I. Submittal of shop drawings to the ARCHITECT or CONSTRUCTION MANAGER shall be made by the CONTRACTOR with a dated transmittal form or letter and not by subcontractors or suppliers.

J. The ARCHITECT'S review of shop drawings shall not relieve the CONTRACTOR of responsibility for any deviation from the requirements of the Contract Documents unless the CONTRACTOR has informed the ARCHITECT in writing of such deviation at the time of submission and the ARCHITECT has given written acceptance to the specific deviation, nor shall the ARCHITECT'S favorable review relieve the CONTRACTOR from responsibility for errors or omissions in the shop drawings.

K. No portion of work requiring shop drawings shall be commenced until the shop drawings have been returned with a favorable review by the ARCHITECT.

1.05 PRODUCT DATA

A. Submit eight (8) copies. Seven (7) copies will be retained by the ARCHITECT.

B. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.

C. After review, distribute and provide copies for Record Documents.

1.06 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for ARCHITECT selection or in custom colors selected.

C. Include identification on each sample with full Project information.

D. Submit a minimum of five (5) samples or as specified in individual sections of the specifications, four (4) of which will be retained by the ARCHITECT.

E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

F. Selection or rejection of samples will be made by the ARCHITECT in writing.

1.07 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for Product Data.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.08 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit manufacturers' certificate to ARCHITECT for review in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to ARCHITECT.

1.09 COORDINATED DRAWINGS

A. Submit drawings, which indicate routing, locations, sizes, types and numbers of components in concealed spaces where potential conflict may occur between structures, mechanical, electrical, fire sprinklers, communications and ceiling suspension systems.

B. Indicate locations of all ceiling penetrations and surface-mounted items. Provide cross

sections at all areas to indicate proper support of ceilings and non-interference with work of other sections of the specifications. Cross sections shall indicate coordination required and proposed solutions for routing of elements where potential conflict exists. Reproduction of ARCHITECT'S reflected ceiling plan is not acceptable.

C. Drawings shall be based on field measurements, shop drawings and product data.

D. Conflicts shall be brought to ARCHITECT'S attention immediately.

E. Submit to the CONSTRUCTION MANAGER, in writing, requests for clarification or interpretations that will affect the intent of the Contract Documents.

F. The coordinated drawings shall indicate each class of work in the affected area. The drawing or written submittal shall include CONTRACTOR'S recommendations for the solution of any potential conflicts as well as recommendations tendered by any work of any section of the specifications which may be affected thereby.

G. Submit the coordinated drawings in a scale of not less than 1/8" = 1'-0" with necessary sections and profiles at an appropriate, clearly readable enlarged scale. Submit the coordinated drawings as one (1) reproducible and two (2) blue-line prints.

H. The ARCHITECT will review the submittals, make appropriate notations and comments to ensure the solution meets the intent of the Contract Documents and then return to CONTRACTOR for implementation.

I. The CONTRACTOR shall be responsible for the proper coordination of the work of all sections of the specifications in the execution of coordinated drawing. Any installation of materials, components or equipment under one section of the specifications without full and complete, agreement, knowledge and consent by fabricators of adjacent or otherwise related or affected work will not be approved.

J. It shall be incumbent upon the CONTRACTOR that all fabricators of work involved in the execution of coordinated drawings be informed, consulted and advised in sufficient advance time to arrive at solutions where no extension of contract time or extra cost to the OWNER will be approved due to CONTRACTOR'S negligence in the expeditious, timely submittal of coordinated drawings.

K. Refer to Scope Summaries for electronic file requirements.

1.10 DEFERRED APPROVALS

A. Submit five (5) hard copies. Four (4) copies will be retained by the CONSTRUCTION MANAGER/ARCHITECT.

B. Submit eight (8) bond copies of product data on 8½" x 11". Seven (7) copies will be retained by the CONSTRUCTION MANAGER/ARCHITECT. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.

C. Upon approval and review and final corrections, provide eight (8) copies for Record Documents/use by the CONSTRUCTION MANAGER.

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

NOT USED

***END OF SECTION***

**SECTION 01 35 00**

**LIST OF REQUIRED SUBMITTALS**

## PART 1 -- GENERAL

1.01 SCOPE OF WORK

A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

B. Submit Shop Drawings, Product Data, Samples and other information according to 01 33 00 Submittals – Shop Drawings & Submittals of the General Conditions.

C. Provide specific information according to the requirements of each Specification Section.

1.02 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.03 SUBMITTALS

In accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.

1.04 SUBMITTAL RESPONSE

1 = No Exception taken
2 = Approved as Noted
3 = Revise & Resubmit
4 = Submit Specified Item
5 = Rejected

| SECTION # | SECTION NAME | RECEIVED | RETURNED | RESPONSE |
|---|---|---|---|---|
| 02 32 00 | Geotechnical Report | | | |
| 02 41 13 | Selective Demolition and Reconstruction | | | |
| 03 05 80 | Underslab Vapor Barrier | | | |
| 03 10 00 | Concrete Formwork and Accessories | | | |
| 03 20 00 | Reinforcing Steel | | | |
| 03 21 00 | Synthetic Fiber | | | |
| 03 30 00 | Cast-In-Place Concrete | | | |
| 03 32 00 | Concrete Sealers | | | |
| 03 35 00 | Concrete Finishing | | | |
| 04 43 13 | Manufactured Stone Veneer | | | |
| 05 10 00 | Supporting from Structure | | | |
| 05 12 00 | Structural Steel | | | |
| 05 50 00 | Metal Fabrications | | | |
| 06 10 00 | Rough Carpentry | | | |
| 06 17 00 | Prefabricated Structural Wood and Trusses | | | |
| 06 18 00 | Glue Laminated Construction | | | |
| 06 20 00 | Finish Carpentry | | | |
| 06 40 00 | Custom Casework | | | |
| 06 60 00 | Plastic Surfacing Materials | | | |
| 06 64 00 | Fiberglass Reinforced Panels (FRP) | | | |
| 06 65 00 | Resilient Flooring | | | |

| SECTION # | SECTION NAME | RECEIVED | RETURNED | RESPONSE |
|---|---|---|---|---|
| 07 05 00 | Concrete Floor Testing | | | |
| 07 10 00 | Waterproofing & Dampproofing | | | |
| 07 19 00 | Water Repellant Coatings | | | |
| 07 21 00 | Thermal Insulation | | | |
| 07 22 00 | Roof and Deck Insulation | | | |
| 07 25 00 | Weather Barrier | | | |
| 07 27 00 | Air Barrier | | | |
| 07 41 00 | Metal Wall Panels | | | |
| 07 50 00 | Adhered Feltback PVC Thermoplastic Roofing | | | |
| 07 57 37 | Silicone Polyurethane Foam Roofing | | | |
| 07 60 00 | Flashing and Sheet Metal | | | |
| 07 61 13 | Standing Seam Metal Roof | | | |
| 07 72 33 | Roof Hatches and Safety Railings | | | |
| 07 84 00 | Firestopping | | | |
| 07 90 00 | Caulking and Sealants | | | |
| 08 10 00 | Metal Doors and Frames | | | |
| 08 14 00 | Wood Doors | | | |
| 08 41 13 | Aluminum Entrance and Framing Systems | | | |
| 08 53 13 | Interior Aluminum Door and Window Frames | | | |
| 08 71 00 | Finish Hardware | | | |
| 08 80 00 | Glazing | | | |
| 09 20 00 | Lath and Plaster | | | |
| 09 21 16 | Gypsum Board Systems | | | |
| 09 30 00 | Tilework | | | |
| 09 51 00 | Acoustical Ceiling System | | | |
| 09 54 26 | Tongue and Groove Wood Ceiling | | | |
| 09 60 00 | Carpet | | | |
| 09 71 00 | Acoustical Wall Panels | | | |
| 09 77 00 | Prefinished Wall Panels | | | |
| 09 90 00 | Painting | | | |
| 09 96 23 | Anti-graffiti Water Repellent Protection | | | |
| 10 14 00 | Identifying Devices | | | |
| 10 15 50 | Solid Plastic Toilet Partitions | | | |
| 10 41 00 | Knox Boxes | | | |
| 10 44 00 | Fire Protection Specialties | | | |
| 10 75 00 | Flagpoles | | | |
| 10 80 00 | Toilet Accessories | | | |
| 12 20 00 | Window Treatments | | | |
| 12 93 00 | Site Furnishings | | | |
| DIV. 22 | Plumbing | | | |
| DIV. 23 | HVAC | | | |
| DIV. 26 | Electrical | | | |
| DIV. 27 | Communications | | | |
| DIV. 28 | Electronic Safety and Security | | | |

| SECTION # | SECTION NAME | RECEIVED | RETURNED | RESPONSE |
|---|---|---|---|---|
| DIV. 31 | Earthwork | | | |
| DIV. 32 | Exterior Improvements | | | |
| DIV. 33 | Utilities | | | |

*****END OF SECTION*****

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**SECTION 01 45 29**

**TESTING LABORATORY SERVICES**

## PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

A. Work Included:

1. Cooperate with the Owner's selected testing agency and all others responsible for testing and inspecting the Work.

2. The Contractor shall provide other testing and inspecting as in this Section and/or elsewhere in the Contract Documents.

B. Related Work:

1. Requirements for testing may be described in other Sections of the Project Manual.

2. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require the testing to be performed under current pertinent standards. Payment for testing will be made as described in this Section.

C. Work Not Included:

1. Selection of testing laboratory: The Owner will select a pre-qualified independent testing laboratory.

2. Payment for initial testing: The Owner will pay for all initial services of the testing laboratory except as further described in Article 2.01 of this Section.

1.03 QUALITY ASSURANCE

A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Testing will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

In accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.

## PART 2 -- PRODUCTS

2.01 PAYMENTS FOR TESTING INVOLVING NON-COMPLIANCE

When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests as well as costs of subsequent retesting occasioned by the non-compliance will be paid by the Owner and the amount deducted from the Contract Sum.

2.02 SPECIFIC TESTS AND INSPECTIONS

A. Provide all tests and inspections required by the 2007 California Building Code, required by provisions of the Contract Documents, and such other tests and inspections as are dictated by the Architect.

B. Tests include, but are not necessarily limited to, those described in detail in Part 3 of this Section.

**PART 3 -- EXECUTION**

3.01 TAKING SPECIMENS

The testing personnel, unless otherwise provided in the Contract Documents, shall take all specimens and samples for testing. The testing laboratory will provide all sampling equipment and personnel. The testing laboratory will perform all deliveries of specimens and samples to the testing laboratory.

3.02 COOPERATION WITH TESTING LABORATORY

Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.03 OWNER NOTIFICATION

A. The Contractor shall notify the Owner's representative a sufficient time in advance of the manufacture of material to be supplied by him under the Contract Documents, which must be tested according to the terms of the Contract, in order that the Owner may arrange for the testing of same at the source of supply.

B. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required and shall not be incorporated in the job.

3.04 TEST REPORTS

A copy of all test reports shall be forwarded to both the Owner and the Architect by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of California Building Code and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements of the Contract Documents.

3.05 SOIL INSPECTING AND TESTING

A. Make required inspections and tests including, but not limited to:

1. Visually inspect on-site and imported fill and backfill, making such tests and retests as are necessary to determine compliance with the Contract requirements and suitability for the proposed purpose.

2. Make field density tests on samples from in-place material as required.

3. As pertinent, inspect and test the scarifying and recompacting of cleaned subgrade; inspect the progress of excavating, filling, and grading; make 90% density tests at fills and backfills; and verify compliance with provisions of the Contract Documents and governmental agencies having jurisdiction.

B. Make and distribute necessary reports and certificates.

3.06 CONCRETE TESTING AND INSPECTIONS

A. General: Concrete testing and inspection shall comply with Chapter 19 requirements for "Testing and Inspection," CBC, Current Edition.

B. Portland cement:

1. Secure from the cement manufacturer Certificates of Compliance delivered directly to the concrete producer for further delivery directly to the testing laboratory.

2. Require the Certificates of Compliance to positively identify the cement as to production lot, bin or silo number, dating and routing of shipment, and compliance with specified standards.

3. If so required by the Architect, promptly provide such other specific physical and chemical data as requested.

4. One sample shall be taken for each 100 tons of cement except that when used in bulk loading ready-mix plants where separate bins for pre-tested cement are not available, grab samples shall be taken for each shipment of cement placed in the bin with not less than one sample being taken for each day's pour and such samples shall be subsequently tested if required by the Architect, Structural Engineer (or the Office of the State Architect.)

C. Aggregate:

1. Provide on test unless character of material changes, material is substituted, or additional test as requested by the Architect.

2. Sample from conveyor belts or batching gates at the ready-mix plant:

a. Sieve analysis to determine compliance with specified standards and grading;

b. Specific gravity test for compliance with specified standards.

D. Laboratory design mix:

1. Laboratory design mix shall comply with Structural Engineers requirements as stated in Section 02550 and 03300 as found in these specifications.

2. After acceptance of aggregate, and whenever character or source of materials is changed, provide mix design in accordance with ACI 613.

3. Provide designs for all mixes prepared by a licensed Civil Engineer registered in the State of California.

E. Molded concrete cylinders:

1. Provide three test cylinders for each 50 cubic yards, or fraction thereof, of each class of concrete of each day's placement.

2. Test one cylinder at seven days, one at 28 days, and one when so directed.

3. Report the mix, slump, gage, location of concrete in the structure, and test results.

4. Take specimens and make tests in accordance with the applicable ASTM standard specifications.

F. Core tests:

1. Provide only when specifically so directed by the Architect because of low cylinder test results.

2. Cut from locations directed by the Architect, securing in accordance with ASTM C42, and prepare and test in accordance with ASTM C39.

3. Cores shall be of a diameter determined by the Testing Laboratory but no less than 4" in diameter.

G. Placement inspections:

1. The Owner's Inspector shall inspect placement of concrete.

2. Throughout progress of concrete placement, make slump tests to verify conformance with specified slump.

3. Using all required personnel and equipment, throughout progress of concrete placement verify that finished concrete surfaces will have the level or slope that is required by the Contract Documents.

4. A project record shall be kept on the time and date of placing concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to inspection by the Owner and his Representatives.

H. Batch plant inspections:

1. The quality and quantity of materials used in transit mixed concrete and in batched aggregate shall be continuously inspected at the location where materials are measured by a specifically approved inspector.

3.07 MORTAR AND GROUT TESTS

A. General: Mortar and grouts tests shall comply with Chapter 21 requirements of the CBC, Current Edition, for "Tests and Inspections."

B. At the beginning of all masonry work, at least one test sample of the mortar and grout shall be taken on three successive working days and at least one-week intervals thereafter. The samples shall be continuously stored in moist air until tested. They shall meet the minimum strength requirement given in Section 04100 of these Specifications.

C. Additional samples shall be taken whenever any change in materials or job conditions occur, or whenever in the judgment of the Architect, Structural Engineer (or the Division of the State Architect), such tests are necessary to determine the quality of the material.

3.08 CONCRETE REINFORCEMENT INSPECTION AND TESTING

A. General: Concrete reinforcement inspection and testing shall comply with Chapter 19 requirements for "Inspections of Welded Reinforcement Bars," CBC 1998.

B. Prior to use, test all reinforcement steel bars for compliance with the specified standards.

1. Where samples are taken from bundles delivered from the mill, with the bundles identified as to heat number, and provided the mill analysis accompanies the report, then, one tensile test and one bend test shall be made on a specimen from each 10 tons or fraction thereof for each size of reinforcing steel.

2. Tag identified steel at the supplier's shop. When steel arrives at the job site without such tags, test it as unidentified steel.

C. Unidentified Steel:

1. Have the testing laboratory select samples consisting of two pieces, each 18" long, of each size.

2. Have the testing laboratory make one tensile test and one bend test for each 2-1/2 tons or fraction thereof of each size of unidentified steel.

3. Costs of tests for unidentified steel will be paid by the Owner and deducted from the Contract sum.

D. Provide continuous inspection for all welding of reinforcement steel.

3.09 STRUCTURAL STEEL INSPECTING AND TESTING

A. Prior to use, test all structural steel for compliance with the specified standards.

1. Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing. Require the supplier to furnish mill test reports to the laboratory for certification.

2. Tag identified steel at the supplier's shop. When steel arrives at the job site without such tags, test it as unidentified steel.

B. Unidentified Steel:

1. Have testing laboratory make one tensile test and one bend test for each five tons or fraction thereof of each shape and size of unidentified structural steel.

2. Costs of tests for unidentified steel will be paid by the Owner and deducted from the Contract sum.

C. Shop Welding:

1. Provide qualified testing laboratory inspector. The jurisdictional authority shall approve inspector.

2. On single pass welds, inspect after completion of welding prior to painting.

3. On multiple pass welds, and on butt welds with cover pass on the backside, provide continuous inspection.

D. Field Welding: Provide continuous inspection by a qualified testing laboratory inspector. The jurisdictional authority shall approve inspector.

3.010 ROOFING AND WATERPROOFING INSPECTING AND TESTING

A. Prior to start of membrane waterproofing and roofing installation, conduct a job site meeting attended by representatives of the installing subcontractors, the Contractor's field superintendent, the testing laboratory inspector, and the Architect, to agree upon procedures to be followed.

B. Prior to start of installation, verify that the materials at the job site comply with the specified standards, that the subcontractor is qualified to the extent specified, and that the installing personnel are fully informed as to procedures to be followed.

C. During installation, verify that materials are installed in strict accordance with the manufacturers' recommendations as accepted by the Architect.

D. When so directed by the Architect, make test cuts to verify conformance with the specified requirements.

3.011 SCHEDULES FOR TESTING

A. Establishing schedule:

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

2. Provide all required time within the construction schedule.

B. Adherence to schedule: When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

3.012 INSPECTION BY THE OWNER

The Owner or his representative shall at all times have access to the shops wherein Work is being fabricated or assembled and inspection is required. The Contractor shall provide safe access for such inspection.

