Table 5

Usage	TI	R-value	Recommended Structural Section
Auto Parking Areas	5.0	50	0.25' HMA/0.35' Class 2 AB
Auto Roads	5.5	50	0.25' HMA/0.35' Class 2 AB
Truck Parking Areas	6.0	50	0.25' HMA/0.35' Class 2 AB
Truck Ramps and Roads	8.0	50	0.40' HMA/0.45' Class 2 AB

HMA = hot mix asphalt AB = aggregate base

Recommended structural sections were calculated based on TIs and our preliminary sampling and testing. For other TIs, the structural sections provided in Enclosure "C-15" should provide satisfactory AC pavement.

The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils, with the upper 6 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

PRELIMINARY RIGID PAVEMENT DESIGN:

Based upon an R-value of 50, we recommend the following PCC pavement designs. These designs are based upon the ACI "Guide for Design and Construction of Concrete Parking Lots" (ACI 330R).

Table 6

Design Area	Recommended Section
Car Parking and Access Lanes ADTT = 1 (Category A)	4.5" PCC/Compacted Soil
Truck Parking Areas Multiple Units ADTT = 25 (Category B)	6.0" PCC/Compacted Soil

ADTT = Average Daily Truck Traffic

The recommended concrete sections are based on a design life of 20 years, with integral curbs or thickened edges. In addition, the above structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils, with the upper 12 inches of subgrade soils brought to a uniform relative compaction of 95 percent (ASTM D1557).

Slab edges that will be subject to vehicle loading should be thickened at least 2 inches at the outside edge and tapered to 36 inches back from the edge. Typical details are given in the ACI "Guide for Design and Construction of Concrete Parking Lots" (ACI 330R). Alternatively, slab edges subject to vehicle loading should be designed with dowels or other load transfer mechanisms. Thickened edges or dowels are not necessary where new pavement will abut areas of curb and gutter, parking structures or other structures preventing through-vehicle traffic and associated traffic loads.

The concrete sections may be placed directly over a compacted subgrade prepared as described above. The concrete to be utilized for the concrete pavement should have a minimum modulus of rupture of 550 pounds per square inch (psi). This approximates a 28-day compressive strength of 3,500 psi. However, the design strength should be based upon the modulus of rupture and not the compressive strength. Contraction joints should be sawcut in the pavement at a maximum spacing of 30 times the thickness of the slab, up to a maximum of 15 feet. Sawcutting in the pavement should be performed within 12 hours of concrete placement, preferably sooner. Sawcut depths should be equal to approximately one-quarter of the slab thickness for conventional saws or 1 inch when early-entry saws are utilized on slabs 9 inches thick or less. The use of plastic strips for formation of jointing is not recommended. The use of expansion joints is not recommended, except where the pavement will adjoin structures. Construction joints should be constructed such that adjacent sections butt directly against each other and are keyed into each other or the joints are properly doweled with smooth dowels. It should be noted that distributed steel reinforcement (welded wire fabric) is not necessary, nor will any decrease in section thickness result from its inclusion.

The pavement designs were based upon the results of preliminary sampling and testing and should be verified by additional sampling and testing during construction when the actual subgrade soils are

exposed. CHJ Consultants does not practice traffic engineering. We recommend that the ADTT TIs used for this project be reviewed by the project civil engineer or traffic engineer to verify that they are appropriate for this project.

SHALLOW FOUNDATION RECOMMENDATIONS

The proposed parking structure may be supported by shallow foundations, including conventional spread footings and grade beams, provided the recommendations contained in this report are implemented during planning, grading and construction.

PREPARATION OF FOOTING AREAS:

All footings should rest entirely upon at least 36 inches of properly compacted fill material. The mandatory removal and replacement of the upper 8 feet of existing soil will accommodate footings as deep as 5 feet below existing grade. Additional removal and replacement will be required for footings deeper than 5 feet. This subexcavation operation should include removal of all undocumented fill and loose upper native soils existing within the areas to be graded, even though planned filling will be sufficient to satisfy compacted fill thickness requirements.

FOUNDATION DESIGN:

If the site is prepared as recommended, the proposed structure may be safely founded on conventional spread foundations, either individual spread footings and/or continuous wall footings, bearing on a minimum of 36 inches of properly compacted soil. Footings should be a minimum of 24 inches wide and should be established at a minimum depth of 24 inches below lowest adjacent final subgrade level. For the minimum width and depth, footings may be designed for a maximum safe net soil bearing pressure of 2,300 psf for dead plus live loads. This maximum net allowable bearing pressure may be increased to 7,000 for footing widths up to 11 feet. Compacted fill was assumed to be of a wet unit weight of 119 pcf, internal frictional angle of 30 degrees and cohesion strength of 0 psf, based on our laboratory test results of on-site near-surface materials. A constrained modulus

of 1,000 tons per square foot (tsf) was also assumed for recompacted fill. These parameters should be confirmed during grading.

The allowable net bearing pressures are based on a factor of safety of 3 against shear failure or an allowable settlement of 1/2 inch, whichever is less. The allowable bearing pressures are net values. If needed, 380 psf can be added to the net values to obtain total allowable bearing pressure.

These bearing values may be increased by one-third for wind or seismic loading.

For footings thus designed and constructed, we would anticipate a maximum static settlement of 1/2 inch or less. Differential settlement between similarly loaded adjacent footings is expected to be approximately one-half the total settlement. These settlement estimates do not include seismically induced settlement.

With the recommended 8 feet of removal and recompaction, and provided that measures will be taken to minimize water infiltration into the underlying soils, it is our opinion that hydroconsolidation settlement will be negligible. As such, total differential settlement (including static, hydroconsolidation and seismic) on the order of 3/4 inch over 40 feet should be considered in the design.

MODULUS OF SUBGRADE REACTION:

We recommend that a modulus of subgrade reaction, k_v, of 150 kips per cubic foot (kcf) be used for design of reinforced concrete floor and mat foundations with widths up to 18 feet. If using the pseudo-coupled method of mat design, the k_v values for the perimeter should be twice the central values, and the integral of all the values over the area of the mat should be equal to the average. CHJ Consultants should be contacted if additional k_v recommendations are necessary for the pseudo-coupled method.

SLABS-ON-GRADE:

To provide adequate support, concrete slabs-on-grade should bear on a minimum of 36 inches of compacted soil. Concrete slabs-on-grade should be a minimum of 4 inches in thickness. The soil should be compacted to 95 percent relative compaction. The final pad surfaces should be rolled to provide smooth, dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder. We recommend that a vapor retarder be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder construction. At a minimum, the vapor retarder should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damages. One inch of sand under the vapor retarder may assist in reducing punctures.

DEEP FOUNDATION RECOMMENDATIONS

As an alternative to using shallow foundations (with the necessary removal and recompaction), the proposed structure could be supported by pile foundations. For purposes of our analyses, a concrete cast-in-drilled-hole (CIDH) pile foundation was assumed in order to develop preliminary conclusions regarding pile capacity and depth. Alternative pile foundations could include driven pre-cast concrete or steel "H" piles. Pile-type selection should be based on environmental considerations, constructability and cost. Pile driving will induce localized ground vibration and is generally much noisier than CIDH construction. Groundwater may be a concern during CIDH pile installation. See the section of this report titled "CIDH Pile Installation".

Pile calculations were performed for 24-, 30- and 36-inch-diameter CIDH piles. A pile length of 50 feet was targeted.

ALLOWABLE AXIAL PILE CAPACITIES:

Both upward and downward allowable axial capacities were calculated (Allpile Version 7.13f) for 24-, 30- and 36-inch-diameter concrete CIDH piles as a function of embedment depth. Enclosures "E-10" and "E-11" show the summaries of downward and uplift pile capacities, respectively. The embedment depths shown on the capacity vs. depth charts are measured from the bottom of the pile cap, which has been assumed to be approximately 6 feet bgs. Axial capacity calculations, including soil profile, pile data and vertical capacities, are shown in Enclosures "E-1", "E-4" and "E-7". The soil profile was generated based on Exploratory Boring No. 3. Greater or lesser pile cap elevations should result in a corresponding decrease or increase in pile depth.

The recommended capacities apply to the total of dead plus live loads and are gross values at the pile head. Both ultimate and allowable capacities are presented in Table 7. The design engineer should select capacities according to the design method. If the "strength design" method is selected, ultimate capacities should be utilized. Alternatively, if the "working stress design" method is used, allowable capacities should be selected. The nominal resistance is provided for use in load and resistance factor design (LRFD). The design engineer should apply performance factors in accordance with corresponding design specifications.

The maximum allowable downward capacity utilized a factor of safety of 2.0 for skin friction and 3.0 for tip bearing. The maximum allowable uplift capacity utilized a factor of safety of 3.0 for skin friction and 2.0 for pile weight. Utilizing these values, the combined dead plus live loads should be limited to the values presented in Table 7. We have also included ultimate downward capacities for piles should calculations utilizing other factors of safety be desired. These capacities may be increased by one-third for wind or seismic loading. The capacities provided are based on soil strengths. Structural capacities of piles must be verified by the design engineer.

The pile lengths shown in Table 7 are based on the assumption that the top of the pile will be approximately 6 feet bgs. Stopping the pile short of the minimum depth of embedment will reduce pile capacity.

For properly installed piles, it is anticipated that a total settlement of less than 1/4 inch will be required to mobilize allowable capacity.

