APPENDIX A

GEOTECHNICAL REPORT

DATED OCTOBER 30, 2008

GEOTECHNICAL INVESTIGATION REPORT
Perris Valley Big League Dreams Sports
Park Perris, California

October 30, 2008

Converse Project No. 07-81-368-01

Prepared For:

MIG
800 North Harbor Boulevard
Fullerton, California 92832

Converse Consultants

Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

October 30, 2008

Mr. Jim Pickel
Principal
MIG
800 North Harbor Boulevard
Fullerton, California 92832

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
Perris Valley Big League Dreams Sports Park
Perris, California
Converse Project No. 07-81-368-01

Dear Mr. Pickel:

Presented herein are the results of our geotechnical investigation performed for the proposed Perris Valley Big League Dreams Sports Park in Perris, California. This work was performed in accordance with our proposal dated November 7, 2007, your Master Agreement dated February 29, 2008, and your Professional Services Supplement Agreement authorized on April 29, 2008.

Based upon our observations, testing and analysis, it is our opinion that the subject site can be developed from a geotechnical standpoint to support the proposed development provided the findings, conclusions, and recommendations presented in this report are incorporated in the preparation of the final foundation design and construction of the project.

Thank you for the opportunity of working with MIG on this project. If there are any questions, please call us at (909) 796-0544. We look forward to assisting you during site-grading and construction.

CONVERSE CONSULTANTS

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

Dist: 4/Addressee

RJR/GT/HSQ/mjr

10391 Corporate Drive, Redlands, California 92374
Telephone: (909) 796-0544 ♦ Facsimile: (909) 796-7675 ♦ e-mail: redlands@converseconsultants.com

PROFESSIONAL CERTIFICATION

This report has been prepared by the staff of Converse Consultants (Converse) under the professional supervision of 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 California. There is no warranty, either expressed or implied.

Roy J. Rushing, P.G., C.E.G.
Senior Geologist

PROFESSIONAL GEOLOGIST
ROY J. RUSHING
NO. 1080
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Gennady Tsarev, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
GENNADY TSAREV
NO. 67997
EXP. 6-30-09
CIVIL
STATE OF CALIFORNIA

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 shall prevail.

- The site is located at the northeast corner of Trumble Road and Mapes Road in the city of Perris, California. It is comprised of approximately 37 acres and is located within a mixed-use area.

- The site is bounded by Mapes Road and open land to the south, open land to the north, Sherman Road and residential development to the east, and Trumble Road and the Eastern Municipal Water District (EMWD) facilities to the west.

- The Big League Dreams Sports Park will include six (6) baseball/softball fields, an indoor field house, Stadium Club, Concession, Administration and Maintenance buildings, a batting cage, playground and picnic areas, walkways, interior lighting, parking and other improvements associated with such a complex.

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

- Twenty-seven (27) borings (BH-1 through BH-27) were drilled and sampled up to a depth of 51.5 feet below ground surface (bgs).

- The soil materials observed within our borings consist primarily of up to 16.5 feet of undocumented fill (mixtures of sand, silt and clay) and alluvium (also mixtures of sand, silt and clay) to the maximum explored depth of 51.5 feet bgs. Based on results of laboratory testing, it is our opinion the undocumented fill is suitable to support structural loads after remedial grading.

- Review of National Flood Insurance Rate Maps (FIRM) indicates that the project site is within a Flood Hazard Zone "X". Zone "X" is designated as "Areas determined to be outside the 0.2% annual chance floodplain." (FIRM, August 28, 2008).

- Groundwater was not encountered in to the maximum explored depth of 51.5 feet bgs. Based on available information, groundwater levels measured between February and May 2008, ranged from about 45 to 80 feet below the ground

surface. These levels are expected to fluctuate due to infiltration from the EMWD ponds. It should be noted that the fluctuations in the groundwater level could also occur due to change in seasons, variations in rainfall, and other factors.

- The site is not situated within a currently designated State of California Earthquake Fault Zone for surface fault rupture. The site is, however, located in a seismically active zone. Ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur during the lifetime of the project.

- The California Building Code (2007) design parameters are provided in the following table.

Seismic Parameters	
Site Class	"C"
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.500g
Mapped 1-second Spectral Response Acceleration, S_1	0.600g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from Table 1613.5.3(2)), F_v	1.3
MCE 0.2-sec period Spectral Response Acceleration, SM_s	1.500g
MCE 1-second period Spectral Response Acceleration, SM_1	0.780g
Design Spectral Response Acceleration for short period, S_{ds}	1.000g
Design Spectral Response Acceleration for 1-second period, S_{d1}	0.520g

- The potential of seismic hazards due to the secondary effects of earthquakes including seismically induced ground settlement and differential settlement, slope stability, lateral spreading, landslides, earthquake induced flooding are considered to be very low to low. Based on the site location, tsunamis or seiches do not pose a hazard.

- The site soils are considered not susceptible to liquefaction under earthquake ground shaking due to deep groundwater and relatively dense conditions of soil.

- Based on the results of the collapse tests, the potential for collapse of the native soils is negligible.

- The near surface soil materials exhibit "Very Low" and "Low" expansion potential as defined by the ASTM D4829 test method.

- Based on the corrosivity test results, the site soils have "Negligible" sulfate exposure to concrete. Therefore, Type II Portland cement may be used. Minimum electrical resistivity test result indicates that the site soils are "Moderately Corrosive" to "Corrosive" when in contact with ferrous metals.

- Subsurface materials within the project site should be excavatable with conventional heavy-duty equipment.

- Site-grading for proposed structures, in general, should include excavation of the upper two (2) feet of existing alluvial soil and undocumented fill in fill areas, and the upper three (3) feet in cut areas, and to five (5) feet beyond the building limits. The excavation should also provide at least two (2) feet or equal to the footing width, whichever is greater, of properly compacted fill beneath all foundations and slab-on-grade.

- After excavation, the exposed soil subgrade should be scarified to 12 inches; moisture conditioned within two (2) percent of the optimum moisture content for coarse-grained soils, up to two (2) percent over the optimum moisture content for fine-grained soils, and then compacted to at least 90 percent of the laboratory maximum dry density.

- Site-grading for pavement areas should consist of excavation of at least two (2) feet of existing alluvium or undocumented fill. Where depth of cut to subgrade elevation exceeds two (2) feet, no additional excavation will be required. Pavement sections can be placed on alluvial soils or undocumented fill with the upper 12 inches scarified, moisture conditioned and then recompacted.

- Site-grading for playground areas can consist of scarification and recompaction at the upper 12 inches. The fill areas should over-excavated at least two (2) feet prior to placing additional fill.

- All fill and backfill soils should be placed in lifts not exceeding 8 inches in thickness, moisture conditioned within two (2) percent of the optimum moisture content for coarse-grained soils, up to two (2) percent over the optimum moisture content for fine-grained soils, then compacted to at least 90 percent of the laboratory maximum dry density. The fill materials should be compacted to at least 95 percent at 12 inches below pavement sections.

- The maximum size of soil particles in the compacted fill should be three (3) inches in maximum dimension. The upper twelve (12) inches of compacted fill beneath footings and slabs should be a maximum of one (1) inch in maximum dimension.

- The proposed structures may be supported on continuous (strip) and/or isolated spread footings. Continuous and isolated spread footings for one-story structures should be at least 12 and 18 inches wide, respectively. Continuous and isolated footings for two-story structures should be 18 and 24 inches wide, respectively. The depth of embedment below lowest adjacent soil grade for one-story and two-

story structures should be at least 12 and 15 inches, respectively. Continuous and isolated footings should be founded on at least two (2) feet or equal to the footing width of compacted fill.

- The recommended net allowable vertical bearing capacity for footings bearing on compacted fill at least 12 inches below lowest adjacent grade is 2,500 pounds per square foot (psf).

- Resistance to lateral loads may be provided by the passive earth pressures acting behind the footings and by the frictional resistances at the base. A coefficient-of-friction of 0.3 may be used. An allowable passive lateral earth pressure of 250 psf per foot of depth may be used for the sides of footings constructed against soils.

- The allowable bearing capacity and passive resistance can be increased by one-third to resist transient loads such as those caused by wind or seismic loads.

- Temporary construction slopes, greater than four (4) feet in height or depth, should be sloped or shored in accordance with the requirements of CAL-OSHA.

- Surface drainage should be sloped away from the proposed buildings. Ponding of surface water should not be allowed adjacent to buildings foundation.

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

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE LOCATION AND HISTORY 1

3.0 SITE DESCRIPTION 1

4.0 PROJECT DESCRIPTION 1

5.0 SCOPE OF WORK 3

5.1 SUBSURFACE EXPLORATION 3
5.2 LABORATORY TESTING 3
5.3 ANALYSES AND REPORT 4

6.0 SITE CONDITIONS 4

6.1 GENERAL 4
6.2 GEOLOGIC SETTING 4
6.3 SITE GEOLOGY 4
6.4 SUBSURFACE CONDITIONS 5
6.5 GROUNDWATER 5
6.6 FLOODING 5

7.0 LABORATORY TESTING 6

8.0 FAULTING AND SEISMICITY 7

8.1 FAULTING 7
8.2 DESIGN RESPONSE SPECTRA 8
8.3 CBC SEISMIC DESIGN PARAMETERS 9
8.4 GEOLOGIC HAZARDS DUE TO SEISMIC ACTIVITIES 9

9.0 SOIL CORROSIVITY EVALUATION 11

10.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS 11

10.1 GENERAL 11
10.2 EXCAVATION WITHIN BUILDING PADS 12
10.3 EXCAVATION FOR PAVEMENT AREAS 12
10.4 EXCAVATION FOR PLAYGROUND AREAS 13
10.5 SUBGRADE PREPARATION 13
10.6 STRUCTURAL FILL 13
10.7 RETAINING WALL BACKFILL 14
10.8 EXCAVATABILITY 14
10.9 SLOPES 14

11.0 SHRINKAGE AND SUBSIDENCE 14

12.0 UTILITY TRENCH BACKFILL 15

12.1 PIPE BEDDING 15
12.2 TRENCH ZONE BACKFILL 16

13.0 DESIGN RECOMMENDATIONS 16

13.1 FOUNDATION TYPE AND BEARING PRESSURES 16
13.2 DRILLED PIER FOUNDATION 17
13.3 LATERAL EARTH PRESSURES AND RESISTANCE TO LATERAL LOADS 18
13.4 SETTLEMENT 19
13.5 MODULUS OF SUBGRADE REACTION 19
13.6 SLAB-ON-GRADE 19
13.7 FLEXIBLE ASPHALT CONCRETE PAVEMENT DESIGN 20

14.0 CONSTRUCTION RECOMMENDATIONS 22

14.1 TEMPORARY TRENCH EXCAVATIONS 22

15.0 PLAN REVIEW AND CONSTRUCTION INSPECTION SERVICES 22

16.0 CLOSURE 23

17.0 REFERENCES 24

ILLUSTRATIONS

FIGURES

Following Page No.

Figure No. 1, *Site Location Map* 1
Figure No. 2, *Earthquake Design Spectra* 8

DRAWING

Drawing No. 1, *Geologic and Approximate Boring Location Map* ..... In Map Pocket

TABLES

Page No.

Table No. 1, *Seismic Characteristics of Nearby Active Faults*.....7
Table No. 2, *Design Response Spectra*.....8
Table No. 3, *CBC Seismic Parameters*.....9
Table No. 4, *Lateral Earth Pressure*.....18
Table No. 5, *Preliminary Asphalt Pavement Sections*.....20
Table No. 6, *Recommended Preliminary PCC Pavement Sections*.....21
Table No. 7, *Slope Ratios for Temporary Trench Excavation*.....22

APPENDICES

Appendix A.....*Field Exploration*
Appendix B.....*Laboratory Testing Program*
Appendix C.....*Earthwork Specifications*

1.0 INTRODUCTION

This report presents the results of our geotechnical exploration performed for the proposed Perris Valley Big League Dreams Sports Park project in Perris, California. The location of the project is shown on Figure No. 1, *Site Location Map.*

2.0 SITE LOCATION AND HISTORY

The site is located at the northeast corner of Trumble Road and Mapes Road in the city of Perris, California. It is comprised of approximately 37 acres and is located within a mixed-use area. The site is bounded by Mapes Road and open land to the south, open land to the north, Sherman Road and residential development to the east, and Trumble Road and the Eastern Municipal Water District (EMWD) facilities to the west. Several underground utility easements are present adjacent to Trumble, Mapes and Sherman Roads. The site elevations range between about 1,432 feet above Mean Sea Level (MSL) in the central area of the project and near Sherman Road, to about 1,417 feet above MSL in a depression near the southwest corner of the site.

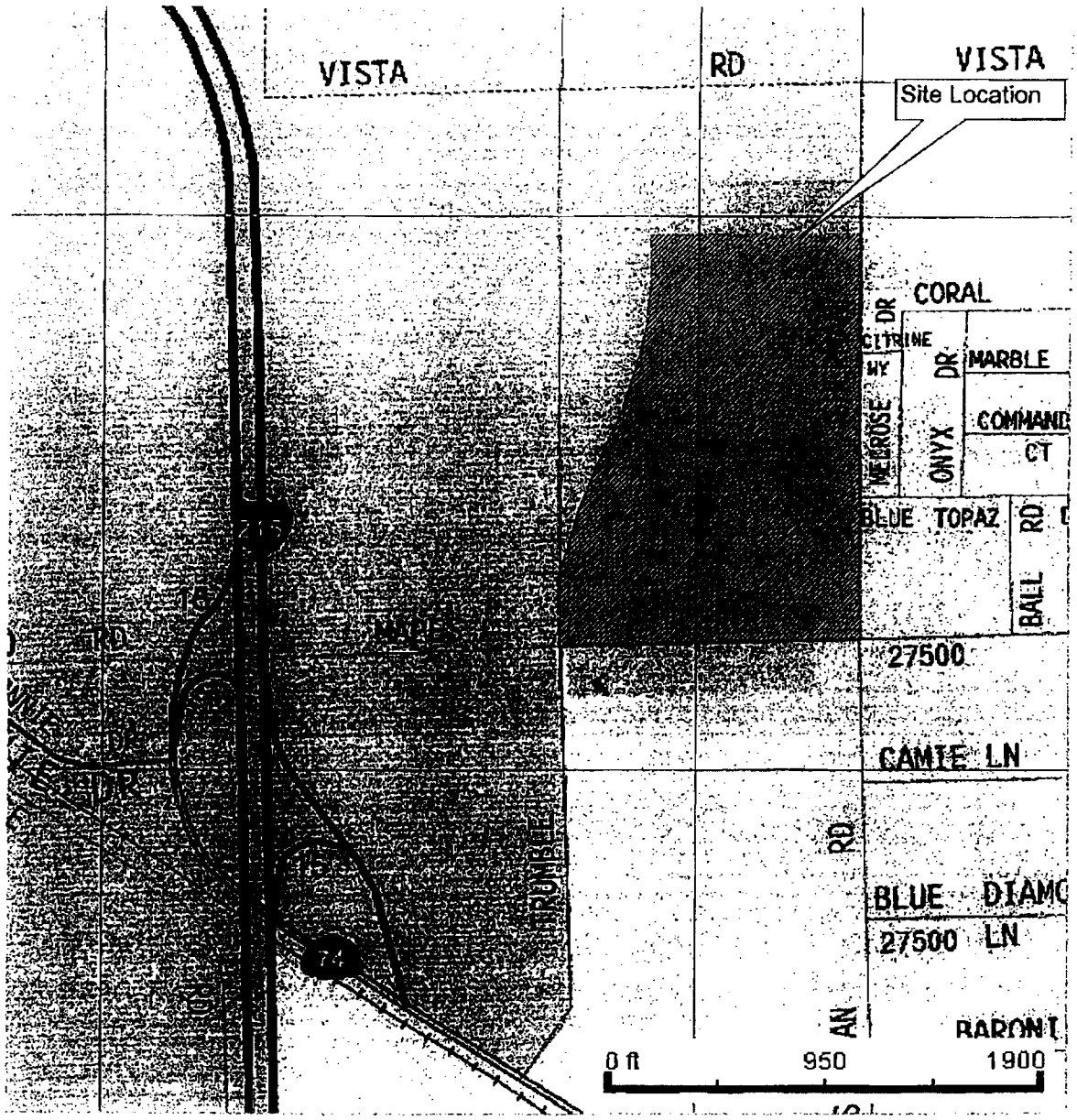
Until 1994, the site was vacant with only a slight covering of native grasses and weeds. The site approximate elevation was 1,420 feet above Mean Sea Level (MSL). Site drainage was gently to the west. According to EMWD, between August 1994 and April 1995, the area was used as a disposal site for material generated during excavation of ponds at their facility west of Trumble Road. Development of Trumble Road was accomplished during that time. Development of Mapes Road and Sherman Road was accomplished later.

3.0 SITE DESCRIPTION

The large raised area in the central and east portions of the site consisting of undocumented fill, has an approximate height of six (6) to eight (8) feet above the alluvial area on the west as shown on Drawing No. 1, *Geologic and Boring Location Map*. There is an east-west trending descending slope to the south that separates the thicker fill area (northern two-thirds of stockpile area) in the central part of the site, from the thinner fill (southern one-third of stockpile area) adjacent to Mapes Road. At the time of our field investigation, the site was vacant with a covering of native grasses, weeds and occasional shrubs. Drainage is generally towards the west, south and southwest.