3.013 OWNER'S INSPECTOR

An inspector employed by the Owner in accordance with the requirements of California Building Code Amendments will be assigned to the Work. The work of construction in all stages of progress shall be subject to the personal continuous observation of the inspector. He shall have free access to any or all parts of the work at any time. The Contractor shall furnish the inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this contract. The inspector and/or Owner shall have authority to stop the work whenever the provisions of the Contract Documents are not being complied with and the Contractor shall instruct his employees accordingly.

3.014 OWNER'S INSPECTOR -- FIELD OFFICE

The Contractor shall provide for the use of the Owner's Inspector a temporary office to be located as directed by the Inspector and to be maintained until the Owner authorizes removal. This office shall be of substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. The door shall have a lock. The Contractor shall provide a table satisfactory for the study of plans and two chairs. The Contractor shall provide and pay for adequate electric lights, private local telephone service with a loud exterior bell, and adequate heat or air conditioning for this field office until completion of the Contract. Minimum area of field office shall be 144 square feet.

***** END OF SECTION *****

**SECTION 01 50 00**

**TEMPORARY FACILITIES AND CONTROLS**

## PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

A. Work Included: Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:

1. Temporary utilities such as heat and air conditioning, water, electricity, and telephone.
2. Field offices for the Contractor's personnel and the Owner's Inspector.
3. Sanitary facilities.
4. Enclosures such as tarpaulins, barricades, and canopies.
5. Temporary fencing of the construction site.
6. Project sign.

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.
2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their portions of the Work is not part of this Section.
3. Permanent installation and hook-up of the various utility lines are described in other Sections.

1.03 PRODUCT HANDLING

Maintain temporary facilities and controls in proper and safe condition throughout progress of the work.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

Provide in accordance with Article 3 of the General Conditions.

## PART 2 -- PRODUCTS

2.01 UTILITIES

A. Water: Provide necessary temporary piping and water supply connections to existing systems on site so as not to disrupt current users and, upon completion of the Work, remove such temporary facilities.

B. Electricity:

1. Provide necessary temporary wiring and, upon completion of the Work, remove such temporary facility.
2. Provide area distribution boxes so located that the individual trades may furnish and use 100 ft. maximum length extension cords to obtain power and lighting at points

where needed for work, inspection and safety.

3. Provide for separate metering and pay for electricity used in construction.

C. Heating or Air Conditioning: Provide and maintain heat or air conditioning necessary for proper conduct of operations needed in the Work.

D. Telephone:

1. Make necessary arrangements and pay costs for installation and operation of telephone service to the Contractor's and Owner's Inspector offices at the site.

2. Make the telephone available to the Architect for use in connection with the Work.

2.02 FIELD OFFICES AND SHEDS

A. Contractor's Facilities:

1. Provide field office within the existing building construction areas adequate in size and accommodation for Contractor's offices, supply, and storage.

2. Within the Contractor's facilities, provide enclosed space adequate for holding project meeting. Furnish with table, chairs, facsimiles (FAX) Equipment and utilities.

B. Owner's Inspector Facilities:

1. Provide an office for the exclusive use by the Owner's Inspector. Office is to be a minimum of 144 sq. ft., equipped with electric lights, heating, air conditioning, a window and a secure, lockable door.

2. Furnish room with a plan table, desk, chair and bookcase. A telephone shall be installed using a separate, private line.

3. The cost of providing and furnishing the Inspector's office, complete with utilities, phone and phone service, will be paid by the Contractor.

2.03 ENCLOSURES

Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

2.04 TEMPORARY FENCING

Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent entry onto the Work by the public.

2.05 PROJECT SIGNS

A. Provide a 4 foot x 8 foot project sign of exterior plywood mounted on two 4" x 4" posts. See Drawings for location and depiction of the Project Sign.

B. Except as otherwise specifically accepted by the Architect, do not permit other signs or advertising on the job site.

**PART 3 -- EXECUTION**

3.01 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Architect.

***** END OF SECTION *****

**SECTION 01 66 00**

**PRODUCT HANDLING**

## PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work Included: Provide products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.03 QUALITY ASSURANCE

Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

Provide in accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.

1.06 MANUFACTURERS' RECOMMENDATIONS

Except as otherwise accepted by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.07 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with materials meeting the specified requirements, at no additional cost to the Owner.

B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.08 PROTECTION

A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain existing surfaces to remain and finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.09 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the acceptance of the Architect and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

***** END OF SECTION *****

**SECTION 01 73 29**

**CUTTING AND PATCHING**

## PART 1 -- GENERAL

1.01 SUMMARY

Division – Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

A. Work Included: This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work. The Contractor shall do all cutting, fitting, or patching of Work as required to make its several parts come together properly and fit to receive or be received by work of other contractors shown upon, or reasonably implied by, the drawings and specifications for the completed structure as Architect may direct. In addition, the Contractor shall do the following:

1. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
2. Remove and replace work not conforming to requirements of the Contract Documents.
3. Remove and replace defective work.

B. All cost caused by defective or ill-timed work shall be borne by Contractor.

C. Contractor shall not endanger any work by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with consent of Architect.

D. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.
2. In addition to other requirements specified, upon the Architect's or Owner’s request uncover work to provide for inspection of the covered work, and remove samples of installed materials for testing.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

Request for Architect's consent:

1. In accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.
2. Prior to cutting which effects structural safety, submit written request to the Architect for permission to proceed with cutting. Obtain Structural Engineer approval prior to cutting.
3. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and the required Change Order prior to proceeding.

## PART 2 - PRODUCTS

2.01 MATERIALS

For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

## PART 3 -- EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.

2. After uncovering the work, inspect conditions affecting installation of the new work.

B. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.

2. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION PRIOR TO CUTTING

Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.03 PERFORMANCE

Perform required excavating and backfilling as required under pertinent other Sections of these Specifications.

1. Perform cutting and demolition by methods, which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.

2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

***** END OF SECTION *****

**SECTION 01 74 00**

**CLEANING**

## PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work Included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

1.03 QUALITY ASSURANCE

A. Conduct daily inspection, and more if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

Provide in accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.

## PART 2 -- PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

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

## PART 3 -- EXECUTION

3.01 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.

2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this work.

3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.

4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.

2. Weekly, and more often if necessary, inspect all arrangements of materials stored on site. Re-stack, tidy, or otherwise service arrangements to meet the requirements above.

3. Maintain the site in a neat and orderly condition at all times.

C. Structures:

1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.

2. Weekly, and more often if necessary, sweep interior spaces clean.

a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.

a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material that, in the opinion of the Architect, may be injurious to the finish floor material.

3.02 FINAL CLEANING

A. "Clean," for the purpose of this article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.

C. Site:

1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site.

2. Completely remove resultant debris.

D. Structures:

1. Exterior:

a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.

b. Remove all traces of splashed materials from adjacent surfaces.

c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.

d. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no cost to the Owner.

2. Interior:

a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.

b. Remove all traces of splashed material from adjacent surfaces.

c. Remove paint drippings, spots, stains, and dirt from finished surfaces.

3. Glass: Clean inside and outside.

4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

E. Schedule final cleaning as accepted by the Architect to enable the Owner to accept a completely clean Work.

3.03 CLEANING DURING OWNER'S OCCUPANCY

A. Prior to the Owner occupying the Work or any portion thereof prior to the completion of the total project by the Contractor, the Contractor shall perform final cleaning for the area to be turned over in accordance with the General Requirements of the Contract.

B. The Owner and Architect shall walk the limits of the area to be occupied and determine a punch list with expressly identified limits of area to be released. Once the area is accepted and occupied, the contractor shall be released from general cleaning except as required by the completion of the punch list items.

***** END OF SECTION *****

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**SECTION 01 78 00**

**CONTRACT CLOSEOUT**

## PART 1 GENERAL

1.01 SECTION INCLUDES

A. Closeout procedures.

B. Adjusting.

C. Project record documents.

D. Operation and maintenance data.

E. Warranties and Guarantees.

F. Spare parts and maintenance materials.

G. Instructions to COUNTY'S personnel.

1.02 CLOSEOUT PROCEDURES

A. Partial Occupancy and Substantial Completion:

1. Conform to Part 1, Title 24, Section 4-336 CCR, Requirements for Verified Reports and Closeout Procedures.
2. In conjunction with the Project Inspector, prepare a list of items to be completed or corrected. List may be developed by areas, when approved by the ARCHITECT.
3. Within a reasonable time after receipt of the list, the ARCHITECT will inspect to determine status of completion.
4. Should the ARCHITECT determine that Work is not substantially complete:
    a. The ARCHITECT will promptly notify the CONTRACTOR in writing, giving the reasons for his determination.
    b. CONTRACTOR shall remedy the deficiencies and notify the ARCHITECT when Work is ready for re-inspection.
    c. The ARCHITECT will re-inspect the Work.
5. When the ARCHITECT concurs that work is substantially complete:
    a. The ARCHITECT will prepare a "Certificate of Substantial Completion" on AIA Form G704, accompanied by the CONTRACTOR'S list of items to be completed or corrected as verified by the ARCHITECT.
    b. The ARCHITECT will submit the Certificate to the COUNTY and to the CONTRACTOR for their written acceptance of the responsibilities assigned to them in the Certificate.

B. Final Completion:

1. Prepare and submit a notice that Work is ready for final inspection and acceptance.
2. Verify the Work is complete.
3. Certify that:
    a. Work has been inspected by all governing agencies and is in compliance with Contract Documents.
    b. Work has been inspected for compliance with the Contract Documents.

c. Work has been completed in accordance with the Contract Documents.

d. Equipment and systems have been tested as required and are operational.

e. Work is completed and ready for final inspection.

4. The ARCHITECT will make an inspection to verify status of completion.

5. Should the ARCHITECT determine the Work is incomplete or defective:

a. The ARCHITECT will promptly notify the CONTRACTOR in writing, listing incomplete or defective work.

b. CONTRACTOR shall remedy the deficiencies promptly and notify the ARCHITECT when ready for re-inspection.

6. When the ARCHITECT determines the Work is acceptable under the Contract Documents, he will request the CONTRACTOR to make closeout submittals.

C. Closeout submittals include, but are not necessarily limited to:

1. Project Record Documents.

2. Operation and maintenance data for items so listed in pertinent Sections of these Specifications and for other items when so approved by the ARCHITECT.

3. Warranties and Guarantees.

4. Keys and keying schedule.

5. Spare parts, materials, extra stock to be turned over to the COUNTY.

6. Evidence of payment and release of liens, when requested by COUNTY.

7. List of subcontractors, service organizations and principal vendors, including names, addresses and telephone numbers, where they may be contacted for emergency service at all times, including nights, weekends and holidays.

D. Final Payment:

1. Submit a Final Payment Request, showing all adjustments to the Contract Sum.

2. Retention will be released no sooner than thirty-five (35) days and not later than sixty (60) days after Notice of Completion has been recorded with the County Recorder's Office.

1.03 NOT USED

1.04 ADJUSTING

Adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 PROJECT RECORD DOCUMENTS

A. COUNTY will provide one (1) set of blueline drawings and one (1) copy of the Project Manual for use during construction to record changes made during construction manually. CONTRACTORS installing underground utilities may have additional AutoCadd electronic as-built requirements as assigned in scope of work summaries.

B. Record in concise and neat manner and on a weekly basis all actual revisions to the work:

1. Changes made on the Drawings, including Clarification Drawings.

2. Changes made to the Specifications.

3. Changes made by Addenda.

4. Changes made by Instruction Bulletins.

5. Change Orders or other authorized Modifications to the Contract.

6. Revisions made to shop drawings, product data and samples.

C. Store Record Documents separate from documents used for construction. Replace soiled or illegible documents.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturer's name, trade name, product model and number and supplier.
2. Authorized product substitutions or alternates utilized.
3. Changes made by Addenda and Modifications.

F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Identify drains and sewers by invert elevation.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work. Identify ducts, dampers, valves, access doors and control equipment wiring.
4. Field changes of dimension and detail.
5. Details not on original Drawings.
6. Refer to Scope Summaries for electronic as-built requirements.

G. Obtain Inspector's signed certification that Record Documents have been fully updated prior to submitting monthly payment requests. Compliance is mandatory before payment will be made.

H. Submit Inspector's certified documents to ARCHITECT with claim for final Application of Payment. Fully completed record drawings are a prerequisite to final payment.

I. The COUNTY, at his option, may require the preparation of a final reproducible "RECORD SET" of drawings that incorporate all changes made during the construction process to include incorporation of all change orders, addenda, field orders and "As Installed" conditions noted on the CONTRACTOR prepared record documents. The preparation and printing cost of the "RECORD SET" is not a part of the contract.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit three (3) sets prior to final inspection, bound in 8½ x 11 inch text pages, in binders with durable covers, tabbed by specification section and/or other organizing heading.

B. Deliver to CONSTRUCTION MANAGER'S or COUNTY'S office, itemized and inventoried on transmittal.

1.07 WARRANTIES AND GUARANTEES

A. Submit three (3) wet-signed originals separate from Operation and Maintenance data.

B. Manufacturer's warranties and guarantees not withstanding, warrant entire Work against defects in materials and workmanship for twelve (12) months from date of Substantial Completion. Warranties and guarantees between CONTRACTOR and manufacturers and CONTRACTOR and suppliers shall not affect warranties or guarantees between CONTRACTOR and COUNTY.

C. Execute and assemble documents from subcontractors, suppliers and manufacturers.

D. Submit to CONSTRUCTION MANAGER OR COUNTY prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.

B. Deliver to CONSTRUCTION MANAGER'S or COUNTY'S office, inventoried and transmitted similar to Operation and Maintenance manuals.

1.09 UNDERGROUND WET UTILITY VIDEO

A. Upon completion of the storm drain system, the Plumbing CONTRACTOR shall fully flush the storm drain system and confirm proper functionality. Additionally, the CONTRACTOR shall provide all services necessary to electronically view and record (video) the improvements to the storm drain system. The IOR shall witness the review and recording process. The CONTRACTOR shall turn-over two (2) copies of the documented review (video tape, DVD - media of the COUNTY'S choice) of the storm drain system at the completion of the project.

B. Upon completion of the sewer system, the Plumbing CONTRACTOR shall fully flush the sewer system and confirm proper functionality. Additionally, the CONTRACTOR shall provide all services necessary to electronically view and record (video) the improvements to the sewer system **at all interior clean outs and main lines and all exterior building P.O.C./cleanout out to the public system P.O.C..** The IOR shall witness the review and recording process. The CONTRACTOR shall turn-over two (2) copies of the documented review (video tape, DVD - media of the COUNTY'S choice) of the sewer system at the completion of the project.

1.10 INSTRUCTIONS TO COUNTY'S PERSONNEL

A. Instruct the COUNTY'S personnel in proper operation and maintenance of all systems, equipment and similar items, which were provided as part of the work. Provide maintenance and inspection schedules that conform to manufacturer's recommendations.

B. CONTRACTOR shall provide a schedule to the COUNTY for approval for each of the instruction periods required.

1. Organize the instruction sessions into group sizes and schedule the elapsed time for instruction in a manner to provide complete coverage of the subject matter. Video each session and provide COUNTY with two (2) copies on DVD.

C. Instruction sessions will be held in a COUNTY designated area on the project site and at COUNTY'S convenience. Amount of time required for each session shall be as specified in individual sections.

D. Instructors shall be qualified by the product manufacturer in the subject matter presented at each session.

1. Submit names of instructors and qualifications to the ARCHITECT and COUNTY for approval thirty (30) days prior to each scheduled session.

2. Substitution of instructors will not be permitted without prior approval of ARCHITECT or COUNTY.

**PART 2 PRODUCTS -** NOT USED

**PART 3 EXECUTION -** NOT USED

*****END OF SECTION*****

**SECTION 01 78 00**

**LIST OF PROJECT CLOSE-OUT ITEM**

## PART 1 -- GENERAL

1.01 SUMMARY

A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

B. The Lists in this Section are provided for the convenience of the General Contractor and shall not diminish the requirements of the specific Sections of the Project Manual.

1.02 QUALITY ASSURANCE

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

1.03 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.03 SUBMITTALS

A. In accordance with Article 3 of the General Conditions, Project Manual Section 00 70 00.

B. Unless otherwise directed in other Sections, or in writing by the Architect, submit (3) three copies of the final Manual to the Architect prior to indoctrination of operation and maintenance personnel.