LATERAL PILE ANALYSES:

As part of our lateral pile capacity evaluation, we analyzed the behavior of CIDH piles embedded into the representative soil profiles in the proposed structure area for both free- and fixed-head conditions. In each case, base shear forces were applied at the top of the pile, which was assumed to be at the bottom of the footing. The graphed results, showing pile deflection and force distribution and lateral load vs. head deflection or maximum moment, are included in Enclosures "E-2" and "E-3", "E-5" and "E-6", and "E-8" and "E-9". Based on these results, we have estimated the allowable lateral loads as shown in Table 7, considering Section 1810.3.3.2 of the 2010 CBC.

The structural engineer should use judgment when modeling the degree of fixity. If a "semi-fixed" condition is considered, the lateral deflections should be re-estimated.

Table 7

Axial and Lateral Pile Capacities				
ITEM				
	Soil Profile	**B-3**		
	Pile Length (ft.)	50	50	50
	Pile Diameter (in.)	24	30	36
	Section Rigidity (E.I.) ($\times 10^7$ kip·in^2)	4.895	11.94	24.8
Vertical Capacities	Ultimate Downward Capacity (kips)	427	645	899
	Ultimate Uplift Capacity (kips)	179	238	294
	Nominal Downward Resistance (kips)	279	408	553
	Nominal Uplift Resistance (kips)	93	126	156
	Allowable Downward Capacity (kips)	186	272	369

ITEM				
	Soil Profile	B-3		
	Allowable Uplift Capacity (kips)	62	84	104
Lateral Capacities	Ultimate*, Free Head	106	140	180
	Nominal, Free Head	79	105	135
	Allowable, Free Head	53	70	90
	Point of 0 Deflection (below pile cap, ft.)	11.5	14.6	17.3
	Ultimate*, Fixed Head	230	300	378
	Nominal, Fixed Head	172	225	283
	Allowable, Fixed Head	115	150	189
	Point of 0 Deflection (below pile cap, ft.)	15.9	19.6	23.1

*Assumes a maximum lateral deflection of 1 inch at pile head

PILE SPACING AND GROUP EFFICIENCY:

Both axial and lateral capacities recommended in the above sections are for single piles. In the case of grouped piles, the total capacity will be subjected to pile spacing. Per the 2010 CBC, group effects should be considered for axial downward capacities where the center-to-center spacing is less than 3D and for lateral capacities where the center-to-center spacing is less than 8D, where D is the pile diameter or width. For pile groups subjected to uplift, the allowable working uplift load for the group should be the lesser of:

a. The proposed individual pile uplift working load times the number of piles in the group.

b. Two-thirds of the effective weight of the pile group and the soil contained within a block defined by the perimeter of the group and the length of the pile. An average unit weight of 108 pcf may be utilized in the calculation of soil weight.

We recommend the following group effects in accordance with the current AASHTO (2010) and FHWA (2010) design guidelines.

Group Effects for Downward Capacity of Drilled Group Shafts

The individual downward capacity of each shaft in the pile group should be reduced by a group efficiency factor η taken as:

- η =0.65 for a center-to-center spacing of 2.5 diameters
- η =1.0 for a center-to-center spacing of 4.0 diameters or more

For intermediate spacings, the value of η may be determined by linear interpolation.

Group Effects for Lateral Capacity of Drilled Group Shafts

For general design of foundations composed of groups of drilled shafts, the P-multiplier, P_M, values provided in Table 8 are suggested.

The following publications can also be referenced for the necessary group efficiency to be considered in the design of group piles.

- AASHTO, 2010, *LRFD Bridge Design Specifications*, 5th Edition
- FHWA, 2010, Drilled Shafts: *Construction Procedures and Design Methods*, Publication No. FHWA-NHI-10-016

Table 8

Recommended P-multiplier, P_M, Values for Design by Row Position				
	Design P-multiplier, P_M			
Pile Spacing (center-to-center)	3D	4D	5D	≥6D
Lead Row	0.7	0.85	1.0	1.0
Second Row	0.5	0.65	0.85	1.0
Third Row and Higher	0.35	0.5	0.7	1.0

CIDH PILE INSTALLATION:

The installation of the CIDH piles should be observed by the geotechnical engineer to verify the soil condition and that the desired diameter and depth of pile are achieved. CIDH piles should be true and plumb.

Because of the granular nature of the soils encountered and the anticipated diameter of the drilled holes, it is anticipated that caving could occur during the drilling and the construction of piles within the on-site soils. Appropriate precautions should therefore be taken during the construction of piles to reduce caving and raveling.

The drilling speed should be reduced as necessary to minimize vibration and caving of the sandy materials. Based on the data developed during our investigation, drilling for the piles may proceed without the need for casing. However, should caving soils be encountered, the contractor should be prepared to use casing or other approved means to prevent caving.

Closely spaced piles should be drilled and filled alternately, allowing the concrete to set at least eight hours before drilling the adjacent pile. All excavations should be filled with concrete as soon after drilling as possible. In no event should pile holes be left open overnight. The concrete should be

placed with appropriate equipment, so that the concrete is not allowed to fall freely more than 5 feet and to prevent concrete from striking the walls of the shaft, thus causing caving. All loose materials should be cleared from the bottom of the pile excavation. This is especially important because end bearing has been considered in determining the provided pile capacities. If casing is necessary and is utilized, then the casing should be withdrawn concurrently with the concrete placement.

Prior to concrete placement, any disturbed soils under and within the area of the grade beams or at the sides of pile caps should be compacted to at least 95 percent relative compaction (ASTM D1557).

PRE-JOB CONFERENCE:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site pre-job meeting with the owner, the contractor and the geotechnical engineer should occur prior to all grading-related operations. It should be stressed that operations undertaken at the site without the presence of the geotechnical engineer may result in exclusion of affected areas from the final compaction report for the project.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The geotechnical engineer's field representative will be present to provide observation and field testing and will not provide any supervising or directing of the actual work of the contractor, his employees or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

CHJ Consultants has striven to perform our services within the limits prescribed by our client and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different from those described herein be encountered in the field by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,
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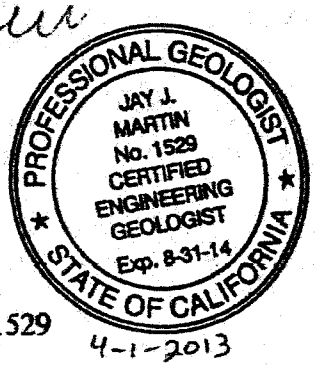

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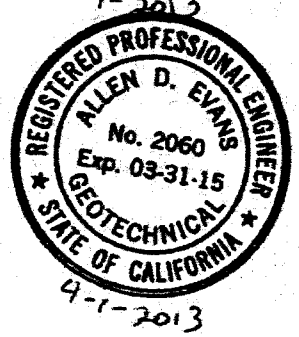

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Yi, F., 2010b, "Procedure to Evaluate Seismic Settlement Based on Shear Wave Velocity - Part I, Saturated Sands", The 9th U.S. National and 10th Canadian Conference on Earthquake Engineering (9USN/10CCEE), Toronto, Canada, July 25-29, 2010.

Yi, F., 2010c, "Procedure to Evaluate Seismic Settlement Based on Shear Wave Velocity - Part II, Unsaturated Sands", The 9th U.S. National and 10th Canadian Conference on Earthquake Engineering (9USN/10CCEE), Toronto, Canada, July 25-29, 2010.

Yoshimine, M., Nishizaki, H., Amano, K., and Hosono, Y., 2006, Flow deformation of liquefied sand under constant shear load and its application to analysis of flow slide in infinite slope, Soil Dynamics and Earthquake Eng. 26, Pages 253-264.

Youd, T. L., and Idriss, I. M., 2001, "Liquefaction Resistance of Soil: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils", Journal of Geotechnical and Geoenvironmental Engineering, Volume 127, No. 10.

Yucca Valley, Town of, 1995, General Plan.

Yule, D. and Sieh, K., 2003, Complexities of the San Andreas fault near San Gorgonio Pass: implications for large earthquakes, *J. Geophyical Res.*, v. 108.

Zhang, G., Robertson, P. K., and Brachman, R. W. I. (2002) "Estimating liquefaction-induced ground settlements from CPT for level ground" Canadian Geotechnical Journal, Ottawa, 39: 1168-1180.

AERIAL PHOTOGRAPHS REVIEWED

Riverside County Flood Control and Water Conservation District, June 20, 1974, black and white aerial photograph nos. 635 and 636.