4.0 PROJECT DESCRIPTION

The Big League Dreams Sports Park site will occupy an area of about 37 acres. The park will likely include the following amenities:



Source: Thomas Guide

SITE LOCATION MAP

Perris Valley Big League Dreams Sports Park

City of Perris, Riverside County, California

For: MIG

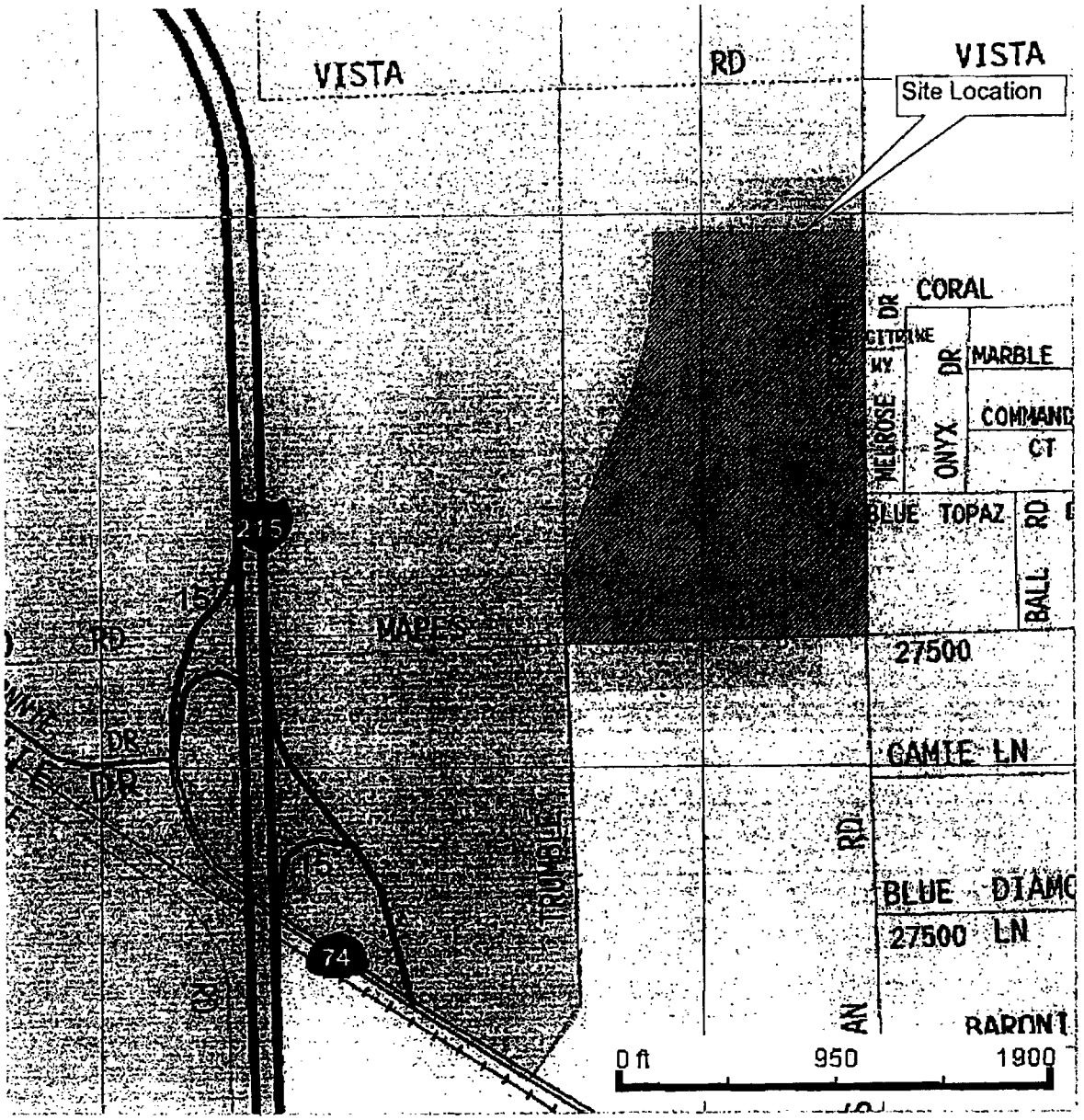
Project Number:

07-81-368-01

Converse Consultants

Figure No.

1



Source: Thomas Guide

SITE LOCATION MAP

Perris Valley Big League Dreams Sports Park City of Perris, Riverside County, California For: MIG	Project Number: 07-81-368-01
Converse Consultants	Figure No. 1

- Six (6) fully lighted, baseball/softball diamonds, four (4) of which will be constructed with stadium design features as replicas of existing Major League Baseball fields. Also included will be a glare control sports lighting system, players' shelter, seating/bleachers, and storage areas.
- A steel structure indoor field house for indoor soccer and other group events.
- A Stadium Club building of approximately 10,500 square feet, located in the south end of the property at the center of the cluster of the four (4) replica baseball diamonds.
- A Concession building located at the north end of the central plaza with a small warming kitchen. The building will also contain storage space and two large restrooms.
- An Administration building of approximately 2,600 square feet located at the entry to the park, providing offices for park staff as well as a controlled entry point for park patrons.
- An eight-station batting cage combined with an instructional academy area.
- A pre-fabricated metal Maintenance building located at the northernmost perimeter of the park, to house lawn grooming equipment and supplies. The park's maintenance staff will also use the building as an office and workshop.
- Two (2) children's playground areas.
- Two (2) picnic areas with tables and trash enclosures.
- Parking for about 600 cars.
- Walkways and other public ingress/egress and access areas with landscaping.
- Security lighting, miscellaneous signage, drinking fountains, trash receptacles and benches.
- Trash enclosure.
- Primary park entrance with monument signage.
- Street improvements for frontage along Trumble Road, Mapes Road and Sherman Road.

Preliminary grading plans indicate cuts of up to about three (3) feet and fill up to about six (6) feet in depth from existing grades. A borrow site is planned north of the sports park site at the southeast corner of Trumble Road and Vista Way.

5.0 SCOPE OF WORK

Our investigation consisted of the following scope of work:

5.1 Subsurface Exploration

Our subsurface exploration included a site reconnaissance by a Converse engineer. The purpose of the site reconnaissance was to observe surface conditions and to determine the approximate boring locations. The approximate locations of the borings are shown on Drawing No. 1, *Geologic and Boring Location Map.*

Twenty-seven (27) test borings were advanced at the site between September 2nd and 4th, 2008 at the approximate locations shown on Drawing No. 1, *Geologic and Boring Location Map.* The borings were drilled with a truck-mounted drill rig equipped with hollow stem augers for soil sampling to depths ranging from 11.0 to 51.5 feet below the existing ground surface (bgs).

Logs of the subsurface conditions as encountered in the test borings were recorded at the time of drilling and are presented on the boring logs included in Appendix A, *Field Exploration.* Relatively undisturbed ring samples and bulk samples of subsurface materials were obtained at frequent intervals below the ground surface and were taken to the laboratory for evaluation and testing. Standard Penetration tests were conducted in the deep borings starting at 35 feet bgs. A more detailed description of the field exploration procedures and the logs of borings are presented in Appendix A, *Field Exploration.*

5.2 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. These tests included:

- *In-situ* Moisture Contents and Dry Densities (ASTM D2937)
- Swell/Collapse (ASTM D5333)
- Expansion Index (ASTM D4829)
- Soil Corrosivity Tests (Caltrans 643, 422, 417, and 532)
- R-value (ASTM Standard D2844)
- Percent Passing The #200 Sieve (ASTM D1140)
- Gradation Analysis (ASTM D422)
- Maximum Dry Density And Optimum-Moisture Content Relationship (ASTM D1557)

- Direct Shear (ASTM D3080)
- Consolidation (ASTM D2435)

For *in-situ* moisture and 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.*

5.3 Analyses and Report

Data obtained from the exploratory fieldwork and laboratory-testing program were evaluated. Geotechnical analyses were performed, and this report was prepared to present our findings and recommendations developed during the investigation.

6.0 SITE CONDITIONS

6.1 General

A general description of the subsurface conditions and various materials encountered at the site during our field exploration is contained in this section. A discussion of the site-specific geology is also contained in this section.

6.2 Geologic Setting

The project site lies within the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges province is characterized by northwest trending valleys and mountain ranges, which have formed in response to the regional tectonic forces along the boundary between the Pacific and North American tectonic plates. The geologic structure is dominated by northwest trending right-lateral faults, most notably, the San Andreas Fault System. This Province extends southward from the Transverse Ranges into the Baja California Peninsula.

The project site is located within a structural block with the Peninsular Ranges known as the Perris Block. This block is bounded on the northeast by the San Jacinto fault and on the southwest by the Elsinore fault. The northern boundary is formed by the east-west compressional faults associated with the Transverse Ranges Physiographic Province. The southern boundary is less clearly defined.

6.3 Site Geology

The site is situated on alluvial deposits from the Lakeview Mountains to the northeast. The majority of the site is covered with undocumented fill ranging from three (3) to sixteen and one-half (16.5) feet in thickness.

6.4 Subsurface Conditions

Based on our exploratory borings, at least 16.5 feet of undocumented fill was encountered in the raised area across the eastern portion of the site. Between three (3) and five (5) feet of fill was encountered at the south portion of the site. The fill (Map Symbol-Af) consists primarily of silty sand, sandy silt with some mixtures of sand, silt and clay. As previously discussed, the fill originated from the development of the Eastern Municipal Water District (EMWD) complex. Underneath the fill and elsewhere in the western portion of the site, alluvial soils (Map Symbol-Qal) consisting primarily of silty sand and sandy silt to the maximum depth explored of 51.5 feet bgs were encountered.

Since no fill compaction certification is available at this time, the fill is considered undocumented. However, the degree of compaction of the fill soils, relative to the several maximum density/optimum moisture relationships, ranges from 82.2 to 100 percent with an average of 94.8 percent. Of the 64 samples evaluated, 19 were below 90 percent with only 8 below 88 percent. Therefore, it is our opinion the majority of the existing fill is considered suitable to support structural loads after remedial grading. We recommend verifying fill material compaction after completion of excavations for structures.

6.5 Groundwater

Groundwater was not encountered in any of the borings at the time of drilling to the maximum depth explored of 51.5 feet bgs. Based on available information, groundwater levels measured between February and May 2008, ranged from about 45 to 80 feet below the ground surface. These levels are expected to fluctuate due to infiltration from the EMWD ponds. It should be noted that the fluctuations in the groundwater level could also occur due to change in seasons, variations in rainfall, and other factors.

6.6 Flooding

Review of National Flood Insurance Rate Maps (FIRM) indicates that the project site is within a Flood Hazard Zone "X". Zone "X" is designated as "Areas determined to be outside the 0.2% annual chance floodplain." (FIRM, August 28, 2008). The area northwest of the intersection of Trumble Road and Vista Road is within Flood Hazard Zone "AE". Zone "AE" is designated as "Special Flood Hazard Areas Subject to inundation by the 1% annual Chance Flood – Base flood elevations determined." The Base Flood Elevation for the San Jacinto River in this area is 1,422 feet above Mean Sea Level.

7.0 LABORATORY TESTING

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

- *In-situ* Moisture and Dry Density – *In-situ* dry densities of the fill materials within the upper five (5) feet ranged from 110 to 133 pounds per cubic feet (pcf). *In-situ* moisture content of the fill materials within the upper five (5) ranged from five (5) to fourteen (14) percent. Within the upper ten (10) feet of fill material, the dry densities of the fill materials ranged from 106 to 133 pounds with moisture contests ranged from five (5) to fifteen (15) percent. *In-situ* dry densities of the upper five (5) feet of alluvial materials ranged from 84 to 139 pounds per cubic feet (pcf). *In-situ* moisture content of the alluvial materials ranged from five (5) to eighteen (18) percent.

- Swell/Collapse Potential – Ten (10) relatively undisturbed representative samples were tested in accordance with the ASTM D5333 method. The collapse potential was measured under a vertical stress of 2.0 kips per square foot (ksf). The results of these tests and the results of the consolidation tests indicate that the site soils have between 0.15 percent of swell and 0.35 percent of collapse, which corresponds to "Slight" collapse potential.

- Expansion Index – Five (5) representative samples from the upper five (5) feet of the site fill soils were tested to evaluate Expansion Potential. The value of the measured EI's ranged from 16 to 45. These values indicate "Very Low" to "Low" expansion potential.

- Soil Corrosivity – Six (6) representative fill samples were tested to determine soil corrosivity with respect to common construction materials such as concrete and steel. The test results evaluation is presented in Section 9.0, *Soil Corrosivity Evaluation.*

- R-value Tests – Two (2) R-value tests were performed on representative bulk alluvial soil samples. Based on the test results, the R-value of near surface site soils were both 21.

- Percent Passing Sieve #200 – Results of two (2) tests along with the results from the sieve analyses. The results indicate that the fill and alluvial soils consists primarily of silty sand (SM).

- Sieve Analysis – Five (5) representative samples were tested to determine the relative grain sizes. The results indicate the soil tested is primarily silty sand (SM).

- Maximum Dry Density and Optimum Moisture Content – The laboratory maximum dry density and optimum moisture content of three (3) samples ranged from 129.0 to 136.0 pounds per cubic foot (pcf) and 7.5 and 8.5 percent, respectively.

- Direct Shear – Results of four (4) direct shear tests performed on relatively undisturbed fill samples indicate that the site soils have moderate shear strength.

- Consolidation Test – Four (4) consolidation tests were performed on relatively undisturbed representative fill samples of the site soil. Based on the results of this test, the compressibility of the site soils is moderate.

8.0 FAULTING AND SEISMICITY

8.1 Faulting

There are no known active faults projecting toward or extending across the project site. The site is not situated within a currently designated State of California Earthquake Fault-Rupture Hazard Zone. Table No. 1, *Seismic Characteristics of Nearby Active Faults*, presents nearest distances from nearby active faults within 50 kilometers of the site.

Table No. 1, Seismic Characteristics of Nearby Active Faults

[illegible]	[illegible]	[illegible]	[illegible]
San Jacinto-San Jacinto Valley	16.3	6.9	12.0
Elsinore-Temecula	20.0	6.8	5.0
Elsinore-Glen Ivy	20.1	6.8	5.0
San Jacinto-Anza	24.6	7.2	12.0
San Jacinto-San Bernardino	29.1	6.7	12.0
Chino-Central Ave. (Elsinore)	36.5	6.7	1.0
San Andreas-Southern	38.2	7.4	24.0
Elsinore-Whittier	43.4	6.8	2.5
Elsinore-Julian	45.3	7.1	5.0
Cucamonga	52.7	6.9	5.0

8.2 *Design Response Spectra*

A site-response spectra was developed in accordance with CBC (2007), Section 1614A.1.2, for a Maximum Considered Earthquake (MCE), defined as a horizontal peak ground acceleration that has a 2 percent probability of being exceeded in 50 years (return period of approximately 2,475 years).

In accordance with ASCE 7-05, Section 21.2, the site-specific response spectra can be taken as the lesser of the probabilistic MCE (Section 21.2.1) and the deterministic MCE (Section 21.2.2) response spectra. The design response spectra can be taken as 2/3 of site-specific MCE response spectra, but should not be lower then 80 percent of CBC general response spectra.

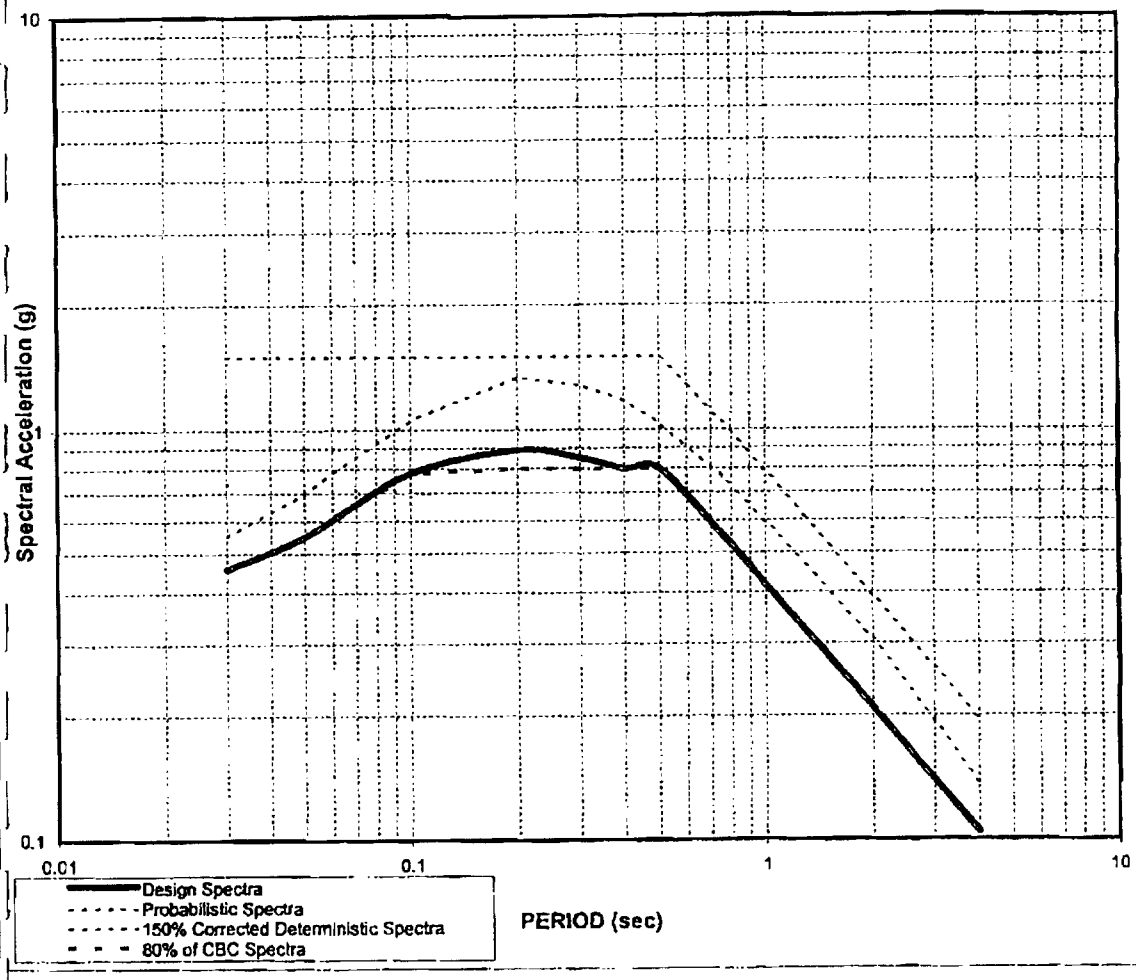
A site specific response analysis was developed using the computer program EZ-FRISK by Risk Engineering (v. 7.26) and the 2002 CGS Statewide Fault Model. Attenuation relationships proposed by Campbell-Bozorgnia (2008), Abrahamson-Silva (2008), and Boore-Atkinson (2007) was used in the analysis. These attenuation relationships are based on Next Generation Attenuation (NGA) project model. An average shear wave velocity at the upper 30 meters of soil profile (Vs30) of 300 m/s and depth to engineering rock of 150 feet were selected.