## PART 2 -- ITEMS

2.01 REPORTS

| Section: | Name: | Comments: |
|---|---|---|
| DIV. 22 | Plumbing | Refer to Plumbing Plans |
| DIV. 23 | HVAC | Refer to Mechanical Plans |
| 26 01 00 | Electrical | Per Item 1.05 |
| 28 31 11 | Fire Alarm Systems | Per Item 3.3 |

2.02 AS-BUILT DRAWINGS (2 SETS)

| Section: | Name: | Comments: |
|---|---|---|
| DIV. 22 | Plumbing | |
| DIV. 23 | HVAC | |
| DIV. 26 | Electrical | |

2.03 EXTRA MATERIALS

| Section: | Name: | Comments: |
|---|---|---|
| 32 17 26 | Detectable Warning Surface | 2% of each type. |
| 09 30 00 | Tile | 2% (1 box minimum) |
| 09 51 00 | Acoustical Ceiling Tile | 3% (1 box minimum) |
| 06 65 00 | Resilient Flooring | 5% (1 box minimum) |
| 09 68 00 | Carpet | 5% |

| Section: | Name: | Comments: |
|---|---|---|
| 09 71 00 | Acoustical Wall Panels | 5% |
| 09 90 00 | Painting | 10% (1 gallon per color minimum) |
| 10 80 00 | Accessories | (2) Master Keys |
| DIV. 22 | Fire Sprinkler | Refer to Plumbing Plan |
| 28 31 11 | Fire Alarm | Per Item 1.11 |

2.04 MAINTENANCE & OPERATION MANUALS (2 BINDERS)

| Section: | Name: | Comments: |
|---|---|---|
| 04 43 13 | Manufactured Stone Veneer | Per Item 1.04 - B |
| 06 65 00 | Resilient Flooring | Per Item 1.05 |
| 09 30 00 | Tilework | Per Item 1.05 |
| 28 31 11 | Fire Sprinkler | |
| DIV. 22 | Plumbing | Refer to Plumbing Plans |
| DIV. 23 | HVAC | Refer to Mechanical Plans |
| DIV. 26 | Electrical | Refer to Electrical Plans |

2.05 SUPPLEMENTAL WARRANTIES

| Section | Name: | Items: | Time: | Comments: |
|---|---|---|---|---|
| 32 17 26 | Detectable Warning Surface | All | 5 years | |
| 06 40 00 | Custom Casework | All | 2 years | |
| 07 19 00 | Water Repellent Coatings | Material | 5 years | |
| 07 21 00 | Insulation | All | 5 years | |
| 07 41 00 | Metal Wall Panels | Material | 20 years | |
| 07 50 00 | Membrane Roofing | Complete System | 30 years | |
| 07 47 37 | Foam Roofing | All | 10 years | |
| 07 61 13 | Standing Seam Metal Roof | Labor & Materials | 2 years | |
| | | Finish | 20 years | |
| 07 60 00 | Flashing and Sheet Metal | All | 2 years | |
| 07 90 00 | Caulking and Sealants | All | 5 years | |
| 08 14 00 | Aluminum Entrance Systems | Labor & Materials | 2 years | |
| 08 53 13 | Aluminum Windows | Labor | 2 years | |
| 08 71 00 | Finish Hardware | Locksets | 3 years | |
| | | Heavy-Duty Locksets | 7 years | |
| | | Exit Devices | 3 years | 1-year for electrical |
| | | Closers | 10 years | 2-years for electrical |
| | | Hinges | Lifetime | |
| | | Other | 2 years | |
| 08 80 00 | Glazing | All | 2 years | |
| 10 15 50 | Solid Polymer Toilet Partitions | Materials & Labor | 15 years | |
| DIV. 22 | Plumbing | Water Hammer Arrestors | Lifetime | |
| DIV. 23 | HVAC Equipment | Equipment Motors | 5 years | |
| DIV. 26 | Electrical | System | 2 years | |

*****END OF SECTION*****

**SECTION 01 78 23**

**OPERATION AND MAINTENANCE DATA**

## PART 1 -- GENERAL

1.01 SUMMARY

A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

B. Work Included: To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other Sections of these Specifications.

1.02 QUALITY ASSURANCE

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

1.03 SUBTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.04 SUBMITTALS

A. In accordance with Article 3 of the General Conditions.

B. Submit two copies of a preliminary draft of the proposed Manual or Manuals to the Architect for review and comments.

C. Unless otherwise directed in other Sections, or in writing by the Architect, submit (3) three copies of the final Manual to the Architect prior to indoctrination of operation and maintenance personnel.

## PART 2 -- PRODUCTS

2.01 OPERATION MANUALS

A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.

B. Reference Chart: See Section 01 78 00 – List of Project Close-Out Items for summary of Sections that require submittal of Operation Manuals.

C. Format:

1. Size: 8-1/2" x 11"
2. Paper: White bond, at least 20 lb. weight
3. Text: Neatly written or printed
4. Drawings: 11" in height preferable; bind in with text; fold-out acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.
5. Flysheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the Manual; 3-ring binders will be acceptable; all binding is subject

to the Architect's acceptance.

7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, lbs., and cfm.

D. Provide front and back covers for each Manual, using durable material accepted by the Architect, and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE INSTRUCTIONS:

_____

Name and Address of Work

_____

Name of Contractor

_____

General Subject of this Manual

_____

Space for Signature of the Architect and Date

E. Contents: Include at least the following:

1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
3. Complete nomenclature of all parts of all equipment.
4. Complete nomenclature and part number of all replacement parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
5. Copy of all guarantees and warranties issued.
6. Manufacturer's bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturer's data with which this installation is not concerned.
7. Such other data as required in pertinent Sections of these Specifications.

2.02 INSTRUCTION MANUALS

A. Preliminary:

1. Prepare a preliminary draft of each proposed Manual.
2. Show general arrangement, nature of contents in each portion, probable number of drawings and their size, and proposed method of binding and covering.
3. Secure the Architect's acceptance prior to proceeding.

B. Final: Complete the Manuals in strict accordance with the accepted preliminary drafts and the Architect's review comments.

C. Revisions: Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Manual with the Architect.

***** END OF SECTION*****

**SECTION 01 78 39**

**PROJECT RECORD DOCUMENTS**

## PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work Included:

1. Throughout the construction period, maintain an accurate record of changes in the Contract Documents, as described in Article 3.01 below.
2. Upon completion of the Work, transfer the recorded changes to a set of Record Documents, as described in Article 3.02 below.

1.03 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as accepted by the Architect.

B. Accuracy of records:

1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the accepted Project Record Documents.

C. Make entries within 24 hours after receipt of information that the change has occurred.

1.04 SUBSTITUTIONS

Substitutions will be considered per the Instructions to Bidders, Section 3.3 Substitutions.

1.05 SUBMITTALS

A. In accordance with Article 3 of the General Conditions.

B. The Architect's acceptance of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.

C. Prior to submitting request for final payment, submit the final Project Record Documents to the Architect and secure his acceptance.

1.06 PRODUCT HANDLING

A. Maintain the job set Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer all recorded data to the final Project Record Documents.

B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.

1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
2. In such case, provide replacements to the standards originally required by the Contract Documents.

## PART 2 -- PRODUCTS

2.01 RECORD DOCUMENTS

A. Job Set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Architect at no charge to the Contractor one complete set of all Documents comprising the Contract.

B. Final Record Documents of As-Built Conditions List: See Section 01900 – List of Project Close-Out Items for summary of Sections that require submittal of As-Built Documents.

C. Summary List of Reports of Tests: See Section 01900 – List of Project Close-Out Items for summary of Sections that require submittal of Tests by the Contractor.

## PART 3 -- EXECUTION

3.01 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the job set described in Paragraph 2.01-A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

B. Preservation:

1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the acceptance of the Architect.
2. Do not use the job set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to final Project Record Documents.
3. Maintain the job set at the Project Site unless otherwise requested by the Architect.

C. Making entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
2. Date all entries.
3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
4. In the event of overlapping changes, use different colors for the overlapping changes.

D. Make entries in the pertinent other Documents as accepted by the Architect.

E. Conversion of schematic layouts:

1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
    a. Contractor shall determine final arrangement, subject to the Architect's acceptance.
    b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items that are shown only schematically on the Drawings.
2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.01-E-1 above.

a. Clearly identify the item by accurate note such as "cast iron drain", "galvanized water", and the like.

b. Show, by symbol or note, the vertical location of the item ("under slab", "in ceiling plenum", "exposed", and the like).

c. Make all identification sufficiently descriptive that it may be related reliably to the Specifications.

3. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

3.02 FINAL PROJECT RECORD DOCUMENTS

A. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Acceptance of recorded data prior to transfer:

1. Following receipt of the transparencies described in Paragraph 2.01-b above, and prior to start of transfer of recorded data thereto, obtain the Architect's acceptance of all recorded data.

2. Make required revisions.

C. Transfer of data to Drawings:

1. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.

2. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.01-E-1 above.

3. Call attention to each entry by drawing a "cloud" around the area or areas affected.

4. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.

D. Transfer of data to other Documents:

1. If the Documents other than Drawings have been kept clean during progress of the Work, and if entries thereon have been orderly to the acceptance of the Architect, the job set of those Documents other than Drawings will be accepted as final Record Documents.

2. If any such Document is not so accepted by the Architect, secure a new copy of that Document from the Architect at the Architect's cost for reproduction and handling, and carefully transfer the change data to the new copy to the acceptance of the Architect.

E. Review and Submittal:

1. Submit the completed set of Project Record Documents to the Architect as described in Paragraph 1.03-C above.

2. Participate in review meetings as required.

3. Make required changes and promptly deliver the final Project Record Documents to the Architect.

3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

***** END OF SECTION *****

**SECTION 02 32 00**

**GEOTECHNICAL REPORT**

# Refer to Separate Attachment
# Dated March 25, 2016

***** END OF SECTION *****

# UPDATED GEOTECHNICAL INVESTIGATION REPORT

Proposed Nuview Library
29990 Lakeview Avenue
Unincorporated Nuevo Area,Riverisde County, California
Converse Project No. 06-81-245-03

March 25, 2016

**Prepared For:**

County of Riverside
Economic Development Agency (EDA)
3403 10th Street, 4th Floor
Riverside, CA 92501

**Prepared By:**

**Converse Consultants**
10391 Corporate Drive
Redlands, California 92374

**Converse Consultants**
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

March 25, 2016

Mr. Eric Sydow
Facilities Project Manager III
Project Management Office
County of Riverside Economic Development Agency (EDA)
3403 10th Street, 4th Floor
Riverside, CA 92501

Subject: **UPDATED GEOTECHNICAL INVESTIGATION REPORT**
Proposed Nuview Library
29990 Lakeview Avenue
Unincorporated Nuevo Area, Riverside County, California
Converse Project No. 06-81-245-03

Dear Mr. Sydow:

Enclosed are the findings of our updated geotechnical investigation performed for the proposed construction of the Nuview Library located at 29990 Lakeview Avenue in the unincorporated Nuevo area, Riverside County, California. This report updates the previous geotechnical investigation report prepared for RHA Landscape Architects dated November 15, 2007. Our services were provided in accordance with our proposal dated February 18, 2016 and your purchase order number FMARC-0000063566 dated February 25, 2016.

Based on our investigation, we conclude that the project site is suitable for the proposed library expansion, provided the findings and conclusions presented in this report are incorporated in the planning, design, and construction of the project.

We appreciate this opportunity to be of service to County of Riverside Economic Development Agency. If you should have any questions regarding this report, please feel free to contact the undersigned at (909) 796-0544.

**CONVERSE CONSULTANTS**

Hashmi S. E. Quazi, Ph.D., P.E., G. E.
Regional Manager/Principal Engineer

Dist: 4/Addressee
JB/SM/HSQ/kvg

## PROFESSIONAL CERTIFICATION

This report has been prepared by the individuals whose seals and signatures appear hereon.

The findings, recommendations, specifications or professional opinions contained in this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice in this area of Southern California. There is no warranty, either expressed or implied.

Jordan Roper, P.E.
Project Engineer


Scot Mathis, C.E.G. , P.G.
Senior Geologist

# EXECUTIVE SUMMARY

The following is a summary of our geotechnical investigation, conclusions and recommendations, as presented in the body of this report. Please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report should prevail.

- The Nuview Library site is located at 29990 Lakeview Avenue in the unincorporated Nuevo area, Riverside County, California. The project will include demolition of the existing library building, construction of a new 3,700 square foot library building, sewage system, and a small storm water management basin.

- The Nuview Library is located at the northwest corner of an 8.96-acre site previously planned for development as a par k. Converse prepared a geotechnical investigation report (Converse, 2007) for the park development. This report updates and expands the previous report to address the currently planned library.

- Our scope of work included site reconnaissance, field exploration, percolation testing, laboratory testing, engineering analysis, and preparation of this report.

- Ten (10) exploratory borings (BH-1 through BH-10) were drilled within the project site on September 11 and 13, 2007 as part of the park project. The borings were advanced using a truck-mounted drill rig equipped with eight-inch diameter hollow-stem augers for soil sampling. The depth of the borings ranged from 11.5 to 51.5 feet below existing ground surface (bgs).

- Two (2) additional exploratory borings (BH-11 and BH-12) were drilled within the project site on March 2, 2016. The borings were advanced using a truck-mounted drill rig equipped with eight-inch diameter hollow-stem augers for soil sampling. The depth of the borings were 5.0 and 50.0 feet below existing ground surface (bgs).

- The site soils consisted of alluvial deposits to the maximum depth explored of 51.5 feet below existing ground surface (bgs). Approximately 7.5 feet of fill was encountered in boring BH-12. This fill was likely placed during grading operations for the existing Nuview Library building pad. The alluvial deposits and fill generally consisted of layers of primarily silty sand and sand with trace clay.

- Groundwater was not encountered in any of the borings drilled within the project site to the maximum depth of 51.5 feet explored. Based on available information, the depth to the groundwater at the site vicinity is deeper than 100 feet bgs. Groundwater is not expected to be encountered during construction of the

proposed improvements. Shallow perched groundwater may be present locally, particularly following precipitation or irrigation events.

- Based on the results of our field exploration the subsurface soils at the site of the proposed improvements are anticipated to generally be excavatable with conventional heavy-duty excavation equipment.

- The estimated infiltration rate of the soils at the stormwater basin is 3.0 inches per hour. The estimated seepage pit percolation rate is 1.37 gallons per square foot per day.

- Laboratory testing was performed to determine the physical characteristics and engineering properties of the subsurface soils. Results of *in-situ* moisture and dry density tests are presented on the Logs of Borings in Appendix A, *Field Exploration.* Tests results are included in Appendix B, *Laboratory Testing Program*.

- The site is not located within a currently designated State of California or Riverside County designated Earthquake Fault Zone (CGS, 2007; Riverside County, 2016). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

- Seismic parameters based on 2013 California Building Code and site coordinates 33.8239 north and 117.1289 west are provided in Table No. 2, *CBC 2013 Seismic Parameters*.

- The potential hazards at the site from secondary effects of seismic activity including surface fault rupture, soil liquefaction, landslides, lateral spreading, tsunamis, seiches, and earthquake-induced flooding are considered low. The site has the potential for up to 6.2 inches of dynamic dry settlement and up to 2.7 inches of differential settlement over a distance of 40 linear feet.

- The site soils correspond to American Concrete Institute (ACI) exposure category S0 for sulfate and C1 for chlorides. The tested site soils range from mildly to severely corrosive to ferrous metals in contact with the soil. A qualified corrosion consultant should provide appropriate corrosion mitigation measures for ferrous metals in contact with the site soils.

- The site soils have Very Low expansion potential and Slight to Moderate collapse potential.

- Structure footings should be o ver-excavated to at least 36 inches below the ground surface, or 24 inches below bottom of footings, whichever is deeper.

Deeper removal will be needed if firm soil conditions are not exposed on the excavation bottom. The lateral limits of the over-excavation should extend at least 5 feet beyond the building footprint areas, where space is available.

- Footings placed at a depth of 18 inches below lowest adjacent grade may be designed based on an allowable net bearing capacity of 2,500 pounds per square foot (psf).

The site is suitable from a geotechnical standpoint for the proposed development, provided that the recommendations presented in this report are incorporated into the design and construction of the project.

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## TABLES

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## APPENDICES

# 1.0 INTRODUCTION

This report presents the results of the geotechnical investigation update performed for the proposed construction of the Nuview Library located at 29990 Lakeview Avenue in the unincorporated Nuevo, Riverside County, California. The location of the site is shown in Figure No. 1, *Approximate Site Location Map.*

The purposes of this investigation were to determine the nature and engineering properties of the subsurface soils, provide earthwork recommendations, provide geotechnical recommendations for design and construction, and provide infiltration rates for the design of an onsite septic system and retention basin.

This report is prepared for the project described herein and is intended for use solely by the County of Riverside Economic Development Agency (RCEDA) and authorized agents. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

# 2.0 PROJECT BACKGROUND AND DESCRIPTION

## *2.1 Project Background*

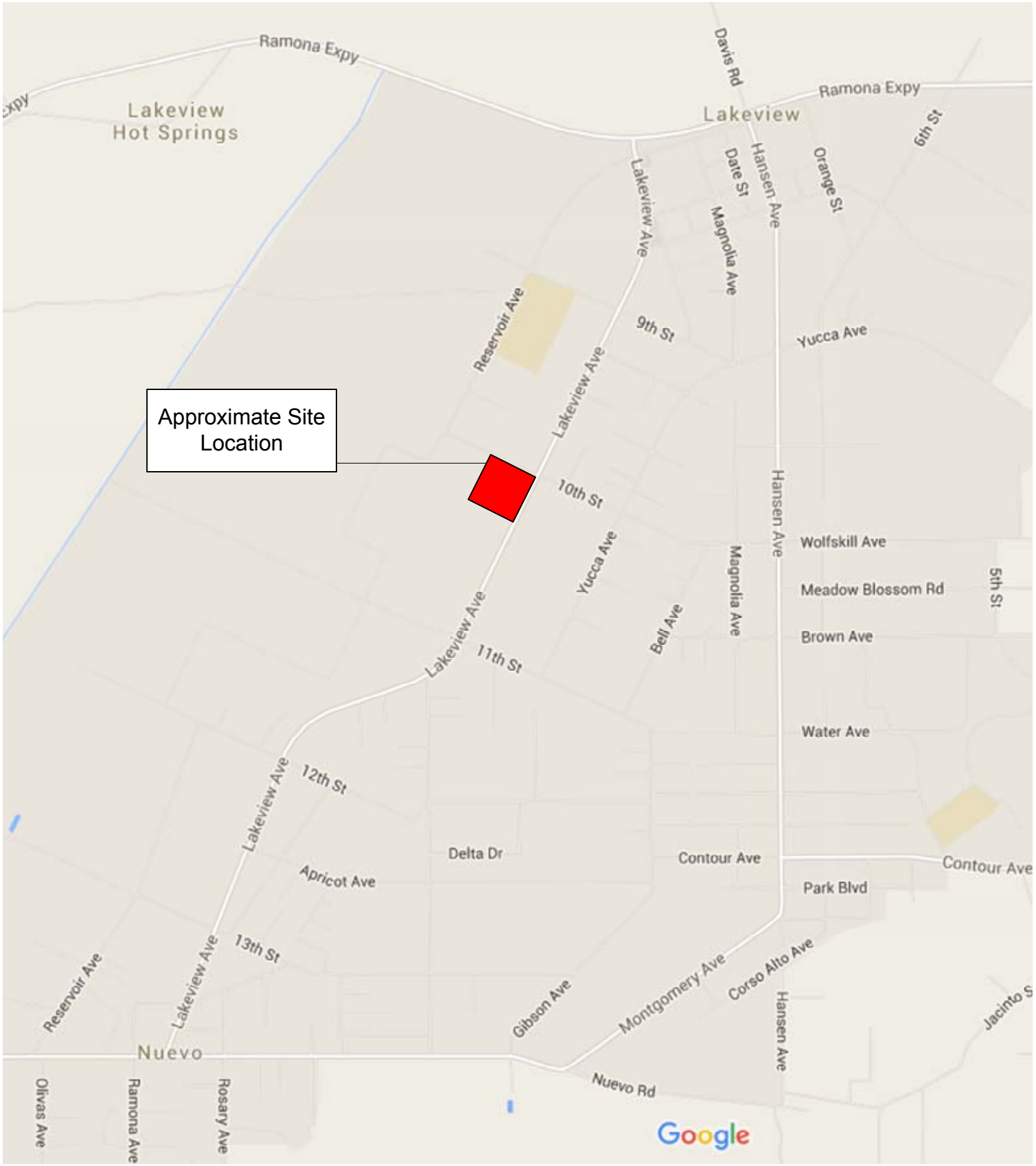
The Nuview Library is located at the northwest corner of an 8.96-acre site previously planned for development as a park. Converse Consultants was retained by RHA Landscape Architects as their geotechnical consultant for the park project. Converse prepared a Geotechnical Investigation Report dated November 15, 2007 (Converse, 2007) for the park development. As part of our scope of work we drilled 10 borings ranging in depths from 11.5 to 51.5 feet below existing ground surface, conducted appropriate laboratory testing and engineering analyses.