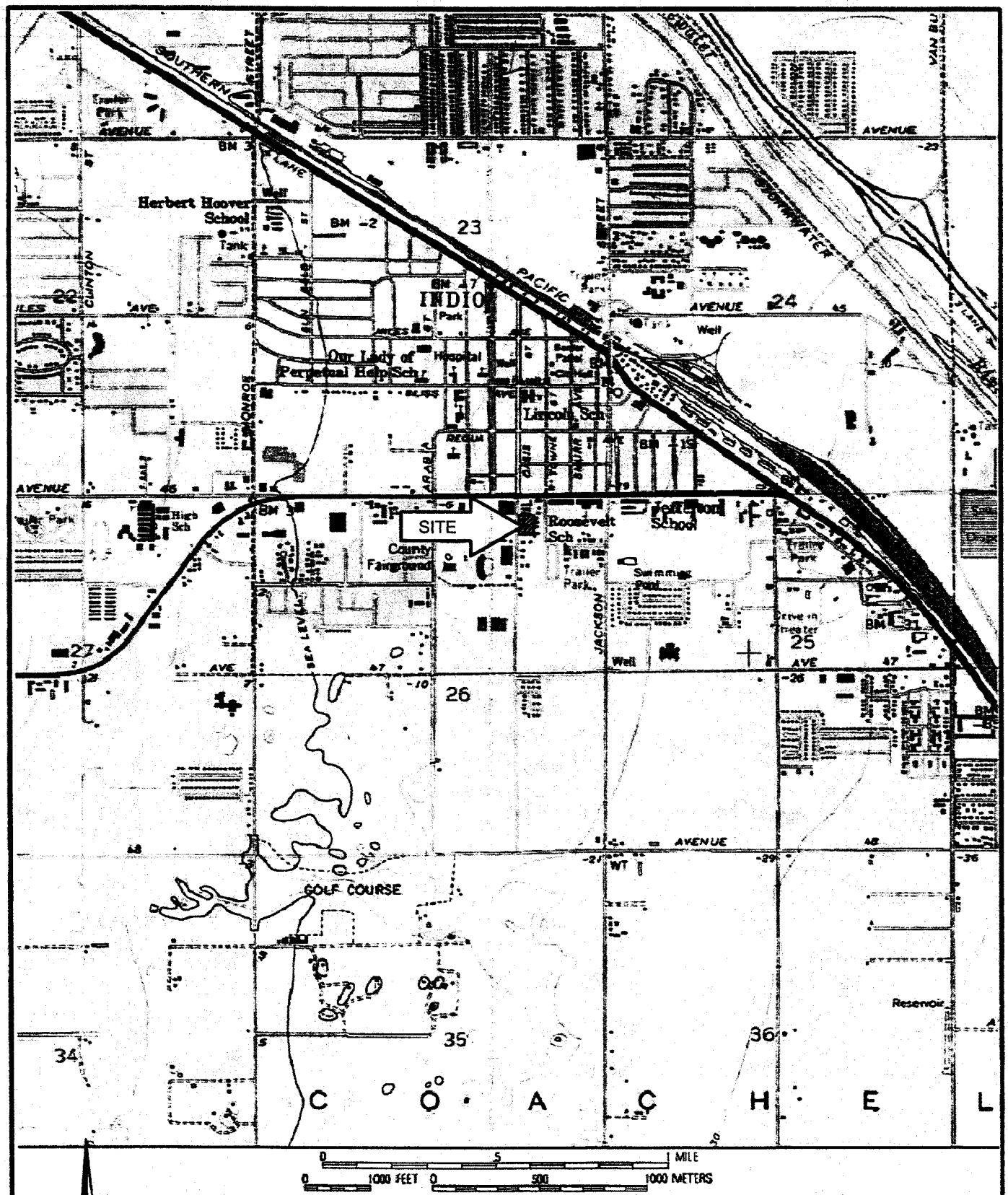
Riverside County Flood Control and Water Conservation District, April 15, 1980, black and white aerial photograph no. 669.

Riverside County Flood Control and Water Conservation District, January 20, 1984, black and white aerial photograph nos. 865 and 866.

Google Earth, 2012, imagery dated September 25, 1996; May 5, 2002; November 16, 2004; November 16, 2006; June 5, 2009; and September 16, 2011.

APPENDIX "A"

GEOTECHNICAL MAPS

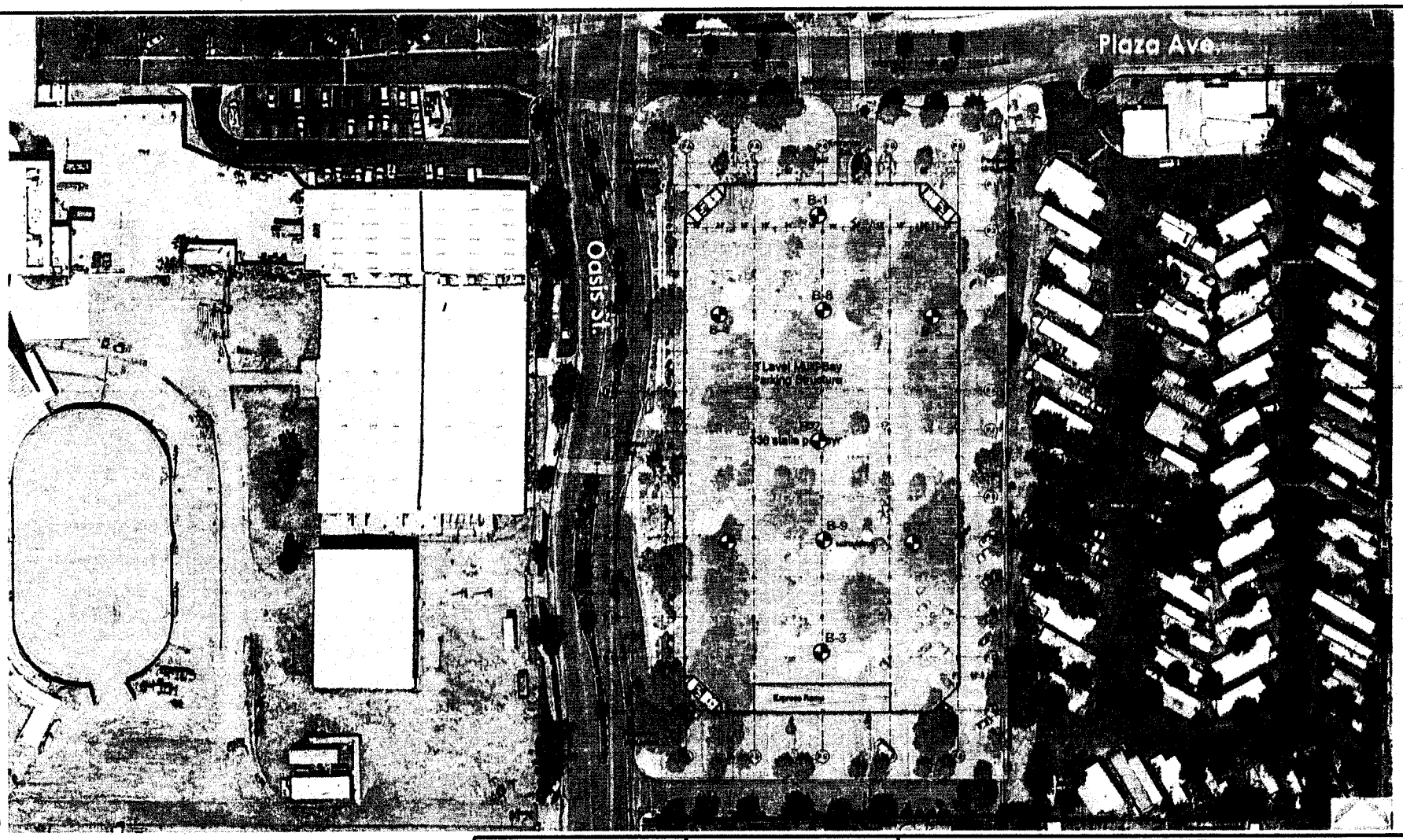


INDEX MAP

FOR: ECONOMIC DEVELOPMENT AGENCY COUNTY OF RIVERSIDE	GEOTECHNICAL INVESTIGATION PROPOSED EAST COUNTY DETENTION CENTER PARKING STRUCTURE SOUTH OF PLAZA AVENUE AND OASIS STREET INDIO, CALIFORNIA	ENCLOSURE "A-1"
DATE: MARCH 2013		JOB NUMBER 13143-3

SCALE: 1" = 2000'

CHJ Consultants



-N-

SCALE: 1" = 30'

Base Map:

Parking Structure Space Plan
ECDC Parking Structure
Holt Architecture
January 1, 2013