Applicable response spectra data are presented in the following table and on Figure No. 2, *Earthquake Design Spectra*. These curves correspond to response values obtained from above attenuation relations for horizontal elastic single-degree-of-freedom systems with equivalent viscous damping of 5 percent of critical damping.

Table No. 2, Design Response Spectra

0.03	0.55	0.40	1.50	0.55	0.458	0.458
0.05	0.70	0.49	1.50	0.70	0.551	0.551
0.10	1.06	0.68	1.50	1.06	0.782	0.782
0.20	1.34	0.83	1.50	1.34	0.891	0.800
0.30	1.28	0.76	1.50	1.28	0.852	0.800
0.40	1.18	0.69	1.50	1.18	0.800	0.800
0.50	1.04	0.60	1.50	1.04	0.800	0.800
0.75	0.76	0.46	1.04	0.76	0.555	0.555
1.00	0.59	0.35	0.78	0.59	0.416	0.416
2.00	0.31	0.23	0.39	0.31	0.208	0.208
3.00	0.19	0.21	0.26	0.19	0.139	0.139
4.00	0.14	0.15	0.20	0.14	0.104	0.104

DESIGN RESPONSE SPECTRA
CBC 2007, 5% of Damping



Note: Calculated using EZFRISK program Risk Engineering, version 7.26 and California Geological Survey's 2002. fault model database.

EARTHQUAKE DESIGN SPECTRA

Perris Valley Big League Dreams Sports Park

City of Perris, Riverside County, California

Client: MIG

Project Number:

07-81-368-01

Converse Consultants

Figure No.

2

Vertical acceleration at the site may be estimated by multiplying the horizontal acceleration by an adjustment factor. The adjustment factor should be 1.6 for periods less than 0.1 seconds. Between periods of 0.1 and 0.3 seconds, the adjustment factor should linearly decrease to a value of 0.5. For periods greater than 0.3, a value of 0.5 may be used. These adjustment factors were developed by Bozorgnia et. al. (1999). When combining horizontal and vertical acceleration in the structural analysis, it should be noted that the vertical motion will have, in general, a 40 to 60 percent higher frequency than the horizontal motions, the maximum vertical and horizontal accelerations seldom occur simultaneously.

8.3 CBC Seismic Design Parameters

Seismic parameters based on the 2007 California Building Code are provided below.

Table No. 3, CBC Seismic Parameters (Lat. 33.7595, Long. 117.1819)

Seismic Parameters	
Site Class	"C"
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.500g
Mapped 1-second Spectral Response Acceleration, S_1	0.600g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from Table 1613.5.3(2)), F_v	1.3
MCE 0.2-sec period Spectral Response Acceleration, SM_s	1.500g
MCE 1-second period Spectral Response Acceleration, SM_1	0.780g
Design Spectral Response Acceleration for short period, S_{ds}	1.000g
Design Spectral Response Acceleration for 1-second period, S_{d1}	0.520g

8.4 Geologic Hazards Due to Seismic Activities

Historical evidence and current technology indicate that at least one moderate to severe earthquake will occur during the design life of the proposed sports complex. During a moderate to severe earthquake occurring on the nearby faults, strong ground shaking of the project site will probably occur. In addition to ground shaking, effects of seismic activity on a project site may include surface fault rupture, soil potential, landslides, lateral spreading, differential settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. Results of a site-specific evaluation of each of the above possible secondary effects are explained below:

Surface Fault Rupture: The project site is not located within a currently designated State of California Earthquake Fault Zone. Based on our review of existing geologic information, no known major surface fault crosses through or extends towards the site. The potential for surface rupture resulting from the movement of a previously unrecognized fault is not known with certainty but is considered low.

Liquefaction Potential: Soil liquefaction is a phenomenon, which occurs when saturated cohesionless soil layers, located within about 50 feet of the ground surface, lose strength during cyclic loading, as caused by earthquakes. During the loss of strength, the soil acquires "mobility" sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, saturated, uniformly graded, fine-grained sands that lie below the groundwater table within a depth usually considered to be about 50 feet. The factors known to influence liquefaction potential include soil type and depth, grain size, density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking.

Based on our recent subsurface exploration, the subsurface soils to depths of about 51.5 feet consist of predominantly loose to dense silty sand and sandy silt. Most of these soil types are fine- to coarse-grained and relatively free draining. Sand and clay mixtures appear to be relatively thin and discontinuous. In addition, groundwater was not encountered to the maximum depth of 51.5 feet bgs. Therefore, the potential for liquefaction to affect the site is considered low.

Landslides: Seismically induced landslides and other slope failures are common occurrences in areas of significant ground slopes during or soon after earthquakes. The site is relatively flat; therefore, there is no potential for seismically induced landslides affecting the site.

Lateral Spreading: Seismically induced lateral spreading involves lateral movement of earth materials due to ground shaking. It differs from a slope failure in that ground failure involving a large movement does not occur due to the flatter slope of the initial ground surface. Lateral spreading is characterized by near-vertical cracks with predominantly horizontal movement of the soil mass involved over the liquefied soils. Since the site is not prone to liquefaction, the potential for lateral spreading at the subject site is considered very low.

Differential Settlement Due to Seismic Shaking: Since the potential for liquefaction is considered low and due to dense consistency of site soils, differential settlement due to seismic shaking is also considered low.

Tsunamis: Tsunamis are tidal waves generated in large bodies of water by fault displacement or major ground movement. The site is more than 50 miles from the Pacific Ocean. Based on the location of the site, tsunamis do not pose a hazard to this site.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Based on our review, no significant dams or other enclosed bodies of water are present near the site. It is our opinion that the potential for damage due to seiches is considered low.

Earthquake-Induced Flooding: Flooding may be caused by failure of dams or other water retaining structures due to earthquakes. The potential for earthquake-induced flooding is considered low.

9.0 SOIL CORROSIVITY EVALUATION

Schiff Associates, Claremont, California, tested six (6) bulk soil samples collected from the upper five (5) feet during our investigation. The tests include minimum resistivity, pH, soluble sulfates, and chloride content. The results are also included in Appendix B, *Laboratory Testing Program.*

Test results indicated site soils have sulfate concentrations ranging between 35 and 88 parts per million (ppm). The measured values of minimum electrical resistivity when saturated ranged between 1,520 and 2,200 Ohm-cm. The chloride concentrations ranged between 13 to 47 ppm. These values indicate a "Negligible" sulfate exposure to concrete, and a "Moderately Corrosive" to "Corrosive" potential for ferrous metals in contact with these soils. Type II Portland cement may be used. A corrosion engineer should be consulted for detailed corrosion mitigation measures.

10.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS

10.1 General

This section contains our general recommendations regarding earthwork and site grading for the proposed Big League Dreams Sports Park. These recommendations are based on our field exploration, laboratory testing, and data evaluation as presented in the preceding sections. These recommendations may need to be modified based on observation of the actual field conditions exposed during grading. The preliminary grading plan indicates that soil will be imported from the site adjacent to the sports park on the north.

Prior to the start of any earthwork, the site should be cleared of all vegetation and debris. The materials resulting from the clearing and grubbing operations should be removed from the site.

As presently proposed, the project earthwork will likely include fill placement in the southern and western portions of the site and cut in the raised area of the north eastern and central portion of the site of the proposed structures, the northern bleachers and ball field areas areas, and transition zones between cut and fill.

The final bottom surface of all excavations should be observed to locate zones of overly saturated and/or loose, unsuitable material of any origin and should be approved by the project geotechnical consultant prior to placing any fill and/or structures. We

recommend performing field density testing on existing fill materials exposed in excavations for structures. Soils with less then 85 percent relative compaction will require additional excavations. In addition, based on field observations, removal of localized areas deeper than those documented may be required during grading. Some variations in the depth and lateral extent of excavation recommended in this report should be anticipated.

10.2 Excavation within Building Pads

In fill areas, we recommend to excavate at least the upper two (2) feet of alluvial soils or existing fill, prior to placing any compacted fill. Deeper removal may be necessary to provide the required minimum amount of compacted fill under building footings and slab-on-grade as follows:

- Continuous or isolated footings should be placed on compacted fill, the thickness of which should be equal to the footing width or two (2) feet, whichever is greater.

- Over-excavation should provide as a minimum, two (2) feet of structural fill below the bottom of slabs-on-grade.

Cut areas should be over-excavated an additional three (3) feet below finish grade. Deeper removal may be required to provide the required minimum amount of compacted fill under building footings and slab-on-grade as discussed above.

Excavations should extend at least five (5) feet outside building footprints or a distance equal to the actual depth of removal, whichever is greater.

After the required excavation and grading, the proposed buildings should be supported entirely on properly compacted fill. Transition building pads (part of the pad on compacted fill and part of the pad on undocumented fill) should be over-excavated to provide minimum fill thickness under footings and slab-on-grade as discussed above.

10.3 Excavation for Pavement Areas

In areas receiving asphalt concrete or Portland concrete paving, including sidewalks, curbs and gutters, and other flatwork, the upper two (2) feet of undocumented fill or alluvium soils should be excavated. Such excavation should extend at least two (2) feet beyond the pavement edges. Where depth of cut to subgrade elevation exceeds two (2) feet, no additional excavation will be required. That surface should be scarified a minimum of twelve (12) inches, moisture conditioned as necessary, and compacted to a minimum of 95 percent of the laboratory maximum dry density.

10.4 Excavation for Playground Areas

In the playground areas, the top 12 inches of the finished grade should be scarified and recompacted to 90 percent of the laboratory maximum dry density and should be free of particles exceeding one (1) inch in nominal size. In fill areas, we recommend to excavate the upper two (2) feet of existing alluvial or fill soils, prior to placing compacted fill.

10.5 Subgrade Preparation

The bottom of all excavations should be scarified to a depth of at least 12 inches. Prior to compaction, fill soils should be thoroughly mixed and moisture conditioned, when necessary, to within ± two (2) percent of optimum moisture for coarse-grained soils and up to two (2) percent above optimum for fine-grained soils.

All structural fill should be placed on competent, uniform and non-yielding, scarified and compacted native materials as determined by a Converse representative and in accordance with the specifications presented in this section and in Appendix C, *Recommended Earthwork Specifications*. To obtain a uniform subgrade, soils should be well mixed and uniformly compacted.

10.6 Structural Fill

All structural fill should be placed on competent, scarified and compacted native materials or existing fill, as determined by a Converse representative and in accordance with the specifications presented in this section and in Appendix C, *Earthwork Specifications.*

Import fill from the proposed borrow site should be tested and approved by Converse prior to transporting to the site. This site is the extension of the existing undocumented fill north of the project site. Import soils from other areas should also be tested prior to transporting to the site and should have similar gradation and expansion properties as the on-site soils.

Prior to compaction, fill materials should be thoroughly mixed and moisture conditioned when necessary, to within ± two (2) percent of optimum moisture content for coarse-grained soils and two (2) percent above optimum for fine-grained soils. All fill, if not specified otherwise elsewhere in this report, should be compacted to at least 90 percent of the laboratory maximum dry density in accordance with the ASTM Standard D1557 test method.

At the time of our field investigation, *in-situ* moisture content of the alluvial and fill soils at the upper five (5) feet ranged from five (5) to eighteen (18) percent. The optimum moisture was 7.5 and 8.5 percent. Moisture conditioning will be necessary prior to the material being placed as compacted fill. The amount of processing required for proper

moisture conditioning at the site will depend on the variations in the *in-situ* moisture conditions, the equipment, and the processing method.

A minimum of 90 percent compaction in the upper 12 inches of the pad is recommended. We also recommend verifying the expansion index of the actual soil mix at the completion of grading operations.

At least the upper 12 inches of subgrade soils underneath any sidewalks, exterior slabs, driveways, interior streets or parking areas should be compacted to a minimum of 95 percent of the laboratory maximum dry density as per ASTM Standard D1557 test method. All base and subbase, if any, for pavement structures should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM Standard D1557 test method.

10.7 Retaining Wall Backfill

Backfill behind the retaining/structural walls should be compacted to a minimum of 90 percent of the laboratory maximum dry density. The use of heavy compaction equipment should not be permitted within a horizontal distance of five (5) feet from the wall. Backfill behind structural walls within the recommended 5-foot zone should be compacted using lightweight construction equipment such as handheld compactors to avoid overstressing the walls.

10.8 Excavatability

Based on our field exploration, the earth materials at the site should be excavatable with conventional heavy-duty earth moving and/or trenching equipment.

10.9 Slopes

As presently proposed, cut slopes in the existing fill materials and new fill slopes to the maximum expected height of eight (8) feet will be stable when constructed at a slope ratio of no steeper than 2:1 (horizontal:vertical). Most slopes may be temporary for construction of bleacher seating areas for the proposed ball fields.

11.0 SHRINKAGE AND SUBSIDENCE

The shrinkage and/or bulking would depend on, among other factors, the depth of cut and/or fill, and the grading method and equipment utilized. For preliminary estimation, bulking and shrinkage factors may be taken as presented below:

- The shrinkage factor for the upper 6.5 feet of fill soils is estimated to have an average of about 4 percent shrinkage. The shrinkage factor for the upper 6.5 feet of alluvial soils is estimated about 2 percent shrinkage.

- Subsidence would depend on the construction methods including type of equipment utilized. For estimation purposes, ground subsidence may be taken as 0.20 feet.

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.

12.0 UTILITY TRENCH BACKFILL

Pipelines are expected to be constructed into and out of the proposed Big League Dreams Sports Park. Utilities are expected to include, water, sewer, storm drain, electrical, cable, etc.

Open cuts adjacent to existing roadways and/or adjacent structures are not recommended within a 1:1 (horizontal:vertical) plane extending beyond and down from the roadway or structure perimeter.

Spoils from any trench excavation should not be stockpiled within six (6) feet in or within a distance H (ft) from the top of the trench edge, where H is the depth of the trench in feet. Spoils, if any, should not be stockpiled behind the shoring within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

12.1 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 12 inches above the pipe. To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate or crushed rock may be used as pipe bedding material. The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe. Care should be taken to densify the bedding material below the springline of the pipe.

Pipe design generally requires a granular material with a sand equivalent (SE) greater than 30. Bedding material for the pipes should be free from oversized particles (greater than 1-inch).

Migration of fines from the surrounding native soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria:

$$D_{15} < 2.5 \text{ mm } (0.1 \text{ inch}) \text{ and } D_{50} < 19.0 \text{ mm } (0.75 \text{ inch})$$

Where D_{15} and D_{50} represent particle sizes of the bedding material corresponding to 15 percent and 50 percent passing by weight, respectively.

12.2 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. The trench zone should be backfilled in accordance with the recommendations presented in Appendix C, *Earthwork Specifications.*

Excavated on-site soils after proper processing may be used to backfill the trench zone. Imported trench backfill, if used, should be approved by the project soils consultant prior to delivery at the site.

The material used for trench zone backfill should meet the following criteria:

- No particles larger than three (3) inches in the largest dimension
- No particles larger than one (1) inch should be placed within upper 12 inches of subgrade soils at structures or pavement areas
- Free of all perishable material
- Have an expansion index of 20 or less

13.0 DESIGN RECOMMENDATIONS

The various design recommendations provided in this section are based on the assumption that in preparing the site, the earthwork, and site grading recommendations provided in this report will be followed.

13.1 Foundation Type and Bearing Pressures

The proposed structures may be supported on continuous (strip) and/or isolated spread footings. Continuous and isolated spread footings for one-story structures should be at least 12 and 18 inches wide, respectively. Continuous and isolated footings for two-

story structures should be 18 and 24 inches wide, respectively. The depth of embedment below lowest adjacent soil grade of one-story and two-story footings should be at least 12 and 15 inches, respectively. Continuous and isolated footings should be founded on at least two (2) feet or equal to the footing width of compacted fill. Laterally, such fill should extend at least five (5) feet or equal to fill thickness, whichever is greater, beyond the footing perimeter.