Subsequently, Mr. Dominick Lombardi with RCEDA retained Converse Consultants to prepare a percolation test report for design of an on-site sewage disposal system. Four percolation test pits were excavated in the southeast corner of the proposed park site. Our report titled, “Percolation Test Report,” dated November 14, 2008, was submitted to Mr. Lombardi.

We understand that RCEDA have changed their site development plan. This report updates and expands our previous report (Converse, 2007) to address the currently planned library building.

## *2.2 Project Description*

The original proposed park project included the following improvements:




# Approximate Site Location Map

Project: Proposed Nuview Library Expansion
Location: Southwest Corner of 10th Street and Lakeview Avenue, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No
06-81-245-03

**Converse Consultants**

FIGURE NO.
1

- Baseball/softball diamond
- Basketball court
- Playfield/Tot lot areas
- Security lighting
- Drinking fountain
- Shade structure
- Parking
- Skate park facility
- Future community center
- Multi-purpose field within open grass area
- Benches
- Outdoor exercise stations
- Perimeter fencing
- Picnic areas
- Asphalt perimeter and walking trail
- Bollards
- Restrooms
- Future health clinic

The updated project plan for the proposed library expansion includes the following:

- Demolition of the existing 2,700 square foot library building and septic system.
- Construction of a new 3,730 square foot library building.
- Construction of an on-site sewage system southwest corner of the proposed new library building. The sewage system would consist of a seepage pit with an inlet at approximately 10 feet bgs and a bottom at approximately 50 feet bgs. The seepage pit dimensions were provided by Matt Acton, Lead Designer for Holt Architecture.
- Construction of a small storm water basin northwest of the existing driveway.

## 3.0 SITE DESCRIPTION

The approximately 1-acre existing library site is developed with an approximately 2,700 square foot library building, parking lot, sidewalks, and landscaping. The site is relatively flat with an average elevation of 1466 feet above mean sea level (AMSL). It is bounded by Lakeview Avenue to the southeast, 10th Street to the northeast, and vacant land to the southwest and northwest. The existing library is located at the northeast corner of the 8.96-acre site.

The remainder of the 8.96-acre site is currently vacant measuring 650 to 450 feet northwest to southeast and 620 to 300 feet northeast to southwest. The site is relatively flat and is overgrown with grass and brush. The Nuview Fire Station is located to the northwest of the site.

## 4.0 SCOPE OF WORK

The scope of this update investigation included site reconnaissance, field exploration and laboratory testing, percolation testing, analysis and interpretation of data and preparation of this report.

### *4.1 Project Set-up*

The project set-up consisted of the following tasks.

- Review of the existing documents pertaining to local/regional geology, and groundwater.
- Conducted a site reconnaissance and mark the approved field exploration locations so that drill rig access was available.
- Notified Underground Service Alert (USA) at least 48 hours prior to investigation to clear the locations of any conflict with existing underground utilities.
- Retained a drilling subcontractor.

### *4.2 Field Exploration*

Ten exploratory borings (BH-1 through BH-10) were drilled within the project site on September 11 and 13, 2007. Two additional exploratory borings (BH-11 and BH-12) were drilled within the project site on March 2, 2016 for the investigation update. The borings were advanced using a truck-mounted drill rig equipped with eight-inch diameter hollow-stem augers for soil sampling. Boring locations are shown in Figure No. 2, *Approximate Boring Location Map*. The depths of the borings ranged from 5 and 51.5 feet below existing ground surface (bgs). Each boring was visually logged by a Converse geologist and sampled at regular intervals and at changes in subsurface soils. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*.

California Modified Sampler (Ring samples), Standard Penetration Test samples, and bulk soil samples were obtained for laboratory testing.

Following completion of drilling, borings BH-11 and BH-12 were set up for percolation testing and presoaked. Percolation testing was completed the following day on March 3, 2016 as described in Appendix C, *Percolation Testing and Infiltration Rate Evaluation*. Following completion of percolation testing, the pipes were removed and the boreholes were loosely filled with soil cuttings.

The surface at the boring locations may settle over time. If construction is delayed, we recommend the owner monitor the boring site and backfill any settlement or depression that might occur, or provide protection around the area of the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement. Where encountered, existing pavement thicknesses were measured at the boring locations.


## EXPLANATION

BH-10 — Approximate Location and Number for Borings Completed in 2007

BH-12 — Approximate Location and Number for Borings Completed in 2016

# Approximate Boring Location Map

| | |
|---|---|
| Project: | Proposed Nuview Library Expansion |
| Site Location: | Southwest Corner of 10th Street and Lakeview Avenue, Riverside County, California |
| Client: | County of Riverside Economic Development Agency (EDA) |

Project No
06-81-245-03

**Converse Consultants**

FIGURE NO.
**2**

### *4.3 Laboratory Testing*

Representative samples of the site soils were tested in the laboratory to aid in the soils classification and to evaluate the relevant engineering properties of the site soils. The tests conducted for the original investigation included:

- *In situ* moisture contents and dry densities (ASTM Standard D2216)
- Collapse (ASTM Standard D5333)
- Expansion Index (ASTM Standard D4829)
- R-value (ASTM Standard D2844)
- Sand equivalent (ASTM Standard D2419)
- Soil corrosivity tests (Caltrans 643, 422, 417, and 532)
- Grain size distribution (ASTM Standard D422)
- Maximum dry density and optimum-moisture content relationship (ASTM Standard D1557)
- Direct shear (ASTM Standard D3080)
- Consolidation (ASTM Standard D2435)

The tests conducted for the updated investigation included:

- *In-situ* moisture contents and dry densities (ASTM Standard D2216)
- Soil corrosivity tests (Caltrans 422, 417, and 643)
- Collapse (ASTM Standard D5333)
- Grain Size Distribution (ASTM Standard D422)
- Maximum dry density and op timum-moisture content relationship (ASTM Standard D1557)

For *in-situ* moisture and dry density data, see the logs of borings in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

### *4.4 Analyses and Report Preparation*

Data obtained from the exploratory fieldwork and l aboratory-testing program were analyzed and evaluated with respect to the planned construction. This updated report was prepared to provide the findings, conclusions and r ecommendations developed during our study and evaluation.

## 5.0 GEOLOGIC CONDITIONS

A general description of the regional and site-specific geology is presented in this section. Also presented in this section is a de scription of the subsurface conditions, various materials and groundwater conditions encountered at the site during field exploration.

## *5.1 Regional Geologic Setting*

The project site is located in the Perris Valley within the Peninsular Ranges physiographic province. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the south by the Pacific Ocean.

The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto and Elsinore, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

The site is within the Perris Block, a relatively stable structural block. The Perris Block is bounded on the southwest by the Elsinore fault about 10 miles from the site, on the northeast by the San Jacinto fault zone at a distance of about 13 miles, and by the Cucamonga fault, more than 15 miles to the north. The southern boundary of the block is considered to be the Murrietta Hot Springs fault, which, although it is not as large as the other three bounding faults, is considered to be active because sedimentary deposits less than 11,000 years old have been offset by the fault.

## *5.2 Local Geology*

The site is located near the center of the Perris Valley, which is underlain by older Pleistocene alluvial fan deposits, comprised of sandy erosional debris from the nearby hills, and sand, silt and clay deposited in recent geologic time by flooding of the San Jacinto River. Alluvial deposits in the area consist of relatively unconsolidated sand, silt, and clay with some gravel. Basement rock consists of igneous rocks similar to the *granitic rock exposed in the hills that are within 2 miles of the site to the west, east, and south (Morton and Miller, 2006).*

## *5.3 Flooding*

Review of National Flood Insurance Rate Maps (FEMA, 2014) indicates that the project site is within an area designated as Zone X, which is defined as, “Areas determined to be outside the 0.2% annual chance floodplain.”

## *5.4 Subsurface Conditions*

The encountered subsurface conditions are discussed in the following subsections.

### 5.4.1 Subsurface Profile

The site soils consisted of alluvial deposits to the maximum depth explored of 51.5 feet below existing ground surface (bgs).

Approximately 7.5 feet of fill was encountered in boring BH-12. This fill was likely placed during grading operations for the existing Nuview Library structure. The alluvial deposits consisted of layers of unconsolidated silty sand and sand with trace clay. Based on our observations and laboratory density testing, these deposits may be Holocene in age, rather than the older Pleistocene deposits mapped at the site location.

For additional information on the subsurface conditions, see Appendix A*, Field Exploration.*

### 5.4.2 Groundwater

Groundwater was not encountered in any of the borings drilled within project site to the maximum depth of 51.5 feet explored. Based on information obtained from the Cooperative Well Measuring Program report (Watermaster Support Services, 2015), the groundwater level at the nearest well (EMWD, NMW Co. #6) was recorded at 211 feet bgs, at elevation of 1,260 feet above mean sea level (MSL) in 2015. Groundwater levels in the well have ramped from 211 to 253 feet bgs from 1990 to 2015.

The GeoTracker database (SWRCB, 2016) was reviewed for groundwater data from wells located within approximately 1-mile of the project site. Nuview Union School District (Site No. T0606500596) is located approximately 1,200 feet southwest of the project site reported groundwater at an estimated depth of greater than 100 feet bgs in 1999.

Groundwater is not expected to be encountered during construction of the proposed improvements. Shallow perched groundwater may be pr esent locally, particularly following precipitation or irrigation events.

### 5.4.3 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be ex ercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

For a detailed description of the subsurface materials encountered in the exploratory borings, see the boring logs in Appendix A, *Field Exploration.*

### *5.5 Excavatability*

Based on the results of our field exploration the subsurface soils at the site of the proposed improvements are anticipated to generally be excavatable with conventional heavy-duty excavation equipment. Selection of appropriate excavation equipment should be done by an experienced earthwork contractor.

## 6.0 LABORATORY TESTING

Laboratory testing was performed to determine the physical characteristics and engineering properties of the subsurface soils. Results of *in-situ* moisture and dry density tests are presented on the Logs of Borings in Appendix A, *Field Exploration.* Tests results are included in Appendix B, *Laboratory Testing Program*. Discussions of the various test results performed for the original and update investigations are presented in the following sections.

### *6.1 Original Investigation Laboratory Testing*

- *In-situ* Moisture and Dry Density – *In-situ* dry densities and moisture content of the upper 5 feet of the soil material ranged from 103 to 125 pounds per cubic feet (pcf) and from 2 to 9 percent, respectively.
- Collapse Potential – The collapse potential under a vertical stress of 2.0 kips-per-square-foot (ksf) of five relatively undisturbed representative samples (including one from consolidation test) was tested in accordance with the ASTM Standard D5333 test method. The collapse potential ranged 0.3 to 2.1 percent; indicating "Slight" collapse potential according to ASTM Standard D5333 test method.
- Expansion Index – Two representative samples from the upper 5 feet of the site soils were tested to evaluate Expansion Potential (EI) in accordance with the ASTM Standard D4829. The values of the measured EIs were 0 and 2. These values indicate "Very Low" expansion potential.
- R-value – One representative bulk soil sample was tested for resistance value (R-value) in accordance with ASTM Standard D2844. This test is designed to provide a relative measure of soil strength for use in pavement design. The test indicated an R-value of 38.
- Sand Equivalent – Two representative soil samples from the upper 15 feet of the site soils were tested to evaluate Sand Equivalent (SE) in accordance with the ASTM Standard D2419. The values of the measured SE were 16 and 19.
- Soil Corrosivity – Two representative samples of the site soils were tested to determine soil corrosivity with respect to common construction materials such as

concrete and steel. The test results are presented in 9.6, *Corrosivity Test Evaluation,* and in Appendix B, *Laboratory Testing Program.*

- Grain Size Analysis – Grain size analysis were performed on three representative soil samples according to ASTM Standard D422. The results are presented in Drawing No. B-1, *Grain Size Distribution Results*, in Appendix B, *Laboratory Testing Program*.
- Maximum Dry Density and Optimal Moisture Content – The typical moisture-density relationships of one representative soil sample was determined in accordance with ASTM Standard D1557. The maximum dry density of the tested sample was 129.5 pounds per cubic foot (pcf), with an optimum moisture content of 7.5 percent. Test results are shown on Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*.
- Direct Shear – Two direct shear tests were performed on a relatively undisturbed sample and a sample remolded to 90 percent of laboratory maximum dry density, in saturated conditions. The results indicate that the site soils have moderate shear strength.
- Consolidation Test – A consolidation test was performed on a representative sample of the site soils. Based on the results of this test, the compressibility of the site soils is moderate.

### *6.2 Update Investigation Laboratory Testing*

- *In-situ* Moisture and Dry Density – *In-situ* dry densities and moisture content of the upper 10 feet of the soil material ranged from 112 to 129 pounds per cubic feet (pcf) and from 2 to 9 percent, respectively.
- Collapse Potential – The collapse potential under a vertical stress of 2.0 kips-per-square-foot (ksf) of one relatively undisturbed representative sample was tested in accordance with the ASTM Standard D5333 test method. The collapse potential measured 3.6 percent; indicating “Moderate” collapse potential within the footprint of the proposed library expansion according to ASTM Standard D5333 test method.
- Soil Corrosivity – One representative sample of the site soils within the footprint of the proposed library expansion was tested to determine soil corrosivity with respect to common construction materials such as concrete and steel. The test results are presented in 9.8, *Soil Corrosivity Evaluation,* and in Appendix B, *Laboratory Testing Program.*
- Grain Size Analysis – Grain size analysis were performed on three representative soil samples according to ASTM Standard D422. The results are presented in Drawing No. B-1, *Grain Size Distribution Results*, in Appendix B, *Laboratory Testing Program*.

- Maximum Dry Density and Optimal Moisture Content – The typical moisture-density relationships of one representative soil sample was determined in accordance with ASTM Standard D1557. The maximum dry density of the tested sample was 133.5 pounds per cubic foot (pcf), with an optimum moisture content of 8.0 percent. Test results are shown on Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*.

## 7.0 FAULTING AND SEISMICITY

Discussion on faulting and seismicity is presented in the following sections.

### *7.1 Faulting*

The site is not located within a currently designated State of California or Riverside County designated Earthquake Fault Zone (CGS, 2007; Riverside County, 2016). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

The proposed site is situated in a seismically active region. As is the case for most areas of Southern California, ground shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

The following table contains a list of active and potentially active faults within 100 kilometers of the subject site. The fault parameters and distances presented in the following table are based on the output from EQFAULT (Blake, 2000), revised in accordance with CGS fault parameters (Cao et. al., 2003).