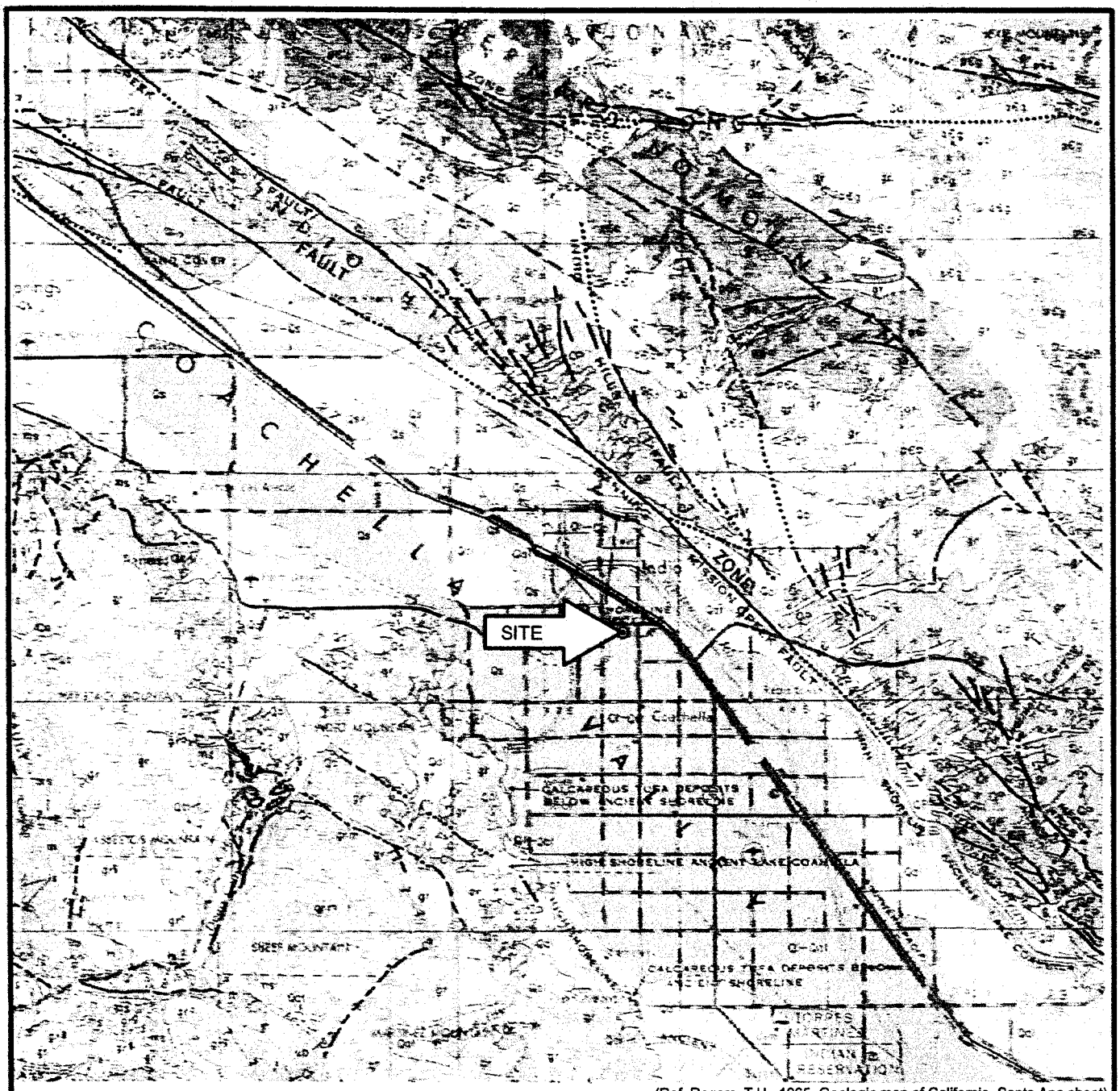
LEGEND:

B-9 EXPLORATORY BORING LOCATION

SITE PLAN

FOR: ECONOMIC DEVELOPMENT AGENCY COUNTY OF RIVERSIDE	GEOTECHNICAL INVESTIGATION PROPOSED EAST COUNTY DETENTION CENTER PARKING STRUCTURE SOUTH OF PLAZA AVENUE AND OASIS STREET INDIO, CALIFORNIA	ENCLOSURE: "A-2"
DATE: MARCH 2013		JOB NUMBER: 13143-3

CHJ Consultants



(Ref. Rogers, T.H., 1965, Geologic map of California, Santa Ana sheet)

GEOLOGIC UNITS:

Qs - Dune Sand (Holocene)
Qal Alluvium (Holocene)
gr - granitoid rocks (Mesozoic)
ms - Metasedimentary rocks (Paleozoic)

geologic contact

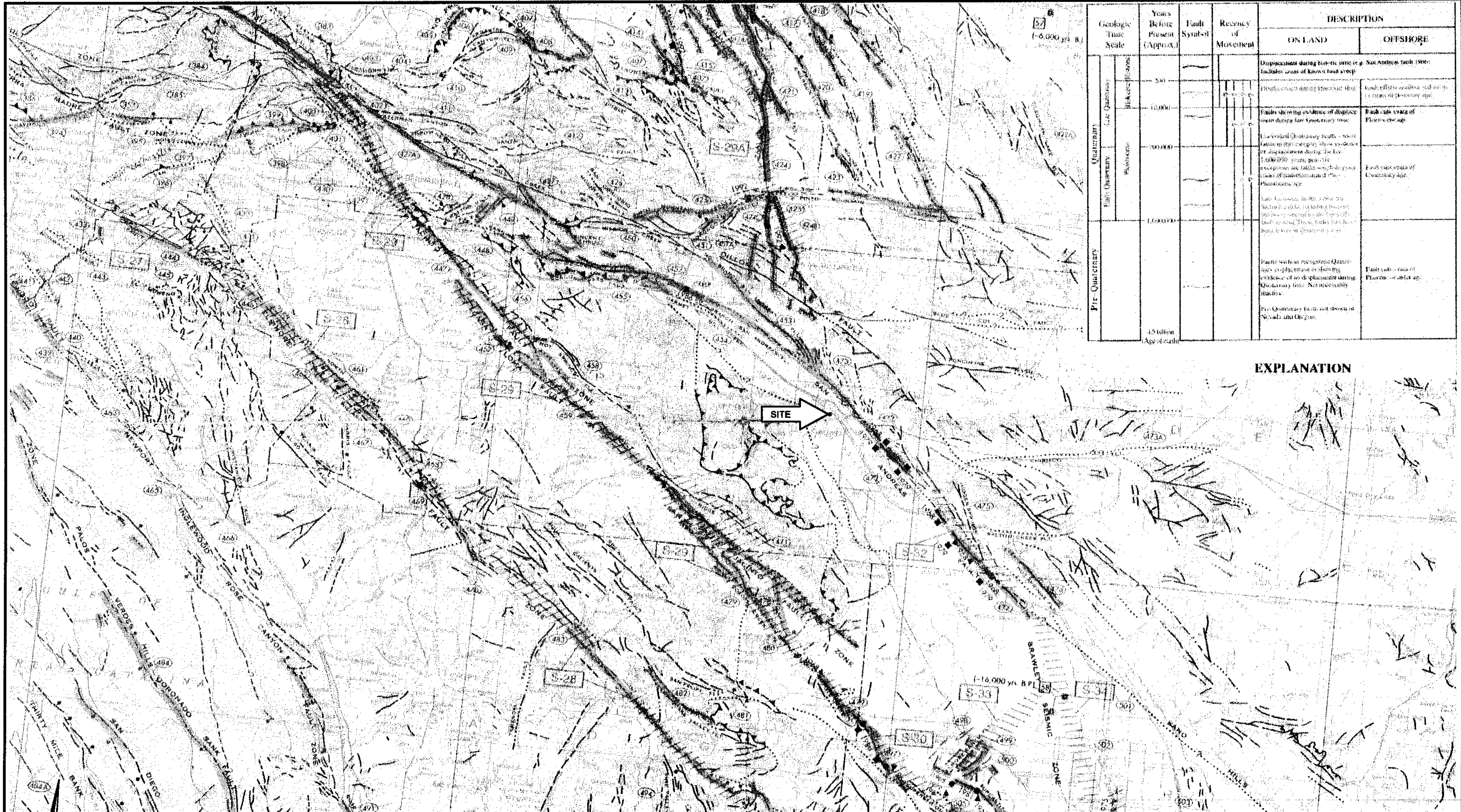
-N-

SCALE: 1:250,000

GEOLOGIC INDEX MAP

FOR: ECONOMIC DEVELOPMENT AGENCY COUNTY OF RIVERSIDE	GEOTECHNICAL INVESTIGATION PROPOSED EAST COUNTY DETENTION CENTER PARKING STRUCTURE SOUTH OF PLAZA AVENUE AND OASIS STREET INDIO, CALIFORNIA	ENCLOSURE "A-3"
DATE: MARCH 2013		JOB NUMBER 13143-3

