate of 1.5 mm/yr and a maximum magnitude of 6.5 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the Raymond fault.

San Jose Fault

The active San Jose fault is located approximately 8.5 miles east-northeast of the site. The San Jose fault trends in a general east-northeast direction through the San Gabriel Valley from the San Jose Hills on the south to the City of Claremont on the north. The fault juxtaposes middle Miocene (12 to 19 million years ago) age rocks of the Topanga Formation, on the north side of the fault, against late Miocene (5 to 12 million years ago) age Puente Formation rocks on the south side of the fault (Jennings, 1994). South and east of the San Jose Hills, the fault is concealed by Holocene age alluvial deposits and is a recognized groundwater barrier. In this area, the California Department of Water Resources (1970) has documented a 100-kilometer vertical offset in the buried Pleistocene (greater than 11,000 years old) age sediments. An average slip rate of 0.4 mm/yr and a maximum magnitude of 6.4 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the San Jose fault.

Sierra Madre Fault Zone

The active Sierra Madre fault is located 10 miles north of the college campus. This fault zone borders the southern front of the San Gabriel Mountains and consists of a series of discontinuous reverse faults that separate pre-Tertiary crystalline rocks on the north from Tertiary and Quaternary sedimentary deposits on the south. The various faults exhibit northerly dips from 15 degrees to vertical, with the crystalline rocks thrust upward toward the south over sediments as young as mid-Pleistocene age. The Sierra Madre fault zone extends approximately 80 kilometers along the southern flank of the San Gabriel Mountains from Big Tujunga Canyon on the west to Cajon Pass on the east. The fault zone, which includes the active Cucamonga fault, consists of a series of reverse fault segments that are believed to have been active at different times in the geologic past (Crook et al., 1987). The moderate Mw 5.8 1991 Sierra Madre earthquake is believed to be a result of movement on a small portion of the Sierra Madre fault zone. Recent paleoseismic investigations in Altadena (Rubin et al., 1998) have shown that the Sierra Madre fault fails in large, infrequent earthquakes. The past two ruptures in Altadena
produced about 4.5 to 5 m of slip at the ground surface and occurred within the past ~18,000 years. Farther east in San Dimas, Tucker and Dolan (2001) documented the occurrence of two large-slip earthquakes during the period between ~8,000 and ~24,000 years ago. The most recent event on the eastern portion of the Sierra Madre fault zone occurred prior to ~8,000 years ago and a minimum slip rate of 0.6 to 0.9 mm/yr was estimated (Tucker and Dolan, 2001). The CGS considers the Sierra Madre fault to be capable of a Magnitude 7.2 earthquake and estimates an annual slip rate of 2 millimeters per year (Cao et al. 2003; Field et al. 2013).

**Clamshell-Sawpit Fault Zone**

The Clamshell-Sawpit fault is located about 10 miles north of the college campus. The fault system consists of parallel and anastomosing, northward-dipping, reverse faults, that thrusts gneiss over unconsolidated gravels. The fault dip is variable, ranging from about 35 to 70 degrees to the north. The fault trends northeast from near the mouth of Santa Anita Canyon to Camp Rincon on the West Fork of San Gabriel River (Crook et al., 1987). The CGS considers the Clamshell-Sawpit fault to be capable of a Magnitude 6.5 earthquake and estimates an annual slip rate of 0.39 millimeters per year (Cao et al. 2003; Field et al. 2013).

**Verdugo Fault**

The active Verdugo fault zone is composed of several faults including the Verdugo fault, the San Rafael fault, and the Eagle Rock fault. The Verdugo fault is located approximately 14 miles northwest of the college campus. The most recent documented activity along this fault occurs in the Holocene age alluvial deposits along the western flank of the Verdugo Mountains in the Burbank area (County of Los Angeles Seismic Safety Element, 1990). Additionally, this portion of the fault is considered active by the State (Jennings and Bryant, 2010). An Alquist-Priolo Earthquake Fault Zone has not been established for the Verdugo fault by the State. However, a fault rupture hazard zone has been designated by the City of Burbank for the Verdugo fault. It is our opinion that the Verdugo fault should be considered active for planning purposes. The CGS considers the Clamshell-Sawpit fault to be capable of a Magnitude 6.9 earthquake and estimates an annual slip rate of 0.39 millimeters per year (Cao et al. 2003; Field et al. 2013).
Chino Fault

The active Chino fault is located approximately 19 miles east of the site. The fault splays from the active Elsinore fault zone in the vicinity of Corona and extends northwestward along the eastern flank of the Puente Hills. According to the Southern California Earthquake Center (SCEC), the Chino fault has an overall length of approximately 21 kilometers. Geomorphic evidence for Pleistocene age movement is indicated along the Chino portion of the fault trace by right deflected drainages and northeast-facing scarps. Recent paleoseismic research indicates the fault has ruptured as recent as the mid-Holocene. (Madden and Yeats, 2008). The CGS considers the Chino fault to be capable of a Magnitude 6.7 earthquake and estimates an annual slip rate of 1 millimeter per year (Cao et al. 2003; Field et al. 2013).

San Andreas Fault Zone

The active San Andreas fault zone is located about 31 miles northeast of the college campus. This fault zone, California's most prominent geological feature, trends generally northwest for almost the entire length of the state. The Mojave segment of the fault is the closest to the college campus. The CGS considers the Mojave section to be capable of a Magnitude 7.0 earthquake and estimates an annual slip rate of 34 millimeters per year (Cao et al. 2003; Field et al. 2013). The magnitude 7.8 1857 Fort Tejon earthquake was the last major earthquake along the San Andreas fault zone in Southern California.

Blind Thrust Faults

Several buried thrust faults, commonly referred to as blind thrusts, underlie the Los Angeles Basin at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than 3 kilometers. These faults do not present a potential surface fault rupture hazard. However, the following described blind thrust faults are considered active and potential sources for future earthquakes.

Puente Hills Blind Thrust

The Puente Hills Blind Thrust (PHBT) is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Shaw et. al, 2002). This blind thrust fault system extends eastward from downtown Los Angeles to Brea (in northern Orange
County). The PHBT includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Santa Fe Springs segment of the PHBT is believed to be the causative fault of the October 1, 1987 Whittier Narrows Earthquake (Shaw et. al, 2002).

The PHBT underlies the college campus at depth. Postulated earthquake scenarios for the PHBT include single segment fault ruptures capable of producing an earthquake of magnitude 6.5 to 6.6 (Mw) and a multiple segment fault rupture capable of producing an earthquake of magnitude 7.1 (Mw) (Shaw et.al, 2002). More recent paleoseismic studies of Holocene uplift include estimated earthquakes of Mw 7.2 to 7.5 (Dolan et. al, 2003). The PHBT is not exposed at the ground surface and does not present a potential for surface fault rupture. However, the PHBT is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. The CGS considers the PHBT to be capable of a Magnitude 7.1 earthquake and estimates an annual slip rate of 0.9 millimeters per year (Cao et al. 2003; Field et al. 2013).

Compton Thrust

The Compton blind thrust has been defined from seismic reflection profiles and borehole data (Leon et al., 2009) as a northeast-dipping structure. This blind thrust fault system extends approximately 28 miles from southwest Los Angeles County to northern Orange County in a southeastern direction. Leon et al. (2009) has correlated blind faulting at depth to near-surface folding. Several uplift events have been observed by investigating deformed Holocene layers along buried fold scarps. The cumulative uplift from the observed events ranged from 2 to 6 feet or approximately 4 to 14 feet of thrust displacement with magnitudes (Mw) of 7.0 to 7.4 (Leon et al., 2009). Slip rate is estimated to be 0.9 mm/yr (Field et al., 2013). The closet point to the surface projection of the Compton Thrust fault is approximately 3.5 miles southwest.

Upper Elysian Park Blind Thrust

The Upper Elysian Park fault is a blind thrust fault that overlies the Los Angeles and Santa Fe Springs segments of the Puente Hills Thrust (Oskin et al., 2000 and Shaw et al.,
2002). The eastern edge of the Upper Elysian Park fault is defined by the northwest-trending Whittier fault zone. The vertical surface projection of the Upper Elysian Park fault is approximately 5.1 miles northwest of the college campus at its closest point. Like other blind thrust faults in the Los Angeles area, the Upper Elysian Park fault is not exposed at the surface and does not present a potential surface rupture hazard; however, the Upper Elysian Park fault should be considered an active feature capable of generating future earthquakes. The CGS considers the Upper Elysian Park thrust to be capable of a Magnitude 6.4 earthquake and estimates an annual slip rate of 1.9 millimeters per year (Cao et al. 2003; Field et al. 2013).

San Joaquin Hills Blind Thrust

Recent studies by Grant et al. (1999, 2000, and 2002) suggest that an active blind thrust fault system underlies the San Joaquin Hills. The vertical surface projection of the San Joaquin Hills fault is approximately 23 miles south-southeast of the college campus at its closest point. This postulated blind thrust fault is believed to be a faulted anticlinal fold, sub parallel to the Newport-Inglewood fault zone but considered a distinctly separate seismic source (Grant et al., 2002). The San Joaquin Hills are rising at an estimated average rate of 0.21 to 0.27 meters per 1,000 years.

The San Joaquin Hills thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the San Joaquin Hills Thrust is an active feature that is believed to be capable of generating future earthquakes. The California Geological Survey estimates an average slip rate of 0.6 millimeters per year and a maximum Magnitude of 6.6 for the San Joaquin Hills Thrust (Cao et al., 2003; Field et al., 2013).

Northridge Blind Thrust

The Northridge Thrust is located beneath the majority of the San Fernando Valley and is the causative fault of the January 17, 1994 Northridge earthquake. This thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the Northridge Thrust is an active feature that can generate future earthquakes. The vertical surface projection of the Northridge Thrust is approximately 26 miles west-northwest of the site at the closest point. An average slip rate of 1.5 mm/yr and a
maximum magnitude of 7.0 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the Northridge Blind Thrust.

**Potentially Active Faults**

**Workman Hill Fault**

The potentially active Workman Hill fault diverges northwestward from the Whittier fault zone near La Habra, and trends northwest through the Puente Hills and is shown on regional geologic maps across the southernmost portion of the college campus at the ball fields approximately 0.4 miles southwest of the site. The fault dips about 50 degrees towards the northeast, with the northeast block apparently down-dropped with respect to the southwest block. Daviess and Woodford showed the Workman Hill fault cuts the lower Fernando but not the upper Fernando (Yeats, 2004.) Trieman (1991) did not see evidence of Holocene activity and recommended that it not be zoned.

**Norwalk Fault**

The potentially active Norwalk fault is located about 7.5 miles south-southwest of the college campus. The fault is a known groundwater barrier along the southern edge of the Coyote Hills, trending southeasterly along which the Coyote Hills have been uplifted. This fault offsets lower Pleistocene age and older deposits near the mouth of the Santa Ana Canyon. However, there is no evidence that this fault has offset Holocene age alluvial deposits (Ziony and Jones, 1989).

**Central Avenue Fault**

The Central Avenue fault is located east of and trending parallel to the Chino fault where it was first identified as a groundwater barrier (Woodford et al., 1944). Later studies further identified the structure as a zone of weakness (Madden and Yeats, 2008) marking the hingeline between the Chino Basin and the Perris Block (Yeats, 2002). Yeats (2002) indicates that the fault does not demonstrate signs of late Quaternary movement in relation to the active Chino fault to the south. Additionally, Jennings and Bryant (2010) classifies the Central Avenue fault as late Pleistocene in age. The Central Avenue fault is located approximately 16 miles east-northeast of the site.
5.5 SEISMICITY

Earthquake Catalog Data

The seismicity of the region surrounding the college campus was determined from research of an electronic database of seismic data (Southern California Seismographic Network, 2014). This database includes earthquake data compiled by the California Institute of Technology from 1932 through 2014 and data for 1812 to 1931 compiled by Richter and the U.S. National Oceanic Atmospheric Administration (NOAA). The search for earthquakes that occurred within 100 kilometers of the college campus indicates that 435 earthquakes of Richter magnitude 4.0 and greater occurred from 1932 through 2014; 3 earthquakes of magnitude 6.0 or greater occurred between 1906 and 1931; and 1 earthquake of magnitude 7.0 or greater occurred between 1812 and 1905. A list of these earthquakes is presented as Table 3. Epicenters of some of the moderate and major earthquakes (greater than magnitude 5.0) are shown in Figure 6.

In Table 3, the information for each earthquake includes date and time in Greenwich Civil Time (GCT), location of the epicenter in latitude and longitude, quality of epicentral determination (Q), depth in kilometers, distance from the site in kilometers, and magnitude. Where a depth of 0.0 is given, the solution was based on an assumed 16-kilometer focal depth. The explanation of the letter code for the quality factor of the data is presented on the first page of the table.

Historic Earthquakes

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within the last 150 years. A partial list of these earthquakes, including the magnitude of the earthquake and the distance of the epicenter to the college campus, is included in the following table.

List of Historic Earthquakes

<table>
<thead>
<tr>
<th>Earthquake</th>
<th>Date of Earthquake</th>
<th>Magnitude</th>
<th>Distance to Epicenter (miles)</th>
<th>Direction to Epicenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Tejon</td>
<td>January 9, 1857</td>
<td>7.8</td>
<td>87</td>
<td>NW</td>
</tr>
<tr>
<td>Long Beach</td>
<td>March 10, 1933</td>
<td>6.4</td>
<td>28</td>
<td>S</td>
</tr>
<tr>
<td>Tehachapi</td>
<td>July 21, 1952</td>
<td>7.5</td>
<td>93</td>
<td>NW</td>
</tr>
<tr>
<td>San Fernando</td>
<td>February 9, 1971</td>
<td>6.6</td>
<td>34</td>
<td>NW</td>
</tr>
<tr>
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<td>Date</td>
<td>Magnitude</td>
<td>Azimuth</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>-----------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Whittier Narrows</td>
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<td>4</td>
<td>WNW</td>
</tr>
<tr>
<td>Sierra Madre</td>
<td>June 28, 1991</td>
<td>5.8</td>
<td>17</td>
<td>N</td>
</tr>
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<td>7.3</td>
<td>89</td>
<td>E</td>
</tr>
<tr>
<td>Big Bear</td>
<td>June 28, 1992</td>
<td>6.4</td>
<td>68</td>
<td>E</td>
</tr>
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<td>32</td>
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<td>October 16, 1999</td>
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<td>La Habra</td>
<td>March 28, 2014</td>
<td>5.1</td>
<td>9</td>
<td>SE</td>
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</tbody>
</table>

### 5.6 GEOLOGIC HAZARDS

#### Fault Rupture

The site is not within a currently established Alquist-Priolo Earthquake Fault Zone (A-P Zone) for surface fault rupture hazards. The closest active fault to the site with the potential for surface fault rupture is the Whittier fault located approximately 1.8 miles to the south. The closest Alquist-Priolo Earthquake Fault Zone, established for the East Montebello fault, is located approximately 2.7 miles to the northwest.

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the site during the design life of the proposed development is considered low.

#### Slope Stability

The college campus is located in a hillside area (County of Los Angeles, 1990). According to the California Geological Survey, the descending northwestern slope adjacent to the site is within a Seismic-Induced Landslides Hazard Zone (California Division of Mines and Geology, 1999).

MACTEC, our legacy company, performed a landslide study for the lower student parking area documented in reports dated March 7, 2006 and February 16, 2009. Based on review of historic topographic maps and aerial photographs, subsurface geotechnical explorations, laboratory testing and slope stability analysis, the reports concluded that a landslide of Quaternary age (between 10,000 and 1.6 million years old) exists on the
west/northwest facing slope of the campus (MACTEC, 2006). The approximate location is shown on Figure 2. The report concludes that the slope is grossly stable due to the buttressing effect of the San Gabriel River alluvium at the base of the landslide. Slope stability analysis yielded an average static factor of safety of 1.96 and an average pseudo-static factor of safety of 1.12, for the two cross-sections through the overall landslide, both of which are greater than the requirements of 1.5 and 1.1.

Two of our four recent borings (Borings 1 and 3), were bucket auger borings and were down-hole logged to observe local geologic conditions. Although slightly to moderately fractured, the bedrock and landslide material were observed to be generally intact. No shears or clay beds were observed that could result in local instability. Geologic conditions are shown on Section A-A’, Figure 3.

Liquefaction and Seismically-Induced Settlement

Liquefaction potential is greatest where the groundwater level is shallow, and submerged loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases.