**Table No. 1, Summary of Regional Faults**

| Fault Name | Approximate Distance (miles (km)) | Moment Magnitude (Mw) |
|---|---|---|
| San Jacinto-San Jacinto Valley | 5.2 (8.3) | 6.9 |
| San Jacinto-Anza | 13.6 (21.9) | 7.2 |
| San Jacinto-San Bernardino | 14.9 (23.9) | 6.7 |
| Elsinore-Glen Ivy | 17.8 (28.7) | 6.8 |
| Elsinore-Temecula | 17.8 (28.7) | 6.8 |
| San Andreas - San Bernardino | 18.5 (29.7) | 7.5 |
| San Andreas - Southern | 18.5 (29.7) | 7.4 |
| Chino-Central Ave. (Elsinore) | 26.0 (41.8) | 6.7 |
| Pinto Mountain | 28.5 (45.8) | 7.2 |
| Whittier | 29.3 (47.2) | 6.8 |
| North Frontal Fault Zone (West) | 29.8 (47.9) | 7.2 |

| Fault Name | Approximate Distance (miles (km)) | Moment Magnitude (Mw) |
|---|---|---|
| Elsinore-Julian | 31.6 (50.9) | 7.1 |
| Cleghorn | 32.0 (51.5) | 6.5 |
| Cucamonga | 32.2 (51.8) | 6.9 |
| North Frontal Fault Zone (East) | 34.0 (54.7) | 6.7 |
| San Jose | 38.5 (61.9) | 6.4 |
| San Andreas - Coachella | 38.5 (61.9) | 7.2 |
| Helendale - S. Lockhardt | 40.6 (65.4) | 7.3 |
| San Andreas - Mojave | 40.8 (65.6) | 7.4 |
| Sierra Madre | 41.1 (66.2) | 7.2 |
| Elysian Park Thrust | 42.4 (68.3) | 6.7 |
| Newport-Inglewood (Offshore) | 43.4 (69.8) | 7.1 |
| San Jacinto-Coyote Creek | 43.7 (70.4) | 6.8 |
| Burnt Mtn. | 44.1 (70.9) | 6.5 |
| Lenwood-Lockhart-Old Woman Sprgs | 46.4 (74.6) | 7.5 |
| Eureka Peak | 46.7 (75.1) | 6.4 |
| Landers | 47.2 (75.9) | 7.3 |
| Newport-Inglewood (L.A. Basin) | 48.1 (77.4) | 7.1 |
| Compton Thrust | 48.9 (78.7) | 6.8 |
| Rose Canyon | 50.9 (81.9) | 7.2 |
| Clamshell-Sawpit | 51.9 (83.6) | 6.5 |
| Johnson Valley (Northern) | 52.0 (83.7) | 6.7 |
| Earthquake Valley | 54.4 (87.5) | 6.5 |
| Raymond | 56.0 (90.2) | 6.5 |
| Emerson So. - Copper Mtn. | 56.7 (91.2) | 7.0 |
| Palos Verdes | 59.0 (94.9) | 7.3 |
| Coronado Bank | 59.8 (96.2) | 7.6 |
| Verdugo | 61.6 (99.2) | 6.9 |
| Calico - Hidalgo | 62.0 (99.7 ) | 7.3 |

## *7.2 CBC Seismic Design Parameters*

Seismic parameters based on California Building Code (CBSC, 2013) are provided in the following table. A site-specific seismic design study was not required because the Mapped 1-second Spectral Response Acceleration ($S_1$) is below 0.750g. These parameters were determined using the U.S. Seismic Maps Tool (USGS, 2016).

**Table No. 2, CBC 2013 Seismic Parameters**

| Seismic Parameters | |
|---|---|
| Coordinates | 33.8239°N, -117.1289°W |
| Site Class | "D" |
| Mapped Short period (0.2-sec) Spectral Response Acceleration, $S_s$ | 1.617g |
| Mapped 1-second Spectral Response Acceleration, $S_1$ | 0.662g |
| Site Coefficient (from Table 1613.5.3(1)), $F_a$ | 1.0 |
| Site Coefficient (from Table 1613.5.3(2)), $F_v$ | 1.5 |
| MCE 0.2-sec period Spectral Response Acceleration, $S_{Ms}$ | 1.167g |
| MCE 1-second period Spectral Response Acceleration, $S_{M1}$ | 0.993g |
| Design Spectral Response Acceleration for short period $S_{ds}$ | 1.078g |
| Design Spectral Response Acceleration for 1-second period, $S_{d1}$ | 0.662g |
| Peak Ground Acceleration, PGA | 0.629g |

### *7.3 Secondary Effects of Seismic Activity*

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, landslides, lateral spreading, settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

***Surface Fault Rupture:*** The site is not located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 2007, Riverside County, 2016). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

***Liquefaction:*** Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength due the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur. They are as follows:

- Soils must be submerged
- Soils must be loose to medium-dense
- Ground motion must be intense

- Duration of shaking must be sufficient for the soils to lose shear resistance

The project site is in an area designated as having low susceptibility to liquefaction by Riverside County. Groundwater was not encountered during the investigations to the maximum explored depth of 51.5 feet bgs and is deeper than 200 feet bgs in the site vicinity. Due to the absence of shallow groundwater, the potential for liquefaction is considered low.

***Seismic Settlement:*** Seismically-induced settlement occurs in loose unsaturated granular soils during ground shaking associated with earthquakes. Based on the analysis presented in Appendix D, *Dry Seismic Settlement Analysis*, the site has the potential for up to 6.2 inches of dynamic dry settlement and up to 2.7 inches of differential settlement over a distance of 40 linear feet.

***Landslides:*** Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. Due to the relatively flat nature of the project site and surrounding area, landslides are not considered to be a risk.

***Lateral Spreading:*** Seismically induced lateral spreading involves primarily lateral movement of earth materials toward open slope faces over underlying materials which are liquefied due to ground shaking. It differs from the slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Based on the relatively flat nature of the project site and low liquefaction potential, the risk of lateral spreading is considered low.

***Tsunamis:*** Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the site, tsunamis are not considered to be a risk.

***Seiches:*** Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Lake Perris is located approximately 2.5 miles northwest fo the site. Due to the distance from Lake Perris, the potential for flooding due to off-site seiching is considered low.

***Earthquake-Induced Flooding***: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site located adjacent to but not within a designated Riverside County inundation zone (Riverside County, 2013). The risk of flooding due to offsite dam failure is considered low.

# 8.0 EARTHWORK/SITE GRADING RECOMMENDATIONS

## *8.1 General Evaluation*

This section contains our general recommendations regarding earthwork and grading recommendations for the proposed project. These recommendations are based on the results of our field exploration, laboratory testing, our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may need to be modified based on observation of the actual field conditions during grading.

Based on our field exploration, laboratory testing, and analyses of subsurface conditions at the site, remedial grading will be required to prepare the site for support of the proposed structure that are constructed with conventional shallow footings. To reduce differential settlement, variations in the soil type, degree of compaction, and thickness of the compacted fill placed underneath the footings should be kept uniform.

Site grading recommendations provided below are based on our experience with similar projects in the area and our evaluation of this investigation. Site preparation for the proposed structures will require removal of existing structures, improvements, and other existing underground manmade structures and utilities.

All debris, surface vegetation, deleterious material, existing undocumented fill, and surficial soils containing roots and perishable materials should be stripped and removed from the site. Deleterious material, including organics, concrete, and debris generated during excavation, should not be placed as fill.

The excavated site soils, free of vegetation, shrub and debris, may be placed as compacted fill in structural areas after proper processing. Rocks larger than 3 inches in the largest dimension should not be placed as fill. If encountered, on-site clayey soils with an expansion index exceeding 20 should not be re-used for compaction within 2 feet below the proposed foundations. Soils containing organic materials should not be used as structural fill.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill. Based on these observations, removal of localized areas deeper than those documented may be required during grading. Therefore, some variations in the depth and lateral extent of excavation recommended in this report should be anticipated.

## *8.2 Over-excavation for Structures and Pavements*

We recommend over-excavation for structure footings to be at least 24 inches below bottom of footings. The lateral limits of the over-excavation should extend at least 5 feet beyond the building footprint areas, where space is available.

Based on the samples collected in the undocumented fill layer, it appears the densities are at or near 90 percent relative compaction of maximum dry density. At the completion of the overexcavation, the undocumented fill layer should be verified to be at least 90 percent of the laboratory maximum dry density and have a very low expansion potential. The density and expansion potential should be verified through testing. If these requirements are not met, the undocumented fill should be removed.

For pavement and at grade hardscapes, we recommend over-excavation be at least 18 inches below existing grade and extend at least 12 inches laterally, where space is available.

Over-excavation should not undermine adjacent off-site improvements. Remedial grading should not extend within a projected 1:1 (horizontal to vertical) plane projected down from the outer edge of adjacent off-site improvements.

If soft or yielding soil conditions are encountered, deeper removals may be required. The actual depth of removal should be based on recommendations and observation made during grading. Therefore, some variations in the depth and lateral extent of over-excavation recommended in this report should be anticipated.

### *8.3 Structural Fill*

All surfaces to receive additional fill should be scarified to a depth of 6 inches. The scarified soil should be moisture conditioned to within ± 3 percent of optimum moisture for granular soils or 0 to 2 percent above optimum for fine soils. The scarified soil should be recompacted to at least 90 percent of the laboratory maximum dry density prior to the placement of any fill.

Fill soils should be evenly spread in horizontal, 8-inch-maximum, loose lifts. The fill materials should be thoroughly mixed and moisture conditioned to within 3 percent of optimum moisture content for granular soils and up to 2 percent above optimum moisture content for fine-grained soils. The *in situ* moisture contents of the upper 5 feet of soils at the time of our investigation was generally in the range of 2 to 9 percent. The optimum moisture content for the site soils is approximately 7 to 8 percent. Moisture conditioning will be required during site grading.

All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test method. The upper 12 inches of soil below asphalt and concrete pavement, should be compacted to at least 95 percent of laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not

resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

To reduce differential settlement, variations in the soil type, degree of compaction and thickness of the compacted fill placed underneath the foundations should be kept to a minimum.

The project geotechnical consultant should observe the placement of fill and conduct in-place field density tests to check for adequate moisture content and relative compaction as required by the project specifications. Where less than the required relative compaction is indicated, additional compactive efforts should be applied and the soil moisture-conditioned as necessary, until the required relative compaction is attained.

### *8.4 Shrinkage and Subsidence*

Soil shrinkage and/or bulking as a result of remedial grading depends on several factors including the depth of over-excavation, and the grading method and equipment utilized, and average relative compaction. For preliminary estimation, bulking and shrinkage factors for various units of earth material at the site may be taken as presented below.

- The approximate shrinkage factor for the native alluvial soils is estimated to range from 0 to 15 percent. An average of 7 percent may be used for earthwork planning.
- For estimation purposes, ground subsidence may be taken as 0.12 feet in previously ungraded areas or 0.05 feet in previously graded areas.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

## 9.0 DESIGN AND CONSTRUCTION RECOMMENDATIONS

### *9.1 Shallow Foundation Design Parameters for Buildings*

The proposed structure may be supported on conventional continuous (strip) and/or isolated (spread) footings. Footings should be placed on at least 24 inches of compacted fill as described in Section 8.0, *Earthwork/Site Grading Recommendations*.

Interior and exterior footings should be placed at least 18 inches below lowest adjacent soil grade. Width of the continuous and isolated footings should be at least 18 inches. Footings may be designed based on an allowable net bearing capacity of 2,500 pounds per square foot (psf).

### *9.2 Lateral Earth Pressure*

If retaining walls are planned, the following recommendations should be followed in design and construction. The earth pressure behind any buried wall depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressure. It is recommended that the backfill for the retaining walls will consist of soils with expansion index less than 20. The following fluid pressures are recommended for vertical walls with no hydrostatic pressure, and no surcharge.

**Table No. 3, Equivalent Fluid Pressure**

| Condition | Equivalent Fluid Pressure, pcf |
|---|---|
| Free to deflect (Cantilever) | 41 |
| Restrained (At-rest) | 62 |

### *9.3 Lateral Resistance*

Resistance to lateral loads can be assumed to be provided by friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 between concrete and soil may be used with the dead load forces. Passive earth pressure of 260 psf per foot of depth may be used for the sides of footings poured against recompacted native soils. The maximum value of the passive earth pressure should be limited to 2,500 psf. These lateral resistances may be increased by 33 percent for seismic forces.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

### *9.4 Slabs-on-Grade*

Structural design elements of slabs-on-grade, including but not limited to thickness, reinforcement, joint spacing, should be selected based on the analysis performed by the project structural engineer considering anticipated loading conditions and the modulus of subgrade reaction of the supporting materials.

Slabs should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Care should be taken during concrete placement to avoid slab curling. Prior to the slab pour, all utility trenches should be properly backfilled and compacted.

The upper 12 inches of soil subgrade under slabs-on-grade should be moisture conditioned to 0 to 3 percent above optimum moisture content within 12 hours prior to placement of concrete.

Subgrade for slabs-on-grade should be firm and uniform. All loose or disturbed soils including under-slab utility trench backfill should be recompacted.

### *9.5 Soil Expansion*

Foundations, slabs, and other structures may be designed for very low expansive soil conditions (Expansion Index ≤ 20). The undocumented fill soils should be verified to have a very low expansion potential prior to use as structural fill. We recommend that additional expansion index tests be performed at the completion of sub-grade preparation, to verify the as-constructed expansion potential.

### *9.6 Settlement*

Static settlement will be due to foundation loads, as well as long-term compression of fill soils and compressible native materials below the fill.

Anticipated total static settlement of continuous and isolated footing, designed as recommended above, from structural load-induced settlements and short-term settlement of properly compacted fill is 1.0 inch or less. The expected differential settlement can be taken as equal to one half of the total settlement over a distance of 40 feet.

Based on the analysis presented in Appendix D, *Dry Seismic Settlement Analysis*, the site has the potential for up to 6.2 inches of dynamic dry settlement and up to 2.7 inches of dynamic differential settlement over a distance of 40 linear feet.

The static and dynamic settlement estimates should not be combined for design purposes. The maximum combined static and dynamic settlement is not anticipated to exceed the maximum anticipated dynamic settlement.

### *9.7 Soil Corrosivity Evaluation*

Converse retained the Environmental Geotechnology Laboratory, Inc., located in Arcadia, California, to test one bulk sample for the updated investigation. Two representative bulk samples were tested for the original investigation. The tests included minimum resistivity, pH, soluble sulfates, and chloride content, with the results of all three tests summarized on the following table.

**Table No. 4, Soil Corrosivity Test Results**

| Boring No. | Sample Depth (feet) | pH (Caltrans 643) | Soluble Chlorides (Caltrans 422) ppm | Soluble Sulfate (Caltrans 417) % by Weight | Saturated Resistivity (Caltrans 532) Ohm-cm |
|---|---|---|---|---|---|
| BH-3 | 0.0-5.0 | 7.5 | 1.7 | 0.0028 | 11,200 |
| BH-7 | 0.0-5.0 | 7.1 | 16 | 0.0031 | 4,160 |
| BH-12* | 1.0-5.0 | 7.93 | 560 | 0.020 | 690 |

*Test located within the footprint of the proposed library building.

The sulfate contents of the site soils correspond to American Concrete Institute (ACI) exposure category S0 (ACI 318-11, Table 4.2.1). ACI recommends a minimum compressive strength of 2,500 psi with no type restriction for exposure category S0 in ACI 318-11, Table 4.3.1.

We anticipate that concrete structures will be exposed to moisture from precipitation and irrigation. Based on the site location and the results of chloride testing of the site soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-11, Table 4.2.1). ACI provides concrete design recommendations in ACI 318-11, Table 4.3.1, including a minimum compressive strength of 2,500 psi, and a maximum chloride content of 0.3 percent.

The tested site soils range from mildly to severely corrosive for ferrous metals in contact with the soil (Romanoff, 1957). Converse does not practice in the area of corrosion consulting. A qualified corrosion consultant should provide appropriate corrosion mitigation measures for ferrous metals in contact with the site soils.

### *9.8 Infiltration Rate and Seepage Pit Percolation Rate*

The infiltration rate at the planned stormwater basin was estimated based on percolation testing at BH-11 presented in Appendix C, *Percolation Testing and Infiltration Rate Evaluation*. The estimated infiltration rate at the stormwater basin is 3.0 inches per hour.

The seepage pit percolation rate was estimated based on percolation testing at BH-12 presented in Appendix C, *Percolation Testing and Infiltration Rate Evaluation*. The estimated seepage pit percolation rate is 1.37 gallons per square foot per day.

A safety factor of 2 was applied to the measured infiltration rate and seepage pit percolation rate to account for subsurface variations, uncertainty in the test method, and

future siltation. The stormwater basin and seepage pit designer should determine whether additional design-related safety factors are appropriate.

### *9.9 Flexible Asphalt Concrete Pavement Design*

An R-value of 38 was obtained on a representative soil sample. At the completion of grading, the actual R-value of the final subgrade soils should be determined and the pavement structural sections should be reevaluated.

Asphalt concrete pavement sections corresponding to Traffic Indices (TIs) ranging from 5.0 to 7.0, and an R-value of 38 are presented for preliminary design. Analysis was based on Caltrans' design procedure for flexible pavement structural sections. The results of our analysis are summarized in the following table.

**Table No. 5, Recommended Preliminary Pavement Sections**

| R-value | Traffic Index (TI) | Pavement Section | |
|---|---|---|---|
| | | Asphalt Concrete (inches) | Aggregate Base (inches) |
| 38 | 5 | 3.0* | 6.0* |
| | 6 | 3.5 | 6.0 |
| | 7 | 4.0 | 7.5 |

*Riverside County minimum pavement section is 3” of asphalt concrete over 6” of aggregate base

Prior to placement of aggregate base, at least the upper 12 inches of subgrade soils should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2015) and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC and should be placed in accordance with Section 302.5 of the SSPWC.

### *9.10 Site Drainage*

Adequate positive drainage should be provided away from the structures to prevent ponding and to reduce percolation of water into structural backfill. We recommend that the landscape area immediately adjacent to foundations should be designed sloped away from the building with a minimum 5 percent slope gradient for at least 10 feet measured perpendicular to the face of the wall. Impervious surfaces within 10 feet of the foundation should have a minimum 2 percent slope away from the building.

Planters and landscaped areas adjacent to the building perimeter should be designed to minimize water infiltration into the subgrade soils.

## 10.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

This report has been prepared to aid in the evaluation of the site, to prepare site grading recommendations, and to assist the structural engineer in the design of the proposed structures. It is recommended that final design drawings and specifications be reviewed by the project's geotechnical consultant to evaluate if the recommendations of this report have been properly implemented.

Recommendations presented herein are based upon the assumptions that continuous earthwork monitoring will be pr ovided by Converse. Excavation bottoms should be observed by a C onverse representative. Structural fill and backfill should be placed and compacted during continuous observation and testing by this office. Footing excavations should be observed by Converse prior to placement of steel and concrete, so that footings are founded on satisfactory materials and excavations are free of loose and disturbed materials.