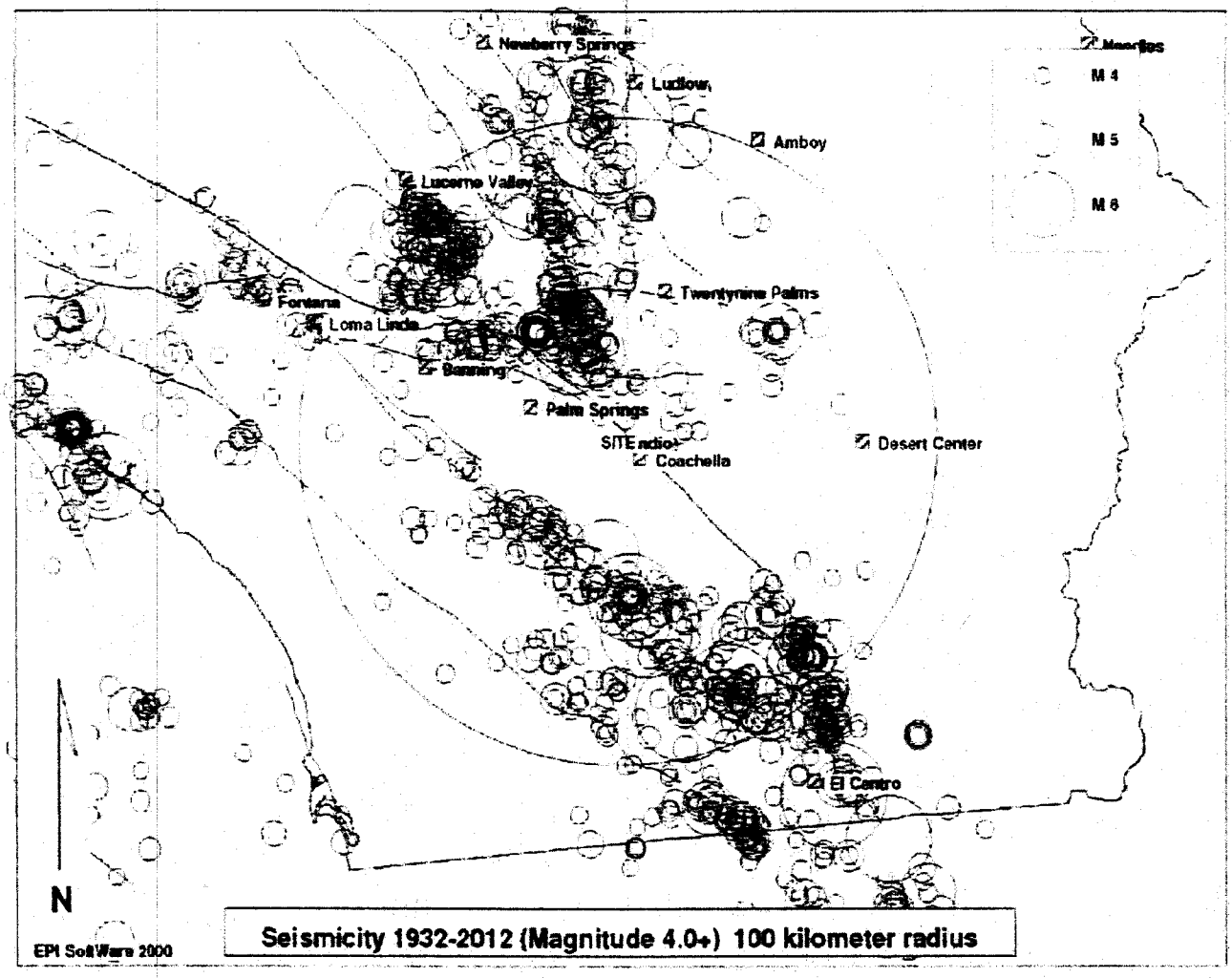
CHJ Consultants



REGIONAL FAULT MAP

FOR: ECONOMIC DEVELOPMENT AGENCY COUNTY OF RIVERSIDE	GEOTECHNICAL INVESTIGATION PROPOSED EAST COUNTY DETENTION CENTER PARKING STRUCTURE SOUTH OF PLAZA AVENUE AND OASIS STREET INDIO, CALIFORNIA	ENCLOSURE "A-4"
DATE: MARCH 2013		JOB NUMBER 13143-3

CHJ Consultants



SITE LOCATION: 33.7138 LAT. -116.220224 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 1349

TOTAL # OF EVENTS WITHIN SEARCH RADIUS: 765

0 50 100
KILOMETERS

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

4.0- 4.9 : 684
5.0- 5.9 : 70
6.0- 6.9 : 9
7.0- 7.9 : 2
8.0- 8.9 : 0

CLOSEST EVENT: 4.5 ON SUNDAY, OCTOBER 31, 1943 LOCATED APPROX. 8 KILOMETERS NORTH OF THE SITE

LARGEST 5 EVENTS:

7.3 ON SUNDAY, JUNE 28, 1992 LOCATED APPROX. 57 KILOMETERS NORTHWEST OF THE SITE
7.1 ON SATURDAY, OCTOBER 16, 1999 LOCATED APPROX. 97 KILOMETERS NORTH OF THE SITE
6.6 ON TUESDAY, NOVEMBER 24, 1987 LOCATED APPROX. 85 KILOMETERS SOUTHEAST OF THE SITE
6.6 ON WEDNESDAY, OCTOBER 21, 1942 LOCATED APPROX. 85 KILOMETERS SOUTH OF THE SITE
6.5 ON TUESDAY, APRIL 09, 1968 LOCATED APPROX. 58 KILOMETERS SOUTH OF THE SITE

EARTHQUAKE EPICENTER MAP

FOR: ECONOMIC DEVELOPMENT AGENCY COUNTY OF RIVERSIDE	GEOTECHNICAL INVESTIGATION PROPOSED EAST COUNTY DETENTION CENTER PARKING STRUCTURE SOUTH OF PLAZA AVENUE AND OASIS STREET INDIO, CALIFORNIA	ENCLOSURE "A-5"
DATE: MARCH 2013		JOB NUMBER 13143-3

CHJ Consultants

APPENDIX "B"

EXPLORATORY LOGS

KEY TO LOGS

LEGEND OF LAB/FIELD TESTS:

Blows	A measure of the penetration resistance of soil expressed as the number of hammer blows required to advance the indicated sampler 6 inches (or less if noted). Samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches ahead of the boring, providing up to three sets of blows per drive.
Bulk	Indicates Disturbed or Bulk Sample
Consol.	Consolidation Test (ASTM D 2435)
Cor.	Chemical/Corrosivity Tests
Dist.	Indicates Disturbed Sample
DS	Direct Shear Test (ASTM D 3080)
EI	Expansion Index
MDC	Maximum Density Optimum Moisture Determination (ASTM D 1557)
N.R.	Indicates No Recovery of Sample
P #200	Wash through #200 Screen
PI	Plasticity Index
Ring	Indicates Relatively Undisturbed Ring Sample. Relatively Undisturbed Ring Samples are obtained with a "Modified California Sampler" (3.25" O.D. and 2.42" I.D.) lined with rings driven with a 140-pound weight falling 30 inches.
SA	Sieve Analysis (ASTM D 422)
SE	Sand Equivalent Test (ASTM D 2419)
SPT	Indicates a sample obtained with an unlined Standard Penetration Test sampler (2" O.D. and 1-3/8" I.D.).

ENGINEERING PROPERTIES FROM SPT BLOWS

Relationship of Penetration Resistance to Relative Density for Cohesionless Soils*
(After Mitchell and Katti, 1981)

Number of SPT Blows (N_{60})	Descriptive Relative Density	Approximate Relative Density (%)
<4	Very Loose	0-15
4-10	Loose	15-35
10-30	Medium Dense	35-65
30-50	Dense	65-85
>50	Very Dense	85-100

* At an effective overburden pressure of 1 ton per square foot (100 kPa)

Approximate Values of Undrained Shear Strength for Cohesive Soils
(Terzaghi and Peck, 1967)

Number of SPT Blows (N_{60})	Approximate Soil Consistency	Undrained Shear Strength (psf)
<2	Very Soft	Less Than 250
2-4	Soft	250-500
4-8	Medium Stiff	500-1000
8-15	Stiff	1000-2000
15-30	Very Stiff	2000-4000
>30	Hard	More Than 4000

Enclosure "B" (3 of 3)
Job No. 13143-3

UNIFIED SOIL CLASSIFICATION SYSTEM

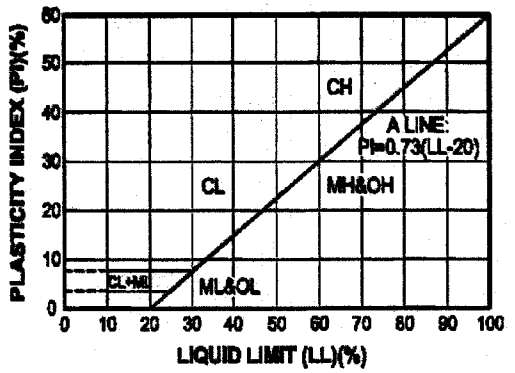
UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART			
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)			
GRAVELS More than 50% of coarse fraction larger than No.4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No.4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more 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 of 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 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA		
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size). Coarse-grained soils are classified as follows:

Less than 5 percent.....GW, GP, SW, SP
More than 12 percent.....GM, GC, SM, SC
5 to 12 percent.....Borderline cases requiring dual symbols

PLASTICITY CHART



EXPLORATORY BORING NO. 1

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	Asphalt Concrete, 3"	Fill						
	Aggregate Base, 4.5"							
	(SM) Silty Sand, fine with medium, brown		X		3 6 11			Pass #200, SPT
				▩		3.8		Cor., MDC, RV, SA
5	(ML) Sandy Silt, fine, light brown	Native	X		4 3 4			Pass #200, SPT
				▩		6.2		
10	(SM) Silty Sand, fine, light brown, with interbedded sand and silt lenses		X		4 8 8			Pass #200, SPT
15	(ML) Sandy Silt, fine, brown		X		2 3 6			Pass #200, SPT
20			X		3 3 6			Pass #200, SPT
25	(SM) Silty Sand, fine, brown		X		5 11 12			Pass #200, SPT
30	(ML) Sandy Silt, fine, brown		X		5 10 10			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-1a

EXPLORATORY BORING NO. 1

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
				X		8 7 9			Pass #200, SPT
40		(SM) Silty Sand, fine, brown		X		8 15 16			Pass #200, SPT
45		(ML) Sandy Silt, fine, brown		X		8 15 16			Pass #200, SPT
50			Smoky Auger	X		5 8 10			Pass #200, SPT
55				X		6 8 11			Pass #200, SPT
60		(SM) Silty Sand, fine with medium, brown, with interbedded sand and silt lenses		X		5 10 12			Pass #200, SPT
65				X		10 8 16			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-1b

EXPLORATORY BORING NO. 1

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
				X		4 8 16			Pass #200, SPT
75				X		8 26 39			Pass #200, SPT
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 5', NO CAVING IN UPPER 10' GROUNDWATER ENCOUNTERED AT 70'							
80									
85									
90									
95									
100									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. Enclosure
13143-3 B-1c

EXPLORATORY BORING NO. 2

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		Asphalt Concrete, 3"	Fill						
		Aggregate Base, 7"							
		(SM) Silty Sand, fine, brown		X		5 4 4			Pass #200, SPT
					▩		3.3		Cor., MDC, RV, SA
5				X		2 3 4			SPT
		(SM) Silty Sand, fine, brown	Native		▩		4.0		
10				X		8 10 8			Pass #200, SPT
15		(ML) Sandy Silt, fine, brown, with thin sandy lenses		X		2 5 7			Pass #200, SPT
					▩		4.4		
20				X		3 6 6			Pass #200, SPT
25				X		4 8 9			Pass #200, SPT
30				X		6 8 9			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. Enclosure
13143-3 B-2a