According to the County of Los Angeles Seismic Safety Element (1990) and the California Geological Survey (California Division of Mines and Geology, 1999), the site is not within an area identified as having a potential for liquefaction. The materials beneath the site are primarily bedrock of the Fernando Formation and landslide material and fill soils derived from the bedrock. These materials are not considered to be susceptible to liquefaction and the associated ground deformation or seismically-induced settlement.

Tsunamis, Inundation, Seiches, and Flooding

The site is not in a coastal area. Therefore, tsunamis (seismic sea waves) are not considered a significant hazard at the site.

According to the Los Angeles County Safety Element (1996), the site is not located downslope of any large bodies of water that could adversely affect the site in the event of
earthquake-induced dam failures or seiches (wave oscillations in an enclosed or semi-enclosed body of water).

The site is located in an area of 0.2% annual chance flood (Zone X) as designated by the Federal Emergency Management Association (FEMA, 2008). Therefore, the potential for flooding to affect the site is considered low.

Subsidence

The site is not within an area of known subsidence associated with fluid withdrawal (groundwater or petroleum), peat oxidation, or hydrocompaction.

Oil Wells and Methane Gas

The site is within the boundaries of the abandoned Lapworth oil field based on the California Division of Oil, Gas, and Geothermal Resources’ Well finder system (DOGGR, 2015). There are three plugged and abandoned oil wells west and northwest of the site between approximately 1000 and 2000 feet away. Plugged and abandoned oil wells are not known to be located at the site; however, there is a remote possibility that undocumented wells could be encountered during construction. Any well encountered would need to be properly abandoned in accordance with the current requirements of the California Division of Oil, Gas and Geothermal Resources (DOGGR).

Methane migrating to the surface from the oil field is a potential hazard. However, based on our previous experience at the college campus, which includes down-hole geologic logging of large diameter borings throughout the campus and geotechnical inspection and testing services during the original grading for the college campus and several additional projects, methane hazards have not been encountered. In addition, we are not aware of any incidents of methane gas migrating to the surface anywhere on the college campus. Therefore, we anticipate that the potential for methane gas migrating to the surface at the project site would be low.
Radon Gas

According to the Environmental Protection Agency (EPA), the site is located in an area of low radon gas potential for indoor levels (less than 2.0 picocuries per liter) (EPA, 2014). Therefore, the potential for radon gas intrusion is considered low.

5.7 GEOLOGIC CONCLUSIONS

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located beneath or projecting toward the site. In our opinion, the potential for surface rupture at the site due to fault plane displacement propagating to the ground surface during the design life of the project is considered low. Although the site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

The western portion of the library is underlain by a large, deep-seated Quaternary age landslide that is present on the west facing slope of the campus. Prior investigation by MACTEC, our legacy company, found the landslide to be grossly stable. No shears or clay beds were observed in the borings of our current investigation that could result in local instability. Therefore, the potential for slope instability is considered low.

The potential for other geologic hazards such as liquefaction, seismically-induced settlement, tsunamis, inundation, seiches, flooding, and subsidence affecting the site is also considered to be low.

6.0 RECOMMENDATIONS

6.1 GENERAL

Based on our records, the existing spread footings supporting the L Tower extend into the undisturbed bedrock materials beneath the site. Parameters are provided in the following sections for analysis of the existing spread footings for resistance of the additional loads occurring as a result of the proposed retrofit. If necessary, existing footings may be enlarged to support additional loads or pile foundations may be used to provide additional
resistance of downward and upward loads and to limit differential settlement. New foundations may consist of pile foundations or conventional spread footings established in undisturbed bedrock. Recommendations are provided herein for the design of new spread footings, drilled cast-in-place concrete pile foundations, and micropiles.

Due to the highly expansive nature of the upper materials at the site, new floor slabs, pavement, and exterior concrete walks and slabs on grade will need to be underlain by at least 2 feet of relatively non-expansive soil. In cut areas, the exposed materials should be overexcavated to allow for the placement of at least 2 feet of relatively non-expansive soil beneath floor slabs, pavement, and exterior concrete walks and slabs on grade. In fill areas, the upper 2 feet of the new fill beneath floor slabs, pavement, and exterior concrete walks and slabs on grade should consist of relatively non-expansive soil.

6.2 EXISTING FOUNDATIONS

Bearing Value

Based on our records, the existing spread footings supporting the L Tower extend into the undisturbed bedrock materials beneath the site. Accordingly, the existing spread footings may be analyzed using an allowable net dead-plus-live load pressure of 10,000 pounds per square foot.

A one-half increase may be used for wind or seismic loads. The recommended bearing value is a net value, and the weight of concrete in the footings may be taken as 50 pounds per cubic foot; the weight of soil backfill may be neglected when determining the downward loads.

Settlement

We estimate that the settlement of the existing footings occurring as a result of the additional dead-plus-live loads imposed in the existing foundations using the recommended allowable bearing value above, will be on the order of ¼ inch. If additional settlement of the existing spread footings can be tolerated, the allowable bearing value can be increased.
Lateral Resistance

Lateral loads may be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.4 may be used between the footings and the floor slab and the supporting soils. The passive resistance of natural materials or properly compacted fill soils may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. A one-third increase in the passive value may be used for wind or seismic loads. The frictional resistance and the passive resistance of the soils may be combined without reduction in determining the total lateral resistance.

6.3 NEW FOUNDATIONS

Spread Footings

Bearing Value

New spread footings, carried at least 2 feet below the lowest adjacent grade or floor level may be designed to impose a net dead-plus-live load pressure of 10,000 pounds per square foot on undisturbed bedrock. The excavations should be deepened as necessary to extend into satisfactory soils.

A one-half increase in the above bearing value may be used for wind or seismic loads. The weight of concrete in the footings may be taken as 50 pounds per cubic foot; the weight of any soil backfill may be neglected when determining the downward loads.

Settlement

We estimate that the settlement of new spread footings supported in the manner recommended, will be on the order of 1¼ inch or less.

Lateral Resistance

Lateral loads may be resisted by soil friction and passive resistance of the soils. A coefficient of friction of 0.4 may be used between the foundation and the supporting soils. The passive resistance of the natural materials or properly compacted fill may be assumed to be equal to that developed by a fluid with a density of 300 pounds per cubic foot.
foot. A one third increase in the passive value may be used when considering wind or seismic loads. The passive resistance and the frictional resistance of the soils may be combined without reduction in determining the total lateral resistance.

**Ultimate Design Factors**

When considering an ultimate design approach, the recommended design values provided in the previous sections may be multiplied by the factors shown:

<table>
<thead>
<tr>
<th>Design Item</th>
<th>Ultimate Design Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing Value</td>
<td>3.0</td>
</tr>
<tr>
<td>Passive Pressure</td>
<td>1.5</td>
</tr>
<tr>
<td>Coefficient of Friction</td>
<td>1.5</td>
</tr>
</tbody>
</table>

In no event, however, should foundation sizes be less than those required to support dead-plus-live loads when using the allowable stress design method.

**Drilled Cast-in-Place Concrete Pile Foundations**

**Axial Capacities**

The allowable downward and upward capacities of 24-inch diameter conventional drilled concrete piles are presented on Figure 7, Drilled Pile Capacities. The pile capacities shown on Figure 7 are dead-plus-live load capacities; a one-third increase may be used for wind or seismic loads. The capacities presented are based on the strength of the soils; the compressive and tensile strength of the pile sections should be checked to verify the structural capacity of the piles.

**Settlement**

We estimate the total and differential settlement of the proposed construction supported on conventional drilled cast-in-place piles in the manner recommended to be less than 1 inch and ½ inch, respectively.
Lateral Capacities

Lateral loads may be resisted by the piles, by friction between the floor slab and the supporting fill soils, and by the passive resistance of the soils against pile caps and grade beams. The resistance of the piles, the frictional resistance, and the passive resistance of the soils against pile caps and grade beams may be combined without reduction in determining the total lateral resistance.

We have computed the lateral capacities of the piles using the computer program LPILE by ENSOFT, Inc. Resistance of the soils adjacent to the 24-inch-diameter drilled piles are shown in the following tables for top of pile deflections of \( \frac{1}{2} \) and \( \frac{1}{4} \) inches. These resistances have been calculated assuming fixed-head pile conditions.

### Lateral Load Design Data

24-inch Diameter Drilled Concrete Pile (Fixed-Head Conditions)

<table>
<thead>
<tr>
<th>Pile Head Deflection (inches)</th>
<th>( \frac{1}{4} )</th>
<th>( \frac{1}{2} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Load (kips)</td>
<td>130</td>
<td>225</td>
</tr>
<tr>
<td>Maximum Moment (inch-kips)</td>
<td>5,995</td>
<td>11,045</td>
</tr>
<tr>
<td>Depth to Maximum Moment (ft)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Depth to Zero Moment (ft)</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

By: LH 4/7/15 Checked: MM 4/7/15

For piles in groups spaced as shown below and at least 3 pile diameters on centers, no reduction in the lateral capacities need be considered for the first (leading) row of piles in the direction perpendicular to loading. For subsequent rows in the direction of loading, piles in groups spaced closer than 8 pile diameters on centers will have a reduction in lateral capacity due to group effects. Therefore, the lateral capacity of piles in groups, except for the first row of piles, spaced at 3 pile diameters on centers, may be assumed to be reduced by half. The reduction of lateral capacity in the direction of loading for other pile spacings may be interpolated.
A coefficient of friction of 0.4 may be used between the floor slab and the supporting natural materials and/or properly compacted fill. The passive resistance of the natural materials and/or properly compacted fill against pile caps and grade beams may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. A one-third increase in the passive value may be used for wind or seismic loads.

**Ultimate Design Factors**

The recommended values for foundation designs are for use with loadings determined by a conventional allowable stress design. When considering an ultimate design approach, the recommended design values may be multiplied by the following factors:

<table>
<thead>
<tr>
<th>Design Item</th>
<th>Ultimate Design Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial Capacity of Piles</td>
<td>2.0</td>
</tr>
<tr>
<td>Lateral Capacity of Piles</td>
<td>1.0</td>
</tr>
<tr>
<td>Passive Resistance</td>
<td>1.5</td>
</tr>
<tr>
<td>Coefficient of Friction</td>
<td>1.5</td>
</tr>
</tbody>
</table>

In no event, however, should pile lengths be less than those required to support dead-plus-live loads when using the allowable stress design method.
Pile Installation

Caving was not observed within our nearby bucket-auger borings and the soil consists of fine-grained material underlain by bedrock. In addition, groundwater was not encountered to the depths explored for the project. Therefore, conventional installation methods may be adequate for the installation of drilled piles. However, the contractor should have access to special provisions to prevent caving of shaft side walls during construction, should it occur. Special drilling provisions for caving include, but are not limited to, shell casing and/or drilling mud and reduced drilling speed as necessary to minimize vibration and sloughing. As a precaution to minimize (but not eliminate) the potential for caving and raveling during installation, piles spaced less than five diameters on center should be drilled and filled alternately, with the concrete permitted to set at least eight hours before drilling an adjacent hole. Pile excavations should be filled with concrete as soon after drilling and inspection as possible; the holes should not be left open overnight.

Concrete should be pumped from the bottom up through a rigid pipe extending to the bottom of the drilled excavation, with the pipe being slowly withdrawn as the concrete level rises. The discharge end of the pipe should be at least 5 feet below the surface of the concrete at all times during placement. The discharge pipe should be kept full of concrete during the entire placing operation and should not be removed from the concrete until all of the concrete is placed and fresh concrete appears at the top of the pile. The volume of concrete pumped into the hole should be recorded and compared to design volume.

Only competent drilling contractors with experience in the installation of drilled cast-in-place piles in similar soil and groundwater conditions should be considered for the pile construction. We suggest requesting the piling contractor to submit a list of similar projects along with references for each project.

As geotechnical engineer of record (GEOR), we should observe the drilling of the pile excavations and the placing of the concrete continuously to verify that the desired diameter and depth of piles are achieved.
Micropiles

General

As an alternative to the use of drilled cast-in-place concrete piles, post-grouted micropiles may be used to resist downward and upward loading. The micropiles should be designed in accordance with Section 1810A.3.10 of the 2013 California Building Code (CBC) and constructed in accordance with Section 1810A.4.10 of the 2013 CBC, “Micropiles”.

Axial Capacities

The actual axial capacities of post-grouted micropiles should be determined by load testing; however, for preliminary design purposes, the estimated allowable downward and upward capacity for post-grouted micropiles may be taken as presented on Figure 8, Estimated Micropiles Capacities. Ultimate pile capacities may be obtained by multiplying the indicated values by a factor of safety of 2.0. The allowable capacities are dead-plus-live load capacities; a one-third increase to the allowable values may be used when considering wind or seismic loads.

If the micropiles are spaced at least 3 diameters on center, no reduction in the axial capacity of the anchors need be considered due to group action.

Micropile Installation

The primary grouting of the pile excavation should be performed as soon as possible after drilling and inspection as possible; the holes should not be left open overnight. The micropile excavations should be filled during primary grouting with concrete placed by pumping from the tip out.

A free stressing length of at least 15 feet should be used for design of the micropiles. The remaining portion of the micropiles should be bonded. The micropile should be designed to transfer the downward loads through the free stressing length to the bonded zone below. The grout placed during installation (primary grouting) may be placed under nominal pressures sufficient to deliver the grout to the bottom of the drill hole. The grout placed during post-grouting should be placed under a pressure of between 250 and 300
pounds per square inch. Class I corrosion protection is required in accordance with 2013 CBC. Casing may be necessary to prevent caving during the initial grout placement. However, we recommend that a permanent casing be installed to a depth of at least 15 feet below the pile cap in order to meet the requirements of Section 1810A.3.10.4 of the 2013 CBC. This depth can be further refined once the structural engineer has determined the design loads per micropile and the tolerable deflections.

**Testing**

The proposed micropiles should be tested performed in accordance with Section 1810A.3.3.1.2 through 1810A.3.3.1.5 of 2013 CBC. At least two pre-production tests for each size and depth of micropile should be performed in accordance with requirement of Section 1810A.3.10.4 of 2013 CBC. The micropiles may be sacrificial or may be used as production micropiles. The micropiles should be installed near the planned elevation of production micropiles. Preproduction micropiles should be tested to 200% of the design load.

In addition to the preproduction tests, proof tests should be performed on at least two percent of all production micropiles to meet the requirements of the 2013 CBC. Proof tests should be performed to a minimum of 200% of the design load.

If a micropile does not pass the proof test during the load testing program, the micropile may need to have additional post-grouting, be lengthened in the field, or additional micropiles will need to be installed in order to resist the design loads.

**Lock-off Prestressing Load**

We recommend that the micropiles be locked off at a nominal load of at least 10 kips.

**6.4 SEISMIC DESIGN PARAMETERS**

**Mapped Seismic Design Parameters**

We have determined the seismic parameters in accordance with the Section 1613 of the 2013 edition of the CBC and Section 11.4 of ASCE 7-10 Standard (ASCE, 2010) using
the United States Geological Survey program, U.S. Seismic Design Maps Web Application (USGS, 2013). The CBC Site Class was determined to be Site Class “D” based on the results of the explorations and a review of the local soil and geologic conditions. The mapped seismic parameters may be taken as presented in the following table:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mapped Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_s$ (0.2 second period, Site Class B)</td>
<td>2.37g</td>
</tr>
<tr>
<td>$S_1$ (1.0 second period, Site Class B)</td>
<td>0.84g</td>
</tr>
<tr>
<td>Site Class</td>
<td>C</td>
</tr>
<tr>
<td>$F_a$</td>
<td>1.0</td>
</tr>
<tr>
<td>$F_v$</td>
<td>1.3</td>
</tr>
<tr>
<td>$S_{M_S} = F_a S_s$ (0.2 second period)</td>
<td>2.37g</td>
</tr>
<tr>
<td>$S_{M_1} = F_v S_1$ (1.0 second period)</td>
<td>1.09g</td>
</tr>
<tr>
<td>$S_{D_S} = 2/3 x S_{M_S}$ (0.2 second period)</td>
<td>1.58g</td>
</tr>
<tr>
<td>$S_{D_1} = 2/3 x S_{M_1}$ (1.0 second period)</td>
<td>0.73g</td>
</tr>
</tbody>
</table>

Site-Specific Response Spectra

We have performed a Probabilistic Seismic Hazard Analyses (PSHA) and a Deterministic Seismic Hazard Analyses (DSHA) using the computer program EZ-FRISK (Risk Engineering, 2014) in order to develop site-specific response spectra in accordance with the 2013 CBC and Chapter 21 of ASCE 7-10. For the DSHA, a composite deterministic response spectrum was compiled from the maximum of the 84th percentile spectral ordinates computed for known nearby faults. In addition to known fault sources, background seismicity was also included in the PSHA. The computed PSHA and DSHA ground motions were converted to maximum direction ground motions using the multiplication factors recommended in Shahi and Baker (2013).