## 11.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Riverside County EDA and their authorized agents, to assist in the design and construction of the proposed project. Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others.

Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed and t he recommendations of this report are modified or verified in writing. I n addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. C onverse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied. Our conclusions and recommendations are based on the results of the field investigations and laboratory tests, combined with interpolation and extrapolation of soil conditions between and beyond the boring locations.

## 12.0 REFERENCES

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# Appendix A

## Field Exploration

# APPENDIX A

## FIELD EXPLORATION

Field exploration included a site reconnaissance and subsurface exploration program. During the site reconnaissance, the surface conditions were noted, and the approximate locations of the test borings were determined. Exploratory borings were approximately located using existing boundary and other features as a guide and should be considered accurate only to the degree implied by the method used.

Ten exploratory borings (BH-1 through BH-10) were drilled within the project site (proposed park) on September 11 and 13, 2007. Two additional borings (BH-11 and BH-12) were drilled within the project site on March 2, 2016 for this investigation update. The borings were advanced using a truck-mounted drill rig equipped with eight-inch diameter hollow-stem augers for soil sampling. The depth of the borings ranged from 5.0 to 51.5 feet below existing ground surface (bgs). Encountered earth materials were continuously logged by a Converse geologist and classified in the field by visual examination in accordance with the Unified Soil Classification System. Where appropriate, field descriptions and classifications have been modified to reflect laboratory test results.

Ring samples of the subsurface materials were obtained at frequent intervals in the exploratory borings using a drive sampler (2.4-inches inside diameter and 3-inches outside diameter) lined with sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Samples are retained in brass rings (2.4-inches inside diameter and 1.0-inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Blow counts for each sample interval are presented on the logs of borings.

Bulk samples of typical soil types were also obtained. Standard Penetration Test (SPT) was also performed in the deep borings using a standard (1.4-inches inside diameter and 2.0-inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, failing 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings. The standard penetration test was performed in accordance with the ASTM Standard D1586 test method.

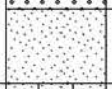
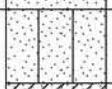
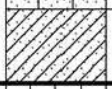
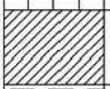
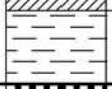
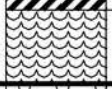
It should be noted that the exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other means, changes in material conditions that occur between driven samples are indicated in the logs at the top of the next drive sample.

Following completion of drilling, borings BH-11 and BH-12 were set up for percolation testing and presoaked. Percolation testing was completed the following day on March 03, 2016 as described in Appendix C, *Percolation Testing*. Following completion of percolation testing, the pipes were removed and the borehole was loosely filled with soil cuttings.

The surface at the boring locations may settle over time. We recommend that the property owner monitor the boring locations and backfill any settlement or depressions that might occur, or provide fencing around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

A key to soil symbols and terms is presented as Drawing No. A-1. Logs of the exploratory borings are presented in Drawing Nos. A-2 through A-13. Boring summary sheets also include descriptions of the materials, pertinent field data and supplementary laboratory data.

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS (LITTLE OR NO FINES) |  | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | |  | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) |  | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | |  | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS (LITTLE OR NO FINES) |  | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | |  | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) |  | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | |  | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 |  | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | |  | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | |  | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 |  | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | |  | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | |  | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | |  | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE 2.42" I.D. sampler.
- DRIVE SAMPLE No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

LABORATORY TESTING ABBREVIATIONS

| TEST TYPE (Results shown in Appendix B) | | STRENGTH | |
|---|---|---|---|
| | | Pocket Penetrometer | p |
| | | Direct Shear | ds |
| | | Direct Shear (single point) | ds* |
| | | Unconfined Compression | uc |
| CLASSIFICATION | | Triaxial Compression | tx |
| Plasticity | pi | Vane Shear | vs |
| Grain Size Analysis | ma | | |
| Passing No. 200 Sieve | wa | Consolidation | c |
| Sand Equivalent | se | Collapse Test | col |
| Expansion Index | ei | Resistance (R) Value | r |
| Compaction Curve | max | Chemical Analysis | ca |
| Hydrometer | h | Electrical Resistivity | er |
| Disturb | Dist. | Permeability | perm |

## UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 1**

Project ID: 06-81-245-01.GPJ; Template: KEY

# Log of Boring No. BH - 1

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)** | | | | | | r |
| | | **SILTY SAND (SM):** fine- to coarse-grained, brown. | ■ | ▨ | 15/18/18 | 2 | 114 | |
| | | - trace clay | ■ | ▨ | 7/8/8 | 4 | 119 | |
| 5 | | | ■ | | 7/9/10 | 7 | 119 | |
| 10 | | **SAND (SP):** fine- to coarse-grained, dark brown. | ■ | | 2/4/4 | 3 | 98 | |
| | | End of boring at 11.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 2**

# Log of Boring No. BH - 2

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | | | | | | ma |
| | | | ■ | | 9/10/13 | 4 | 115 | |
| 5 | | - dark brown | ■ | | 7/11/11 | 5 | 112 | col |
| 10 | | **SAND (SP):** fine- to coarse-grained, gray brown. | ■ | | 5/8/8 | 2 | 117 | |
| | | End of boring at 11.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 3**

# Log of Boring No. BH - 3

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | | | | | | ca, er |
| | | | ■ | | 6/11/11 | 3 | 111 | |
| 5 | | **SAND TO SILTY SAND (SP-SM):** fine- to coarse-grained, dark brown. | ■ | | 8/8/6 | 2 | 114 | c |
| 10 | | **SAND (SP):** fine-grained, dark gray. | ■ | | 4/4/6 | 4 | 104 | |
| | | End of boring at 11.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 4**

# Log of Boring No. BH - 4

Dates Drilled: 9/11/2007 Logged by: AB Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | | | | | | |
| | | **ALLUVIUM(Qal)** | | | | | | |
| | | **SILTY SAND (SM):** fine- to medium-grained, dark brown. | ■ | ▨ | 9/11/14 | 2 | 103 | ma, max, ds, ei |
| | | | ■ | ▨ | 4/8/5 | 5 | 108 | col |
| 5 | | | ■ | | 3/5/5 | 5 | 103 | |
| 10 | | | ■ | | 4/4/6 | 17 | 109 | |
| 15 | | | ■ | | 10/13/14 | 7 | 122 | |
| 20 | | | ■ | | 8/12/16 | 14 | 116 | |
| 25 | | | ■ | | 5/11/16 | 7 | 111 | |
| 30 | | | ☒ | | 5/6/8 | | | ma |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 5a**

# Log of Boring No. BH - 4

Dates Drilled: 9/11/2007 Logged by: AB Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **SILTY SAND (SM):** fine- to coarse-grained, brown. | X | | 10/12/10 | | | |
| 40 | | - little clay | X | | 10/18/19 | | | |
| 45 | | | X | | 26/35/50 (5") | | | |
| 50 | | **SAND (SP):** fine- to coarse-grained, brown. | X | | 25/30/50 (3") | | | |
| | | End of boring at 51.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/11/07. | | | | | | |
| 55 | | | | | | | | |
| 60 | | | | | | | | |
| 65 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 5b**

# Log of Boring No. BH - 5

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | ■ | ▨ | 6/8/9 | 3 | 113 | |
| | | | ■ | ▨ | 3/5/8 | 3 | 109 | |
| 5 | | - trace clay | ■ | | 5/9/11 | 4 | 117 | |
| 10 | | | ■ | | 3/9/10 | 6 | 113 | |
| 15 | | | ■ | | 6/13/19 | 4 | 115 | |
| | | End of boring at 16.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 6**

# Log of Boring No. BH - 6

Dates Drilled: 9/11/2007 Logged by: AB Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | | | | | | |
| | | **2" ASPHALT CONCRETE OVER 4.5" AGGREGATE BASE** | ■ | ▨ | 11/28/34 | 8 | 123 | |
| | | **ALLUVIUM(Qal)** | | | | | | |
| | | **SILTY SAND (SM):** fine- to medium-grained, dark brown. | ■ | ▨ | 10/14/10 | 8 | 125 | |
| 5 | | | ■ | ▨ | 12/12/12 | 8 | 119 | |
| 10 | | **SAND (SP):** fine- to coarse-grained, brown. | ■ | | 9/9/10 | 3 | 116 | |
| | | End of boring at 11.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/11/07. | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 7**

# Log of Boring No. BH - 7

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | | | | | | ei, ca, er |
| | | | ■ | | 3/3/5 | 5 | 113 | |
| 5 | | - dark brown | ■ | | 3/3/3 | 7 | 114 | ds, col |
| 10 | | | ■ | | 5/8/11 | 7 | 110 | |
| 15 | | **SAND (SP):** fine- to coarse-grained, brown. | ■ | | 6/10/15 | 5 | 106 | ma, se |
| 20 | | | ■ | | 7/15/11 | 3 | 118 | |
| | | End of boring at 21.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 8**

# Log of Boring No. BH - 8

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | ■ | | 2/3/5 | 7 | 114 | |
| 5 | | | ■ | | 3/3/5 | 9 | 118 | |
| 10 | | | ■ | | 3/8/9 | 7 | 113 | |
| 15 | | **SAND (SP):** fine- to coarse-grained, brown. | ■ | | 5/9/9 | 2 | 115 | |
| | | End of boring at 16.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 9**

# Log of Boring No. BH - 9

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)**<br>**SILTY SAND (SM):** fine- to coarse-grained, brown. | ■ | ▨ | 7/10/14 | 2 | 110 | |
| 5 | | | ■ | ▨ | 7/7/3 | 4 | 109 | col |
| 10 | | | ■ | | 4/7/13 | 8 | 104 | |
| | | End of boring at 11.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 10**

# Log of Boring No. BH -10

Dates Drilled: 9/13/2007 Logged by: CG Checked By: RJR

Equipment: CME 75 WITH 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM(Qal)** | | | | | | |
| | | **SILTY SAND (SM):** fine- to coarse-grained, brown. | ■ | ▨ | 10/11/11 | 3 | 112 | |
| | | | ■ | ▨ | 5/5/9 | 4 | 107 | |
| 5 | | - trace to little clay | ■ | | 12/15/11 | 4 | 119 | |
| 10 | | **SAND TO SILTY SAND (SP-SM):** fine- to coarse-grained, brown. | ■ | | 4/6/8 | 2 | 111 | se |
| 15 | | | ■ | | 6/10/15 | 4 | 113 | |
| | | End of boring at 16.5 feet.<br>Groundwater not encountered during drilling.<br>Boring backfilled with soil cuttings on 9/13/07. | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **A - 11**

# Log of Boring No. BH-11

Dates Drilled: 3/2/2016 Logged by: Jay Burnham Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, brown. | | | | | | ma |
| | | | ■ | | 13/16/11 | 2 | 113 | |
| 5 | | End of boring at 5 feet bgs.<br>No groundwater encountered.<br>Borehole set up for percolation testing on March 2, 2016. | | | | | | |

Converse Consultants

Proposed Nuview Library Expansion
29990 Lakeview Ave
Unincorporated area of Nuevo, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No. 06-81-245-03

Drawing No. A-12

# Log of Boring No. BH-12

Dates Drilled: 3/2/2016 Logged by: Jay Burnham Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | | | | | | |
| | | **UNDOCUMENTED FILL** | | | | | | |
| | | **SILTY SAND (SM):** fine to coarse-grained, trace CLAY, olive brown. | | ■ | | | | ma, max, ca, er |
| | | | ■ | | 8/13/32 | 9 | 129 | |
| 5 | | | ■ | | 15/14/11 | 6 | 114 | |
| | | **ALLUVIUM** | ■ | ■ | 3/4/4 | 7 | 117 | col ma |
| | | **SILTY SAND (SM):** fine to coarse-grained, trace CLAY, olive brown. | | | | | | |
| 10 | | | ■ | ■ | 3/3/3 | 5 | 112 | |
| 15 | | | ■ | | 8/9/13 | 8 | 114 | |
| 20 | | | ☒ | | 2/4/6 | | | |
| 25 | | | ■ | | 8/7/13 | 11 | 102 | |
| 30 | | | ☒ | | 2/3/6 | | | |

Converse Consultants

Proposed Nuview Library Expansion
29990 Lakeview Ave
Unincorporated area of Nuevo, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No. 06-81-245-03

Drawing No. A-13a

# Log of Boring No. BH-12

Dates Drilled: 3/2/2016 Logged by: Jay Burnham Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): Depth to Water (ft): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | | | | | | |
| | | **SAND (SP):** fine to coarse-grained, brown. | ■ | | 10/18/22 | 4 | 119 | |
| 40 | | - trace CLAY, red brown | ☒ | | 6/10/14 | | | |
| 45 | | **SILTY SAND (SM):** fine to coarse-grained, brown. | ■ | | 12/17/25 | 8 | 120 | |
| | | - no CLAY | ☒ | | 11/14/19 | | | |
| 50 | | End of boring at 50 feet bgs.<br>No groundwater encountered.<br>Borehole set up for percolation testing on March 2, 2016. | | | | | | |

Converse Consultants

Proposed Nuview Library Expansion
29990 Lakeview Ave
Unincorporated area of Nuevo, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No. **06-81-245-03**

Drawing No. **A-13b**

# Appendix B

## Laboratory Testing Program

# APPENDIX B

# LABORATORY TESTING PROGRAM

Tests were conducted in the Converse Geotechnical Laboratory on representative samples for the purpose of evaluating physical properties and engineering characteristics. Tests performed on samples collected borings BH-1 through BH-10 were for the park investigation completed in 2007 and borings BH-11 and BH-12 were performed for the library building update. Test results are presented on the exploration logs and in this appendix. A summary of the various laboratory tests conducted is presented below.

## Moisture Content and Dry Density

Results of moisture content and dry density tests, performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide quantitative measure of the *in situ* dry density. Data obtained from this test provides qualitative information on strength and compressibility characteristics of site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

## Collapse Potential

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, seven representative ring samples were loaded up to approximately 2 kips per square foot (ksf), allowed to stabilize under load, and then submerged. The test was conducted in accordance with ASTM Standard D5333 laboratory procedure. The test results are presented in the following table.

**Table No. B-1, Collapse Tests Results**

| Boring No | Sample Depth (feet) | Soil Description | Percent Collapse, % (+/- Swell/Collapse) | Collapse Potential |
|---|---|---|---|---|
| BH-2 | 5.0-6.5 | Silty Sand (SM) | -1.5 | Slight |
| BH-3* | 5.0-6.5 | Sand to Silty Sand (SP-SM) | -0.3 | Slight |
| BH-4 | 3.0-3.5 | Silty Sand (SM) | -0.8 | Slight |
| BH-7 | 5.0-6.5 | Silty Sand (SM) | -0.3 | Slight |
| BH-9 | 5.0-6.5 | Silty Sand (SM) | -2.1 | Moderate |
| BH-12** | 7.5-9.0 | Silty Sand (SM), trace Clay | -3.6 | Moderate |

*Obtained from Consolidation Test.
** Test performed for the updated report

## Expansion Index Tests

Two representative bulk samples were tested to evaluate the expansion potential of material encountered at the site. The test was conducted in accordance with ASTM Standard D4829. The test results are presented in the following table.

**Table No. B-2, Expansion Index Test Results**

| Boring No. | Depth (feet) | Soil Description | Expansion Index | Expansion Potential |
|---|---|---|---|---|
| BH-4 | 0-5 | Silty Sand (SM) | 2 | Very Low |
| BH-7 | 0-5 | Silty Sand (SM) | 0 | Very Low |

## R-value Test

One representative bulk soil sample was tested for resistance value (R-value) in accordance with State of California Standard Method CT301. This test is designed to provide a relative measure of soil strength for use in pavement design. The test results are shown in the following table.

**Table No. B-3, R-value Test Result**

| Boring No. | Depth (feet) | Soil Classification | Measured R-value |
|---|---|---|---|
| BH-1 | 0-5 | Silty Sand (SM) | 38 |

## Sand Equivalent Tests

Two representative bulk samples were tested in accordance with the ASTM Standard D2419 to determine the Sand Equivalent (SE). Test results are summarized in the following table.

**Table No. B-4, Sand Equivalent Test Results**

| Boring No. | Depth (feet) | Soil Description | Sand Equivalent |
|---|---|---|---|
| BH-7 | 15-20 | Silty Sand (SM) | 19 |
| BH-10 | 0-5 | Silty Sand (SM) | 16 |

## Soil Corrosivity

Three representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests is to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were

performed by Schiff Associates in Claremont, California. The test results are presented in the following table.

**Table No. B-5, Corrosivity Test Results**

| Sample Location (Boring/Depth) | Depth (ft) | pH | Soluble Sulfate (CA 417) (ppm) | Soluble Chlorides (CA 422) (ppm) | Saturated Resistivity (CA 643) Ohm-cm |
|---|---|---|---|---|---|
| BH-3 | 0.0-5.0 | 7.5 | 28 | 1.7 | 11,200 |
| BH-7 | 0.0-5.0 | 7.1 | 31 | 16.0 | 4,160 |
| BH-12* | 1.0-5.0 | 7.9 | 560 | 0.020 | 690 |

* Test performed for the updated report

## Grain-Size Analysis

To assist in classification of soils, mechanical grain-size analyses were performed on six selected samples. Testing was performed in general accordance with the ASTM Standard D422 test method. Grain-size curves for the original report test results are shown in Drawing No. B-1a, *Grain Size Distribution Results*. Grain-size curves for the update report test results are shown in Drawing No. B-1b, *Grain Size Distribution Results*.