EXPLORATORY BORING NO. 2

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
				X		7 8 9			Pass #200, SPT
40		(SM) Silty Sand, fine, brown, with thin silt lenses		X		8 8 7			Pass #200, SPT
45				X		2 7 11			Pass #200, SPT
50				X		6 8 10			Pass #200, SPT
55				X		6 12 23			Pass #200, SPT
60				X		6 12 18			Pass #200, SPT
65		(SP-SM) Sand, fine to medium, few silt, brown	▼	X		9 10 6			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 | Enclosure B-2b

EXPLORATORY BORING NO. 2

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 70.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine, with silt, dark brown		X		5 17 27			Pass #200, SPT
75			Plug in Auger	X		15 15 32			SPT
		END OF BORING							
		NO REFUSAL, NO BEDROCK FILL TO 7', NO CAVING IN UPPER 10' GROUNDWATER ENCOUNTERED AT 70'							
80									
85									
90									
95									
100									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-2c

EXPLORATORY BORING NO. 3

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 69.0

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	Asphalt Concrete, 3.5"	Fill						
	Aggregate Base, 9.5"							
	(SM) Silty Sand, fine, gray-brown		X	■	3 4 6	4.5		Pass #200, SPT Cor., MDC, RV, SA
	(ML) Sandy Silt, fine, light brown	Native		■		7.3		
5			X		1 4 4			Pass #200, SPT
10	(SM) Silty Sand, fine, light brown		X		5 14 17			Pass #200, SPT
15	(ML) Sandy Silt, fine, light brown		X		2 3 5			Pass #200, SPT
20			X		3 4 7			Pass #200, SPT
25	(SM) Silty Sand, fine, brown		X		4 7 9			Pass #200, SPT
30	(ML) Sandy Silt, fine, brown		X		4 5 10			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-3a

EXPLORATORY BORING NO. 3

Date Drilled: 3/21/13 Client: County of Riverside EDA

Equipment: CME 75 Truck Rig Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): Logged by: VJR Measured Depth to Water(ft): 69.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
				X		7 7 6			Pass #200, SPT
40		(SM) Silty Sand, fine, brown		X		7 12 11			Pass #200, SPT
45		(ML) Sandy Silt, fine, brown		X		2 3 7			Pass #200, SPT
50				X		7 10 11			Pass #200, SPT
55				X		6 7 14			Pass #200, SPT
60				X		2 6 12			Pass #200, SPT
65		(SP) Sand, fine to medium, few silt, brown	▼	X		13 18 11			Pass #200, SPT

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. Enclosure
13143-3 B-3b

EXPLORATORY BORING NO. 3

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): 69.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine, brown		X		2 7 13			Pass #200, SPT
75				X		1 4 14			SPT
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 4', NO CAVING IN UPPER 10' GROUNDWATER ENCOUNTERED AT 69'							
80									
85									
90									
95									
100									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. Enclosure
13143-3 B-3c

EXPLORATORY BORING NO. 4

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		Asphalt Concrete, 2.5"	Fill						
		Aggregate Base, 4.5"							
		(SM) Silty Sand, fine, brown					5.6		Cor., MDC, RV, SA
5						4 7 9	3.1 5.6	98	Ring Cor., DS, Exp., MDC, PI, SA
		(ML) Sandy Silt, fine, light brown, with interbedded sand lenses	Native						
10						11 14 14	7.7	101	DS, Ring
15						12 26 4	8.9	105	Ring
20						10 15 18	8.2	104	Ring
25		(SM) Silty Sand, fine, brown, with interbedded silt and sand lenses				16 37 41	3.8	121	Ring
30						17 22 23	9.9	100	Ring

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-4a

EXPLORATORY BORING NO. 4

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(ML) Sandy Silt, fine, light brown		X	▩	15 21 28	4.6 3.5	101	Ring
40		(SP-SM) Sand, fine with medium, with silt, light brown		X		13 17 22	N.R.	N.R.	Ring
45		(SM) Silty Sand, fine, light brown		X	▩	12 30 41	4.9 5.8	106	Ring
50				X		8 13 22	8.3	95	Ring
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 6', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							
55									
60									
65									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-4b

EXPLORATORY BORING NO. 5

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		Asphalt Concrete, 3"	Fill						
		Aggregate Base, 8"							
		(SP-SM) Sand, fine, with silt, brown					6.0		Cor., MDC, RV, SA
5		(SM) Silty Sand, fine, brown, with interbedded sand and silt lenses	Native			8 11 17	9.3	110	Ring
							3.9		
10						7 8 8	14.0	105	DS, Ring
15		(ML) Silt, with sand, fine, brown				3 7 8	29.7 25.8	89	Ring
20						4 7 11	30.0 27.1	94	Ring
25		(SM) Silty Sand, fine with medium, brown, with interbedded sand and silt lenses				10 16 15	13.9 14.3	112	Ring
30						4 18 23	20.0	100	Ring

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-5a

EXPLORATORY BORING NO. 5

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(ML) Sandy Silt, fine, brown		X	▩	8 13 14	3.3 13.0	106	Ring
40		(SP-SM) Sand, fine, with silt, light brown		X		11 22 24	N.R.	N.R.	Ring
45		(ML) Silt, with sand, fine, brown		X	▩	5 14 32	18.2 4.2	102	Ring
50		(SM) Silty Sand, fine, gray brown		X	▩	7 19 36	N.R. 27.7	N.R.	Ring
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 5', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							
55									
60									
65									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-5b

EXPLORATORY BORING NO. 6

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	Asphalt Concrete, 3"	Fill						
	Aggregate Base, 4"							
	(SP-SM) Sand, fine with medium, with silt, brown		X		7 11 15	6.8	104	Ring
				▩		3.8		Cor., MDC, RV, SA
5	(ML) Sandy Silt, fine, light brown	Native	X		7 7 6	16.6	87	Ring
				▩		7.6		Cor., DS, Exp., MDC, PI, SA
10	(SP) Sand, fine, few silt, light brown		X		12 20 50	N.R.	N.R.	Ring
15	(ML) Sandy Silt, fine, brown, with interbedded sand lenses		X		4 6 11	27.5	92	Ring
				▩		22.6		
20			X		6 11 11	19	96	DS, Ring
25	(ML) Silt, few sand, fine, brown		X		5 8 14	15.5	105	Ring
				▩		25.2		
30	(SM) Silty Sand, fine, light brown		X		9 20 27	1.8	109	Ring

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-6a

EXPLORATORY BORING NO. 6

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
				X	▪	13 15 17	N.R. 12.7	N.R.	Ring
40		(SP-SM) Sand, fine, gray-brown		X	▪	11 30 47	4.5 2.4	106	Ring
45		(ML) Sandy Silt, fine, brown		X	▪	6 9 18	24.6 18.6	101	Ring
50		(SM) Silty Sand, fine, brown		X		11 29 42	3.8	103	Ring
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 5', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							
55									
60									
65									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