The site-specific probabilistic and deterministic response spectra were developed using the average ground motions obtained from the Next Generation Attenuation (NGA) West 2 relationships of Abrahamson et al. (2014), Boore et al. (2014), Campbell and Bozorgnia (2014), Chiou and Youngs (2014), and Idriss (2014). For all five NGA relationships, we have used an average shear wave velocity in the upper 30 meters equal to 640 meters per second based on the results of our ReMi survey at the site. We have used a depth to a shear wave velocity of 1,000 meters per second beneath the site ($Z_{1.0}$) of 350 meters.
We have estimated a depth to a shear wave velocity of 2,500 meters per second ($Z_{2.5}$) of approximately 2.5 kilometers based on the available geologic data.

In accordance with Chapter 21 of ASCE 7-10, the probabilistic Risk-Targeted Maximum Considered Earthquake ($MCE_R$) response spectrum was taken as the maximum direction response spectrum with a 2% probability of being exceeded in 50 years multiplied by the risk coefficients $C_{RS}$ and $C_{R1}$. The risk-targeted coefficients, $C_{RS}$ and $C_{R1}$ were taken from Figures 22-17 and 22-18 in ASCE 7-10. The value of $C_{RS}$ was applied for periods less than or equal to 0.2 second, the value of $C_{R1}$ was applied for periods greater than or equal to 1.0 second, and linear interpolation was used to determine the risk coefficient between 0.2 second and 1.0 second. The $C_{RS}$ and $C_{R1}$ values for this project were determined to be 0.937 and 0.949, respectively.

ASCE 7-10 defines the deterministic $MCE_R$ response spectrum as the maximum of the composite deterministic response spectrum and the deterministic lower limit, as defined on Figure 21.2-1 of ASCE 7-10. The site-specific $MCE_R$ response spectrum was then taken as a composite of the probabilistic and deterministic $MCE_R$ response spectra, determined as described above, which consisted of the lesser of the spectral ordinates between the two spectra. The site-specific design response spectrum was computed by multiplying the ordinates of the site-specific $MCE_R$ response spectrum by two-thirds, with a lower limit at all periods of 80% of the spectral ordinates of the general design response spectrum determined in accordance with Section 11.4.5 of ASCE 7-10.

As required by Section 16.1.3.2 of ASCE 7-10, for sites within 3 miles (5 kilometers) of the active fault that controls the hazard, which includes the project site, each pair of components shall be rotated to the fault-normal and fault-parallel directions of the causative fault and shall be scaled so that the average of the fault-normal components is not less than the $MCE_R$ response spectrum for the period range from $0.2T$ to $1.5T$, where $T$ is the fundamental period of the structure. Accordingly, the $MCE_R$ response spectrum, which represents the maximum rotated component of ground motion, was used as the target response spectrum in the fault-normal direction. The $MCE_R$ and design response spectra in the fault-normal direction and their components are presented on Figures 9 and 11, respectively and in digitized form on Tables 4, 5a, and 6a.
ASCE 7-10 does not specify requirements for target spectrum in the fault-parallel direction. Therefore, we have taken the geometric mean spectrum as the target response spectrum for the fault-parallel direction. The $MCE_R$ and design response spectra in the fault-parallel direction and their components are presented on Figures 10 and 12, respectively, and in digitized form on Tables 4, 5b, and 6b.

**Spectrum-Matched Time Histories**

We performed spectral matching for seven selected time-histories for $MCE_R$ response spectra using the computer program EZ-FRISK (Risk Engineering, 2014). The fundamental period for the proposed Library Building, which was provided by Dr. Said Hilmy of IDS Group, ranges from 0.62 to 0.66 seconds. The periods of interest considered were taken between 0.2 and approximately 2.0 times the fundamental period. Therefore, this corresponds to a range of approximately 0.1 to 1.3 seconds. The time histories selected for matching are presented in Table 7. These records were selected based on the following factors: geologic and soil characteristics, fault distance, magnitude, source mechanism, and inclusion of strong directivity or near-source ground motions. In addition, the orientation of these records was also rotated to the fault normal and fault parallel components corresponding to the causative fault prior the matching process.

The $MCE_R$ target spectrum along with the initial and matched response spectra for each record are shown on Figures 13.1a through 19.2a. The acceleration, velocity, and displacement time histories for both the original records and records matched to the $MCE_R$ response spectra, as described in Appendix D, are presented on Figures 13.1b through 19.2b. Each time history was matched using the 5% damped spectrum.

For ease of reference, the figure numbers corresponding to the plots of the pseudospectral acceleration and time histories for the $MCE_R$ ground motions are presented in the table below.
<table>
<thead>
<tr>
<th>NGA Record No.</th>
<th>Earthquake</th>
<th>Station Name</th>
<th>Fault Normal</th>
<th>Fault Parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>779</td>
<td>Loma Prieta</td>
<td>LGPC</td>
<td>Figure 13.1</td>
<td>Figure 13.2</td>
</tr>
<tr>
<td>828</td>
<td>Cape Mendocino</td>
<td>Petrolia</td>
<td>Figure 14.1</td>
<td>Figure 14.2</td>
</tr>
<tr>
<td>1111</td>
<td>Kobe Japan</td>
<td>Nishi-Akashi</td>
<td>Figure 15.1</td>
<td>Figure 15.2</td>
</tr>
<tr>
<td>1511</td>
<td>Chi-Chi Taiwan</td>
<td>TCU076</td>
<td>Figure 16.1</td>
<td>Figure 16.2</td>
</tr>
<tr>
<td>1787</td>
<td>Hector Mine</td>
<td>Hector</td>
<td>Figure 17.1</td>
<td>Figure 17.2</td>
</tr>
<tr>
<td>5818</td>
<td>Iwate Japan</td>
<td>Kurihara City</td>
<td>Figure 18.1</td>
<td>Figure 18.2</td>
</tr>
<tr>
<td>143</td>
<td>Tabas Iran</td>
<td>Tabas</td>
<td>Figure 19.1</td>
<td>Figure 19.2</td>
</tr>
</tbody>
</table>

The details of the spectrum-matched time histories are presented in Appendix D.

### 6.5 FLOOR SLAB SUPPORT

If the subgrade is prepared as recommended in the following section on grading, new floor slabs may be supported on grade. The materials beneath the site are expansive, and floor slabs, pavement, and exterior concrete walks and slabs on grade should be underlain by at least 2 feet of properly compacted fill consisting of relative non-expensive soils.

Construction activities and exposure to the environment can cause deterioration of the prepared subgrade. Therefore, we recommend our field representative observe the condition of the final subgrade soils immediately prior to slab on grade construction, and, if necessary, perform further density and moisture content tests to determine the suitability of the final prepared subgrade.

If vinyl or other moisture-sensitive floor covering is planned, we recommend that the floor slab in those areas be underlain by a capillary break consisting of a vapor-retarding membrane over a 4 inch-thick layer of gravel. A 2-inch-thick layer of sand should be placed between the gravel and the membrane to decrease the possibility of damage to the membrane. We suggest the following gradation for the gravel:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾”</td>
<td>90 - 100</td>
</tr>
<tr>
<td>No. 4</td>
<td>0 - 10</td>
</tr>
<tr>
<td>No. 100</td>
<td>0 - 3</td>
</tr>
</tbody>
</table>
A low-slump concrete should be used to minimize possible curling of the slab. A 2-inch-thick layer of coarse sand can be placed over the vapor retarding membrane to reduce slab curling. If this sand bedding is used, care should be taken during the placement of the concrete to prevent displacement of the sand. The concrete slab should be allowed to cure properly before placing vinyl or other moisture-sensitive floor covering. The sand and gravel layers should not be considered part of the required non-expansive soil layer under concrete slabs.

6.6 TEMPORARY SHORING

General

Where there is not sufficient space for sloped embankments, shoring will be required. Temporary excavations, such as those for new footing construction or the enlargement of existing footings, may be internally braced or supported using conventional soldier beams with wood lagging. Conventional earth moving equipment is anticipated to be adequate to perform the required excavations, but it should be noted that some hard layers of cemented rock may be encountered in the Fernando Formation which will require additional effort.

Lateral Pressures

For design of cantilevered shoring, a triangular distribution of earth pressure may be used. It may be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 30 pounds per cubic foot.

For the design of braced shoring, we recommend the use of a trapezoidal distribution of earth pressure. The recommended pressure distribution, for the case where the grade is level behind the shoring, is illustrated in the following diagram with the maximum pressure equal to 22H in pounds per square foot, where H is the height of the shoring in feet. Where a combination of sloped embankment and shoring is used, the pressure would be greater and must be determined for each combination.
In addition to the recommended earth pressures, the upper 10 feet of shoring adjacent to normal vehicular traffic should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the shoring due to normal traffic. If the traffic is kept back at least 10 feet from the shoring, the traffic surcharge may be neglected. Furthermore, the shoring should be designed to resist any lateral surcharge pressure imposed by existing foundations, heaving equipment, or storage loads.

**Design of Solider Piles**

For the design of soldier piles spaced at least two diameters on centers, the allowable lateral bearing value (passive value) of the soils below the level of excavation may be assumed to be 600 pounds per square foot per foot of depth, up to a maximum of 6,000 pounds per square foot. To develop the full lateral value, provisions should be taken to assure firm contact between the soldier piles and the undisturbed siltstone. The concrete placed in the soldier pile excavations may be a lean mix concrete. However, the concrete used in that portion of the soldier pile which is below the planned excavated level should be of sufficient strength to adequately transfer the imposed loads to the surrounding soils.

**Lagging**

Continuous lagging will be required between the soldier piles. The soldier piles and anchors should be designed for the full anticipated lateral pressure.
Internal Bracing

Raker bracing, if used, could be supported by temporary concrete footings (deadmen). For design of such temporary footings, poured with the bearing surface normal to the rakers inclined at 45 to 60 degrees with the vertical, a bearing value of 10,000 pounds per square foot may be used, provided the shallowest point of the footing is at least 1 foot below the lowest adjacent grade. To reduce the deflection of the shoring, the rakers should be tightly wedged against the footings and/or shoring system.

Deflection

The deflection of a cantilevered shoring system may be estimated by the shoring engineer; however, it is difficult to accurately predict the deflection of a shored embankment when braced shoring is utilized. It should be realized, however, that some deflection will occur. We estimate that this deflection could be on the order of 1 inch at the top of the shored embankment. If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent walkways, utilities, and structures. If desired to reduce the deflection of the shoring, a greater active pressure could be used in the shoring design.

Monitoring

Some means of monitoring the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all the soldier piles. We will be pleased to discuss this further with the design consultants and the contractor when the design of the shoring system and retaining wall has been finalized.

6.7 RETAINING WALLS AND WALLS BELOW GRADE

Lateral Earth Pressure

For design of new cantilevered retaining walls, where the surface of the backfill is level, it may be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 30 pounds per cubic foot.
For the design of new braced retaining walls, an at-rest earth pressure equivalent to that developed by a fluid having a density of 70 pounds per cubic foot may be used where the surface of the backfill is level.

For the analysis of the existing walls below grade, a trapezoidal distribution of earth pressure may be used. The recommended pressure distribution for the case where the grade is level behind the walls, is illustrated in the following diagram, where the maximum lateral pressure will be 22H in pounds per square foot, where H is the height of the height of the basement wall in feet:

In addition to the recommended earth pressure, the upper 10 feet of walls adjacent to streets or vehicular traffic areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal traffic. If the traffic is kept back at least 10 feet from the walls, the traffic surcharge may be neglected. Furthermore, adjacent to the existing structures, the basement walls should be designed for the appropriate lateral surcharge pressures imposed by adjacent foundations.

Based on the height of the existing proposed walls and the cohesive nature of the on-site materials, we estimate that the seismic lateral earth pressure on new and existing walls below grade will be negligible.
Drainage

New retaining walls and walls below grade should be designed to resist hydrostatic pressures or be provided with drainage.

Where the walls are formed, drainage may be provided by a 1-foot wide vertical strip of granular soils or continuous geosynthetic drainage panels, such as Miradrain 6000 (or equivalent), attached to the back of the wall before backfilling. The geosynthetic drainage panels should be terminated at 2 feet below the ground surface. A drainage collection system, such as Quickdrain (or equivalent) should be placed at the base of the wall and connected to the drainage panels and discharge to a solid pipe at least 4 inches in diameter. As an alternative, the drainage collection system may consist of a 4-inch-diameter perforated pipe placed at the base of the wall with the perforations down and surrounded by at least 4 inches of crushed rock. The rock should be separated from the adjacent soils by an appropriate filter fabric. The 1-foot strip of granular soils or the drainage panels should extend to the drainage collection system.

If the walls are not formed and are shotcreted (single-formed), the drainage system may consist of continuous geosynthetic drainage panels, such as Miradrain 6000 (or equivalent), placed at a depth starting at about 2 feet below the existing grade. The drainage panels should be connected to a drainage collection system, such as Quickdrain (or equivalent) placed at the base of the wall and connected to a solid discharge pipe at least 4 inches in diameter. As an alternative, the drainage panels could be connected to weep holes at the bottom of the excavation. The weep holes should consist of solid pipes that are spaced at 10 feet on centers. At the connection of the weep holes and the drainage panels, the weep holes should be embedded in 1 cubic foot of crushed rock placed into the face of the excavation. The crushed rock should be surrounded by an appropriate filter fabric.

The solid discharge pipes may drain by gravity into the nearest storm drain or into a sump-pump system that drains into the storm drain. The flow of water to the nearest storm drain should meet the requirements of the appropriate governmental agencies. The installed drainage system should be observed by personnel from our firm prior to being
backfilled. Inspection of the drainage system may also be required by the reviewing governmental agencies.

The retaining walls and walls below grade should be waterproofed.

6.8 PAVING

To provide support for paving, the subgrade soils should be prepared as recommended in the following section on grading. Compaction of the subgrade, including trench backfills, to at least 90%, and achieving a firm, hard, and unyielding surface will be important for paving support. The preparation of the paving area subgrade should be performed immediately prior to placement of the base course. Proper drainage of the paved areas should be provided since this will reduce moisture infiltration into the subgrade and increase the life of the paving.

Due to the expansion potential of the upper materials, we recommend that pavement be underlain by at least 2 feet of relatively non-expansive soil, which we have assumed will have an R-value of at least 40. Accordingly, the following pavement sections have been determined using an R-value of 40. This R-value should be confirmed during grading.

Asphalt Concrete Paving

The required paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of the on-site or comparable soils compacted to at least 90% as recommended, the minimum recommended paving thicknesses are presented in the following table.

<table>
<thead>
<tr>
<th>Assumed Traffic Index</th>
<th>Asphalt Concrete (Inches)</th>
<th>Base Course (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Automobile Parking)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5 (Driveways with Light Truck Traffic)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6 (Driveways with Heavy Truck Traffic and Fire Trucks)</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The asphalt paving sections were determined using the Caltrans design method. We can determine the recommended paving and base course thicknesses for other Traffic Indices.
if required. Careful inspection is recommended to verify that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed. The above sections are also applicable where a polyurethane or vulcanized rubber coating is applied to the surface of the asphalt.

Portland Cement Concrete Paving

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the following table. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

<table>
<thead>
<tr>
<th>Assumed Traffic Index</th>
<th>Concrete Paving (Inches)</th>
<th>Base Course (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Automobile Parking)</td>
<td>6½</td>
<td>4</td>
</tr>
<tr>
<td>5 (Driveways with Light Truck Traffic)</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>6 (Driveways with Heavy Truck Traffic and Fire Trucks)</td>
<td>7½</td>
<td>4</td>
</tr>
</tbody>
</table>

The paving should be provided with expansion joints at regular intervals no more than 15 feet in each direction. Load transfer devices, such as dowels or keys, are recommended at joints in the paving to reduce possible offsets. The paving sections in the above table have been developed based on the strength of unreinforced concrete. Steel reinforcing may be added to the paving to reduce cracking and to prolong the life of the paving.

Base Course

The base course for both asphaltic and concrete paving should meet the specifications for Class 2 Aggregate Base as defined in Section 26 of the latest edition of the State of California, Department of Transportation, Standard Specifications. Alternatively, the base course could meet the specifications for untreated base as defined in Section 200-2 of the latest edition of the Standard Specifications for Public Works Construction. The base course should be compacted to at least 95%.
6.9 GRADING

Due to the highly expansive nature of the upper materials at the site, new floor slabs, pavement, and exterior concrete walks and slabs on grade will need to be underlain by at least 2 feet of relatively non-expansive soil. In cut areas, the exposed materials should be overexcavated to allow for the placement of at least 2 feet of relatively non-expansive soil beneath floor slabs, pavement, and exterior concrete walks and slabs on grade. In fill areas, the upper 2 feet of the new fill beneath floor slabs, pavement, and exterior concrete walks and slabs on grade should consist of relatively non-expansive soil.