## Maximum Dry Density Test

Laboratory maximum dry density-moisture content relationship tests were performed on two representative bulk samples. The tests were conducted in accordance with ASTM Standard D1557 laboratory procedure. The original report test results are presented on Drawing No. B-2a, *Moisture-Density Relationship Results*. The update report test results are presented on Drawing No. B-2b, *Moisture-Density Relationship Results*

## Direct Shear Tests

Two direct shear tests were performed on a relatively undisturbed sample and a sample remolded to 90 percent of the laboratory maximum dry density at soaked moisture conditions. For each test, three sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated loading conditions.

The samples were sheared at a constant strain rate of 0.05 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Peak strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample

density and moisture content, see Drawing Nos. B-3 and B-4, *Direct Shear Test Results,* and in the following table.

**Table No. B-6, Direct Shear Test Results**

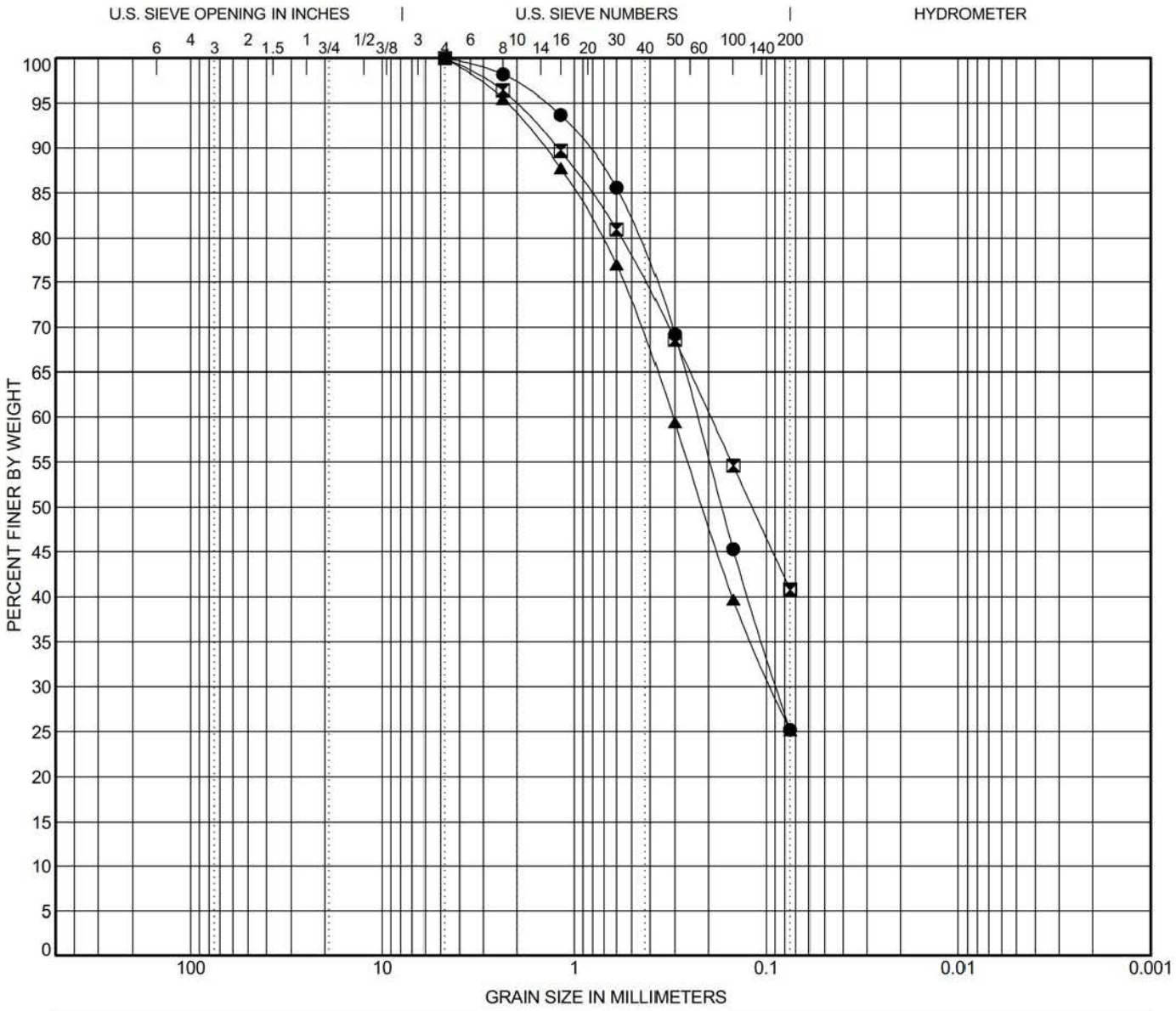
| Boring No. | Depth (feet) | Soil Classification | Test Conditions | Friction Angle (degrees) | Cohesion (psf) |
|---|---|---|---|---|---|
| BH-4 | 0.0-5.0 | Silty Sand (SM) | Remolded to 90% Relative Compaction | 39 | 0 |
| BH-7 | 5.0-6.5 | Silty Sand (SM) | Saturated and drained | 31 | 200 |

## Consolidation Test

Data obtained from this test performed on a relatively undisturbed soil sample was used to evaluate the settlement characteristics of the foundation soils under load. Preparation for this test involved trimming the sample and placing the one-inch high brass ring into the test apparatus, which contained porous stones, both top and bottom, to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state of equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. The sample was tested at field and submerged conditions. The test results, including sample density and moisture content, are presented in Drawing No. B-5, *Consolidation Test Results*.

## Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Boring No. | Depth (ft) | Description | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | BH - 2 | 0.0-5.0' | SILTY SAND (SM) | | | | | |
| ⊠ | BH - 4 | 30.0-31.5' | SILTY SAND (SM) | | | | | |
| ▲ | BH - 7 | 15.0-20.0' | SILTY SAND (SM) | | | | | |

| | Boring No. | Depth (ft) | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | BH - 2 | 0.0-5.0' | 4.75 | 0.229 | 0.088 | | 0.0 | 74.8 | 25.2 | |
| ⊠ | BH - 4 | 30.0-31.5' | 4.75 | 0.195 | | | 0.0 | 59.2 | 40.8 | |
| ▲ | BH - 7 | 15.0-20.0' | 4.75 | 0.307 | 0.094 | | 0.0 | 74.8 | 25.2 | |

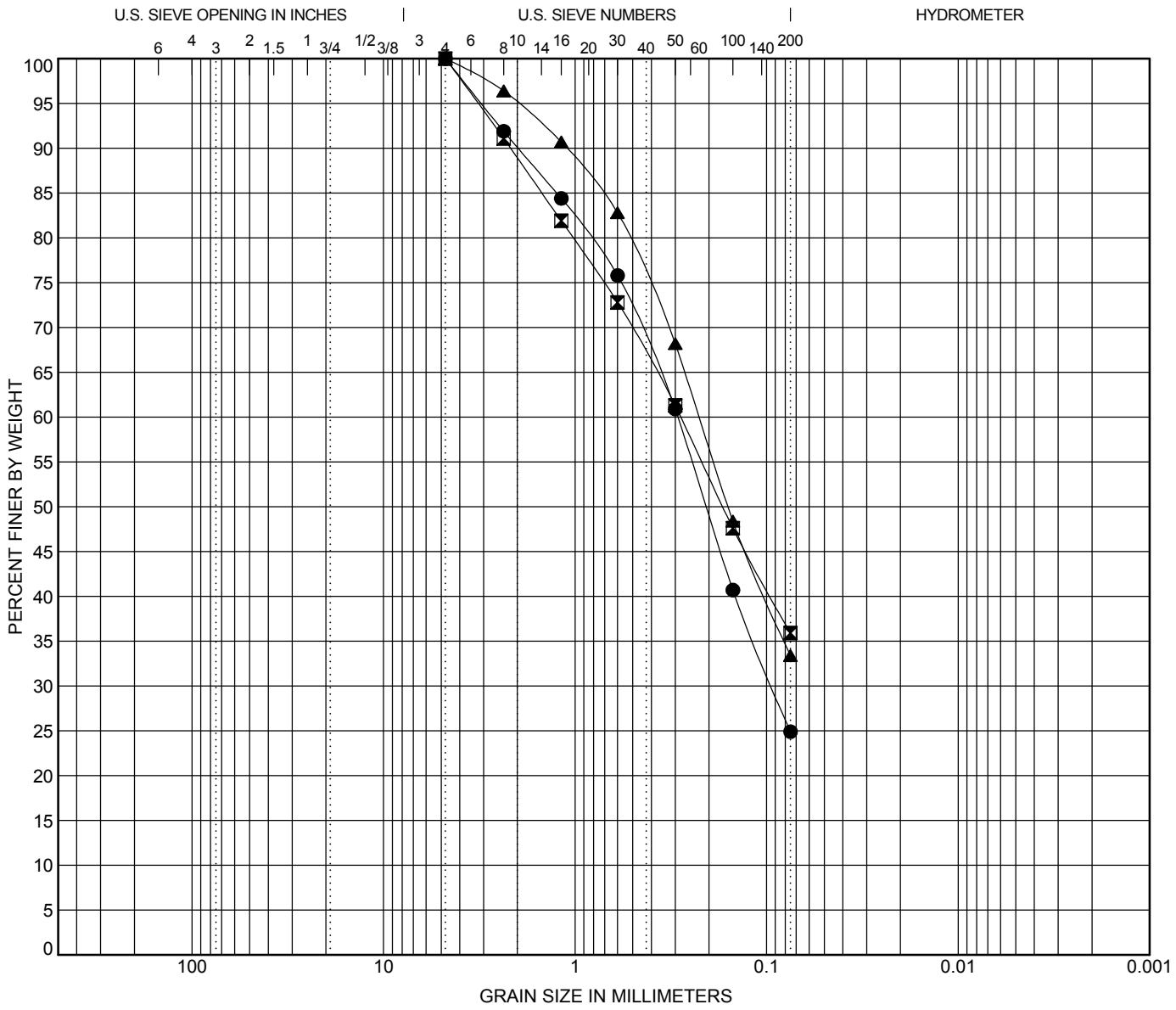
# GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **B - 1a**




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Boring No. | Depth (ft) | Description | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | **BH-11** | **1.0-5.0** | **Silty Sand (SM)** | | | | | |
| ⊠ | **BH-12** | **1.0-5.0** | **Silty Sand (SM), trace Clay** | | | | | |
| ▲ | **BH-12** | **7.5-12.5** | **Silty Sand (SM), trace Clay** | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | Boring No. | Depth (ft) | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | **BH-11** | **1.0-5.0** | **4.75** | **0.291** | **0.094** | | **0.0** | **75.1** | **24.9** | |
| ⊠ | **BH-12** | **1.0-5.0** | **4.75** | **0.281** | | | **0.0** | **64.1** | **35.9** | |
| ▲ | **BH-12** | **7.5-12.5** | **4.75** | **0.225** | | | **0.0** | **66.6** | **33.4** | |
| | | | | | | | | | | |
| | | | | | | | | | | |

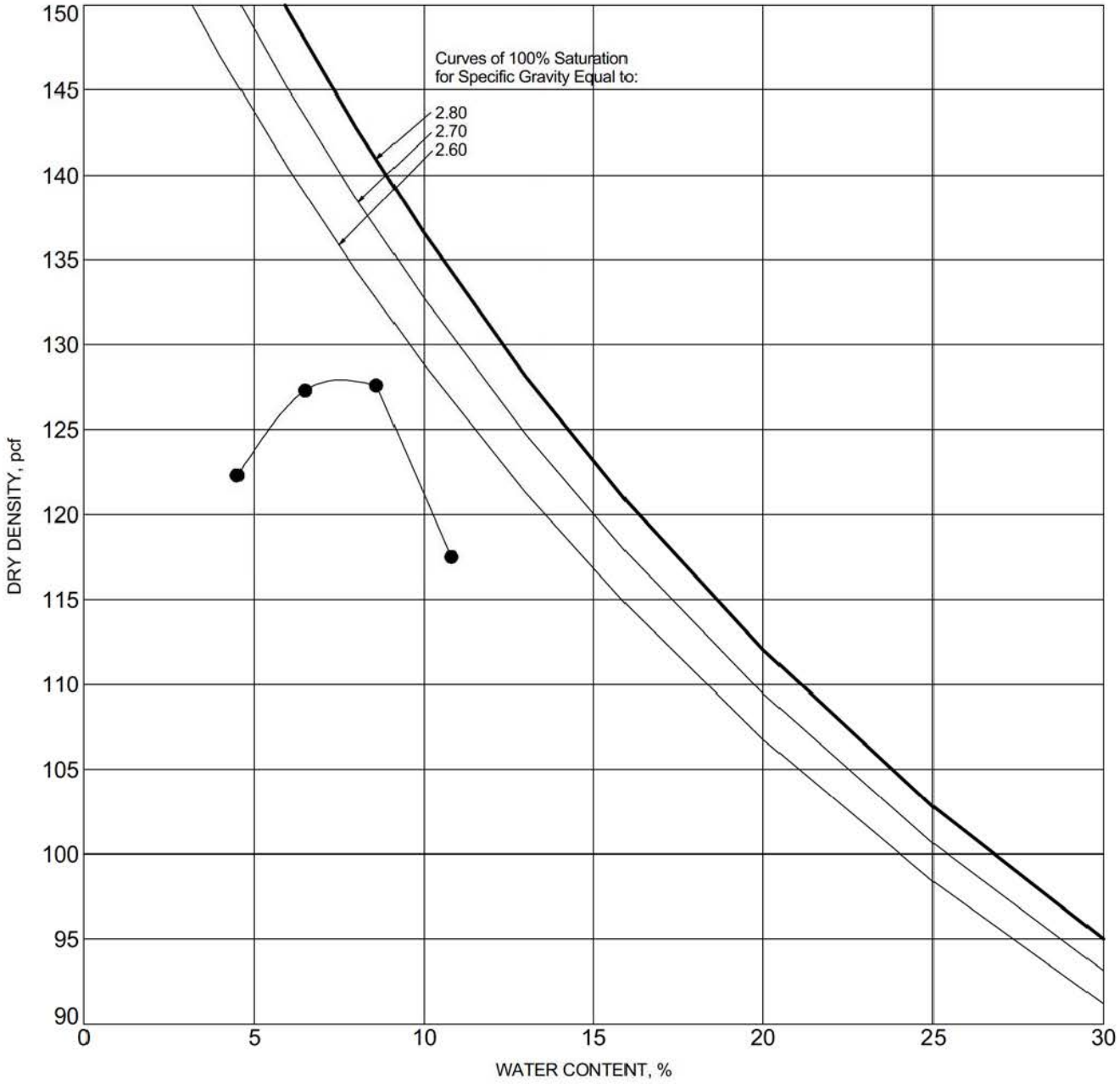
# GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Proposed Nuview Library Expansion
29990 Lakeview Ave
Unincorporated area of Nuevo, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No. **06-81-245-03**

Drawing No. **B-1b**




| SYMBOL | BORING NO. | DEPTH (ft) | DESCRIPTION | ASTM TEST METHOD | OPTIMUM WATER, % | MAXIMUM DRY DENSITY, pcf |
|---|---|---|---|---|---|---|
| ● | BH - 4 | 0.0-5.0' | SILTY SAND (SM) | A | 7.5 | 129.5 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

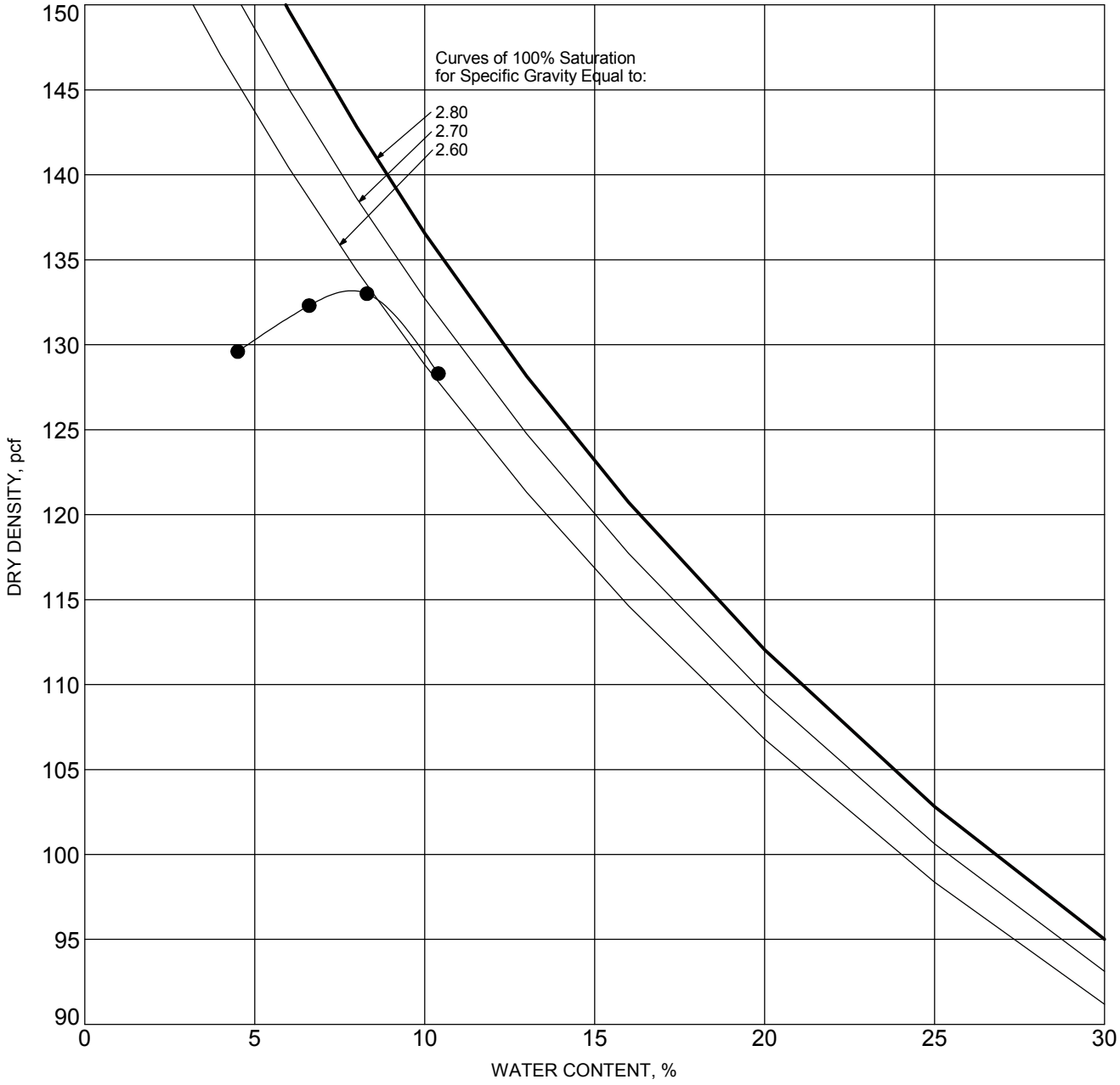
## MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No.
**06-81-245-01**