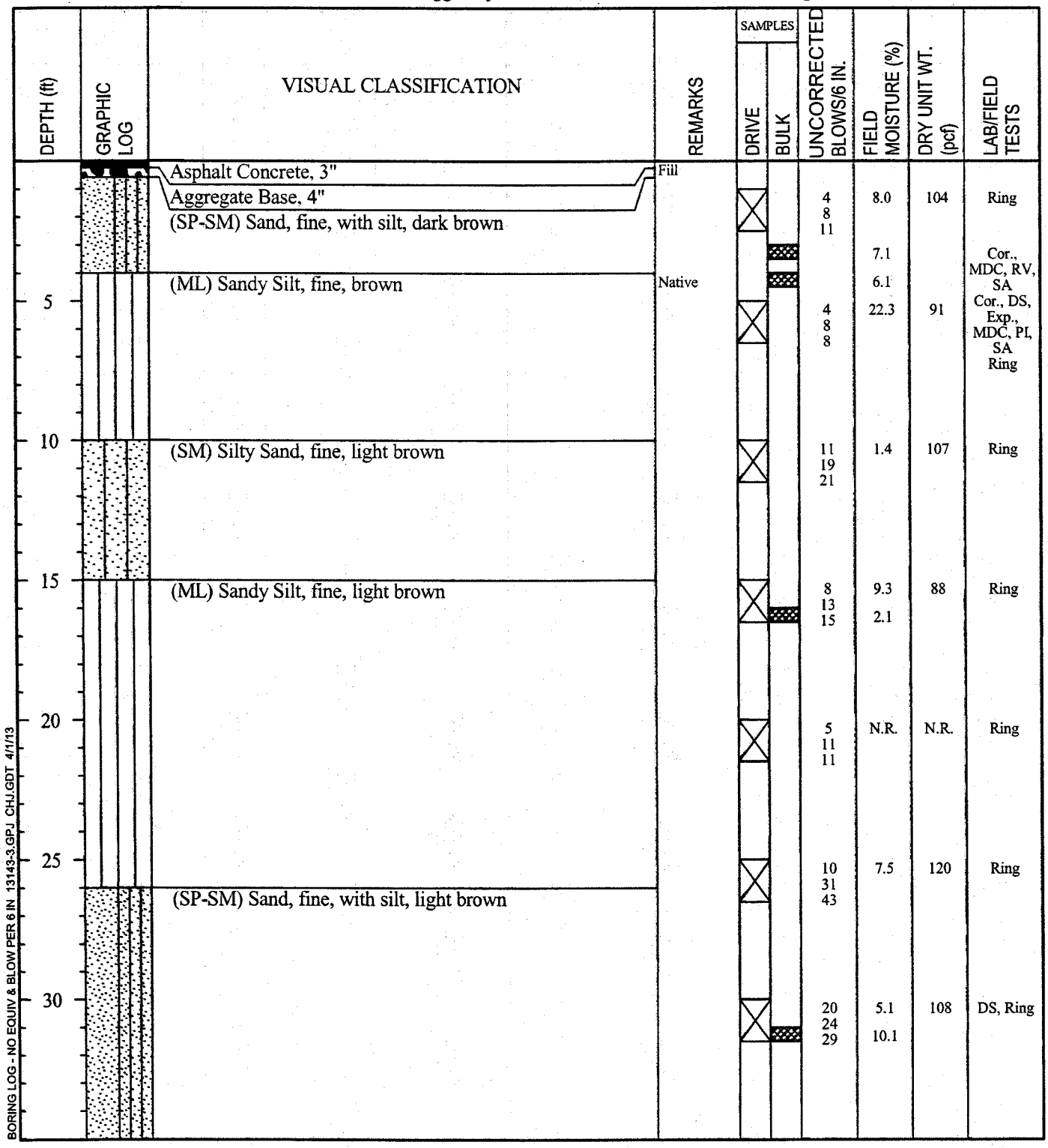
Job No. Enclosure
13143-3 B-6b

EXPLORATORY BORING NO. 7

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A



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INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-7a

EXPLORATORY BORING NO. 7

Date Drilled: 3/22/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(ML) Sandy Silt, fine, brown		X	▩	8 15 17	15.4 3.5	90	Ring
40		(SP-SM) Sand, fine with medium, with silt, light brown		X		12 21 30	N.R.	N.R.	Ring
45		(ML) Sandy Silt, fine, brown		X	▩	8 15 33	18.9 15.9	109	Ring
50		(SM) Silty Sand, fine, light brown		X	▩	8 18 22	5.4 4.4	99	Ring
		END OF BORING NO REFUSAL, NO BEDROCK FILL TO 4', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							
55									
60									
65									

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-7b

EXPLORATORY BORING NO. 8

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	Asphalt Concrete, 3"	Fill						
	Aggregate Base, 7"							
	(SM) Silty Sand, fine, few gravel to 1", light brown		X	■	8 16 26	1.2 1.5	102	Ring Cor., MDC, RV, SA
	(ML) Sandy Silt, fine, brown	Native		■		3.7		Cor., DS, Exp., MDC, PI, SA Consol., Ring
5			X		6 10 9	6.7	92	
10	(SP-SM) Sand, fine, with silt, light brown		X	■	12 24 27	1.2 1.4	110	Ring
15	(ML) Sandy Silt, fine, light brown		X	■	6 9 12	7.7 6.7	95	Ring
20			X		10 15 24	8.9	92	Ring
25			X		15 23 27	1.3	114	Ring
30			X	■	17 19 50	6.8 1.5	107	Ring
	END OF BORING NO REFUSAL, NO BEDROCK FILL TO 3', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 | Enclosure B-8

EXPLORATORY BORING NO. 9

Date Drilled: 3/21/13 | Client: County of Riverside EDA

Equipment: CME 75 Truck Rig | Driving Weight / Drop: 130 lbs./ 30"

Surface Elevation(ft): | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	UNCORRECTED BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	Asphalt Concrete, 3"	Fill						
	Aggregate Base, 6"							
	(SP-SM) Sand, fine, with silt, brown		X		10 15 16	2.5	104	Ring
				■		2.3		Cor., MDC, RV, SA
	(ML) Sandy Silt, fine, brown	Native		■		8.3		
5			X		7 10 11	10.0	99	Cor., DS, Exp., MDC, PI, SA
	(SP) Sand, fine with medium, few silt, brown			■		1.4		Ring
10	(ML) Sandy Silt, fine, brown, with interbedded sand lenses		X		10 12 14	7.9	103	Ring
15			X	■	4 7 12	20.3 15.7	102	Ring
20			X		7 10 12	15.2	83	Consol., Ring
25	(SP-SM) Sand, fine, with silt, light brown		X	■	12 18 26	2.5 2.0	107	Ring
30	(ML) Sandy Silt, fine, brown		X		8 14 25	17.3	106	Ring
	END OF BORING NO REFUSAL, NO BEDROCK FILL TO 4', NO CAVING IN UPPER 10' NO GROUNDWATER ENCOUNTERED							

BORING LOG - NO EQUIV & BLOW PER 6 IN 13143-3.GPJ CHJ.GDT 4/1/13

CHJ

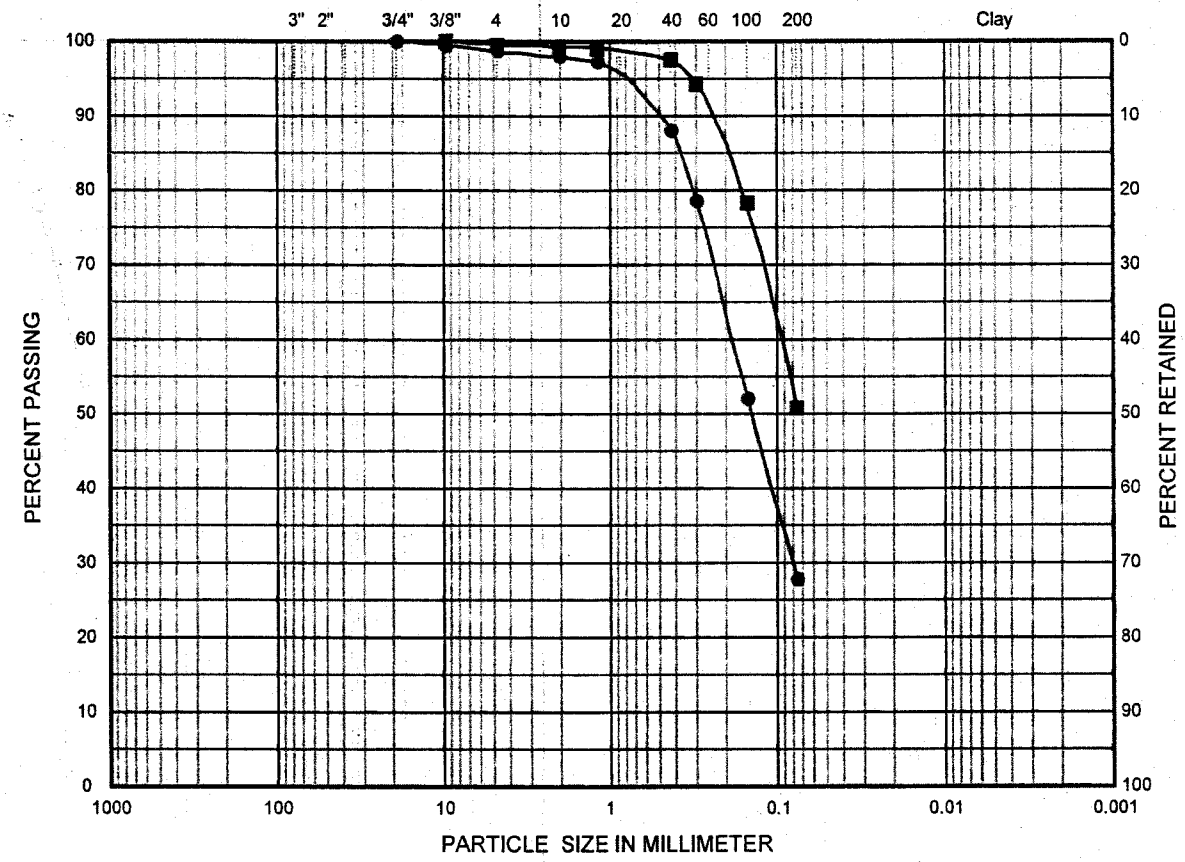
INDIO DETENTION CENTER PARKING STRUCTURE
INDIO, CALIFORNIA

Job No. 13143-3 Enclosure B-9

APPENDIX "C"

LABORATORY TESTING

SCREEN (IN) / SIEVE NO. - U.S.A. Standard Series (ASTM D422)



Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

	Sample No.	Depth	Gravel	Sand	Fines	Clay	D_{10}	D_{30}	D_{50}	D_{60}	C_u	C_c
●	1A to 9A	0.5 - 1.5	1.3	71.0	27.7			0.080	0.14	0.18		
	(SM) Silty sand, fine											
■	4B & 6B to 9B	3 - 8	0.4	48.9	50.7				0.07	0.09		
	(ML) Sandy Silt, fine											

PARTICLE SIZE DISTRIBUTION (ASTM D422)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-1