For shallow spread footings founded on compacted fill placed as per Section 9.6, *Structural Fill,* and in Appendix C, *Earthwork Specifications*, an allowable net bearing capacity of 2,500 pounds per square foot (psf) may be used.

The allowable net bearing capacity is defined as the maximum allowable net bearing pressure on the ground. It is obtained by dividing the net ultimate bearing capacity by a safety factor. The ultimate bearing capacity is the bearing stress at which ground fails by shear or experiences a limiting amount of settlement at the foundation. The net ultimate bearing capacity is obtained by subtracting the total overburden pressure on a horizontal plane at the foundation level from the ultimate bearing capacity.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loading, which will include loading induced by wind or seismic forces.

13.2 Drilled Pier Foundation

The light poles for the illuminated playing fields can be supported on drilled pier foundations deriving their support primarily through skin friction. The piers may be designed for compression using an allowable skin friction value of 300 psf within the upper 20 feet of the finished grade. An allowable skin friction value of 500 psf can be used for the portion of the pier below 20 feet. This value may be increased by 33 percent for transient wind and seismic forces. For pier design in tension, 50 percent of the recommended allowable skin friction values in compression may be used. The drilled pier should have a minimum diameter of 18 inches and a minimum spacing of three times the pier diameter. For design purpose, the upper three (3) feet of the fill soils should be neglected in determining the skin friction. A passive resistance of 250 psf per foot of depth and a coefficient of 0.3 for friction between soil and concrete may be used to resist lateral loads

13.3 Lateral Earth Pressures and Resistance to Lateral Loads

The following subsections outline lateral earth pressures and resistance to lateral loads. Lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils compacted to 92 percent of the laboratory maximum dry density.

13.3.1 Lateral Earth Pressures

The active 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 pressures. The lateral earth pressures are presented below.

Table No. 4, Lateral Earth Pressure

Lateral Earth Pressure	Equivalent Fluid Pressure	
Active earth conditions (wall is free to deflect at least 0.001 radian)	**Level Backfill**	**2:1 (H:V) Backfill**
	40	63
At-rest (wall is restrained)	60	95

These pressures assume no surcharge, no hydrostatic pressure, and soil expansion index less than 30. Adequate drainage could be provided to avoid hydrostatic pressures.

If water pressure is allowed to build-up behind the walls, the active pressures should be reduced by 50 percent and added to the full hydrostatic pressure to compute the design pressures against the walls.

13.3.2 Passive Earth Pressure

Lateral loads can be resisted by an allowable passive earth pressure of 250 pounds per foot of depth for dense natural soil or compacted fill applied against below-grade wall elements. The allowable passive earth pressure indicated above is obtained by applying a factor of safety of 1.5 to the ultimate passive earth pressure. Due to the low overburden stress of the soil at shallow depth, the upper one foot of passive resistance should be neglected unless the soil is confined by pavement or slab. The maximum passive pressure should not exceed 2,500 psf. In addition, a friction coefficient of 0.3 between the concrete and compacted fill can be used in combination with passive earth pressures to resist lateral loads. The coefficient of friction should be applied to net normal dead loads only.

13.4 Settlement

The settlement of the building supported on continuous and isolated footings will depend on the actual footing dimensions and the imposed vertical load.

The settlement due to static loading of the foundations, designed as recommended above, from structural load-induced loads should be 1-inch or less. Differential settlement due to structural loadings should be 0.5-inch or less over a horizontal distance of 50 feet.

13.5 Modulus of Subgrade Reaction

For the subject project, design of the structures supported on subgrade prepared in accordance with the recommendations provided in this report may be based on a soil modulus of subgrade reaction of (k_s) of 200 pounds per square inch per inch.

13.6 Slab-on-grade

The design of the slab-on-grade will depend on, among other factors, on the expansive potential of the pad soils. Based on the expansion index test performed during this investigation, the expansive potential of the soils is "**Very Low**" and "**Low**". Specific recommendations regarding type of slab-on-grade should be based on the expansion index testing of the pad subgrade soils at the completion of grading, and structural requirements.

Structural design elements such as thickness, reinforcement, joint spacing, etc., for slabs-on-grade 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 soils, as presented above.

In areas of moisture-sensitive flooring, the slabs-on-grade should be underlain by two (2) inches of sand to minimize punctures, then by a ten-mil Visqueen (or equivalent) moisture barrier. If the subgrade soils contain gravel and/or rock fragments, the vapor barrier should be underlain by an additional two (2) inches of sand to minimize punctures. Subgrade soils must be firm and non-yielding prior to placement of concrete. In hot weather, the contractor should take appropriate curing precautions after placement of concrete to minimize cracking of the slabs. The potential for slab cracking may be lessened by the addition of fiber mesh to the concrete and/or control of water/cement ratio.

Joints for concrete slab-on-grade must be carefully designed. Joint spacing is dependent upon slab thickness and concrete properties and should be selected by the structural engineer.

Concrete should be cured by protecting it against loss of moisture and rapid temperature change for at least seven (7) days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof, may be used after finishing operations have been completed. The edges of concrete slabs exposed after removal of forms should be immediately protected to provide continuous curing.

The above recommendations are based on the results of tests performed on representative site soils. If soils other than those presently encountered within the project site are placed as structural fill within the building pads, the modulus of subgrade reaction should be reevaluated. The final slab design should be based on the actual modulus of subgrade reaction.

13.7 Flexible Asphalt Concrete Pavement Design

An R-value of 21 was obtained from testing of two (2) representative soil samples. At the completion of grading, the R-value of the subgrade soils should be determined and the pavement structural sections should be reevaluated.

Minimum asphalt pavement sections presented in Table No. 5, *Preliminary Asphalt Pavement Sections*, are based on Traffic Indices (TIs) values of 5.0 through 8.0, and a subgrade R-value of 21, obtained from laboratory testing of representative soil samples of both fill and alluvium at shallow depths.

Table No. 5, Preliminary Asphalt Pavement Sections

[illegible]	[illegible]	[illegible]
5.0	3.0	7.0
6.0	4.0	8.5
7.0	5.0	10.0
8.0	6.0	11.5

13.8 Portland Cement Concrete Pavement

Tentative structural sections for Portland Cement Concrete (PCC) pavements were evaluated in accordance with Portland Cement Association (PCA) procedures using a subgrade R-value of 21. Minimum required pavement section for Traffic Indices (TIs) values of 5.0 through 8.0 are given in the following table for assumed modulus of rupture of 550 psi. The recommended PCC pavement sections are for un-reinforced concrete placed directly on compacted subgrade.

Table No. 6, Recommended Preliminary PCC Pavement Sections

[illegible]	[illegible]
5.0	6.0
6.0	6.5
7.0	7.5
8.0	8.5

The on-site soils will be mixed during grading and the exposed subgrade soils may be different after grading. The R-value of the subgrade soils should be verified after completion of the grading. The paving sections presented above may have to be revised.

Aggregate base should be compacted to at least 95 percent of the laboratory maximum dry density per ASTM D1557 test method. Crushed aggregate base materials should conform to Sections 200-2.2 of the *Standard Specifications for Public Works Construction* (Greenbook), latest edition. To reduce the potential for premature pavement distress, it is important that final pavement grade be designed such that ponding on or adjacent to the pavements is avoided. Pavement runoff should be directed to a suitable non-erosion drainage device. Landscape irrigation should *not* be allowed to flow into pavement subgrade.

Where asphalt pavements meet concrete or existing pavements, the concrete and/or asphalt should be sprayed with an SS-1 or CSS-1 emulsion. Proper asphalt compaction next to concrete pavements, curbs and existing pavements is important to provide a relatively impermeable contact between the two materials.

13.9 Site Drainage

Adequate positive drainage should be provided away from the building pad to prevent ponding and to minimize percolation of water into the foundation soils. The drainage gradient should be at least two (2) percent in landscaped areas and one (1) percent for paved areas towards drainage facilities.

Irrigation should be maintained such that it does not result in excess water percolating into the subgrade soils. Such subsurface water will flow from raised-grade areas to adjacent lower-grade areas. This flow will supplement the percolating subsurface water from the irrigation of the lower area and can result in overly saturated and/or perched groundwater conditions. Surface drainage should preclude the possibility of flow over slope faces with the use of brow ditches, earth berms and other methods.

Surface drainage should be directed to suitable non-erosive devices. Slope drainage should be constructed in accordance with Appendix J of the California Building Code (2007).

Slopes should be planted as soon as possible after construction with drought-resistant vegetation.

14.0 CONSTRUCTION RECOMMENDATIONS

14.1 Temporary Trench Excavations

There will be utilities constructed in and out the new buildings. Based on the materials encountered in the borings, sloped temporary trench excavations may be constructed according to the slope ratios presented in Table No. 7, *Slope Ratios for Temporary Excavation*. Any loose utility trench backfill or other fill encountered in excavations will be less stable than the native soils. Temporary trench cuts encountering loose fill or loose, dry sand may have to be constructed at a flatter gradient than presented in the following table.

Table No. 7, Slope Ratios for Temporary Trench Excavation

[illegible]	[illegible]
0 – 5	vertical
5 - 10	1:1 or flatter

*Slope ratio assumed to be uniform from top to toe of slope.

Surcharge loads, including construction equipment, should not be placed within five (5) feet of the unsupported trench edge. The above maximum slopes are based on a maximum height of six (6) feet of stockpiled soils placed at least five (5) feet from the trench edge.

15.0 PLAN REVIEW AND CONSTRUCTION INSPECTION SERVICES

This report has been prepared to aid in evaluation of the site, to prepare site grading recommendations, and to assist the civil/structural engineer in the design of the proposed facility. This office should be given the opportunity to review the grading plan and final design drawings and specifications to determine if the geotechnical recommendations have been properly implemented.

All site grading and earthwork should be completed under the observation and testing of a qualified geotechnical consultant to verify compliance with the recommendations set forth in this report. All ground surfaces should be examined and approved by the project geotechnical consultant prior to placing any fill and/or structures. All footing excavations

should be observed prior to placement of steel and concrete to see that footings are founded on satisfactory soil and that excavations are free of loose, disturbed or deleterious materials.

16.0 CLOSURE

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice within our profession. We make no other warranty, either expressed or implied. Our conclusions and recommendations are based on the results of the field and laboratory investigations, combined with an interpolation and extrapolation of soil conditions between and beyond the boring locations. If conditions encountered during construction appear to be different from those shown by the borings, this office should be notified.

Design recommendations given in this report are based on the assumption that the earthwork and site grading recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the final site grading and actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

17.0 REFERENCES

BLAKE, T. F., 2000, *EQFAULT*, Windows 95/98 Version 3.0, computer programs for performing deterministic seismic hazard analysis.

BOWLES, J. E., 1982, *Foundation Analysis and Design*, McGraw-Hill, Inc.

CALIFORNIA DIVISION OF MINES AND GEOLOGY, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Faulting Zoning Act with Index to Earthquake Fault Zone Maps, Special Publication 42, Revised 1997, Supplements 1 and 2 added 1999.

CALIFORNIA DIVISION OF MINES AND GEOLOGY, *Fault Activity Map of California and Adjacent Areas*, 1994, CDMG Geologic Data Map No. 6.

CAO, T., BRYANT, W.A., ROWSHANDEL, B., BRANUM, D., AND WILLS, C.J., 2003, The Revised 2002 California Probabilistic Seismic Hazard Maps, June 2003: California Geological Survey web page, <http://www.consrv.ca.gov/cgs/rghm/psha/fault_parameters/pdf/2002_CA_Hazard_Maps.pdf> (November 18, 2005).

CALIFORNIA DEPARTMENT OF TRANSPORTATION, 2006, Highway Design Manual.

CALIFORNIA DIVISION OF MINES AND GEOLOGY (1994), *Fault Activity Map of California and Adjacent Areas, DMG Geologic Data Map No. 6.*

CALIFORNIA BUILDING STANDARDS COMMISSION (2007), *California Building Code (CBC).*

COOPERATIVE WELL MEASURING PROGRAM, Covering Upper Santa Ana River Watershed, San Jacinto Watershed, Santa Margarita Watershed, Spring 2008.

DEPARTMENT OF NAVY, DESIGN MANUAL 7-2, 1982, *Foundations and Earth Structures.*

DEPARTMENT OF WATER RESOURCES (DWR), http://wdl.water.ca.gov/gw/.

EASTERN MUNICIPAL WATER DISTRICT, Mr. Jim Wyatt, personal communication, September 9, 2008.

FLOOD INSURANCE RATE MAP (FIRM), City of Perris, Riverside County, California, Map No. 06065C1445G, Federal Emergency Management Agency, effective date August 28, 2008.

LAMBE, T. W., and WHITMAN, R. V., 1979, *Soil Mechanics*, John Wiley & Sons.

PORTLAND CEMENT ASSOCIATION (1981), Portland Cement Concrete Pavement Design for Light, Medium & Heavy Traffic, Pacific Southwest Region, Publication No. P-14.

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (2006), Joint Committee of the Southern California Chapter, American Public Works Association and Southern California Districts Associated General Contractors of California.

UNITED STATES GEOLOGICAL SURVEY, Perris, California, 7.5 Minute Quadrangle, 1967, photorevised 1979.

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Our field investigation included a site reconnaissance of the property and a subsurface exploration program consisting of drilling of borings. During the site reconnaissance, the surface conditions were noted and the locations of the borings were established. The borings were located using existing topography and boundary features as a guide and should be considered accurate to the degree implied by the method.

Twenty-seven (27) test borings were drilled on the site between September 2nd and 4th, 2008. The borings were drilled with a truck-mounted rig equipped with hollow stem augers for soil sampling. The borings were drilled to depths ranging from 11.0 to 51.5 feet below the existing ground surface (bgs). Soils were continuously logged and classified in the field by visual examination in accordance with the Unified Soil Classification System. The field descriptions have been modified where appropriate to reflect laboratory test results.

Relatively undisturbed ring and bulk samples of the subsurface soils were obtained at frequent intervals in the borings. The relatively undisturbed samples were obtained using a California Drive Sampler (2.4-inches inside diameter and 3.0-inches outside diameter) lined with thin sample rings, and disturbed samples were obtained using a split spoon sampler (1⅜-inches inside diameter and 2-inches outside diameter). Resistance blow counts were obtained with the sampler by dropping a 140-pound automatic hammer through a 30-inch free fall. The number of successive drops of the driving weight ("blows") required for each 6-inch of penetration of the sampler for the total of 18 inches are shown on the Logs of Borings in the "Blow/6-inch" column.

The soil was retained in brass rings (2.4 inches in diameter and one inch in height). The central portion of the sample was retained and carefully sealed in waterproof plastic containers for shipment to the laboratory. Bulk soil samples collected from the borings were sealed in plastic bags and brought to the laboratory.

Standard Penetration Tests (SPTs) were performed in the borings at selected depths below 30 feet 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, falling 30 inches for each blow. The number of successive drops of the driving weight ("blows") required for each six (6) inches of penetration of the sampler for a total of eighteen (18) inches are shown on the Logs of Borings in the "blow/6-inch" column. The standard penetration tests were 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, change in material conditions that occur between drive samples are indicated in the logs at the top of next drive sample.

For a key to soil symbols and terminology used in the boring logs and test pit logs, refer to Drawing No. A-1, *Unified Soil Classification and Key to Boring Log Symbols.* For logs of the borings, see Drawing Nos. A-2 through A-28, *Logs of Borings.*

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)

CLASSIFICATION

Plasticity	pl
Grain Size Analysis	ma
Passing No. 200 Sieve	wa
Sand Equivalent	se
Expansion Index	ei
Compaction Curve	max
Hydrometer	h-

STRENGTH

Pocket Penetrometer	p
Direct Shear	ds
Direct Shear (single point)	ds*
Unconfined Compression	uc
Triaxial Compression	tc
Vane Shear	vs
Consolidation	c
Collapse Test	col
Resistance (R) Value	r
Chemical Analysis	ca
Electrical Resistivity	er

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 1

Log of Boring No. BH - 1

Dates Drilled: 9/3/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1427 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace to little clay, brown.	■		10/36/39	6	135	col
5		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine-grained sand, trace clay, light brown.	■		18/39/50-5"	10	115	
			■		18/40/50-4"	12	119	
10			■		12/30/50-5"	12	128	
		Boring terminated at 11.4 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 2

Log of Boring No. BH - 2

Dates Drilled: 9/3/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1429 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.	■	■	11/19/25	5	119	ma, max, ei, ca, er
			■	■	14/33/50-5"	10	127	ds, col
5			■		19/40/38	11	127	
			■		8/14/17	6	125	
10		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, brown.	■		5/8/12	13	117	
15		**SILTY SAND (SM):** fine-grained, trace clay, brown.	■		50-6"	12	120	
20		- fine-to coarse-grained, light brown	■		50-5"	7	131	
25			■		29/50-5"	12	109	
		Boring terminated at 25.9 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 3

Log of Boring No. BH - 3

Dates Drilled: 9/3/2008 Logged by CG Checked By: RJR

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

Ground Surface Elevation (ft): 1417 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.						
5			■		10/50-5"	8	117	
10			■		13/30/50-6"	10	135	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 4

Log of Boring No. BH - 4

Dates Drilled: 9/3/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1430 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.	■		11/30/30	5	130	
		- some clay	■		8/17/28	13	120	col
5		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine- to coarse-grained, trace to little clay, brown.	■		12/18/25	11	130	
10			■		6/8/14	9	127	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No 07-81-368-01

Drawing No A - 5

Log of Boring No. BH - 5

Dates Drilled: 9/3/2008 Logged by: CG Checked By RJR

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

Ground Surface Elevation (ft): 1433 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
			■		16/32/39	5	131	
5			■		13/22/22	5	126	
10		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine-grained sand, some clay, brown.	■		12/10/15	18	107	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 5

Log of Boring No. BH - 6

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1431 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.			21/21/33	7	123	ma, max, ei, ca, er
					21/31/50-6"	6	127	
5					20/30/41	10	121	
					11/18/24	10	129	
10					8/14/18	6	124	col wa
15		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, brown.			14/28/50-5"	15	124	
20		**SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.			20/37/50-4"	9	133	
25		**SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, brown.			9/50-6"	15	120	
30		**CLAYEY SAND (SC):** fine- to coarse-grained, brown.			15/50-6"	11	117	

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 7a

Log of Boring No. BH - 6

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1431 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		SILTY SAND (SM): fine- to coarse-grained, brown.	X		17/22/21			
40			X		10/23/35			
45			X		18/23/25			
50			X		18/20/30			
		End of boring at 51.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 7b

Log of Boring No. BH - 7

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1428 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		16/25/33	9	133	
5		- trace to little clay	■		6/18/29	10	124	col
10			■		8/13/12	5	130	
15		**SANDY CLAY (SC):** fine- to coarse-grained sand, dark grayish brown.	■		17/50-2"	14	106	
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, some clay, brown.						
20			■		21/50-5.5"	11	134	
		End of boring at 20.9 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 8

Log of Boring No. BH - 8

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1429 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		15/22/27	6	127	
		SANDY SILT (ML): fine- to coarse-grained sand, brown.	■		14/19/24	13	120	
5			■		5/16/24	14	118	
10		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		6/8/14	6	126	

End of boring at 11.5 feet.
No groundwater encountered.
Boring backfilled loose with soil cuttings on 9/3/8.