Except as described above, the on-site materials may be used in any required fill. All required fill should be uniformly well compacted and observed and tested during placement.

Site Preparation

After the site is cleared, the exposed soils should be carefully observed for the removal of all disturbed and unsuitable deposits. Next, in areas to receive fill, the exposed material should be scarified to a depth of 6 inches, brought to near-optimum moisture content, and rolled with heavy compaction equipment. At least the upper 6 inches of the exposed material should be compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction.

Good drainage of surface water should be provided by adequately sloping all surfaces. Such drainage will be important to reduce infiltration of water beneath slabs and pavement.

Excavation and Temporary Support

Where excavations are deeper than 4 feet, the sides of the excavations should be sloped back at 1:1 (horizontal:vertical). Unshored excavation should not extend below a plane drawn at 1½:1 extending downward from adjacent footings. Recommendations for design of temporary shoring are provided in Section 6.6.
Excavations should be observed by personnel of our firm so that any necessary modifications based on variations in soil conditions can be made. All applicable safety requirements and regulations, including OSHA regulations, should be met.

**Compaction**

Any required fill should be placed in loose lifts not more than 8 inches thick and compacted. The fill should be compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction. The moisture content of the on-site materials at the time of compaction should be between 2% and 4% above optimum moisture content. The moisture content of imported sandy soils at the time of compaction should vary no more than 2% below or above optimum moisture content.

**Backfill**

All required backfill should be mechanically compacted in layers; flooding should not be permitted. Proper compaction of backfill will be necessary to reduce settlement of the backfill and to reduce settlement of overlying slabs and paving. Backfill should be compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction. The on-site materials may be used in the compacted backfill. However, the on-site materials are expansive and may be difficult to compact, particularly with light equipment in confined areas, such as adjacent to retaining walls and basement walls. In addition, the on-site materials should not be used within the upper 2 feet of the subgrade beneath floor slabs, pavement, and exterior concrete walks and slabs on grade. The exterior grades should be sloped to drain away from the foundation to prevent ponding of water.

Some settlement of the backfill should be expected, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the building. Also, provisions should be made for some settlement of floor slabs, pavement, and exterior concrete walks and slabs on grade supported on backfill.
Material for Fill

The on-site materials, less any debris or organic matter, may be used in required fills. However, because of their expansive characteristics, the on-site materials should not be used within the 2 feet of the subgrade for floor slabs, pavement, or exterior concrete walks and slabs on grade. Cobbles larger than 4 inches in diameter should not be used in the fill. Any required import material should consist of relatively non-expansive soils with an Expansion Index of less than 35. The imported materials should contain sufficient fines (at least 15% passing the No. 200 sieve) so as to be relatively impermeable and result in a stable subgrade when compacted. All proposed import materials should be approved by our personnel prior to being placed at the site.

6.10 GEOTECHNICAL OBSERVATION

The reworking of the upper soils and the compaction of all required fill should be observed and tested during placement by a representative of our firm. This representative should perform at least the following duties:

- Observe the clearing operations for proper removal of all unsuitable materials.
- Observe the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished subgrade. The representative should also observe proofrolling and delineation of areas requiring overexcavation.
- Evaluate the suitability of on-site and import soils for fill placement; collect and submit soil samples for required or recommended laboratory testing where necessary.
- Observe the fill and backfill for uniformity during placement.
- Test backfill for field density and compaction to determine the percentage of compaction achieved during backfill placement.
- Observe and probe foundation materials to confirm that suitable bearing materials are present at the design foundation depths.

The governmental agencies having jurisdiction over the project should be notified prior to commencement of grading so that the necessary grading permits can be obtained and
arrangements can be made for required inspection(s). The contractor should be familiar with the inspection requirements of the reviewing agencies.
7.0 BASIS FOR RECOMMENDATIONS

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Rio Hondo Program Management Team, and their design consultants to be used solely in the design of the proposed building renovation with the seismic upgrades. The report has not been prepared for use by other parties, and may not contain sufficient information for purpose of other parties or other use.

The recommendations provided in this report are based upon our understanding of the described project information and on our interpretation of the data collected during our current and previous subsurface explorations. We have made our recommendations based upon experience with similar subsurface conditions under similar loading conditions. The recommendations apply to the specific project discussed in this report; therefore, any change in the structure configuration, loads, location, or the site grades should be provided to us so that we can review our conclusions and recommendations and make any necessary modifications.

The recommendations provided in this report are also based upon the assumption that the necessary geotechnical observations and testing during construction will be performed by representatives of our firm. The field observation services are considered a continuation of the geotechnical investigation and essential to verify that the actual soil conditions are as expected. This also provides for the procedure whereby the client can be advised of unexpected or changed conditions that would require modifications of our original recommendations. In addition, the presence of our representative at the site provides the client with an independent professional opinion regarding the geotechnically related construction procedures. If another firm is retained for the geotechnical observation services, our professional responsibility and liability would be limited to the extent that we would not be the geotechnical engineer of record.
8.0 BIBLIOGRAPHY


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Woodford, A.O., Shelton, J.S., and Moran, T.G., 1944, Stratigraphy and oil possibilities of the Puente and San Jose Hills, California: U.S. Geol. Survey Preliminary Investigation Map 23, scale 1:75,000.


TABLES
### Table 1
Major Named Faults Considered to be Active in Southern California

<table>
<thead>
<tr>
<th>Fault (in increasing distance)</th>
<th>Maximum Magnitude</th>
<th>Slip Rate (mm/yr.)</th>
<th>Distance From Site (miles)</th>
<th>Direction From Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puente Hills Blind Thrust</td>
<td>7.1 (a) BT</td>
<td>0.9</td>
<td>0*</td>
<td>---</td>
</tr>
<tr>
<td>Whittier</td>
<td>6.8 (a) SS</td>
<td>2.5</td>
<td>1.8</td>
<td>S</td>
</tr>
<tr>
<td>Compton Thrust</td>
<td>6.8 (a) BT</td>
<td>0.9</td>
<td>3.5**</td>
<td>SW</td>
</tr>
<tr>
<td>Upper Elysian Park</td>
<td>6.4 (a) BT</td>
<td>1.9</td>
<td>5.1**</td>
<td>NW</td>
</tr>
<tr>
<td>Raymond</td>
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<td>2.0</td>
<td>8.0</td>
<td>NNW</td>
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<tr>
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<td>6.4 (a) RO</td>
<td>0.4</td>
<td>8.5</td>
<td>NE</td>
</tr>
<tr>
<td>Sierra Madre</td>
<td>7.2 (a) RO</td>
<td>2.0</td>
<td>8.7</td>
<td>N</td>
</tr>
<tr>
<td>Clamshell-Sawpit</td>
<td>6.5 (a) RO</td>
<td>0.4</td>
<td>10</td>
<td>N</td>
</tr>
<tr>
<td>Verdugo</td>
<td>6.9 (a) RO</td>
<td>0.4</td>
<td>14</td>
<td>NW</td>
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<tr>
<td>Hollywood</td>
<td>6.4 (a) RO</td>
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<td>15</td>
<td>NW</td>
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<tr>
<td>Newport-Inglewood Zone</td>
<td>7.1 (a) SS</td>
<td>1.0</td>
<td>15</td>
<td>SW</td>
</tr>
<tr>
<td>Chino</td>
<td>6.7 (a) NO</td>
<td>1.0</td>
<td>19</td>
<td>E</td>
</tr>
<tr>
<td>San Gabriel</td>
<td>7.2 (a) SS</td>
<td>0.4</td>
<td>21</td>
<td>N</td>
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<tr>
<td>Cucamonga</td>
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<td>1.5</td>
<td>22</td>
<td>NE</td>
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<tr>
<td>Palos Verdes</td>
<td>7.3 (a) SS</td>
<td>3.0</td>
<td>22</td>
<td>SW</td>
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<tr>
<td>Santa Monica</td>
<td>6.6 (a) RO</td>
<td>1.0</td>
<td>22</td>
<td>W</td>
</tr>
<tr>
<td>San Joaquin Hills</td>
<td>6.6 (a) BT</td>
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<td>23**</td>
<td>SSE</td>
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<tr>
<td>Elsinore (Glen Ivy Section)</td>
<td>6.8 (a) SS</td>
<td>5.0</td>
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<tr>
<td>San Fernando</td>
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<td>Northridge Thrust</td>
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<td>WNW</td>
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<tr>
<td>San Andreas (Mojave Section)</td>
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<tr>
<td>Santa Susana</td>
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<td>6.0</td>
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<td>WNW</td>
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<tr>
<td>San Jacinto (San Bernardino Segment)</td>
<td>6.7 (a) SS</td>
<td>6.0</td>
<td>34</td>
<td>NE</td>
</tr>
<tr>
<td>Malibu Coast</td>
<td>6.7 (a) RO</td>
<td>0.3</td>
<td>36</td>
<td>W</td>
</tr>
</tbody>
</table>

(a) Cao et al., 2003; Field et al., 2013 (magnitudes, slip rates)
SS Strike Slip
NO Normal Oblique
RO Reverse Oblique
BT Blind Thrust
(*) Site is located within surface projection of thrust fault
(**) Distance is closest point to surface projection of thrust fault
<table>
<thead>
<tr>
<th>Fault</th>
<th>Magnitude</th>
<th>Slip Rate (mm/yr.)</th>
<th>Distance From Site (miles)</th>
<th>Direction From Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workman Hill</td>
<td>N</td>
<td>NO</td>
<td>0.1</td>
<td>SW</td>
</tr>
<tr>
<td>Norwalk</td>
<td>6.7</td>
<td>(c) RO</td>
<td>7.5</td>
<td>SSW</td>
</tr>
<tr>
<td>Central Avenue</td>
<td>N</td>
<td>NO</td>
<td>16</td>
<td>ENE</td>
</tr>
</tbody>
</table>

(b) Mark, 1977  
(c) Slemmons, 1979  
(d) Wesnousky, 1986  
(e) Yeats, 2004  
SS Strike Slip  
NO Normal Oblique  
RO Reverse Oblique  
N No Estimate  

Prepared by: PER 4/13/15  
Checked by: LH 6/16/15
Table 3
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>Q</th>
<th>DIST</th>
<th>DEPTH</th>
<th>MAGNITUDE</th>
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<tr>
<td>11-01-1932</td>
<td>04:45:00</td>
<td>34.00 N</td>
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<td>72</td>
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<tr>
<td>03-11-1933</td>
<td>02:04:00</td>
<td>33.75 N</td>
<td>118.08 W</td>
<td>C</td>
<td>30</td>
<td>.0</td>
<td>4.9</td>
</tr>
<tr>
<td>03-11-1933</td>
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<td>118.08 W</td>
<td>C</td>
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<tr>
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<tr>
<td>03-11-1933</td>
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<td>47</td>
<td>.0</td>
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NOTE:  Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION
A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
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Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
**Table 3 - continued**

List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site  
(CAL TECH DATA 1932-2014)

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NOTE:  Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

<table>
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<tr>
<th>DATE</th>
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A = +- 1 km horizontal distance; +/- 2 km depth
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### Table 3 - continued

#### List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site

(CAL TECH DATA 1932-2014)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
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<th>Q</th>
<th>DIST</th>
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A = +/- 1 km horizontal distance; +/- 2 km depth
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Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or
Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

<table>
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<tr>
<th>DATE</th>
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<th>LONGITUDE</th>
<th>Q</th>
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<th>MAGNITUDE</th>
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NOTE:  Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION
A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >>- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or
Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

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NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +/- 1 km horizontal distance; +/- 2 km depth  
B = +/- 2 km horizontal distance; +/- 5 km depth  
C = +/- 5 km horizontal distance; no depth restriction  
D = +/- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
## Table 3 - continued
### List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

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List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

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NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +/- 1 km horizontal distance; +/- 2 km depth
B = +/- 2 km horizontal distance; +/- 5 km depth
C = +/- 5 km horizontal distance; no depth restriction
D = >++ 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
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NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
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D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
Table 3 - continued  
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site  
(CAL TECH DATA 1932-2014)

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<tr>
<td>07-29-2008</td>
<td>18:42:15</td>
<td>33.95 N</td>
<td>117.76 W A</td>
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<td>26</td>
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<tr>
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<td>09:41:49</td>
<td>34.08 N</td>
<td>116.97 W A</td>
<td>A</td>
<td>99</td>
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<td>4.1</td>
</tr>
<tr>
<td>01-09-2009</td>
<td>03:49:46</td>
<td>34.11 N</td>
<td>117.30 W A</td>
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<td>03:27:50</td>
<td>33.89 N</td>
<td>117.79 W A</td>
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<tr>
<td>05-19-2009</td>
<td>22:49:11</td>
<td>33.93 N</td>
<td>118.33 W A</td>
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<td>12:03:26</td>
<td>33.93 N</td>
<td>117.02 W A</td>
<td>A</td>
<td>94</td>
<td>13.9</td>
<td>4.3</td>
</tr>
</tbody>
</table>

NOTE:  Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION
A = +/- 1 km horizontal distance; +/- 2 km depth
B = +/- 2 km horizontal distance; +/- 5 km depth
C = +/- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>Q</th>
<th>DIST</th>
<th>DEPTH</th>
<th>MAGNITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-13-2010</td>
<td>21:39:00</td>
<td>34.01 N</td>
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<td>A</td>
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<td>8.5</td>
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<td>03-16-2010</td>
<td>11:04:00</td>
<td>33.99 N</td>
<td>118.08 W</td>
<td>A</td>
<td>5</td>
<td>18.9</td>
<td>4.4</td>
</tr>
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<td>34.34 N</td>
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<td>A</td>
<td>54</td>
<td>7.3</td>
<td>4.2</td>
</tr>
<tr>
<td>09-14-2011</td>
<td>14:44:51</td>
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<td>117.08 W</td>
<td>A</td>
<td>89</td>
<td>16.9</td>
<td>4.1</td>
</tr>
<tr>
<td>06-14-2012</td>
<td>03:17:15</td>
<td>33.91 N</td>
<td>117.79 W</td>
<td>A</td>
<td>25</td>
<td>9.8</td>
<td>4.0</td>
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<td>33.90 N</td>
<td>117.79 W</td>
<td>A</td>
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<tr>
<td>08-08-2012</td>
<td>16:33:22</td>
<td>33.90 N</td>
<td>117.79 W</td>
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<td>A</td>
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<td>4.6</td>
</tr>
</tbody>
</table>

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(CAL TECH DATA 1932-2014)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>Q</th>
<th>DIST</th>
<th>DEPTH</th>
<th>MAGNITUDE</th>
</tr>
</thead>
</table>

SEARCH OF EARTHQUAKE DATA FILE 1

SITE: Rio Hondo Library Retrofit

COORDINATES OF SITE ...... 34.0190 N 118.0335 W
DISTANCE PER DEGREE ...... 110.9 KM-N 92.4 KM-W
MAGNITUDE LIMITS .............. 4.0 - 8.5
TEMPORAL LIMITS ................ 1932 - 2014
SEARCH RADIUS (KM) .............. 100
NUMBER OF YEARS OF DATA .............. 83.00
NUMBER OF EARTHQUAKES IN FILE .............. 4605
NUMBER OF EARTHQUAKES IN AREA .............. 435

Amec Foster Wheeler Environment & Infrastructure, Inc.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site
(RICHTER DATA 1906-1931)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>Q</th>
<th>DIST</th>
<th>DEPTH</th>
<th>MAGNITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-20-1907</td>
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<td>117.10 W</td>
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<tr>
<td>05-15-1910</td>
<td>15:47:00</td>
<td>33.70 N</td>
<td>117.40 W</td>
<td>D</td>
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<td>.0</td>
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<td>07:30:26</td>
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SEARCH OF EARTHQUAKE DATA FILE 2

SITE: Rio Hondo Library Retrofit

COORDINATES OF SITE ...... 34.0190 N 118.0335 W
DISTANCE PER DEGREE ..... 110.9 KM-N 92.4 KM-W
MAGNITUDE LIMITS ............... 6.0 - 8.5
TEMPORAL LIMITS ................. 1906 - 1931
SEARCH RADIUS (KM) ............... 100
NUMBER OF YEARS OF DATA .......... 26.00
NUMBER OF EARTHQUAKES IN FILE ....... 35
NUMBER OF EARTHQUAKES IN AREA ....... 3