Drawing No.
**B - 2a**




| SYMBOL | BORING NO. | DEPTH (ft) | DESCRIPTION | ASTM TEST METHOD | OPTIMUM WATER, % | MAXIMUM DRY DENSITY, pcf |
|---|---|---|---|---|---|---|
| ● | **BH-12** | **7.5-12.5** | **Silty Sand (SM), trace Clay, Olive Brown** | **D1557 - B** | **8.0** | **133.5** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

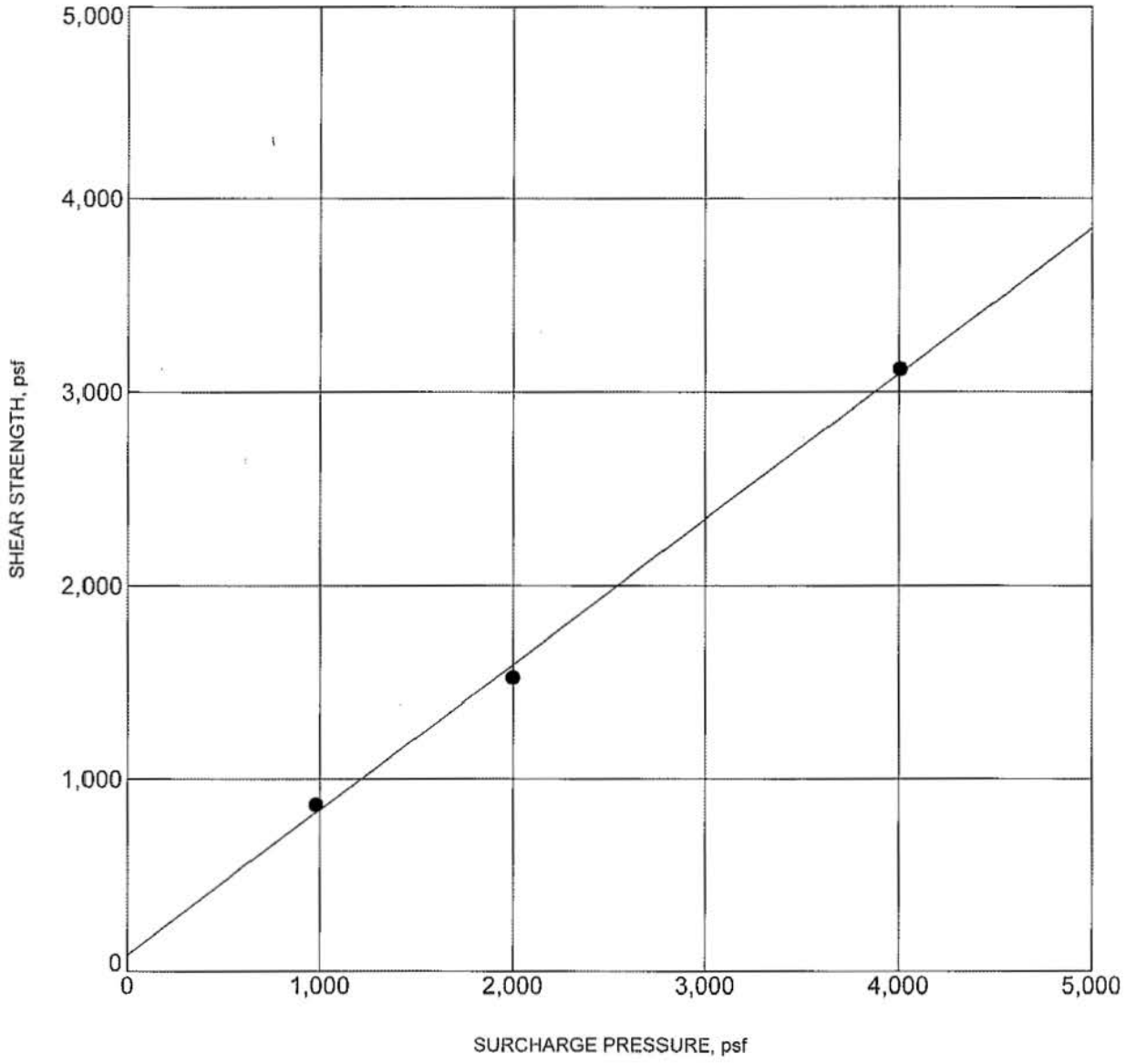
# MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Proposed Nuview Library Expansion
29990 Lakeview Ave
Unincorporated area of Nuevo, Riverside County, California
For: County of Riverside Economic Development Agency (EDA)

Project No. **06-81-245-03**

Drawing No. **B-2b**




| | | | |
|---|---|---|---|
| BORING NO. : | BH - 4 | DEPTH (ft) : | 0.0-5.0' |
| DESCRIPTION : | SILTY SAND (SM) | | |
| COHESION (psf) : | 100 | FRICTION ANGLE (degrees) : | 37 |
| MOISTURE CONTENT (%) : | 7.7 | DRY DENSITY (pcf) : | 117.2 |

NOTE: Ultimate Strength, Sample Remolded to 90% of the Laboratory Maximum Dry Density

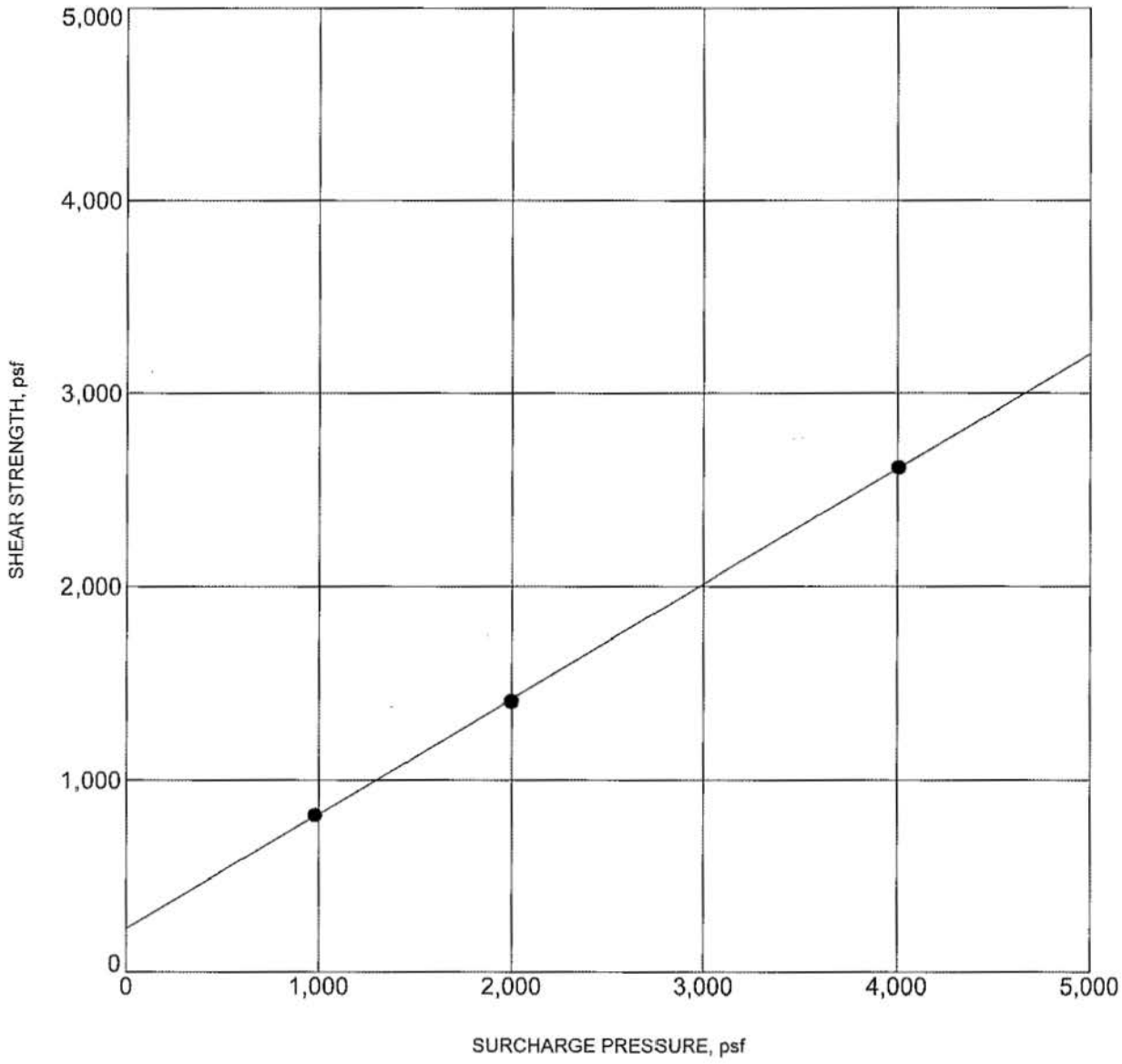
# DIRECT SHEAR TEST RESULTS

Converse Consultants

PROPOSED MAUEL PARK
Unincorporated Area of Lakeview/Nuevo,
Riverside County, California
For: RHA Landscape Architects

Project No. 06-81-245-01

Drawing No. B - 3




| | | | | | |
|---|---|---|---|---|---|
| BORING NO. | : | **BH - 7** | DEPTH (ft) | : | **5.0-6.5'** |
| DESCRIPTION | : | **SILTY SAND (SM)** | | | |
| COHESION (psf) | : | **200** | FRICTION ANGLE (degrees) | | **31** |
| MOISTURE CONTENT (%) | : | **7.7** | DRY DENSITY (pcf) | : | **114.1** |

NOTE: Ultimate Strength.

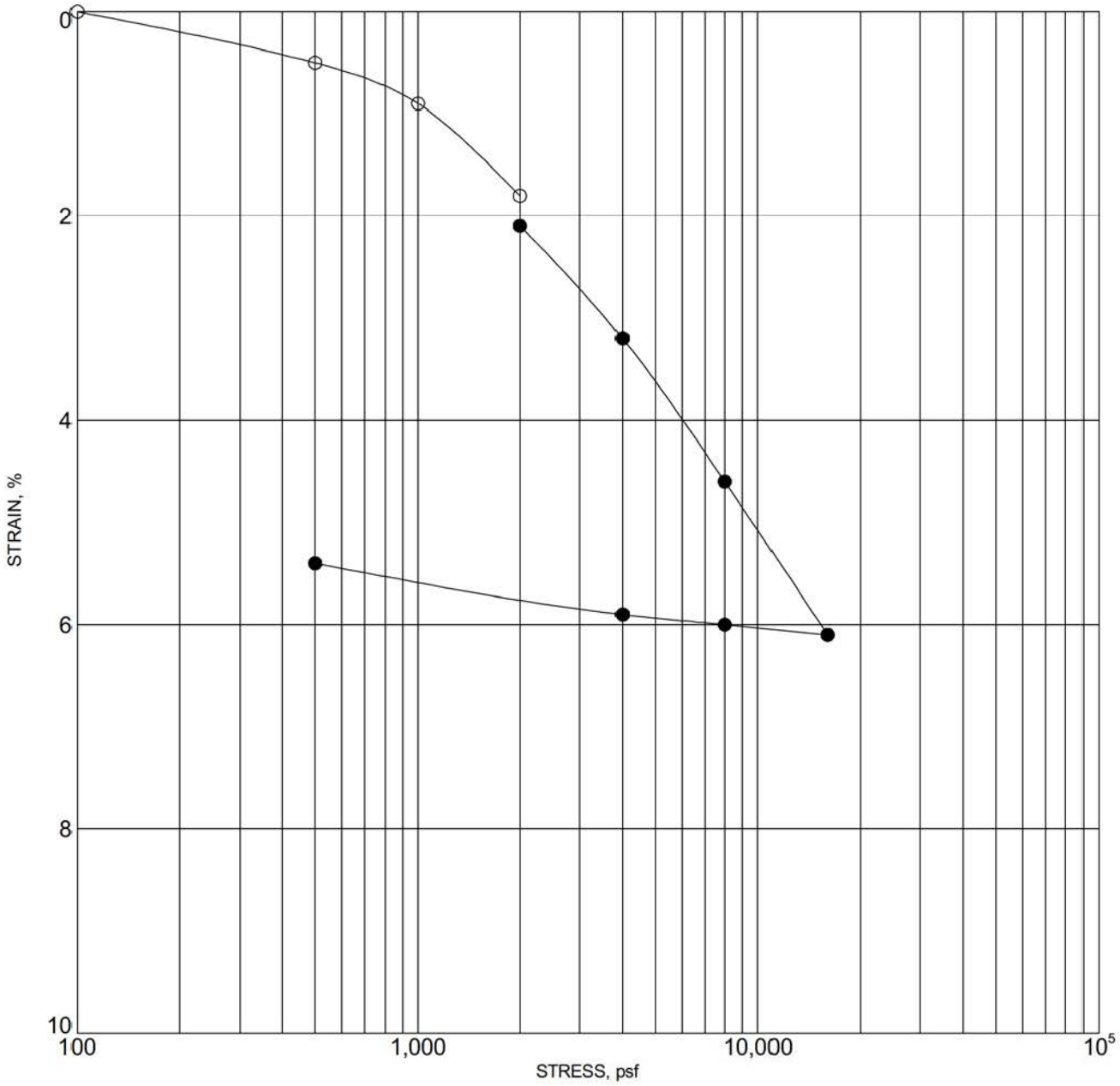
# DIRECT SHEAR TEST RESULTS

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **B - 4**




| BORING NO. : | BH - 3 | DEPTH (ft) : | 5.0-6.5' |
|---|---|---|---|
| DESCRIPTION : | SAND TO SILTY SAND (SP-SM) | | |

| | MOISTURE CONTENT (%) | DRY DENSITY (pcf) | PERCENT SATURATION | VOID RATIO |
|---|---|---|---|---|
| INITIAL | 2.3 | 113.5 | 13 | 0.453 |
| FINAL | 14.2 | 120 | 100 | 0.374 |

NOTE: Solid Circles Indicate Readings After Addition of Water

# CONSOLIDATION TEST RESULTS

Converse Consultants

**PROPOSED MAUEL PARK**
**Unincorporated Area of Lakeview/Nuevo,**
**Riverside County, California**
**For: RHA Landscape Architects**

Project No. **06-81-245-01**

Drawing No. **B - 5**

# Appendix C

## Percolation Testing and Infiltration Rate Evaluation

# APPENDIX C

## PERCOLATION TESTING AND INFILTRATION RATE EVALUATION

Percolation testing was performed at two locations (BH-11 and BH-12). Testing was performed in general accordance with the Design Handbook for Low Impact Development Best Management Practices, Appendix A – Infiltration Testing (RCFCWD, 2011) for BH-11, and the Riverside County Technical Guidance Manual, Onsite Wastewater Treatment Systems, Chapter 3 – Percolation Tests and Requirements (RCDEH, undated) for BH-12. The depths of the percolation test holes were provided by Matt Acton, Lead Designer for Holt Architecture, based on the planned depths of the retention basin and seepage pit. The approximate location of the percolation test holes are shown in Figure No. 2, *Approximate Boring Locations Map.*

The percolation test holes were drilled on March 2, 2016 to a depth of 5.0 and 50.0 feet bgs using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers. See Appendix A, *Field Exploration*, for a log of the test hole.

Upon completion of drilling, a 2-inch thick gravel layer was placed at the bottom of the hole and a 2-inch diameter perforated pipe was installed above the gravel to the ground surface. The boring annulus around the pipe was filled with gravel. The purpose of the pipe and gravel was to reduce the potential for erosion and caving due to the addition of water to the hole. The test holes were presoaked by filling with water to the ground surface.

In boring BH-11, more than 6 inches of water seeped away in two consecutive 25-minute intervals after the initial presoak, indicating that the test hole met the criteria for testing as sandy soil in accordance with RCFCWD guidelines. During testing, the water level and total depth of the test hole were measured from the top of the pipe every 10 minutes for 1 hour. After each measurement, the water level was adjusted to a depth of at least 5 times the radius of the hole. Following the completion of percolation testing, the pipe was removed and the percolation test hole was loosely backfilled with excavated soil.

In boring BH-12, less than half of the water seeped away during two consecutive 25-minute periods after the initial presoak, indicating that the test hole did not meet the criteria for testing as sandy soil. Percolation testing was conducted the following day in accordance with Riverside County DEH guidelines. During testing, the water level and total depth of the test hole were measured from the top of the pipe every 30 minutes for 6 hours. After each measurement, the water level was adjusted to approximately the design depth of the seepage pit inlet. Following the completion of percolation testing, the pipe was removed and the percolation test hole was loosely backfilled with excavated soil.