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No A - 9

Log of Boring No. BH - 9

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1429 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						ma
					21/28/40	7	126	
					14/21/29	6	118	col
5					17/20/25	6	116	
		- trace to little clay			9/14/21	10	119	
10					6/11/13	10	131	
15		**CLAYEY SAND (SC):** fine- to medium-grained, dark brown.			7/18/33	11	132	
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
20					31/50-5"	10	132	
		Boring terminated at 20.9 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 10

Log of Boring No. BH - 10

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1426 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.	■		13/23/25	9	110	
5			■		9/18/20	7	129	
		- trace to little clay	■		10/13/14	12	120	
10			■	▨	7/24/50-4.5"	8	136	ca, er
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, reddish-brown.						
15			■		27/50-3"	11	120	
20			■		22/50-6"	7	134	
		Boring terminated at 21.0 feet No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 11

Log of Boring No. BH - 11

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1429 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
			■		10/20/26	5	115	
			■		7/9/14	12	120	
5								
		SANDY SILT (ML): fine- to medium-grained sand, trace clay, brown.	■		9/13/24	15	118	c
10			■		9/10/12	11	118	
15		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		28/50-5"	9	126	
20			■		11/27/40	6	117	
25		**SANDY SILT (ML):** fine- to coarse-grained, trace to little clay, brown.	■		14/50-6"	13	123	
		Boring terminated at 26.0 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 12

Log of Boring No. BH - 12

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1431 Depth to Water (ft): NOT ENCOUNTERED

SUMMARY OF SUBSURFACE CONDITIONS

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.

Depth (ft)	Graphic Log	Summary of Subsurface Conditions	Samples: Drive	Samples: Bulk	Blows/ 6"	Moisture (%)	Dry Unit Wt. (pcf)	Other
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.						ei, ca, er
			■		17/21/28	7	120	
			■		9/19/23	13	118	
5								
		SANDY SILT (ML): fine- to coarse-grained sand, brown.	■		9/17/22	13	127	col
		SILTY SAND (SM): fine- to coarse-grained, brown.	■		7/8/10	6	117	
10			■		6/11/20	9	130	
15		**SANDY CLAY (SC):** fine- to coarse-grained sand, gray-brown.	■		24/50-3"	12	112	
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
20			■		16/34/45	8	127	
25		**SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, brown.	■		6/20/29	13	120	

End of boring at 26.5 feet.
No groundwater encountered.
Boring backfilled loose with soil cuttings on 9/3/8.

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 13

Log of Boring No. BH - 13

Dates Drilled: 9/2/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1427 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■	▨	13/18/22	9	120	
			■	▨	13/20/33	6	116	ds, col
5		**SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, brown.	■		11/14/17	14	112	
			■		10/12/13	11	125	
10		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine- to coarse-grained, brown.	■	▨	5/8/13	11	128	
15			■		50-5"	12	101	
20		**SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.	■		19/36/50-3"	8	119	
25		**SANDY SILT (ML):** fine- to coarse-grained sand, brown.	■		12/38/50-5"	11	123	
30		**SANDY CLAY (CL):** fine- to coarse-grained sand, brown	■		6/29/50-5"	15	115	

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 14a

Log of Boring No. BH - 13

Dates Drilled: 9/2/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1427 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		SILTY SAND (SM): fine- to coarse-grained, brown.	X		13/19/23			
40			X		10/23/33			
45		**SAND (SP):** fine- to medium-grained, brown.	X		23/29/31			
50			X		16/22/27			
		End of boring at 51.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/2/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 14b

Log of Boring No. BH - 14

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1428 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, few gravel, brown.	■		15/19/27	7	120	
5			■		9/20/30	8	122	c
		SANDY SILT (ML): fine- to coarse-grained sand, brown.	■		4/9/10	15	117	
10		**CLAYEY SAND (SC):** fine- to coarse-grained, brown.	■		5/8/19	10	129	col
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown						
15			■		50-6"	11	107	
20			■		9/25/34	4	122	
25		**SANDY CLAY (CL):** fine- to coarse-grained sand, brown	■		5/16/20	26	118	
		End of boring at 26.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 15

Log of Boring No. BH - 15

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1426 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■	▨	19/30/40	8	122	ma, max, ei, ca, er
		SANDY SILT (ML): fine- to coarse-grained sand, trace clay, brown.	■	▨	12/22/29	14	117	ds
5		**SILTY SAND (SM):** fine- to coarse-grained, brown.	■		7/16/26	9	116	c
		- trace clay	■		4/7/14	9	122	
10		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		35/50-3"	8	116	
15			■		18/33/45	8	118	
20			■		34/50-4.5"	9	122	
25		**SANDY SILT (ML):** fine- to coarse-grained sand, brown.	■		11/50-6"	12	124	

Boring terminated at 26.0 feet.
No groundwater encountered.
Boring backfilled loose with soil cuttings on 9/3/8.

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For. MIG

Project No. 07-81-368-01

Drawing No A - 16

Log of Boring No. BH - 16

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1417 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■	▨	22/25/39	8	123	
		CLAYEY SAND (SC): fine- to coarse-grained, brown.	■	▨	20/50-5"	12	123	
5		**SILTY SAND (SM):** fine- to coarse-grained, brown.	■		18/30/50-5"	7	128	
10			■		11/50-6"	8	109	
		Boring terminated at 11.0 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 17

Log of Boring No. BH - 17

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1422 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		47/50-5"	7	125	
5		**SANDY SILT (ML):** fine- to coarse-grained, brown.	■		16/50-5"	10	120	
10			■		11/16/28	9	125	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No A - 18

Log of Boring No. BH - 18

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1429 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		11/23/39	9	122	
		SAND (SP): fine- to medium-grained, brown.	■		12/24/23	5	121	
5		**SILTY SAND (SM):** fine- to coarse-grained, brown.	■		7/20/19	8	127	
10		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine- to medium-grained, brown.	■		32/50-4"	12	110	
		Boring terminated at 10.8 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 19

Log of Boring No. BH - 19

Dates Drilled: 9/2/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1428 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, trace clay, brown.	■	▨	13/22/26	8	108	ma, ca, er, ei
			■	▨	13/18/24	10	122	ds
5		**SANDY SILT (ML):** fine- to coarse-grained sand, trace clay, light brown.	■		8/20/24	12	122	c
			■		7/13/14	12	106	
10		**SANDY CLAY (CL):** fine- to coarse-grained sand, dark grayish brown.	■	▨	8/50-5.5"	15	118	col
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.		▨				
15			■		20/37/48	8	116	
20			■		50-6"	8	113	
25		- trace to little clay	■		13/50-5"	12	118	
30			■		30/50-4"	7	124	

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 20a

Log of Boring No. BH - 19

Dates Drilled: 9/2/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1428 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		SILTY SAND (SM): fine- to coarse-grained, brown.	X		10/10/20			wa
40			X		13/26/30			
45			X		17/20/29			
50		**SAND (SP):** fine- to coarse-grained, brown.	X		17/22/26			
		End of boring at 51.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/2/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For. MIG

Project No. 07-81-368-01

Drawing No. A - 20b

Log of Boring No. BH - 20

Dates Drilled: 9/3/2008 Logged by: AB Checked By: RJR

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

Ground Surface Elevation (ft): 1427 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SANDY SILT (ML):** fine- to coarse-grained, brown.	■		11/14/22	12	109	
5		**ALLUVIUM (Qal):** **SANDY SILT (ML):** fine- to coarse-grained, brown.	■		8/11/17	14	116	
10			■	▨	6/12/15	10	119	
		End of boring at 13.0 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 21

Log of Boring No. BH - 21

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1423 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		40/50-4"	9	119	
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		31/45/50-5"	8	130	
5		**SANDY SILT (ML):** fine-grained sand, brown.	■		45/46/50-6"	10	126	
10			■		11/30/50-6"	13	126	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 22

Log of Boring No. BH - 22

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1424 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		6/6/10	7	129	
		ALLUVIUM (Qal): **CLAYEY SAND (SC):** fine-grained, brown.	■		8/24/50-5"	12	120	
5			■		26/50-6"	10	130	
		SILTY SAND (SM): fine- to coarse-grained, brown.	■		14/36/50-5"	7	135	
10			■		14/21/31	4	121	
		End of boring at 11.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 23

Log of Boring No. BH - 23

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1424 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■		16/22/50-5"	8	122	
5		**ALLUVIUM (Qal):** **SANDY CLAY (CL):** fine-grained sand, brown.	■		18/50-5"	13	119	
10		**SILTY SAND (SM):** fine- to coarse-grained, brown.	■		23/34/50-4"	7	133	
		Boring terminated at 11.3 feet No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 24

Log of Boring No. BH - 24

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1419 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■	▨	28/50-5"	7	129	
			■	▨	23/50-4"	8	120	
5			■		50-5"	10	84	
10			■		50-5"	11	92	
		Boring terminated at 10.5 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/4/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 25

Log of Boring No. BH - 25

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1418 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.	■	▨	24/50-6"	5	136	
		- trace clay	■	▨	27/50-6"	5	139	
5		**SANDY CLAY (CL):** fine- to coarse-grained sand, brown.	■		14/24/37	13	123	
10		**SILTY SAND (SM):** fine- to coarse-grained, brown.	■		18/50-6"	9	131	

Boring terminated at 11.0 feet.
No groundwater encountered.
Boring backfilled loose with soil cuttings on 9/3/8.

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01 Drawing No. A - 26

Log of Boring No. BH - 26

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1425 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
5		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine- to coarse-grained, brown.						
10		End of boring at 10.0 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-31-368-01

Drawing No. A - 27

Log of Boring No. BH - 27

Dates Drilled: 9/4/2008 Logged by: CG Checked By: RJR

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

Ground Surface Elevation (ft): 1422 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS 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/ 6"	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ARTIFICIAL FILL (Af): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine- to coarse-grained, brown.						
5								
10		End of boring at 10.0 feet. No groundwater encountered. Boring backfilled loose with soil cuttings on 9/3/8.						

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. A - 28

APPENDIX B

LABORATORY TESTING PROGRAM

APPENDIX B

LABORATORY TESTING PROGRAM

Laboratory tests were conducted on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The results of laboratory testing are summarized in the following sections and on the Logs of Borings in Appendix A, *Field Exploration.* The following is a summary of the various laboratory tests conducted for this project.

Moisture Content and Dry Density

Results of these tests performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide qualitative information regarding soil strength and compressibility. 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, ten (10) ring samples were loaded up to approximately two kips per square foot (ksf), allowed to stabilize under load, and then submerged. This test was conducted in accordance with the ASTM Standard D5333. The results (including data from the consolidation tests) are presented in the following table.

Table No. B-1, Collapse Test Results

BH-1	2.0-3.5	Alluvium - Silty Sand (SM), trace to little clay, brown	+0.09
BH-2	3.0-4.5	Fill - Silty Sand (SM), brown	0.00
BH-4	3.0-4.5	Fill - Silty Sand (SM),trace clay brown	+0.20
BH-6	10.0-11.5	Fill - Silty Sand (SM), brown	-0.35
BH-7	5.0-6.5	Fill - Silty Sand (SM), brown.	-0.03
BH-9	3.0-4.5	Fill - Silty Sand (SM), brown	-0.70
BH-11*	7.0-8.5	Fill - Sandy Silt (ML), trace clay, brown	+0.15
BH-12	7.0-8.5	Fill - Sandy Silt (ML), brown	+0.10
BH-13	3.0-4.5	Fill - Silty Sand (SM), brown	-0.31
BH-14*	4.0-5.5	Fill - Silty Sand (SM), brown	0.00
BH-14	10.0-11.5	Fill - Clayey Sand (SC), brown	+0.04
BH-15*	5.0-6.5	Fill - Silty Sand (SM), brown	-0.05

BH-19*	5.0-6.5	Fill - Sandy silt (ML), brown	-0.31
BH-19	10.0-11.0	Fill - Sandy Clay (CL), dark gray brown	+0.15

*Data from consolidation tests

Expansion Index Test

Five (5) representative bulk samples were tested for expansion index to evaluate the expansion potential of the subsurface materials encountered at the site. The tests were conducted in accordance with ASTM D4829 test method. Test results are presented in the following table.

Table No. B-2, Expansion Index Test Results

BH-2	0-5	Fill - Silty Sand (SM), trace clay, brown	45	Low
BH-6	0-5	Fill - Silty Sand (SM), trace clay, brown	35	Low
BH-12	0-5	Fill - Silty Sand (SM), trace clay, brown	26	Low
BH-15	0-5	Fill - Silty Sand (SM), brown	16	Very Low
BH-19	0-5	Fill - Silty Sand (SM), trace clay, brown	33	Low

Soil Corrosivity

Minimum electrical resistivity, pH, soluble sulfate, and chloride concentrations were determined for representative soil samples to evaluate the corrosion potential of common construction materials in contact with the soil. Testing was performed by Schiff Associates of Claremont, California. The test results are summarized in the following table.

Table No. B-3, Soil Corrosivity Test Results

BH-2	0-5	7.1	13	48	1,960
BH-6	0-5	6.9	15	82	1,520
BH-10	0-5	7.4	37	88	1,520

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BH-12	0-5	7.3	25	35	2,200
BH-15	0-5	7.4	47	36	1,640
BH-19	0-5	7.4	39	41	1,720

R-value Test

Two (2) representative bulk samples of the surface alluvial soil were tested for resistance value (R-value) in accordance with State of California Caltrans Method 301. This test is designed to provide a relative measure of the soil strength for use in pavement design. Test results are presented in the following table.

Table No. B-4, R-value Test Results

[illegible]	[illegible]	[illegible]	[illegible]
BH-16	0-5	Silty Sand (SM), brown	21
BH-24	0-5	Silty Sand (SM), brown	21

Percent Passing Sieve No. 200

Two (2) selected samples were tested in accordance with the ASTM Standard D1140 test method to determine the amounts of materials finer than U.S. Standard Sieve No. 200. The test results (includes results from five [50] sieve Analyses) are presented in the following table.

Table No. B-5, Percent Finer than #200 Sieve Results

[illegible]	[illegible]	[illegible]	[illegible]
BH-2*	0-5	Fill - Silty Sand (SM), brown	38.7
BH-6*	0-5	Fill - Silty Sand (SM), brown	39.6
BH-6	10-15	Fill - Silty Sand (SM), brown	48.0
BH-9*	0-5	Fill - Silty Sand (SM), brown	39.3
BH-15*	0-5	Fill - Silty Sand (SM), brown	31.1
BH-19*	0-5	Fill - Silty Sand (SM), brown	36.1
BH-19	35.0-36.5	Alluvium - Silty Sand (SM), brown	36.0

* Data from sieve analyses

Sieve Analysis

To assist in classification of soils, mechanical grain-size analyses were performed on five (5) selected samples. Testing was performed in general accordance with the ASTM Standard D422 test method. For test results, see Drawing No. B-1, *Grain Size Distribution Results*.

Laboratory Maximum Density Tests

Laboratory maximum dry density and optimum moisture content relationship tests were performed on three (3) representative bulk samples. The tests were conducted in accordance with ASTM D1557 test method. The test results are presented on Drawing No. B-2, *Moisture-Density Relationship Results*, and in the following table.

Table No. B-6, Laboratory Maximum Density Test Results

BH-2	0-5	Fill - Silty Sand (SM), brown	132.0	7.5
BH-6	0-5	Fill - Silty Sand (SM), brown	129.0	8.5
BH-15	0-5	Fill - Silty Sand (SM), brown	136.0	7.5

Direct Shear Tests

Four (4) direct shear tests were performed on representative samples at soaked moisture conditions. Three (3) samples for each test, contained in brass 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 conditions. Each sample was then sheared at a constant strain rate of 0.01 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 through B-6, *Direct Shear Test Results*, and in the following table.