Amec Foster Wheeler Environment & Infrastructure, Inc.
<table>
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<tr>
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<th>TIME</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>Q</th>
<th>DIST</th>
<th>DEPTH</th>
<th>MAGNITUDE</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**SEARCH OF EARTHQUAKE DATA FILE 3**

**SITE:** Rio Hondo Library Retrofit

COORDINATES OF SITE ...... 34.0190 N 118.0335 W  
DISTANCE PER DEGREE ...... 110.9 KM-N  92.4 KM-W  
MAGNITUDE LIMITS ................. 7.0 - 8.5  
TEMPORAL LIMITS .................... 1812 - 1905  
SEARCH RADIUS (KM) ................. 100  
NUMBER OF YEARS OF DATA ............ 94.00  
NUMBER OF EARTHQUAKES IN FILE ........ 9  
NUMBER OF EARTHQUAKES IN AREA ........ 1

Amec Foster Wheeler Environment & Infrastructure, Inc.
Table 3 - continued
List of Historic Earthquakes of Magnitude 4.0 or Greater Within 100 Km of the Site

SUMMARY OF EARTHQUAKE SEARCH

* * *

NUMBER OF HISTORIC EARTHQUAKES WITHIN 100 KM RADIUS OF SITE

<table>
<thead>
<tr>
<th>MAGNITUDE RANGE</th>
<th>NUMBER</th>
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<tbody>
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<td>4.0 - 4.5</td>
<td>290</td>
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<tr>
<td>4.5 - 5.0</td>
<td>102</td>
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<td>5.0 - 5.5</td>
<td>32</td>
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<tr>
<td>5.5 - 6.0</td>
<td>7</td>
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<tr>
<td>6.0 - 6.5</td>
<td>4</td>
</tr>
<tr>
<td>6.5 - 7.0</td>
<td>3</td>
</tr>
<tr>
<td>7.0 - 7.5</td>
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<td>7.5 - 8.0</td>
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</tr>
<tr>
<td>8.0 - 8.5</td>
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</tr>
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</table>

* * *

Amec Foster Wheeler Environment & Infrastructure, Inc.
# TABLE 4

## HORIZONTAL SITE-SPECIFIC PROBABILISTIC AND DETERMINISTIC RESPONSE SPECTRA, AND MAXIMUM DEMAND FACTORS

Ground Motion Hazard Evaluation  
Proposed Library Building Retrofit  
Rio Hondo Community College  
3600 Workman Mill Road, Whittier, California

<table>
<thead>
<tr>
<th>Period (seconds)</th>
<th>1. 2% Pe in 50 Years (GMRotD50)</th>
<th>2. 84th Percentile Deterministic (GMRotD50)</th>
<th>3. Scale Factors for Maximum Demand</th>
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</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.9537</td>
<td>1.0750</td>
<td>1.1900</td>
</tr>
<tr>
<td>0.02</td>
<td>0.9822</td>
<td>1.1040</td>
<td>1.1900</td>
</tr>
<tr>
<td>0.03</td>
<td>1.0680</td>
<td>1.2090</td>
<td>1.1900</td>
</tr>
<tr>
<td>0.05</td>
<td>1.3030</td>
<td>1.4150</td>
<td>1.1900</td>
</tr>
<tr>
<td>0.075</td>
<td>1.6980</td>
<td>1.7910</td>
<td>1.1900</td>
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<td>2.0090</td>
<td>2.0590</td>
<td>1.1900</td>
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</tbody>
</table>

Notes:
1. Response spectra are five-percent damped, except for PGA (0.01 seconds), which is not damped.
2. The site-specific spectra in columns 1 and 2 are geomean spectra, referred to as GMRotD50. These spectra have not been adjusted for maximum demand. $P_E$ = Probability of exceedance.
3. ASCE/SEI 7-10 requires that spectra be adjusted to maximum demand. The scale factors for maximum demand in column 3 are factors for the ratio of $S_{rotD100}/S_{rotD50}$ presented in Table 1 of Shahi and Baker (2014). These factors are used to adjust spectra to maximum demand.
### TABLE 5A
COMPARISON OF HORIZONTAL SITE-SPECIFIC PROBABILISTIC AND DETERMINISTIC RESPONSE SPECTRA FOR SELECTION OF MCE<sub>R</sub> RESPONSE SPECTRUM
(FAULT NORMAL)

Ground Motion Hazard Evaluation
Proposed Library Building Retrofit
Rio Hondo Community College
3600 Workman Mill Road, Whittier, California

<table>
<thead>
<tr>
<th>Period (seconds)</th>
<th>4. 84th Percentile Deterministic (Max. Demand)</th>
<th>5. Deterministic Limit</th>
<th>6. Deterministic MCE (Max. Demand)</th>
<th>7. Targeted Risk Factors (ASCE 7-10)</th>
<th>8. Risk Targeted 2% P&lt;sub&gt;E&lt;/sub&gt; in 50 Years (Max. Demand)</th>
<th>9. Site-Specific MCE&lt;sub&gt;R&lt;/sub&gt; (Max. Demand)</th>
</tr>
</thead>
<tbody>
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<td>0.01</td>
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Notes:
1. The site-specific spectra in columns 4 and 8 are adjusted from GMRotD50 to maximum demand (GMRotD100) using scale factors from Table 4.
2. Targeted risk factors are based on values for the site location from ASCE 7-10 (from the U.S. Geological Survey National Seismic Hazard Mapping website (http://earthquake.usgs.gov/hazards/designmaps/)).
3. Probabilistic spectrum is adjusted to be risk-targeted using targeted risk factors from Column 7. P<sub>E</sub> – Probability of exceedance.
### TABLE 5B
**COMPARISON OF HORIZONTAL SITE-SPECIFIC PROBABILISTIC AND DETERMINISTIC RESPONSE SPECTRA FOR SELECTION OF MCE<sub>R</sub> RESPONSE SPECTRUM**

(Fault Parallel)

Ground Motion Hazard Evaluation
Proposed Library Building Retrofit
Rio Hondo Community College
3600 Workman Mill Road, Whittier, California

<table>
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<tr>
<th>Period (seconds)</th>
<th>4. 84&lt;sup&gt;th&lt;/sup&gt; Percentile Deterministic</th>
<th>5. Deterministic Limit</th>
<th>6. Deterministic MCE</th>
<th>7. Targeted Risk Factors (ASCE 7-10)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>8. Risk Targeted 2% P&lt;sub&gt;E&lt;/sub&gt; in 50 Years&lt;sup&gt;2&lt;/sup&gt;</th>
<th>9. Site-Specific MCE&lt;sub&gt;R&lt;/sub&gt;</th>
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Notes:

4. Targeted risk factors are based on values for the site location from ASCE 7-10 (from the U.S. Geological Survey National Seismic Hazard Mapping website [http://earthquake.usgs.gov/hazards/designmaps/]).
5. Probabilistic spectrum is adjusted to be risk-targeted using targeted risk factors from Column 7. P<sub>E</sub> – Probability of exceedance.
TABLE 6A
COMPARISON OF DESIGN GENERAL PROCEDURE AND 2/3 SITE SPECIFIC MCE\textsubscript{R} SPECTRA FOR SELECTION OF SITE-SPECIFIC DESIGN RESPONSE SPECTRUM (FAULT NORMAL)

Ground Motion Hazard Evaluation
Proposed Library Building Retrofit
Rio Hondo Community College
3600 Workman Mill Road, Whittier, California

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<th>Spectral Acceleration (g)</th>
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<th>11. 80% of Design General Procedure Spectrum</th>
<th>12. 2/3 MCE\textsubscript{R} (Site Specific)</th>
<th>13. Site-Specific Design Spectrum\textsuperscript{2}</th>
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Notes:
1. The design General Procedure Spectrum (GPS) equals to 2/3*MCE\textsubscript{R} GPS. The design GPS is for Site Class C (F\textsubscript{x} = 1.0, F\textsubscript{v} = 1.3). The design GPS is calculated following Chapter 11.4.5 of ASCE/SEI 7-10. The corner periods, T\textsubscript{o} and T\textsubscript{s}, are calculated to be 0.09 and 0.46 seconds, respectively, for Site Class C. The long period transition (T\textsubscript{L}) is 8 seconds from ASCE/SEI 7-10.
2. The Design Spectrum is taken as 2/3 times the site-specific MCE\textsubscript{R} spectrum, except not less than 80% of the corresponding ordinate for the design GPS.
### Table 6B

**COMPARISON OF DESIGN GENERAL PROCEDURE AND 2/3 SITE SPECIFIC MCE<sub>R</sub> SPECTRA FOR SELECTION OF SITE-SPECIFIC DESIGN RESPONSE SPECTRUM**

(FAULT PARALLEL)

Ground Motion Hazard Evaluation

Proposed Library Building Retrofit

Rio Hondo Community College

3600 Workman Mill Road, Whittier, California

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<th>11. 80% of Design General Procedure Spectrum</th>
<th>12. 2/3 MCE&lt;sub&gt;R&lt;/sub&gt; (Site Specific)</th>
<th>13. Site-Specific Design Spectrum&lt;sup&gt;2&lt;/sup&gt;</th>
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**Notes:**

1. The design General Procedure Spectrum (GPS) equals to 2/3*MCE<sub>R</sub> GPS. The design GPS is for Site Class C (F<sub>s</sub> = 1.0, F<sub>v</sub> = 1.3). The design GPS is calculated following Chapter 11.4.5 of ASCE/SEI 7-10. The corner periods, T<sub>0</sub> and T<sub>s</sub>, are calculated to be 0.09 and 0.46 seconds, respectively, for Site Class C. The long period transition (T<sub>L</sub>) is 8 seconds from ASCE/SEI 7-10.

2. The Design Spectrum is taken as 2/3 times the site-specific MCE<sub>R</sub>s spectrum, except not less than 80% of the corresponding ordinate for the design GPS.
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  - 4
  - BORING LOCATIONS FROM PRIOR INVESTIGATION (JOB NO. 4953-05-0515)
  - 9
  - BORING LOCATIONS FROM PRIOR INVESTIGATION (JOB NO. 63728)
  - 8
  - BORING LOCATIONS FROM PRIOR INVESTIGATION (JOB NO. 63443)
- GEOLOGIC SECTION
- APPROXIMATE LIMITS OF DEEP SEATED LANDSLIDE
- REMI SURVEY LOCATION
- STRIKE AND DIP OF SUBSURFACE BEDDING PLANE
- STRIKE AND DIP OF SUBSURFACE CLAY BED
- SUBSURFACE JOINT ATTITUDE
Geologic Units

Unit - Description (Age)
af - Artificial fill (late Holocene)
Qa - Alluvial gravel, sand, and silt of valleys and floodplains (Holocene to late Pleistocene)
Qgs - Landslide debris (early Holocene)
Qae - Slightly elevated and locally dissected alluvial gravel and sand at base of hill areas (late Pleistocene)
Qoa - Uplifted remnants of alluvial sand and gravel (Late Pleistocene)
Tfp - Fernando Formation, Pico claytone (Pliocene)
Tfs - Fernando Formation, sandstone (Pliocene)
Tfr - Fernando Formation, Repetto claystone member (early Pliocene)
Tsc - Sycamore Canyon Formation, shale (late Miocene)
Tscs - Sycamore Canyon Formation, conglomerate and sandstone (Miocene)

Contacts:
- contact, location accurate
- contact, location approximate
- contact, location concealed
- fault, location accurate
- fault, location approximate
- fault, location concealed
- fault, location inferred

Symbols
Landslide boundary and direction of failure

Earthquakes

Faults

REFERENCES:


NOTES:

(1) The indicated values refer to the total of dead plus live loads; a one-third increase may be used when considering wind or seismic loads.

(2) Piles in groups should be spaced a minimum of 3 pile diameters on centers. Piles should be drilled and filled alternately with the concrete permitted to set at least 8 hours before drilling an adjacent hole.

(3) The indicated values are based on the strength of the soils; the actual pile capacities may be limited to lesser values by the strength of the piles.

Proposed Library Building Retrofit
Rio Hondo Community College
Whittier, California

DRILLED PILE CAPACITIES
Project No. 4953-15-0301
Figure 7

Prepared/Date: LH 4/7/15
Checked/Date: MM 4/7/15
ESTIMATED ALLOWABLE DOWNWARD PILE CAPACITY (kips)

NOTES:
(1) The indicated values refer to the total of dead plus live loads; a one-third increase may be used when considering wind or seismic loads.

(2) Piles in groups should be spaced a minimum of 3 pile diameters on centers. Piles should be drilled and filled alternately with the concrete permitted to set at least 8 hours before drilling an adjacent hole.

(3) The indicated values are based on the strength of the soils; the actual pile capacities may be limited to lesser values by the strength of the piles.

Programmed Library Building Retrofit
Rio Hondo Community College
Whittier, California

Prepared/Date: LH 4/7/15
Checked/Date: MM 4/7/15

ESTIMATED MICROPILE CAPACITIES
Project No. 4953-15-0301
Figure 8
NOTES: Probabilistic MCE<sub>R</sub> spectrum was computed for a ground motion level expected to achieve a 1% probability of collapse within a 50 year period.

Deterministic MCE<sub>R</sub> spectrum is governed by:
Magnitude-7.85 earthquake on the Elsinore Fault from 0 to 0.075 and 0.4 to 10 seconds, and Magnitude-7.1 earthquake on the Puente Hills Fault from 0.075 to 0.4 seconds.
NOTES: Probabilistic MCE_R spectrum was computed for a ground motion level expected to achieve a 1% probability of collapse within a 50 year period.

Deterministic MCE_R spectrum is governed by:
Magnitude-7.85 earthquake on the Elsinore Fault from 0 to 0.075 and 0.4 to 10 seconds, and Magnitude-7.1 earthquake on the Puente Hills Fault from 0.075 to 0.4 seconds.
Components of the Design Response Spectrum

- Site-Specific Design Response Spectrum
- ½ of Site-Specific MCE
- 80% of Design Response Spectrum

Spectral Acceleration (g) vs. Period (seconds)

5% of Critical Structural Damping

Prepared/Date: AH 4/21/2015
Checked/Date: MM
5% of Critical Structural Damping
- Site-Specific Design Response Spectrum
- 75% of Site-Specific MCE
- 80% of Design Response Spectrum

Spectral Acceleration (g)

Period (seconds)
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE_R Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)
Initial and Matched Time Histories

Earthquake: 1989 Loma Prieta (Mw = 6.93)
Record: LGPC (RSN No. 779) - Fault Normal

Figure 13.1b

Initial Time Histories

Matched Time Histories

By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories
Earthquake: 1989 Loma Prieta (Mw = 6.93)
Record: LGPC (RSN No. 779) - Fault Normal
Figure 13.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean $MCE_r$ spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015
Matched time histories have been padded by 24.83 sec at the beginning of record.

Earthquake: 1989 Loma Prieta (Mw = 6.93)

Record: LGPC (RSN No. 779) - Fault Parallel

Figure 13.2b

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories

Initial Time Histories

Matched Time Histories

By: JF 5/13/2015, Checked By: AH 5/18/2015
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE_r Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015
Initial Time Histories

Matched Time Histories

Earthquake: 1992 Cape Mendocino (Mw = 7.01)
Record: Petrolia (RSN No. 828) - Fault Normal

Figure 14.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean $MCE_r$ spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record.
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the $MCE_R$ Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1995 Kobe Japan (Mw = 6.90)
Record: Nishi-Akashi (RSN No. 1111) - Fault Normal
Figure 15.1a
Initial Time Histories

Matched Time Histories

By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories
Earthquake: 1995 Kobe Japan (Mw = 6.90)
Record: Nishi-Akashi (RSN No. 1111) - Fault Normal
Figure 15.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean MCE\(_r\) spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Initial and Matched Response Spectra
Earthquake: 1995 Kobe Japan (Mw = 6.90)
Record: Nishi-Akashi (RSN No. 1111) - Fault Parallel
Figure 15.2a
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record.

**Rio Hondo Community College**
**Proposed Library Building Retrofit**
**Whittier, California**
**Project No. 4953-15-0301**

Initial and Matched Time Histories

Earthquake: 1995 Kobe Japan (Mw = 6.90)

Record: Nishi-Akashi (RSN No. 1111) - Fault Parallel

Figure 15.2b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE$_R$ Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1999 Chi-Chi Taiwan (Mw = 7.62)
Record: TCU076 (RSN No. 1511) - Fault Normal
Figure 16.1a
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record.