Table No. B-7, Summary of Direct Shear Test Results

BH-2	3.0-4.5	Fill - Silty Sand (SM), trace clay, brown	33	200
BH-13	3.0-4.5	Fill - Silty Sand (SM), brown	28	400
BH-15	3.0-4.5	Fill - Sandy Silt (ML), brown	28	300
BH-19	3.0-4.5	Fill - Silty Sand (SM), brown	38	0

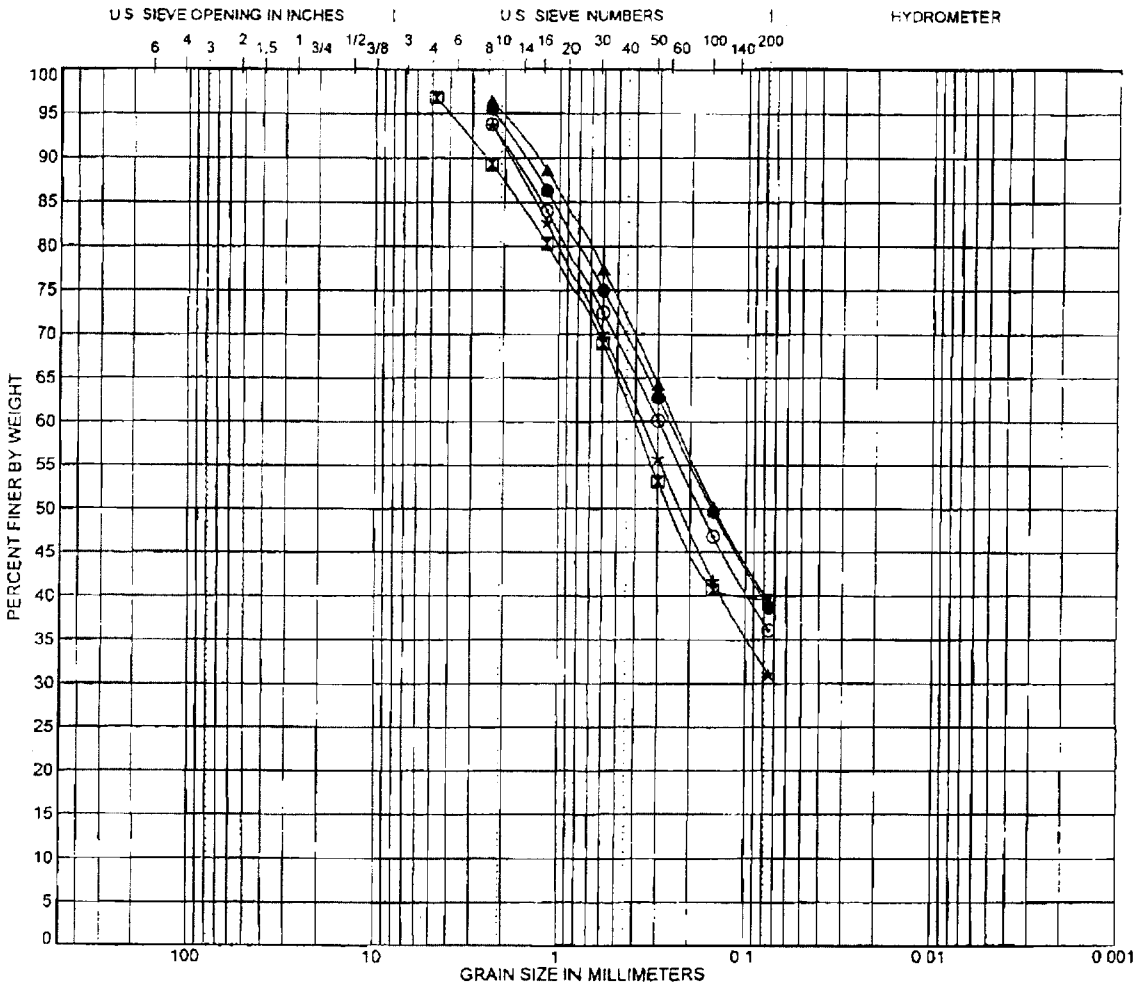
Consolidation Test

Four (4) consolidation tests were performed on relatively undisturbed ring samples to evaluate the settlement characteristics of the on-site soils under load. Preparation for this test involved trimming the sample, placing it in a one-inch-high brass ring, and loading it into the test apparatus, which contained porous stones to accommodate drainage during testing. The samples were tested at field moisture and submerged conditions. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various times. 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.

For test results, including sample density and moisture content, see Drawing Nos. B-7 through B-10, *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	Fill - Silty Sand (SM)					
⊠	BH - 6	0.0 - 5.0	Fill - Silty Sand (SM)					
▲	BH - 9	0.0 - 5.0	Fill - Silty Sand (SM)					
★	BH - 15	0.0 - 5.0	Fill - Silty Sand (SM)					
⊙	BH - 19	0.0 - 5.0	Fill - Silty Sand (SM)					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH - 2	0.0 - 5.0	2.36	0.26			0.0	56.8	38.7	
⊠	BH - 6	0.0 - 5.0	4.75	0.405			0.0	57.2	39.6	
▲	BH - 9	0.0 - 5.0	2.36	0.244			0.0	57.2	39.3	
★	BH - 15	0.0 - 5.0	2.36	0.368			0.0	62.6	31.1	
⊙	BH - 19	0.0 - 5.0	2.36	0.298			0.0	57.7	36.1	

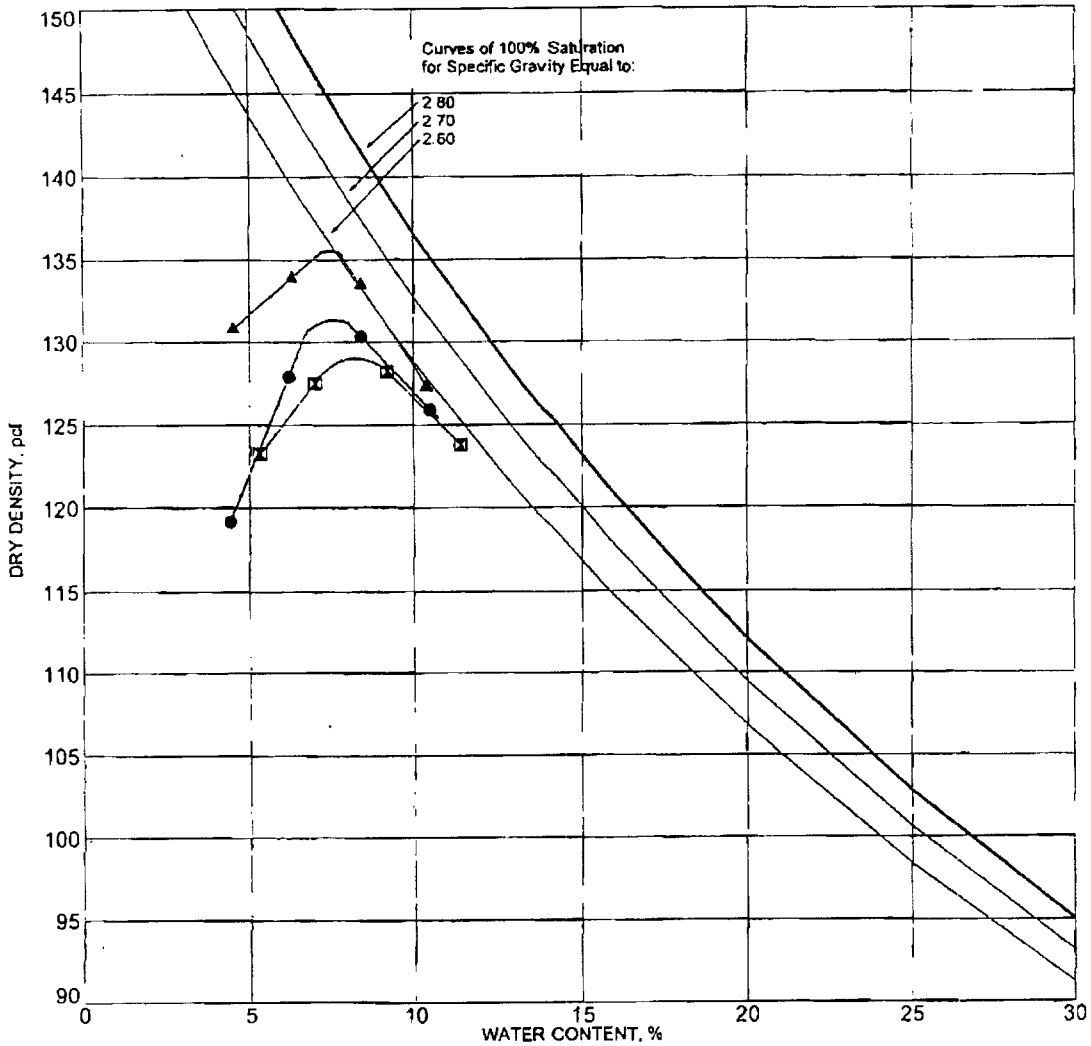
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 1



SYMBOL	BORING NO	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	BH - 2	0.0 - 5.0	Fill - Silty Sand (SM)	D1557 Method A	7.5	132.0
⊠	BH - 6	0.0 - 5.0	Fill - Silty Sand (SM)	D1557 Method A	8.5	129.0
▲	BH - 15	0.0 - 5.0	Fill - Silty Sand (SM)	D1557 Method A	7.5	136.0

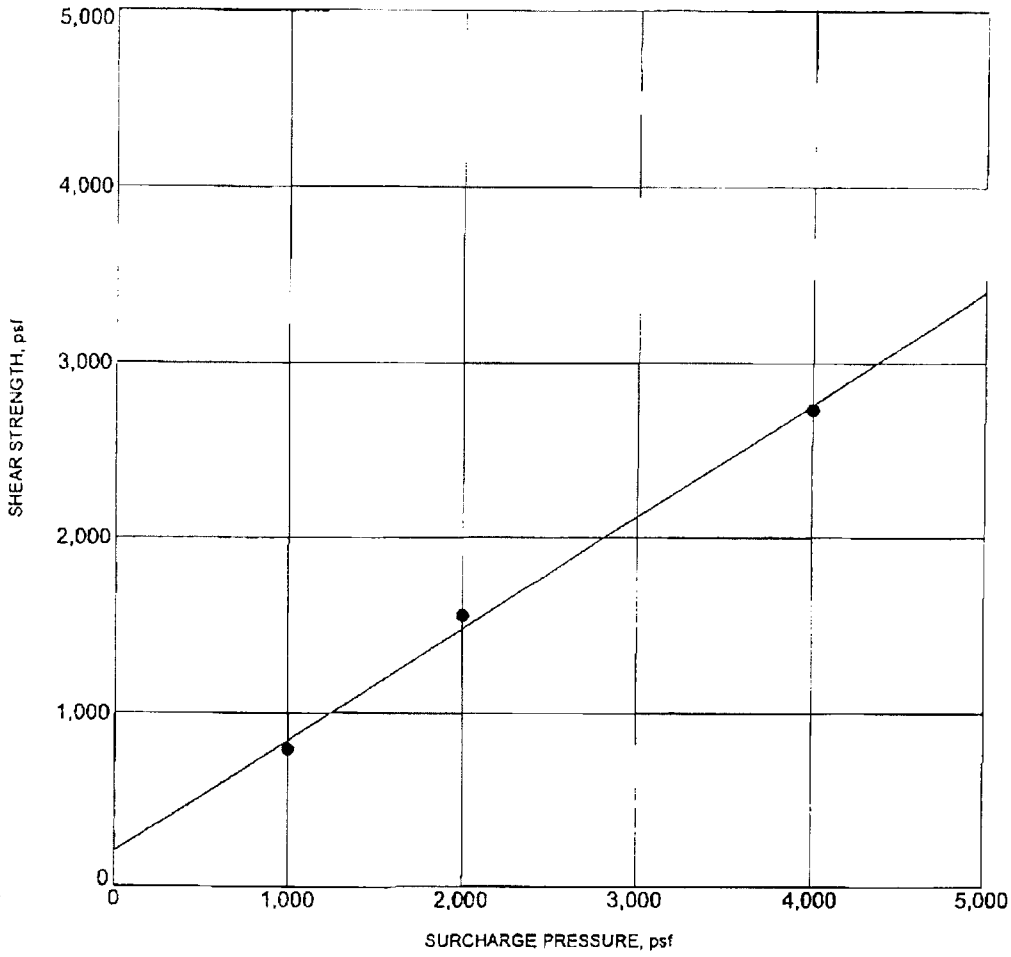
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 2



BORING NO :	BH - 2	DEPTH (ft) :	3.0 - 4.5
DESCRIPTION :	Fill - Silty Sand (SM)		
COHESION (psf) :	200	FRICTION ANGLE (degrees)	33
MOISTURE CONTENT (%) :	9.6	DRY DENSITY (pcf) :	126.8

NOTE: Ultimate Strength

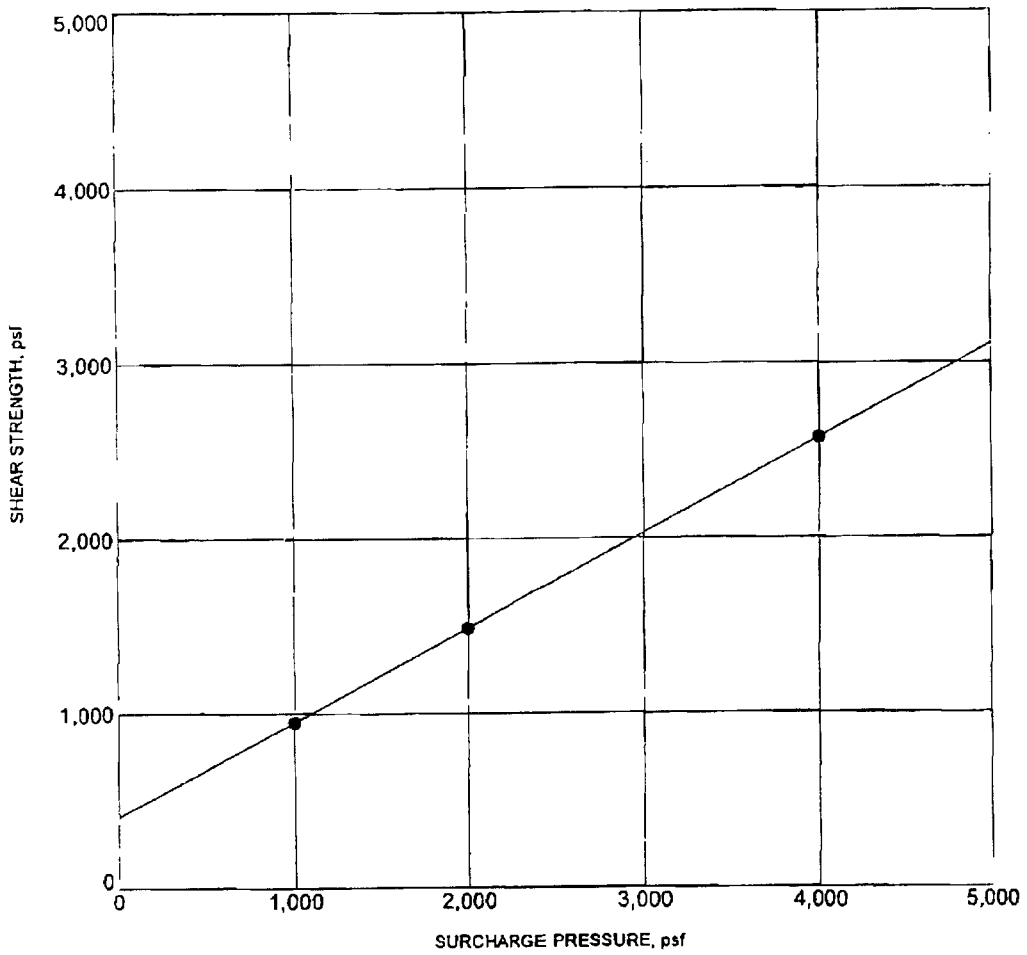
DIRECT SHEAR TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 3



BORING NO :	BH - 13	DEPTH (ft) :	3.0 - 4.5
DESCRIPTION :	Fill - Silty Sand (SM)		
COHESION (psf) :	400	FRICTION ANGLE (degrees)	28
MOISTURE CONTENT (%) :	12.3	DRY DENSITY (pcf) :	124.2