Initial and Matched Time Histories

Earthquake: 1999 Chi-Chi Taiwan (Mw = 7.62)

Record: TCU076 (RSN No. 1511) - Fault Normal

Figure 16.1b

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

amec foster wheeler

Initial and Matched Time Histories
Earthquake: 1999 Chi-Chi Taiwan (Mw = 7.62)
Record: TCU076 (RSN No. 1511) - Fault Normal
Figure 16.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean MCE$_r$ spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1999 Chi-Chi Taiwan (Mw = 7.62)
Record: TCU076 (RSN No. 1511) - Fault Parallel
Figure 16.2a
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record.

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories
Earthquake: 1999 Chi-Chi Taiwan (Mw = 7.62)
Record: TCU076 (RSN No. 1511) - Fault Parallel
Figure 16.2b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE$_R$ Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1999 Hector Mine (Mw = 7.13)
Record: Hector (RSN No. 1787) - Fault Normal
Figure 17.1a
Initial and Matched Time Histories

Earthquake: 1999 Hector Mine (Mw = 7.13)
Record: Hector (RSN No. 1787) - Fault Normal
Figure 17.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean MCE_r spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1999 Hector Mine (Mw = 7.13)
Record: Hector (RSN No. 1787) - Fault Parallel
Figure 17.2a
Initial and Matched Time Histories

Earthquake: 1999 Hector Mine (Mw = 7.13)
Record: Hector (RSN No. 1787) - Fault Parallel
Figure 17.2b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE_R Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)
Initial Time Histories

Matched Time Histories

By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories
Earthquake: 2008 Iwate Japan (Mw = 6.90)
Record: Kurihara City (RSN No. 5818) - Fault Normal
Figure 18.1b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean MCE_R spectrum

Prepared By: JF 5/13/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 2008 Iwate Japan (Mw = 6.90)
Record: Kurihara City (RSN No. 5818) - Fault Parallel
Figure 18.2a
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record.

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Time Histories
Earthquake: 2008 Iwate Japan (Mw = 6.90)
Record: Kurihara City (RSN No. 5818) - Fault Parallel
Figure 18.2b
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault normal target response spectrum was taken as the MCE<sub>R</sub> Spectrum adjusted to maximum demand using scale factors from Shahi and Baker (2014)

Prepared By: JF 5/12/2015, Checked By: AH 5/18/2015

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California
Project No. 4953-15-0301

Initial and Matched Response Spectra
Earthquake: 1978 Tabas Iran (Mw = 7.35)
Record: Tabas (RSN No. 143) - Fault Normal
Figure 19.1a
Initial and Matched Time Histories

Earthquake: 1978 Tabas Iran (Mw = 7.35)
Record: Tabas (RSN No. 143) - Fault Normal

Figure 19.1b

By: JF 5/12/2015, Checked By: AH 5/18/2015
Notes:
1. Response spectra presented are for 5% structural damping
2. The fault parallel target response spectrum was taken as the geomean MCE$_r$ spectrum

Prepared By: JF 5/12/2015, Checked By: AH 5/18/2015
NOTE: Matched time histories have been padded by 24.83 sec at the beginning of record

Rio Hondo Community College  
Proposed Library Building Retrofit  
Whittier, California  
Project No. 4953-15-0301  

Initial and Matched Time Histories  
Earthquake: 1978 Tabas Iran (Mw = 7.35)  
Record: Tabas (RSN No. 143) - Fault Parallel  
Figure 19.2b
Period: PGA
Mean Magnitude: 6.81
Mean Distance: 6.5
Period: 0.1
Mean Magnitude: 6.77
Mean Distance: 6.93
Period: 0.5
Mean Magnitude: 6.84
Mean Distance: 6.99
Period: 1.0
Mean Magnitude: 6.89
Mean Distance: 7.3

Figure - 20.4

Project No. 4953-15-0301

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California

Prepared/Date: AH 5/08/2015
Checked/Date: MM

MAGNITUDE AND DISTANCE DEAGGREGATION FOR 2.475-YEAR RETURN PERIOD HAZARD AT 1.0 SEC.
APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TEST RESULTS
APPENDIX A

CURRENT FIELD EXPLORATIONS AND LABORATORY TEST RESULTS

CURRENT FIELD EXPLORATIONS

The soil conditions beneath the site were explored by drilling 4 borings to depths of 68 feet at the locations shown on Figure 2. Borings 2 and 4 were drilled using 8-inch-diameter hollow-stem auger drilling equipment. Borings 1 and 3 were drilled with bucket-type equipment and were downhole logged by our geologist.

The soils encountered were logged by our engineer and undisturbed and bulk samples were obtained for laboratory inspection and testing. The logs of the borings are presented on Figures A-1.1 through A-1.4; the depths at which undisturbed samples were obtained are indicated to the left of the boring logs. The number of blows required to drive the Crandall sampler 12 inches using a 140 hammer falling 30 inches is indicated on the log. The soils are classified in the accordance with the Unified Soil Classification System described on Figure A-2.

LABORATORY TEST RESULTS

Laboratory tests were performed on selected samples obtained from the current borings to aid in the classification of the soils and to determine their engineering properties.

The field moisture content and dry density of the soils encountered were determined by performing tests on the undisturbed samples. The results of the tests are shown to the left on the boring logs.

Direct shear tests were performed on selected undisturbed samples to determine the strength of the soils. The tests were performed after soaking to near-saturated moisture content and at various surcharge pressures. The yield-point values determined from the direct shear tests are presented on Figure A-3, Direct Shear Test Data.
Confined consolidation tests were performed on 2 undisturbed samples to determine the compressibility of the soils. The results of the tests are presented on Figures A-4, Consolidation Test Data.

The Expansion Index of the soils was determined by testing two samples in accordance with the ASTM Designation D4829 method. The results of the test are presented on Figure A-5, Expansion Index Test Data.
SAMPLE LOC.

BLOW COUNT*
(blows/ft)

DRY DENSITY
(pcf)

MOISTURE
(% of dry wt.)

"N" VALUE
STD.PEN.TEST

DEPTH (ft)

ELEVATION (ft)

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION
SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND
AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B12SOIL_CRANDALL (BUCKET AUGER) L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB
P:\4953 GEOTECH\2015-PROJ\150301 RIO HONDO LIBRARY BLDG RETROFIT\3.2 ALL FIELD NOTES\4953-15-0301.GPJ 6/12/15

BORING 1
DATE DRILLED:
March 20, 2015
EQUIPMENT USED:
Bucket Auger
HOLE DIAMETER (in.): 24
ELEVATION (ft.): 423 **
E

W

Landscaping - 3 -inch thick top soil and vegetation
LANDSLIDE DEBRIS
SILTSTONE - moist, brown, some fine sand, thinly bedded, some rootlets
At 2 feet: Ruptured irrigation line

420

SANDY SILTSTONE - grayish brown, fine sand, some roots and root
hairs, slightly to moderately fractured, slightly to moderately micaceous,
massive
At 4 feet: Very light seep northeast wall
At 4.5 feet: White carbonate nodules

5

20.9

102

9

22.3

102

18

23.2

93

20

Orange mottling, slightly clayey

415

10

CLAYEY SILTSTONE - light olive, brown, moist, fine sand, massive

410

15

Bedding at 15 feet: N50E;19W, orange brown, sandy bed ½-inch thick
At 16 feet: More fractured zone of 1 to 2 feet in thickness

405

20

22.3

101

25

At 20.5 feet: Brown (2.5Y 5/6)
At 21 feet: More fractured zone of 1 to 2 feet in thickness

400

At 23 feet: Small root fragments
At 24 feet: Concretion (2 inches in diameter)
25

27.2

92

25

At 25 feet: Concretion (2 inches in diameter)
Light olive brown, becomes sandier
At 26 feet: Fractured zone, very broken

395

At 29 feet: Concretion 1½ inches in diameter
30

(CONTINUED ON FOLLOWING FIGURE)
Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California

Field Tech: PER
Prepared By: JF
Checked By: RM

LOG OF BORING

Project: 4953-15-0301

Figure: A-1.1a


<table>
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<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>&quot;N&quot; VALUE</th>
<th>STD.PEN.TEST</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
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</table>

Prominent fractures at 31 feet: N12W;90

At 33 feet: Concretion (approximately 1½ inches in diameter)

SANDY SILTSTONE - Light yellowish brown (2.5Y 6/4), slightly clayey, slightly fissile

At 37 feet: Concretion (approximately 1½ inches in diameter)

At 39 feet: Moderately fractured zone, some root fragment

Light yellowish brown (2.5Y 6/3)

Bedding at 43 feet: N29W;51S

At 43 to 43.5 feet: Gray

At 44 feet: Moderately fractured zone

At 50 feet: Fractured zone

At 52.5 feet: Concretion (approximately 1½ inches in diameter)

Sandy horizon bedding at 53.5 feet: N50-60E;10W

At 54 feet: Sand bed from 1/4 to 1 inch thick, N75E;21W

At 55 feet: Concretion (approximately 1½ inches in diameter)

At 59.5 feet: Concretion (approximately 1½ inches in diameter)

Field Tech: PER
Prepared By: JF
Checked By: RM

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California

LOG OF BORING
Project: 4953-15-0301 Figure: A-1.1b
At 63 feet: Light yellowish brown (2.5Y 6/4), trace medium to coarse sand, some clay

Fine sand, laminated sand and silt, oxidized layers, micaceous, some clayey laminations, olive yellow (2.5Y 6/6), broken zone

At 67 feet: Some slightly cemented layers, clayey cuttings

END OF BORING AT 68 FEET

NOTES:
Groundwater not encountered. Downhole logged to 65 feet by RM and PER. Boring backfilled with cuttings.

* Number of blows to drive the Crandall sampler 12 inches using the weight of kelly bars of the bucket auger drilling equipment

**Elevations based on topographic survey map provided by Westberg and White Architects

---

**LOG OF BORING**

Project: 4953-15-0301  
Figure: A-1.1c
<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
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<tr>
<td>410</td>
<td>15</td>
<td>17.6</td>
<td>103</td>
<td>35</td>
<td>Landscaping - 3-inch thick top soil and vegetation</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>SANDY SILTSTONE - moist, light yellowish brown, fine sand, mica, some lamination</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>16.0</td>
<td>102</td>
<td>37</td>
<td>SILTSTONE - moist, light yellowish brown, orange mottling, some fine sand, cemented, some clay</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Trace fine sand, some mica, cemented</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>18.5</td>
<td>100</td>
<td>74/11½</td>
<td>Light yellowish orange</td>
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<tr>
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<td>Light yellowish brown, trace fine sand, mica, some clay</td>
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Log of Boring (Continued on Following Figure)
**BORING 2 (Continued)**

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<th>ELEVATION (ft)</th>
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<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
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<td>18.9</td>
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<td>69/11&quot;</td>
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<tr>
<td>20.3</td>
<td>380</td>
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<td>106</td>
<td>75/11&quot;</td>
<td>Some thick interlayers of grayish lamination and yellowish brown layers, more mica, some clay</td>
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<tr>
<td>20.9</td>
<td>375</td>
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<td>67</td>
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<tr>
<td>21.5</td>
<td>370</td>
<td>21.5</td>
<td>101</td>
<td>78/11½&quot;</td>
<td>END OF BORING AT 51 FEET</td>
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**NOTES:**
- Hand augered upper 6 feet to avoid damage to utilities. Groundwater not encountered. Boring backfilled with cuttings.
- * Number of blows to drive the Crandall sampler 12 inches using a 140 pound automatic hammer falling 30 inches.
**BORING 3**

DATE DRILLED: March 21, 2015  
EQUIPMENT USED: Bucket Auger  
HOE DIAmeter (in.): 24  
ELEVATION (ft.): 433 **

**Landscaping** - 3 -inch thick top soil and vegetation  
**FILL** - SANDY SILT - moist, yellowish brown, fine sand, mica

SANDY SILTSTONE - moist, yellowish brown, fine sand, micaceous  
At 4 feet: Sand lense (1 inch thick and 6 inches long), roots fragments  
At 5.5 feet: Concretion (approximately 1 inch in diameter, moderately fractured)  
At 6.5 feet: Cement filled fractured (1 inch long)

At 9 feet: Sandy lenses, micaceous  
At 10.5 feet: Some clay, concretion, carbonate-lined, 1 inch in diameter  
At 11 feet: Concretion

Some orange mottling  
At 17 feet: Possible slide plane, very broken (6-inch thick), 55-65E;13NW, concretion in broken zone, less fractured below 17 feet  
Concretionary bed at 19 feet: 8E;18SW

Becomes clayey, gray  
At 27.5 feet: Sand beds about 1½ inches thick to 28.2 feet, mottled orange brown  
At 28.2 feet: N24W;7S  
At 28.5 feet: Concretion  
At 29 feet: Clayer

BIS SOIL, CRANDALL (BUCKET AUGER)  L:\70131 GEOTECH\GINTW\LIBRARY AMEC JUNE2012.GLB  
P:\4953 GEOTECH\2015-PROJ\150301 RIO HONDO LIBRARY BLDG RETROFIT\3.2 ALL FIELD NOTES\4953-15-0301.GPJ  6/12/15  

_FIELD TECH: WL  
PREPARED BY: JF  
CHECKED BY: RM  

_THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL._

Rio Hondo Community College  
Proposed Library Building Retrofit  
Whittier, California  

LOG OF BORING  
Project: 4953-15-0301  
Figure: A-1.3a
At 29.5 feet: Gray clay bed, not sheared
At 30 feet: Fractured
At 31 feet: Sand bed (1½ feet thick), friable, slight belling of south wall, very moist

At 34 feet: Concretion (1 inch in diameter)
At 34.3 feet: Concretionary bed (approximately 2/3 around hole), 6 inches thick
At 34.5 feet: Sand bed 1½ feet thick, yellowish brown
At 35.8 feet: Clay bed, not sheared
At 36 feet sand bed: N16-17W;21S, very moist, orange brown, Sandy Siltstone below

Yellowish to orangish brown, some clay

At 42 feet: Very fractured Sandy to Clayey Siltstone
Fracture at 42.5 feet: N40-50E;60NW, polished

Yellowish brown and gray, cemented, some clay

Orangish to yellowish brown and gray, some clay

END OF BORING AT 51 FEET

NOTES:
Groundwater not encountered. Downhole logged to 42.5 feet by RM. Boring backfilled with cuttings.

* Number of blows to drive the Crandall sampler 12 inches using the weight of kelly bars of the bucket auger drilling equipment

---

**NOTE:**
This record is a reasonable interpretation of subsurface conditions at the exploration location. Latitudes and longitudes of boring locations shown on logs are approximate; refer to plot plan for more accurate location information. Subsurface conditions at other locations and at other times may differ. Interfaces between stratum are approximate. Transitions between strata may be gradual.

---

**DATE DRILLED:** March 21, 2015

**EQUIPMENT USED:** Bucket Auger

**HOLE DIAMETER (in.):** 24

**ELEVATION (ft.):** 433 **

---

**LOG OF BORING**

**DRY DENSITY (pcf) - BLOW COUNT (blows/ft) - SAMPLE LOC.**

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<th>DEPTH (ft.)</th>
<th>&quot;N&quot; VALUE</th>
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<th>BLOW COUNT (blows/ft)</th>
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</table>
## Landscaping
- 3-inch thick top soil and vegetation

### FILL - SILT to SANDY SILT
- moist, brown, fine sand

### SANDY SILTSTONE
- moist, light yellowish brown, fine sand

<table>
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<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (pcf)</th>
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*Some fine sand

**LOG OF BORING**

- **DATE DRILLED:** March 20, 2015
- **EQUIPMENT USED:** Hollow Stem Auger
- **HOLE DIAMETER (in.):** 8
- **ELEVATION (ft.):** 432.0**

---

Rio Hondo Community College
Proposed Library Building Retrofit
Whittier, California

Field Tech: WL
Prepared By: JF
Checked By: LT

(Continued on following figure)
### NOTES:
- Hand augered upper 7 feet to avoid damage to utilities. Groundwater not encountered. Boring backfilled with cuttings.
- **At 30.75 feet:** Thin layer of Silty Sandstone, light brownish gray to yellowish brown at bottom of sample
- **SILTSTONE - moist, yellowish brown, trace fine sand, some clay**
- **CLAYEY SILTSTONE - moist, olive to yellowish brown**
- **SILTSTONE - moist, olive to yellowish brown, some fine sand**
- **Yellowish brown**

**END OF BORING AT 51 FEET**

* Number of blows to drive the Crandall sampler 12 inches using a 140 pound automatic hammer falling 30 inches.
<table>
<thead>
<tr>
<th>MAJOR DIVISIONS</th>
<th>GROUP SYMBOLS</th>
<th>TYPICAL NAMES</th>
<th>Sonic Sample Recovery Zone</th>
<th>Auger Cuttings</th>
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<tbody>
<tr>
<td>COARSE GRAINED SOILS</td>
<td>GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)</td>
<td>CLEAN GRAVELS (Little or no fines)</td>
<td>GW</td>
<td>Well graded gravels, gravel - sand mixtures, little or no fines.</td>
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<td>GW</td>
<td>Split Spoon Sample</td>
<td>Bulk Sample</td>
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<td>GRAVELS WITH FINES (Appreciable amount of fines)</td>
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</tr>
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<td></td>
<td>SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)</td>
<td>CLEAN SANDS (Little or no fines)</td>
<td>SW</td>
<td>Well graded sands, gravelly sands, little or no fines.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SP</td>
<td>Water Table at time of drilling</td>
<td>Water Table after drilling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SM</td>
<td>Water Table at time of drilling</td>
<td>Water Table after drilling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC</td>
<td>Water Table at time of drilling</td>
<td>Water Table after drilling</td>
</tr>
<tr>
<td></td>
<td>SILTS AND CLAYS (Liquid limit LESS than 50)</td>
<td>ML</td>
<td>Clean Sands, sand - silt mixtures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CL</td>
<td>Silty sands, sand - silt mixtures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OL</td>
<td>Sand - silt mixtures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MH</td>
<td>Organic silts and organic silt clays of low plasticity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH</td>
<td>Inorganic silts, mucaceous or diatomaceous fine sandy or silty soils, elastic silts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bedrock</td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GRANODIORITE / QUARTZ DIORITE</td>
<td></td>
</tr>
</tbody>
</table>

**BOUNDARY CLASSIFICATIONS:** Soils possessing characteristics of two groups are designated by combinations of group symbols.

<table>
<thead>
<tr>
<th>SILT OR CLAY</th>
<th>SAND</th>
<th>GRAVEL</th>
<th>Cobble</th>
<th>Boulders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fine</td>
<td>Medium</td>
<td>Coarse</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>No.200</td>
<td>No.40</td>
<td>No.10</td>
<td>No.4</td>
</tr>
</tbody>
</table>

**U.S. STANDARD SIEVE SIZE**

DIRECT SHEAR TEST DATA

Project No. 4953-15-0301

Figure A-3

SHEAR STRENGTH in Pounds per Square Foot

SURCHARGE PRESSURE in Pounds per Square Foot

Boring Number and Sample Depth (ft.)

- Samples tested at field moisture content
- Bedrock

Prepared/Date: LH 4/3/2015
Checked/Date: LT 4/22/2015

Proposed Library Building Retrofit
Rio Hondo Community College
Whittier, California

DIRECT SHEAR TEST DATA
Project No. 4953-15-0301
Figure A-3
CONSOLIDATION TEST DATA

Project 4953-15-0301

Figure A-4

Prepared/Date: WL 4/7/15
Checked/Date: LH 4/16/15

CONSOLIDATION IN INCHES PER INCH

LOAD IN KIPS PER SQUARE FOOT

Boring 4 @ 15½'
SANDY SILTSTONE

Boring 2 @ 15½'
SANDY SILTSTONE

Proposed Library Building Retrofit
Rio Hondo Community College
Whittier, California

CONSORTIATION TEST DATA
Project 4953-15-0301
Figure A-4
<table>
<thead>
<tr>
<th>BORING NUMBER AND SAMPLE DEPTH:</th>
<th>2 at 1' to 5'</th>
<th>4 at 1' to 5'</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOIL TYPE:</td>
<td>SANDY SILTSTONE</td>
<td>SANDY SILT</td>
</tr>
<tr>
<td>CONFINING PRESSURE:</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>(lbs./sq. ft.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INITIAL MOISTURE CONTENT:</td>
<td>11.1</td>
<td>12.9</td>
</tr>
<tr>
<td>(% dry wt.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINAL MOISTURE CONTENT:</td>
<td>29.7</td>
<td>29.5</td>
</tr>
<tr>
<td>(% dry wt.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRY DENSITY:</td>
<td>104.0</td>
<td>97.2</td>
</tr>
<tr>
<td>(lbs/cu.ft.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPANSION INDEX:</td>
<td>137</td>
<td>85</td>
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</table>
APPENDIX B

PRIOR FIELD EXPLORATIONS AND LABORATORY TEST RESULTS
<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt.)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>430</td>
<td>18.6</td>
<td>106</td>
<td>30</td>
<td>CL</td>
<td></td>
</tr>
<tr>
<td>425</td>
<td>17.0</td>
<td>92</td>
<td>60/6'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>420</td>
<td>5</td>
<td></td>
<td>30/2'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FILL - SANDY CLAY** - moist, reddish brown to dark brown, some roots

**SANDY SILTSTONE/SILTY SANDSTONE** - hard, moist, light brown, some sand, no bedding

(No Recovery)

**END OF BORING AT 5.5 FEET**

**NOTES:**

Water not encountered. Boring backfilled with soil cuttings, tamped and patched.

* Number of blows required to drive Crandall sampler
  12 inches using a 50 pound hammer falling 17 inches.

**Elevation is based on the topographic plan provided by Rio Hondo College.**
**BORING 3**

DATE DRILLED: April 17, 2009  
EQUIPMENT USED: Hand Auger  
HOLE DIAMETER (in.): 4  
ELEVATION: 433.0**

**FILL - CLAYEY Silt** - moist, dark brown, some roots

**SILTY SAND (POSSIBLE UTILITY BACKFILL)** - medium dense, moist, light brown and gray, fine to coarse, some gravel

**SANDY SILTSTONE/SILTY SANDSTONE** - hard, moist, light brown, some roots, no bedding

**END OF BORING AT 7 FEET**

**NOTES:**
- Water not encountered. Boring backfilled with soil cuttings, tamped and patched
- Number of blows required to drive Crandal sampler
- 12 inches using a 50 pound hammer falling 17 inches.
- **Elevation is based on the topographic plan provided by Rio Hondo College.**

PREPARED BY: HP  
CHECKED BY:  
FIELD TECH: AR

---

**LOG OF BORING**

Project: 4953-09-0591  
Figure: A-1.3
**BORING 4**

**DATE DRILLED:** April 17, 2009  
**EQUIPMENT USED:** Hand Auger  
**HOLE DIAMETER (in.):** 4  
**ELEVATION:** 420.0**

<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (qcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>415</td>
<td>5</td>
<td>19.7</td>
<td>102</td>
<td>26</td>
<td>CL</td>
</tr>
<tr>
<td>410</td>
<td>10</td>
<td>21.6</td>
<td>92</td>
<td>60/9&quot;</td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>15</td>
<td>19.9</td>
<td>93</td>
<td>65/9&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**FILL - CLAY** - moist, dark brown, trace sand  
**SANDY SILTSTONE/SILTY SANDSTONE** - hard, moist, light brown, gray, no bedding  

**END OF BORING AT 4.5 FEET**

**NOTES:**

Water not encountered. Boring backfilled with soil cuttings, tamped and patched

* Number of blows required to drive Crandall sampler

12 inches using a 50 pound hammer falling 17 inches.

** Elevation is based on the topographic plan provided by Rio Hondo College.
### MAJOR DIVISIONS

#### GRAVELS
(More than 50% of coarse fraction is LARGER than the No. 4 sieve size)

<table>
<thead>
<tr>
<th>GROUP SYMBOLS</th>
<th>TYPICAL NAMES</th>
<th>Undisturbed Sample</th>
<th>Auger Cuttings</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEAN GRAVELS</td>
<td>GW</td>
<td>Well graded gravels, gravel - sand mixtures, little or no fines.</td>
<td>Standard Penetration Test</td>
</tr>
<tr>
<td>(Little or no fines)</td>
<td>GP</td>
<td>Poorly graded gravels or gravel - sand mixtures, little or no fines.</td>
<td>Rock Core</td>
</tr>
<tr>
<td>GRAVELS WITH FINES</td>
<td>GM</td>
<td>Silty gravels, gravel - sand - silt mixtures.</td>
<td>Dilatometer</td>
</tr>
<tr>
<td>(Appreciable amount of fines)</td>
<td>GC</td>
<td>Clayey gravels, gravel - sand - clay mixtures.</td>
<td>Packer</td>
</tr>
<tr>
<td>SANDS</td>
<td>SW</td>
<td>Well graded sands, gravelly sands, little or no fines.</td>
<td>Water Table at time of drilling</td>
</tr>
<tr>
<td>(More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)</td>
<td>SP</td>
<td>Poorly graded sands or gravelly sands, little or no fines.</td>
<td></td>
</tr>
<tr>
<td>SANDS WITH FINES</td>
<td>SM</td>
<td>Silty sands, sand - silt mixtures</td>
<td></td>
</tr>
<tr>
<td>(Appreciable amount of fines)</td>
<td>SC</td>
<td>Clayey sands, sand - clay mixtures.</td>
<td></td>
</tr>
</tbody>
</table>

#### SILTS AND CLAYS
(Liquid limit LESS than 50)

<table>
<thead>
<tr>
<th>GROUP SYMBOLS</th>
<th>TYPICAL NAMES</th>
<th>Undisturbed Sample</th>
<th>Auger Cuttings</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILTS AND CLAYS</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts and with slight plasticity.</td>
<td>Standard Penetration Test</td>
</tr>
<tr>
<td>(Liquid limit GREATER than 50)</td>
<td>CL</td>
<td>Inorganic clayey sands, sandy clays, silty clays, lean clays.</td>
<td>Rock Core</td>
</tr>
<tr>
<td>FINE GRAINED SOILS</td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity.</td>
<td>Dilatometer</td>
</tr>
<tr>
<td>(More than 50% of material is SMALLER than No. 200 sieve size)</td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.</td>
<td>Packer</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays</td>
<td>Water Table at time of drilling</td>
</tr>
<tr>
<td>HIGHLY ORGANIC SOILS</td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts.</td>
<td></td>
</tr>
</tbody>
</table>

### BOUNDARY CLASSIFICATIONS
Soils possessing characteristics of two groups are designated by combinations of group symbols.

#### SILT OR CLAY

<table>
<thead>
<tr>
<th>SAND</th>
<th>GRAVEL</th>
<th>Fine</th>
<th>Medium</th>
<th>Coarse</th>
<th>Fine</th>
<th>Coarse</th>
<th>Cobble</th>
<th>Boulders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.200</td>
<td>No.40</td>
<td>No.10</td>
<td>No.4</td>
<td>3/4&quot;</td>
<td>3&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>U.S. STANDARD SIEVE SIZE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### KEY TO SYMBOLS AND DESCRIPTIONS

**MACTEC**

SHEAR STRENGTH in Pounds per Square Foot

<table>
<thead>
<tr>
<th>SURCHARGE PRESSURE in Pounds per Square Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td>4000</td>
</tr>
<tr>
<td>6000</td>
</tr>
<tr>
<td>8000</td>
</tr>
<tr>
<td>10000</td>
</tr>
<tr>
<td>12000</td>
</tr>
</tbody>
</table>

- 4@4
- 1@3½
- 2@3
- 3@6½
- 1@6½
- 2@3
- 3@6½
- 4@4
- 1@20½

Samples tested at field moisture content

Samples tested after soaking to a moisture content near saturation

Bedrock

Prepared/Date: HP 5/11/09
Checked/Date: LT 5/21/09

MACTEC
Proposed Student Union and Quad Improvements
Rio Hondo College
Whittier, California

DIRECT SHEAR TEST DATA
Project No. 4953-09-0591
Figure A-3
## Table 1 - Laboratory Tests on Soil Samples

**MACTEC**  
*Proposed Student Union*  
Your #4953-09-0951, SA #09-0332LAB  
30-Apr-09

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>B-1 @ 5.5'</th>
<th>B-3 @ 6.5'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bedrock</td>
<td>Bedrock</td>
</tr>
</tbody>
</table>

### Resistivity (Units: ohm-cm)
- as-received: 9,800 | 10,400
- saturated: 1,100  | 1,060

### pH
- 7.4  | 7.9

### Electrical Conductivity (mS/cm)
- 0.17  | 0.23

### Chemical Analyses
#### Cations (mg/kg)
- calcium ($Ca^{2+}$): 61 | 54
- magnesium ($Mg^{2+}$): 12 | 11
- sodium ($Na^+$): 85 | 192
- potassium ($K^+$): 29 | 14

#### Anions (mg/kg)
- carbonate ($CO_3^{2-}$): ND | 11
- bicarbonate ($HCO_3^-$): 55 | 235
- fluoride ($F^-$): 5.4 | 4.5
- chloride ($Cl^-$): 33 | 96
- sulfate ($SO_4^{2-}$): 232 | 170
- phosphate ($PO_4^{3-}$): ND | 1.0

#### Other Tests (mg/kg, qual, mV)
- ammonium ($NH_4^+$): 0.8 | 0.8
- nitrate ($NO_3^-$): 33 | 1.1
- sulfide ($S^{2-}$): na  | na
- Redox: mV  | na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.  
mg/kg = milligrams per kilogram (parts per million) of dry soil.  
Redox = oxidation-reduction potential in millivolts  
ND = not detected  
na = not analyzed
<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (origin)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT (B/N)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>395</td>
<td>20</td>
<td></td>
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<td>375</td>
<td>40</td>
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</tr>
</tbody>
</table>

**FILL - SILTS AND SANDS with cemented siltstone and sandstone fragments 6" to 8" diameter, some roots, dumpy to moist, moderately firm, pieces of glass and plaster**

Rock

**SILT with very fine Sand - damp, mottled light brown/light gray, some sandstone fragments, cleaner**

Rock

Occasional cemented rock fragments 6" to 8"

@15' Very mottled brown with gray

**LANDSLIDE MATERIAL - SILTSTONE - slightly moist, medium gray to light brown, some very fine sand, fractured, occasional high angle carbonate streaks**

@17.5' - Carbonate lining 12" to 18" long, abundant fracturing

@18' - Soil filled burrow 1" diameter NE Wall

@18.5' JOINT - Carbonate lined N64°W-78°NE

@19' Light grayish-brown

@20' & 20.5' Soil filled burrow, 1" diameter, some roots, bedrock moderately broken

@24.5' Joint - N30°-50°W-66°NE

@26' Joint - N88°E-49°NE

@28.5' Open fractures

@32' Joint N44°W-81°NE, minor carbonate

@34' Discontinuous partially cemented bed N75°-85°W-40°NE

@36' Light to medium red-orange brown mottling, less fractured, micaceous, very sandy, possibly silty very fine sandstone

Logged By: Roz Munro
Field Tech: GMC
Prepared By: PWK
Checked By: [Signature]

(Continued on following figure)
### BORING 9 (Continued)

<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>335</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>340</td>
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<td>345</td>
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<tr>
<td>370</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **56'** Coarser grained, sandier
- **63'** Clay bed 1/4" - 1/2" thick, very plastic, polished, N77°E-15°NW
- **65** Cemented - hard, difficult drilling to 66.5'
- **70.5'** Discontinuous cemented zone

**NOTES:**
- No water seepage
- No caving
- Compaction/CRB sample 0'-5'
- Geology down hole logged by Roz Munro to 72'
- Backfilled with cuttings and tamped

**LOG OF BORING**
- **DATE DRILLED:** May 11, 2006
- **EQUIPMENT USED:** Bucket Auger
- **HOLE DIAMETER (in.):** 24
- **ELEVATION:** 411 **

**END OF BORING AT 75 FEET**

Logged By: Roz Munro
Field Tech: GMC
Prepared By: FWK
Checked By: [Signature]

A J Center, Rio Hondo College
Whittier, California

(continued on following figure)
<table>
<thead>
<tr>
<th>ELEVATION (0)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt.)</th>
<th>DRY DENSITY (pcf)</th>
<th>BLOW COUNT* (blows/ft)</th>
<th>SAMPLE LOC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>325</td>
<td>85</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>320</td>
<td>90</td>
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<td>315</td>
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<td>310</td>
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<tr>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Number of blows required to drive Crandall Sampler 12 inches using a hammer falling 12 inches and weighing:

- 1600 pounds from depths 0 to 24 feet
- 800 pounds from depths 25 to 49 feet
- 1200 pounds from depths 50 to 75 feet

** Elevations are based on topographic map by Inland Aerial Surveys

Logged By: Roz Munro
Field Tech: GMC
Prepared By: PWK
Checked By: 

A J Center, Rio Hondo College
Whittier, California

MACTEC

LOG OF BORING
Project: 4953-05-0515 Figure: A-1.9c
**BOURING 6**

**DATE DRILLED:** November 27, 1963

**EQUIPMENT USED:** 18"-Diameter Bucket

<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE (% of dry wt)</th>
<th>DRY DENSITY (lbs./cu ft)</th>
<th>SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>430</td>
<td>CL</td>
<td>SILTY CLAY - dark brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>420</td>
<td>425</td>
<td>11.9</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>10</td>
<td>18.3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>410</td>
<td>15</td>
<td>17.8</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>20</td>
<td>16.0</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>25</td>
<td>21.8</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

SHALE - silty, fractured, mottled brown and light brown

Mottled brown and brownish-grey

**NOTE:** Water not encountered; no caving.

**LOG OF BORING**

LEROY CRANDALL & ASSOCIATES

PLATE A-1F
**LOG OF BORING**

**BORING 8**

DATE DRILLED: December 5, 1963  
EQUIPMENT USED: 18"-Diamater Bucket

<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
<th>DEPTH (ft)</th>
<th>MOISTURE % of dry wt</th>
<th>DRY DENSITY (lbs/cu ft)</th>
<th>SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.4</td>
<td>101</td>
<td></td>
<td></td>
<td>CL</td>
</tr>
<tr>
<td>13.2</td>
<td>104</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.4</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>395</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>390</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>390</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>385</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>385</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Water not encountered; no caving.