NOTE: Ultimate Strength

DIRECT SHEAR TEST RESULTS

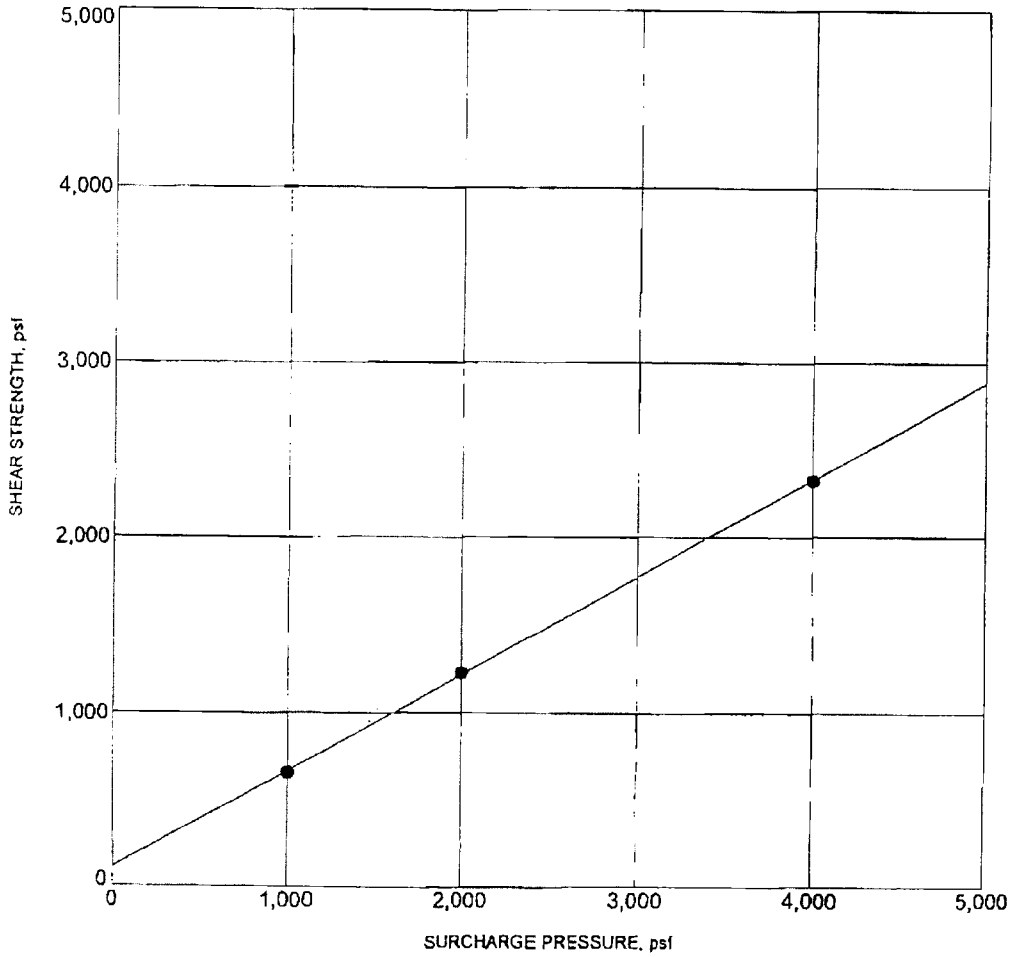
Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 4

Project ID: 07-81-368-01.GPJ, Template: DIRECT SHEAR



BORING NO :	BH - 15	DEPTH (ft) :	3.0 - 4.5
DESCRIPTION :	Fill - Sandy Silt (ML)		
COHESION (psf) :	100	FRICTION ANGLE (degrees)	29
MOISTURE CONTENT (%) :	14.3	DRY DENSITY (pcf) :	117.2

NOTE: Ultimate Strength

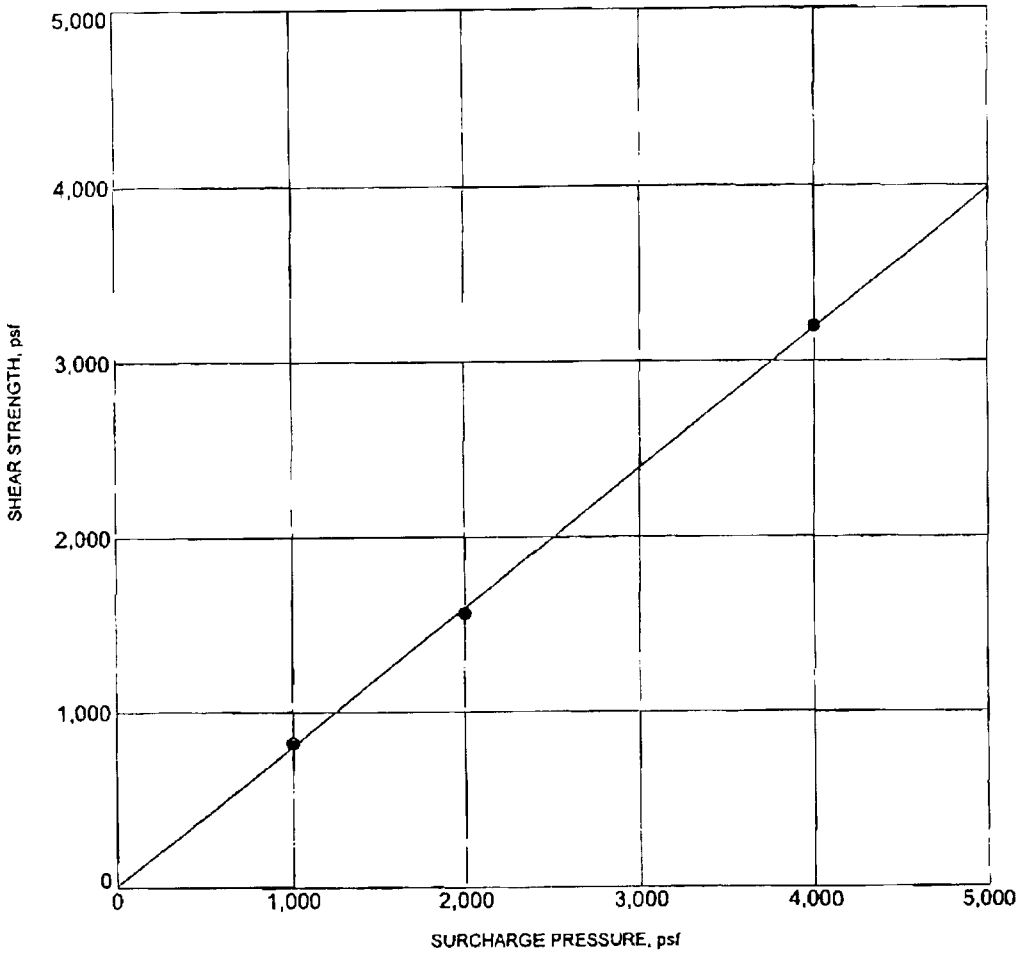
DIRECT SHEAR TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 5



BORING NO :	BH - 19	DEPTH (ft) :	3.0 - 4.5
DESCRIPTION :	Fill - Silty Sand (SM)		
COHESION (psf) :	0	FRICTION ANGLE (degrees)	38
MOISTURE CONTENT (%) :	10.5	DRY DENSITY (pcf) :	122.4

NOTE: Ultimate Strength

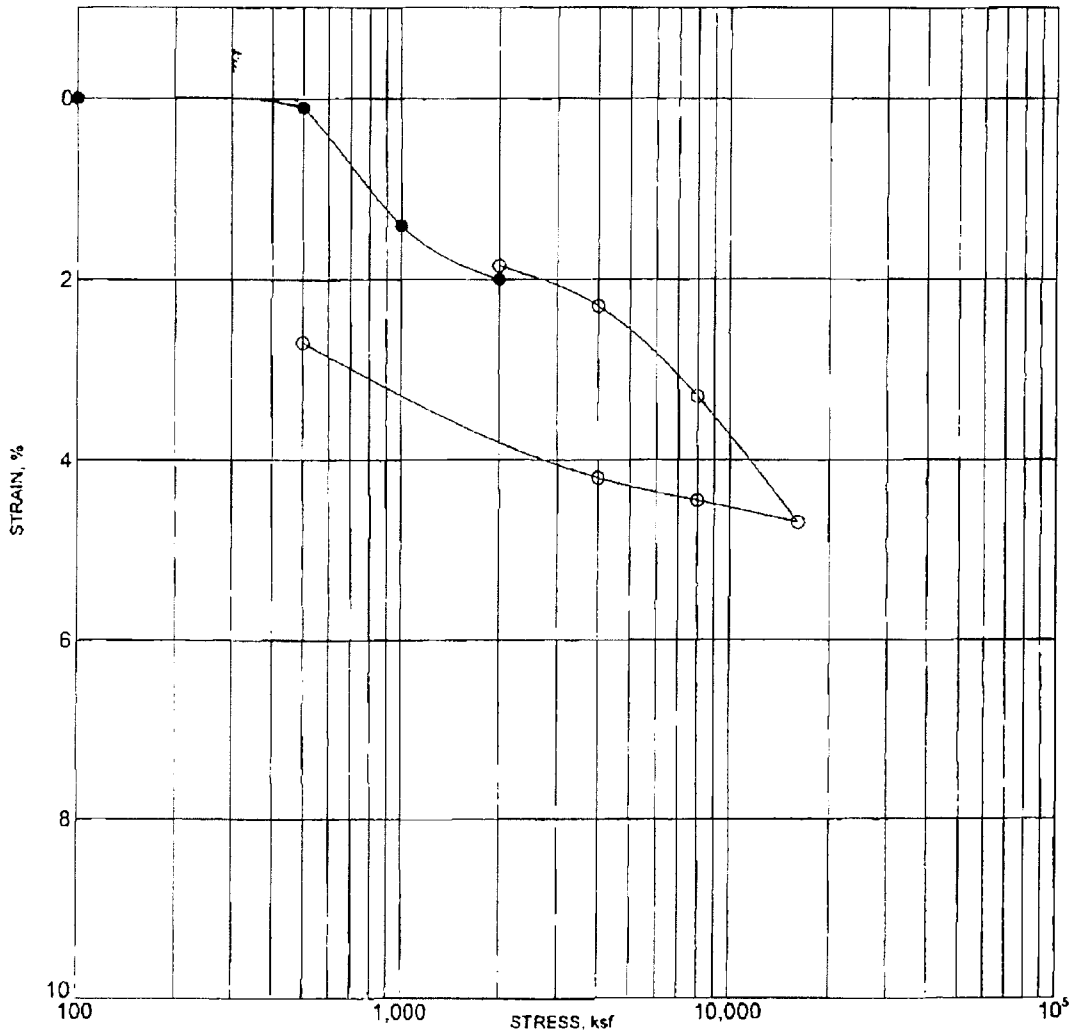
DIRECT SHEAR TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 6



BORING NO :	BH - 11	DEPTH (ft) :	7.0 - 8.5
DESCRIPTION :	Fill - Sandy Silt (ML)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	14.8	117.5	97	0.404
FINAL	15.6	120.1	110	0.373

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

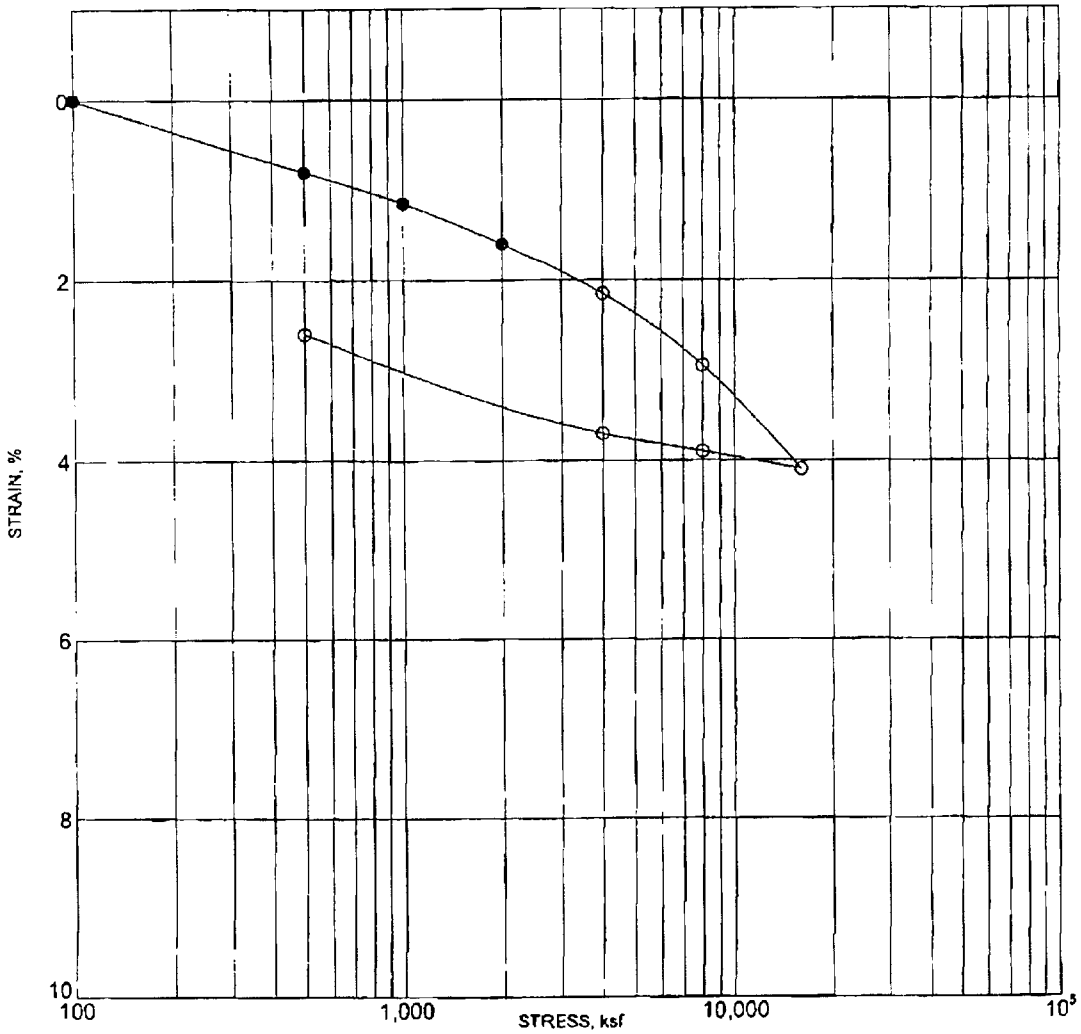
CONSOLIDATION TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 7



BORING NO :	BH - 14	DEPTH (ft) :	4.0 - 5.5
DESCRIPTION :	Fill - Silty Sand (SM)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	7.6	122.4	58	0.348
FINAL	13.7	125.7	120	0.312

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

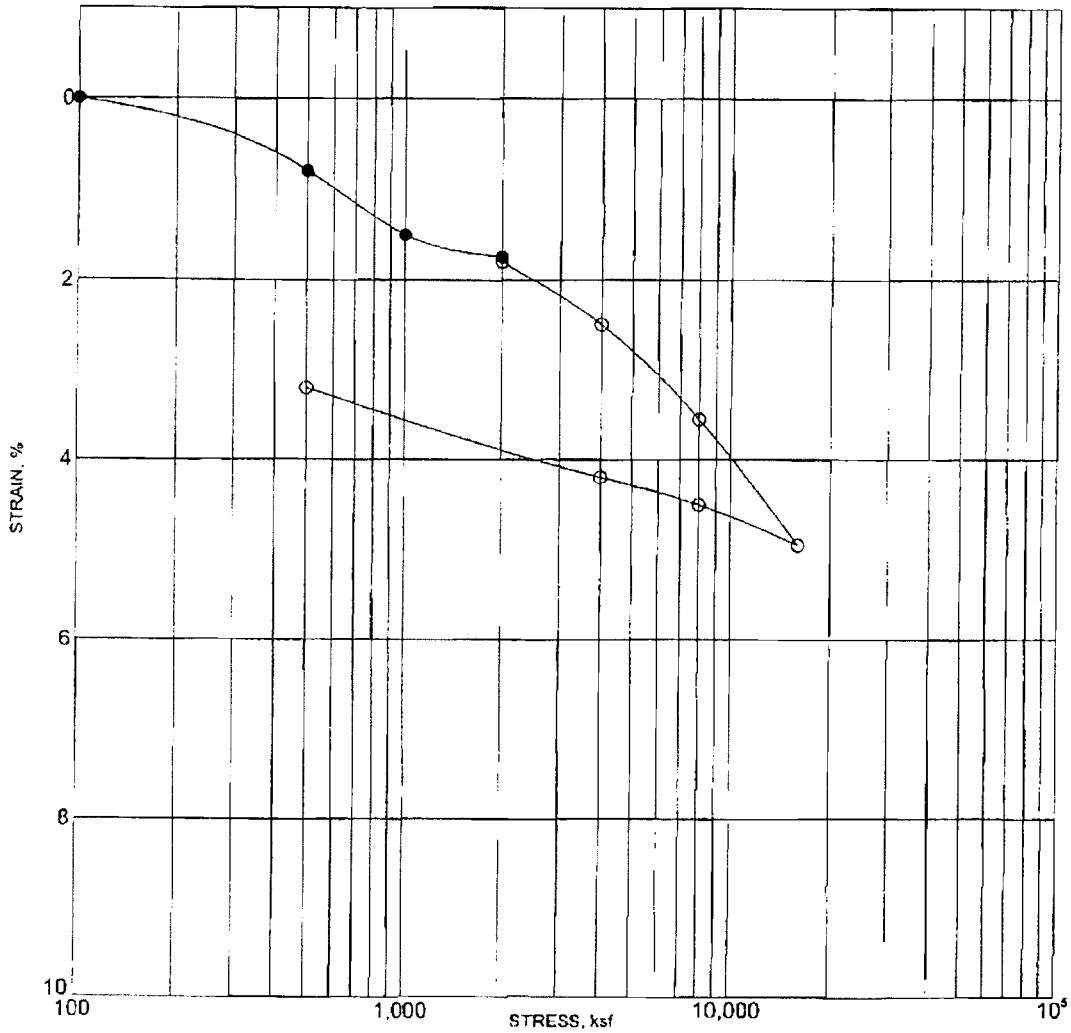
CONSOLIDATION TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 8