LENOY CRANDALL & ASSOCIATES
<table>
<thead>
<tr>
<th>MAJOR DIVISIONS</th>
<th>GROUP SYMBOLS</th>
<th>TYPICAL NAMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAVELS (More than 50% of coarse fraction is larger than the No. 4 sieve size)</td>
<td>GW</td>
<td>Well graded gravels, gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td>CLEAN GRAVELS (Little or no fines)</td>
<td>GP</td>
<td>Poorly graded gravels or gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td>GRAVELS WITH FINES (Appreciable amt. of fines)</td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures.</td>
</tr>
<tr>
<td>SANDS (More than 50% of coarse fraction is smaller than the No. 4 sieve size)</td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-clay mixtures.</td>
</tr>
<tr>
<td>CLEAN SANDS (Little or no fines)</td>
<td>SW</td>
<td>Well graded sands, gravelly sands, little or no fines.</td>
</tr>
<tr>
<td>SANDS WITH FINES (Appreciable amt. of fines)</td>
<td>SP</td>
<td>Poorly graded sands or gravelly sands, little or no fines.</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures.</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures.</td>
</tr>
<tr>
<td>SILTS AND CLAYS (Liquid limit less than 50)</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.</td>
</tr>
<tr>
<td>FINE GRAINED SOILS (More than 50% of material is smaller than No. 200 sieve size)</td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity.</td>
</tr>
<tr>
<td>SILTS AND CLAYS (Liquid limit greater than 50)</td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays.</td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts.</td>
</tr>
<tr>
<td>HIGHLY ORGANIC SOILS</td>
<td>Pt</td>
<td>Peat and other highly organic soils.</td>
</tr>
</tbody>
</table>

Boundary Classifications: Soils possessing characteristics of two groups are designated by combinations of group symbols.

**Particle Size Limits**

<table>
<thead>
<tr>
<th>SILT OR CLAY</th>
<th>SAND</th>
<th>GRAVEL</th>
<th>COBBLES</th>
<th>BOULDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO 200</td>
<td>NO 40</td>
<td>NO 10</td>
<td>NO 4</td>
<td>NO 3</td>
</tr>
</tbody>
</table>

Unified Soil Classification System

Reference:

LeRoy Crandall & Associates
DIRECT SHEAR TEST DATA

KEY:
- Tests at field moisture content
- Tests at increased moisture content
- SHALE & SANDSTONE
- OVERBURDEN SOILS

SHELL STRENGTH in Pounds per Square Foot
0 1000 2000 3000 4000 5000 6000
0 1000 2000 3000 4000 5000 6000
SURCHARGE PRESSURE in Pounds per Square Foot
0 1000 2000 3000 4000 5000 6000

BORING NO. & SAMPLE DEPTH (FEET)
VALUES USED IN FOOTING ANALYSES (SHALE & SANDSTONE)
VALUE USED IN PILE ANALYSES (ALLUVIAL SOILS & COMPACTED FILL)

LERoy CRANDALL & ASSOCIATES
PLATE A-3A
TRIAXIAL SHEAR TEST DATA
(SHALE & SANDSTONE)

NOTE: SMC samples tested at increased moisture content; other samples tested at field moisture content.
DIRECT SHEAR TEST DATA

LEROY CRANDALL & ASSOCIATES

PLATE A-3C
SHEAR STRENGTH in Pounds per Square Foot

BORING NO. & SAMPLE DEPTH (FEET)

VALUES USED IN FOOTING ANALYSES

REMOLED SAMPLES COMPACTED TO 95%

KEY:
- Tests at optimum moisture content
- Tests at increased moisture content

SANDSTONE
SHALE

DIRECT SHEAR TEST DATA

LEROY CRANDALL & ASSOCIATES
NOTE: Samples tested at field moisture content.

CONSOLIDATION TEST DATA
<table>
<thead>
<tr>
<th>BORING NUMBER</th>
<th>SAMPLE DEPTH IN FEET</th>
<th>SOIL TYPE</th>
<th>CONFINING PRESSURE (LBS./SQ. FT.)</th>
<th>EXPANSION DUE* TO SATURATION (%)</th>
<th>SHRINKAGE DUE** TO AIR DRYING (%)</th>
<th>TOTAL VOLUME CHANGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90</td>
<td>Shale</td>
<td>200</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
<td>Shale</td>
<td>200</td>
<td>1.1</td>
<td>None</td>
<td>1.1</td>
</tr>
<tr>
<td>3</td>
<td>1½</td>
<td>Silty Clay</td>
<td>200</td>
<td>1.3</td>
<td>8.5</td>
<td>9.8</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>Shale</td>
<td>200</td>
<td>2.4</td>
<td>None</td>
<td>2.4</td>
</tr>
</tbody>
</table>

*Expansion from field to saturated moisture content.

**Shrinkage from field to air-dried moisture content.

**EXPANSION TEST DATA**
### Boring 4

**Elevation (ft):**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Moisture (% of dry wt)</th>
<th>Density (lbs/cu ft)</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>455</td>
<td>10.1</td>
<td>103</td>
<td>CL</td>
</tr>
<tr>
<td>450</td>
<td>12.0</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>445</td>
<td>17.6</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>440</td>
<td>10.7</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>435</td>
<td>18.0</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**Date Drilled:** June 28, 1963

**Equipment Used:** 18”-Diameter Rotary Bucket

**Note:** Groundwater not encountered; no caving.

**Weathered Sandy Shale -**
- Fractured, dark brown
- Mottled brown and reddish brown
- Reddish-brown
- Slightly jointed, light brown

### Boring 5

**Elevation (ft):**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Moisture (% of dry wt)</th>
<th>Density (lbs/cu ft)</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>565</td>
<td>12.7</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>560</td>
<td>11.7</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>555</td>
<td>13.6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>550</td>
<td>14.4</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>545</td>
<td>18.1</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

**Date Drilled:** June 28, 1963

**Equipment Used:** 18”-Diameter Rotary Bucket

**Note:** Groundwater not encountered; no caving.

**Weathered Sandy Shale -**
- Mottled brown and light brown
- Hard and cemented layer, fractured
- Mottled light grey and reddish brown

---

**Log of Boring**

LEROY CRANDALL & ASSOCIATES

PLATE 2-C
## Unified Soil Classification System

### Major Divisions

<table>
<thead>
<tr>
<th>GroupName</th>
<th>Group Symbols</th>
<th>Typical Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravels (Little or no fines)</td>
<td>GW</td>
<td>Well graded gravels, gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td>Gravels With Fines (Appreciable amt. of fines)</td>
<td>GP</td>
<td>Poorly graded gravels or gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td>Sands (Little or no fines)</td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures.</td>
</tr>
<tr>
<td>Sands With Fines (Appreciable amt. of fines)</td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-clay mixtures.</td>
</tr>
<tr>
<td>Sands With Fines (Little or no fines)</td>
<td>SW</td>
<td>Well graded sands, gravelly sands, little or no fines.</td>
</tr>
<tr>
<td>Sands With Fines (Appreciable amt. of fines)</td>
<td>SP</td>
<td>Poorly graded sands or gravelly sands, little or no fines.</td>
</tr>
<tr>
<td>Silt and Clays (Liquid limit LESS than 50)</td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures.</td>
</tr>
<tr>
<td>Silt and Clays (Liquid limit GREATER than 50)</td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures.</td>
</tr>
<tr>
<td>Silt and Clays (Little or no fines)</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.</td>
</tr>
<tr>
<td>Silt and Clays (Appreciable amt. of fines)</td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.</td>
</tr>
<tr>
<td>Fine Grained Soils (More than 50% of material is SMALLER than No. 200 sieve size)</td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity.</td>
</tr>
<tr>
<td>Silt and Clays (Liquid limit LESS than 50)</td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.</td>
</tr>
<tr>
<td>Silt and Clays (Liquid limit GREATER than 50)</td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays.</td>
</tr>
<tr>
<td>Silt and Clays (Little or no fines)</td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts.</td>
</tr>
</tbody>
</table>

### Boundary Classifications:
Soils possessing characteristics of two groups are designated by combinations of group symbols.

### Particle Size Limits

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Silts or Clay</th>
<th>Sand</th>
<th>Gravel</th>
<th>Cobble</th>
<th>Boulder</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 200</td>
<td>No. 40</td>
<td>No. 10</td>
<td>No. 4</td>
<td>1/16</td>
<td>3/8</td>
</tr>
<tr>
<td>U.S. Standard Sieve Size</td>
<td>Fine</td>
<td>Medium</td>
<td>Coarse</td>
<td>Fine</td>
<td>Coarse</td>
</tr>
</tbody>
</table>

**Reference:**
The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No 3-357, Vol. 1, March, 1953 (Revised April, 1960)

**LEROY CRANDALL & ASSOCIATES**

**PLATE 3**
APPENDIX C

REFRACTION MICROTEMOR (ReMi) SURVEY
APPENDIX C
REFRACTION MICROTREMOR (ReMi) SURVEY

Two Refraction Microtremor (ReMi) surveys (L01 and L02) were conducted on March 30, 2015 near the Library Building on the Rio Hondo College campus in Whittier, California. The locations of the surveys are shown on Figure C-1, ReMi Surveys. The purpose of these surveys was to estimate the shear-wave velocity data at the site, which is required for use in the site-specific ground motion hazard analysis.

A ReMi survey uses ambient vibrations from all sources, including passing vehicles, trains, and construction activity, as its energy source and measures particle-velocity time histories at a linear array of geophones. The measured time history records are used to produce a shear-wave velocity profile representative of a location at the center of the survey line. The equipment used during this investigation consisted of a Seismic Source DAQ Link II 24 seismograph and 24 4.5-Hz vertically oriented geophones connected by refraction cables. For each survey, the geophones were spaced 10 feet apart producing a total survey line length of 230 feet. The ReMi records collected for each survey line were processed using SeisOpt ReMi software.

Using the software, the data files were transformed into a spectral energy Rayleigh-wave frequency versus the inverse of Rayleigh-wave phase velocity (or “slowness”) presentation which captures Rayleigh-wave dispersion caused by the subsurface conditions along the survey line. Points were then picked along the lower bound of the spectral energy Rayleigh-wave velocity dispersion trend at a variety of frequencies. Then, several inverse modeling iterations were performed to generate the calculated dispersion curve with the least RMS error which best fits the selected dispersion curve points.

The results of the modeling for survey lines L01 and L02 are summarized in Figures C-2 and C-4, Shear-Wave Velocity Profiles, which consist of interpreted one-dimensional shear-wave velocity profiles. Figures C-3 and C-5 contain supportive illustrations showing the calculated dispersion curve with data points picked from the Rayleigh-wave phase velocity-frequency image and the image itself with dispersion picks used in the modeling.
process for each line. It must be understood that this type of geophysical measurement and modeling interpretation may not result in a unique solution. Therefore, the shear-wave velocity models were developed with an understanding of the subsurface conditions based on available geologic information at the site such as geotechnical borings.
ShearWave Velocity (ft/s)

Vs Model (ReMi Survey L01)
Rio Hondo College
Library Building Retrofit

Figure C-2
ReMi Survey L01 - Rio Hondo Library Retrofit

Dispersion Curve Showing Picks and Fit

- Calculated Dispersion
- Picked Dispersion

(RMS Error: 328.737 ft/s)

ReMi Image with Dispersion Modeling Picks

Figure C-3
ShearWave Velocity (ft/s)

Depth (ft)

Vs Model (ReMi Survey L02)
Rio Hondo College
Library Building Retrofit

Figure C-4
Dispersion Curve Showing Picks and Fit

Calculated Dispersion
Picked Dispersion

Rayleigh Wave Phase Velocity, ft/s
Period, s

(RMS Error: 140.07 ft/s)

f Image with Dispersion Modeling Picks

ReMi Survey L02 - Rio Hondo Library Retrofit

Figure C-5
APPENDIX D
SPECTRUM-MATCHED TIME HISTORIES
APPENDIX D

SPECTRUM-MATCHED TIME HISTORIES

Target Spectrum

We have performed PSHA and DSHA using the computer program EZ-FRISK (Risk Engineering, 2014) in order to develop target response spectra to be used for spectral matching. We have used the same procedures described in Section 6.6 of this report to obtain target response spectra for the MCE_R ground motions in conformance with the requirements of ASCE 7-10. The target response spectra are presented on Figures 9 and 10.

Period Range of Interest for Spectral Matching

The fundamental period provided by Dr. Said Hilmy of IDS Group for the proposed Library Building ranges from 0.62 to 0.66 seconds. The periods of interest considered were taken between 0.2 and approximately 2.0 times the fundamental period. Therefore, this corresponds to a range of approximately 0.1 to 1.3 seconds.

Hazard Deaggregation

We have performed deaggregation of the probabilistic seismic hazard analysis (PSHA) for the MCE_R earthquake ground motions. Based on the results of the hazard deaggregation, the MCE_R hazard level is dominated by events less than 17 kilometers from site having magnitudes of up to 7.5. Some contribution to the hazard at longer periods is present from events approximately 50 kilometers from site with magnitudes ranging from 7.5 to 8.4. Our deaggregation results are presented on Figures 20.1 through 20.4.

Seed Time Histories

We have selected seven sets of seed time histories for spectral matching of response spectra for MCE_R ground motions for design and analyses. Two orthogonal components of the records were selected and rotated to the fault normal and fault parallel components
corresponding to the causative fault prior the matching process. The time histories were obtained from the Pacific Earthquake Engineering Research (PEER) Center, PEER Ground Motion Database (PGMD) for shallow crustal earthquakes in active tectonic regimes.

The records that have similar response spectral shape with target spectra, earthquake magnitude, site condition represented by shear-wave velocity within upper 30 meters, fault mechanism, and source-to-site distances were used more strictly in selection of the records. Two orthogonal components of the time histories corresponding to the fault-strike-normal and fault-strike-parallel directions were considered in the selection process for all records. In selecting the records, an attempt was made to only consider records that would need a scaling factor of five or less in matching to the target spectra. Also, to consider near field effects, three of the selected records are pulse-like records.

The seven sets of selected time histories for the MCER ground motion are presented in Table 7. Also presented in the table are the earthquake magnitudes, fault mechanisms, source-to-site (Joyner-Boore–R jb) distance, site classification represented by V s30 (average shear wave velocity within the upper 30 meters), pulse period for the pulse-like records, and effective duration (D 5−95).

Spectral Matching

We performed spectral matching for the seven sets of the selected time-histories using the computer program EZ-FRISK, Version 7.65. The spectral matching was performed in the time domain by adding wavelets of limited duration to the original time history. The intent of the spectral matching is to develop time histories that generate response spectra similar to that of the target spectra within the period range of interest, and without significantly changing the frequency content of the original time histories. More significance was placed on obtaining good spectral matches within the period range of interest than outside this period range and in retaining wave forms and frequencies present in the original time histories.

The short period range of the response spectrum (up to 1 second) was matched in the first pass and then the period range of interest for spectral matching was progressively
extended out to about 3 seconds in the subsequent passes. The time step used for spectral matching was 0.005 second (200 samples per second).

The MCE\textsubscript{R} target spectrum along with the initial and matched response spectra for each record are shown on Figures 13.1a through 19.2a. The acceleration, velocity, and displacement time histories for the original records and for the records modified to match the 5% damped MCE\textsubscript{R} response spectrum are presented on Figures 13.1b through 19.2b.