BORING NO :	BH - 15	DEPTH (ft) :	5.0 - 6.5
DESCRIPTION :	Fill - Silty Sand (SM)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	8.8	116.2	56	0.419
FINAL	15.1	120.0	110	0.374

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

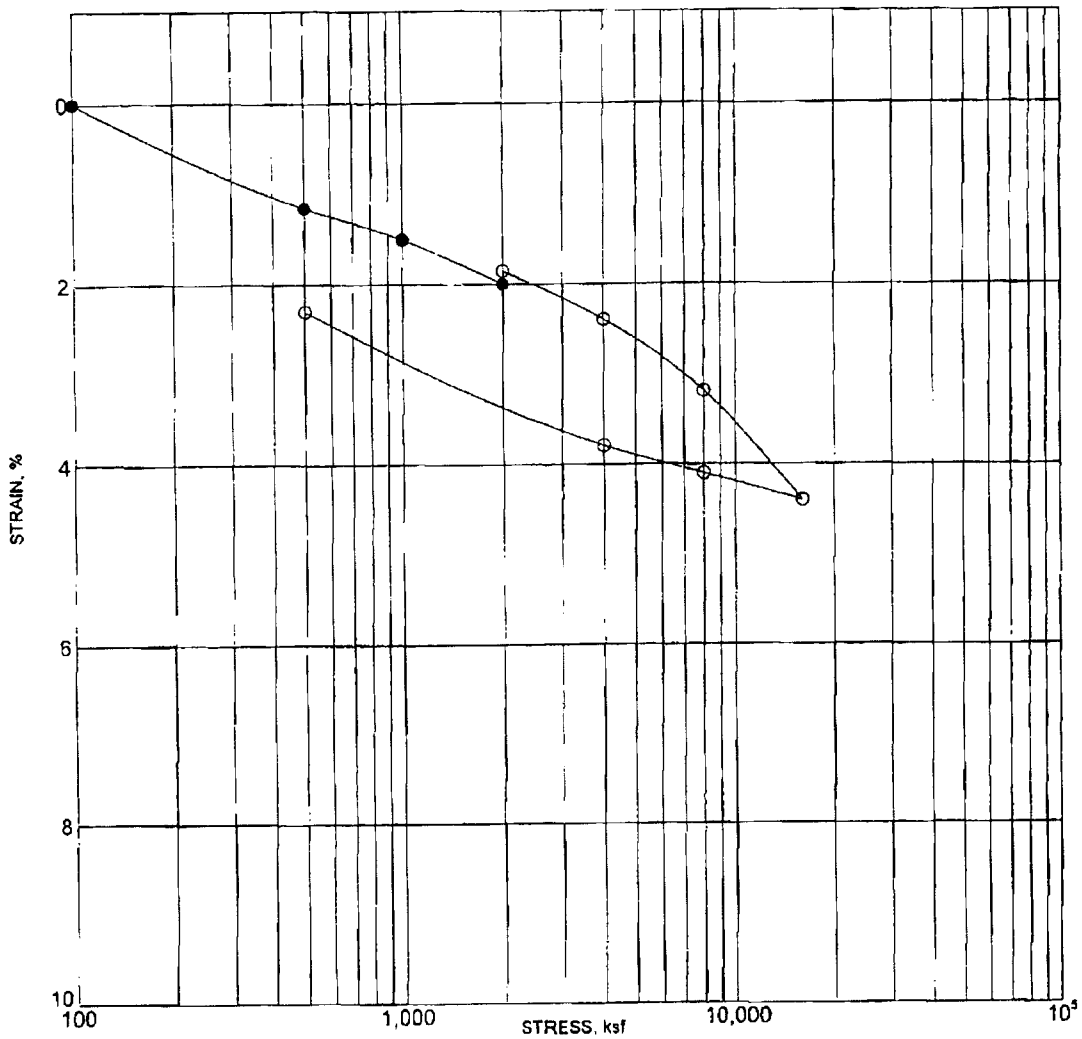
CONSOLIDATION TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No B - 9



BORING NO	BH - 19	DEPTH (ft) :	5.0 - 6.5
DESCRIPTION :	Fill - Sandy Silt (ML)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	12.1	122.0	91	0.352
FINAL	13.9	124.9	110	0.321

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

CONSOLIDATION TEST RESULTS

Converse Consultants

Perris Valley Big League Dreams Sports Park
City of Perris, Riverside County, California
For: MIG

Project No. 07-81-368-01

Drawing No. B - 10

APPENDIX C

EARTHWORK SPECIFICATIONS

APPENDIX C

EARTHWORK SPECIFICATIONS

C1.1 Scope of Work

The work includes all labor, supplies and construction equipment required to construct the building pads and ball fields in a good workmanlike manner, as shown on the drawings and herein specified. The major items of work covered in this section include the following:

- Site Inspection
- Authority of geotechnical engineer
- Site Clearing
- Excavations
- Preparation of Fill Areas
- Placement and Compaction of Fills
- Observation and Testing

C1.2 Site Inspection

1. The contractor shall carefully examine the site and make all inspections necessary in order to determine the full extent of the work required to make the completed work conform to the drawings and specifications. The contractor shall satisfy himself as to the nature and location of the work, ground surface and the characteristics of equipment and facilities needed prior to and during prosecution of the work. The contractor shall satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the drawings, or between the drawings and specifications must be brought to the owner's attention in order to clarify the exact nature of the work to be performed.
2. This *Geotechnical Investigation Report* may be used as a reference to the surface and subsurface conditions on this project. The information presented in this above referenced report is intended for use in design and is subject to confirmation of the conditions encountered during construction. The exploration logs and related information depict subsurface conditions only at the particular time and location designated on the boring logs. Subsurface conditions at other locations may differ from conditions encountered at the exploration locations. In addition, the passage of time may result in a change in subsurface conditions at the exploration locations. Any review of this information shall not relieve the

contractor from performing such independent investigation and evaluation to satisfy himself as to the nature of the surface and subsurface conditions to be encountered and the procedures to be used in performing his work.

C1.3 Authority of the Geotechnical Engineer

1. The geotechnical engineer will observe the placement of compacted fill and will take sufficient tests to determine the uniformity and degree of compaction of filled ground.
2. As the owner's representative, the geotechnical engineer will (a) have the authority to cause the removal and replacement of loose, soft, disturbed and other unsatisfactory soils and uncontrolled fill; (b) have the authority to approve the preparation of native ground to receive fill material; and (c) have the authority to approve or reject soils proposed for use in building areas.
3. The civil engineer and/or owner will decide all questions regarding (a) the interpretation of the drawings and specifications, (b) the acceptable fulfillment of the contract on the part of the contractor and (c) the matters of compensation.

C1.4 Site Clearing

1. Clearing and grubbing shall consist of the removal of all debris and vegetation from areas to be graded.
2. Organic and inorganic materials resulting from the clearing and grubbing operations shall be hauled away from the site.

C1.5 Excavations

1. Based on observations made during our field explorations, the surficial soils can be excavated with conventional earthwork equipment.

C1.6 Preparation of Fill Areas

1. Unsuitable soils shall be removed from the proposed building areas as outlined in Section 10.2, *Excavation/Removal within Building Pads* of this report.
2. After the required removals have been made, the exposed earth materials shall be excavated to provide a zone of structural fill for the support of footings, slabs-on-grade, and exterior flatwork. All loose, soft or disturbed earth materials should be removed from the bottom of excavations before placing structural fill.
3. The subgrade in all areas to receive fill shall be scarified to a minimum depth of 12 inches. The soil moisture should be adjusted to at least two (2) percent above optimum for fine-grained soils and within two (2) percent of optimum moisture content for coarse-grained soils, and then compacted to at least 90 percent of

maximum dry density as determined by ASTM D1557. Scarification may be terminated on moderately hard to hard cemented earth materials with the approval of the geotechnical engineer.

4. Compacted fill may be placed on native soils and or documented fill that have been properly scarified and recompacted as discussed above.
5. All areas to receive compacted fill will be observed and evaluated by the geotechnical engineer before the placement of fill.

C1.7 Placement and Compaction of Fill

1. Compacted fill placed for the support of footings, slabs-on-grade, concrete flatwork, interior streets and driveways shall be considered structural fill. Structural fill may consist of approved on-site soils or imported fill that meets the criteria indicated below.
2. Fill consisting of selected on-site earth materials or imported soils approved by the geotechnical engineer shall be placed in layers on approved earth materials. Soils used as compacted structural fill shall have the following characteristics:
   a. All fill soil particles should not exceed three (3) inches in nominal size, and should be free of organic matter and miscellaneous inorganic debris and inert rubble.
   b. In order to limit moisture penetration to foundation earth materials, imported fill materials should be similar to on-site earth materials with at least 30 percent passing the No. 200 sieve. As an alternative to 30 percent passing the No. 200 sieve, import materials with a remolded permeability of 1 x 10 (-6) cm/sec or less would be acceptable.
   c. Fill materials within the proposed structure areas and to five (5) feet beyond the building limits shall have an Expansion Potential of "Very Low". All imported fill should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM D1557) at about two (2) percent above optimum moisture for fine-grained soils, and within two (2) percent of optimum for granular soils.
   d. Imported fill materials should have less than 0.1 percent sulfate salts, if possible. If laboratory test results indicate import fill materials contain more than 0.1 percent sulfate salts, a concrete mix shall be designed to resist the sulfate levels indicated by the laboratory test results.
3. Fill soils shall be evenly spread in maximum eight-inch lifts, watered or dried as necessary, mixed and compacted to at least the density specified below. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the geotechnical engineer.

4. All fill placed at the site shall be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM D1557 test method. Coarse-grained soils shall be moisture conditioned to within two (2) percent, and fine-grained soils to at least two (2) percent above optimum moisture content.
5. Fill exceeding five (5) feet in height shall not be placed on native slopes that are steeper than 5:1 (horizontal:vertical). Where native slopes are steeper than 5:1, and the height of the fill is greater than five (5) feet, the fill shall be benched into competent materials. The height and width of the benches shall be at least two (2) feet.
6. Representative samples of materials being used as compacted fill will be analyzed in the laboratory by the geotechnical engineer to obtain information on their physical properties. Maximum laboratory density of each soil type used in the compacted fill will be determined by the ASTM D15570 compaction method.
7. Fill materials shall not be placed, spread or compacted during unfavorable weather conditions. When site-grading is interrupted by heavy rain, filling operations shall not resume until the geotechnical engineer approves the moisture and density conditions of the previously placed fill.
8. It shall be the grading contractor's obligation to take all measures deemed necessary during grading to provide erosion control devices in order to protect slope areas and adjacent properties from storm damage and flood hazard originating on this project. It shall be the contractor's responsibility to maintain slopes in their as-graded form until all slopes are in satisfactory compliance with job specifications, all berms have been properly constructed, and all associated drainage devices meet the requirements of the civil engineer.

C1.8 Trench Backfill

The following specifications are recommended to provide a basis for quality control during the placement of trench backfill.

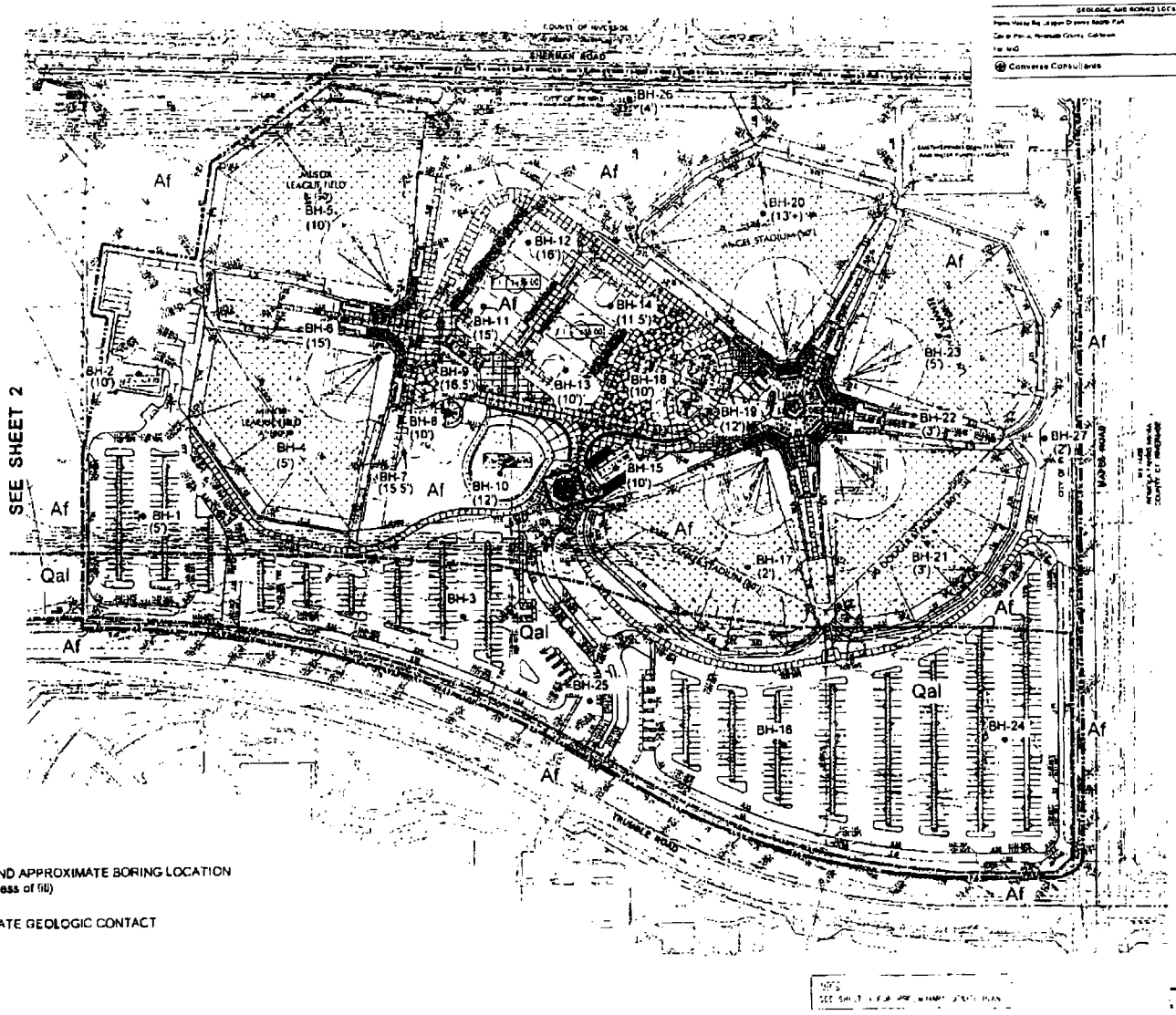
1. Trench excavations to receive backfill shall be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
2. Trench backfill shall be compacted to a minimum of 90 percent of the laboratory maximum dry density as per ASTM D1557 test method.
3. The upper 12 inches of trench backfill shall be compacted to a minimum of 95 percent of the laboratory maximum dry density as per ASTM D1557 test method, where the trench is covered by asphaltic concrete.

4. Rocks larger than one (1) inch should not be placed within 12 inches of the top of the pipeline or within the upper 12 inches of pavement or structure subgrade. No more than 30 percent of the backfill volume shall be larger than 3/4-inch in largest dimension diameter, and rocks shall be well mixed with finer soil.
5. The pipe design engineer should select bedding material for the pipe. Bedding materials generally should have a Sand Equivalent (SE) greater than or equal to 30, as determined by the ASTM Standard D2419 test method.
6. Trench backfill shall be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers, or mechanical tampers, to achieve the density specified herein. The backfill materials shall be brought to within two (2) percent of optimum moisture content for granular soils and above two (2) percent for fine-grained soils, then placed in horizontal layers. The thickness of uncompacted layers should not exceed eight (8) inches. Each layer shall be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
7. The contractor shall select the equipment and processes to be used to achieve the specified density without damage to adjacent ground and completed work.
8. The field density of the compacted soil shall be measured by the ASTM D1556 or ASTM Standard D2922 test methods or equivalent.
9. Observation and field tests should be performed by Converse during construction to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compactive effort shall be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.
10. It should be the responsibility of the contractor to maintain safe conditions during cut and/or fill operations.
11. Trench backfill shall not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are as previously specified.

C1.9 Observation and Testing

1. During the progress of grading, the geotechnical engineer will provide observation of the fill placement operations.
2. Field density tests will be made during grading to provide an opinion on the degree of compaction being obtained by the contractor. Where compaction of less than specified herein is indicated, additional compactive effort with adjustment of the moisture content shall be made as necessary until the required degree of compaction is obtained.

3. A sufficient number of field density tests will be performed to provide an opinion to the degree of compaction achieved. In general, density tests will be performed on each one-foot lift of fill, but not less than one for each 500 cubic yards of fill placed.



EXPLANATION

Symbols

• BH-27 (10') NUMBER AND APPROXIMATE BORING LOCATION (thickness of fill)

APPROXIMATE GEOLOGIC CONTACT

Units

Af FILL

Qal ALLUVIUM

SEPTEMBER 2008

MIG

DESIGN DEVELOPMENT PRELIMINARY GRADING PLAN

PERRIS VALLEY BIG LEAGUE DREAMS

COUNTY OF RIVERSIDE
ECONOMIC DEVELOPMENT AGENCY
SHEET 1 OF 3