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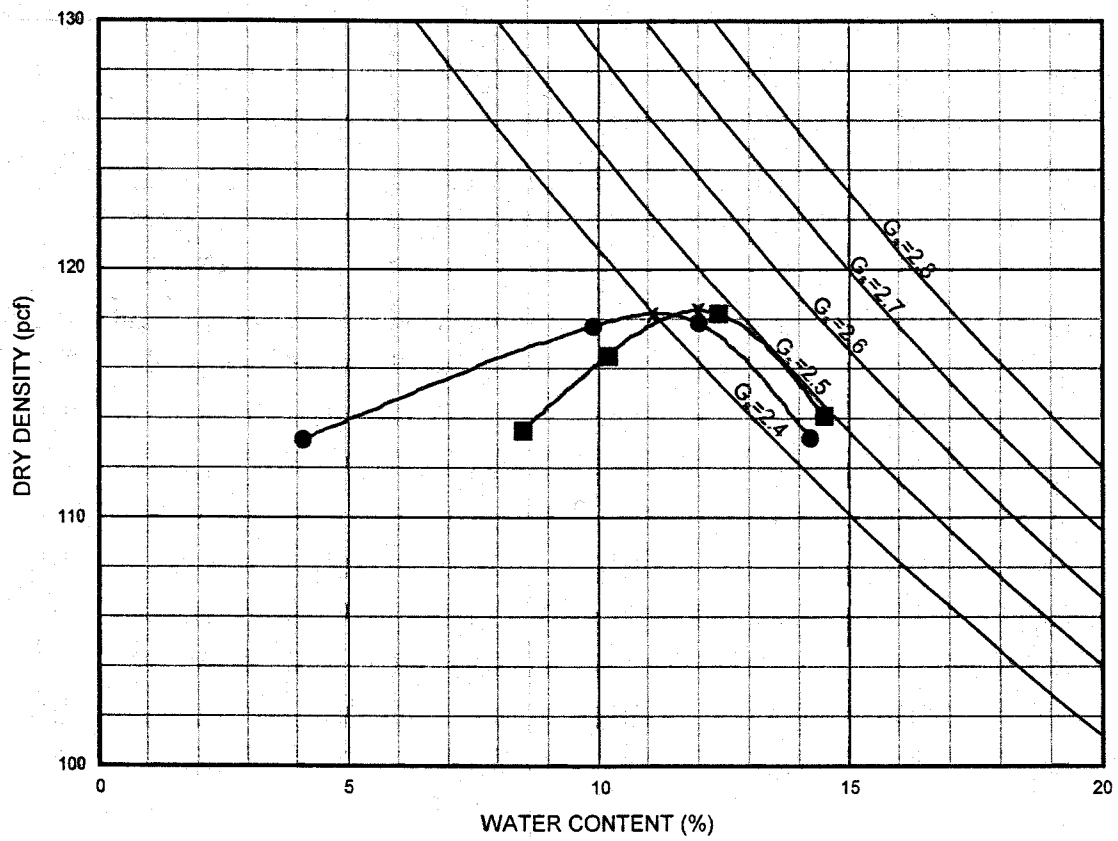
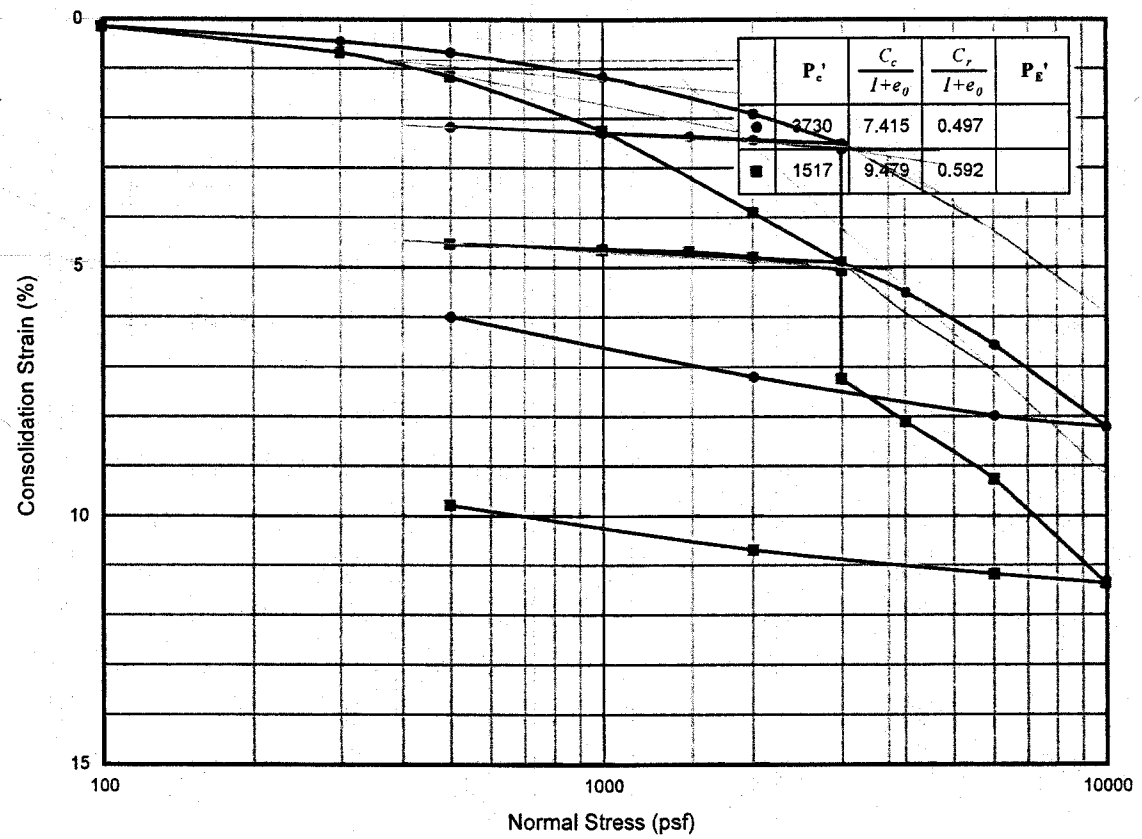


	Sample No.	Depth (ft)	USCS Classification	γ_{dmax} (pcf)	w_o (%)
●	1A to 9A	0.5 - 1.5	(SM) Silty sand, fine	118.2	11.1
■	4B & 6B to 9B	3 - 8	(ML) Sandy Silt, fine	118.3	12.0

COMPACTION CURVES (ASTM D1557)					
Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-2



	Boring No.	Depth (ft)	USCS Classification	γ_d (pcf)	w (%)	HCS (%)
●	8	6	(ML) Sandy silt, fine	88.2	7.6	2.3
■	9	20	(ML) Sandy silt, fine	84.5	12.4	2.2

CONSOLIDATION TESTS (ASTM D2435)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-3

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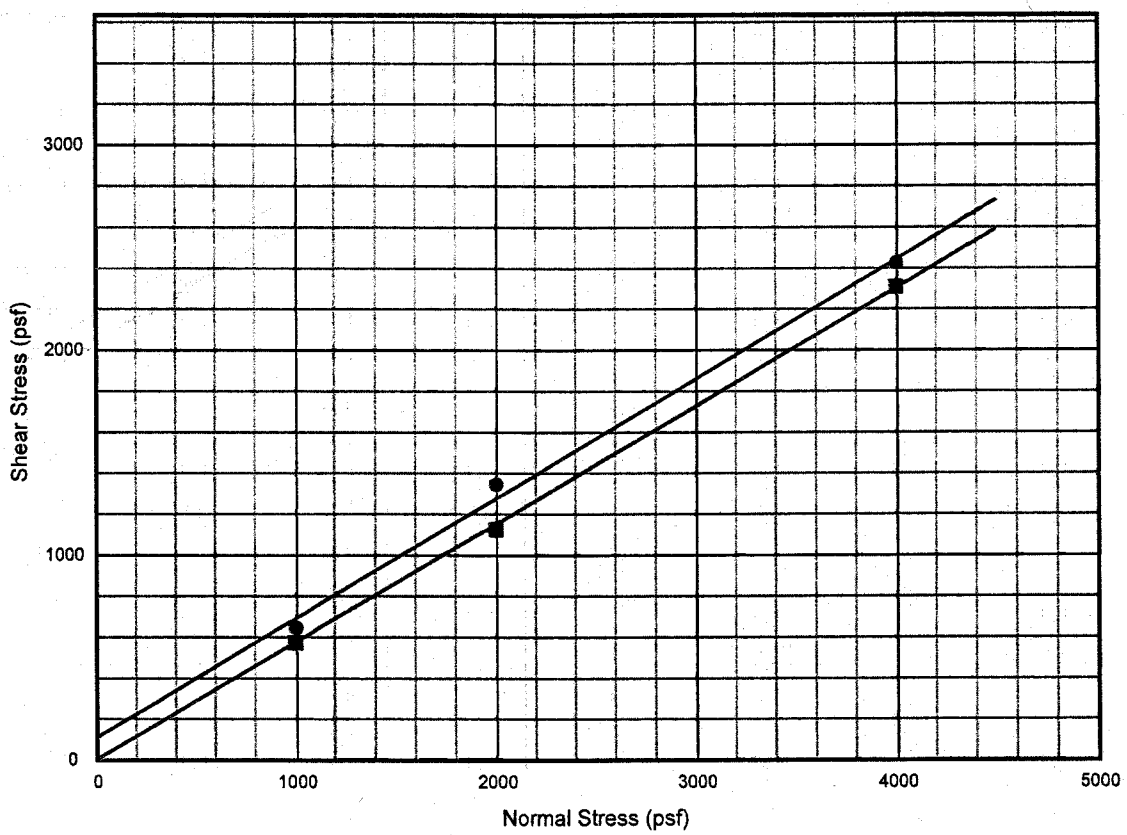

	Boring No.	Depth (ft)	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	4	5	98.0	3.1	151.8	32.3	108.2	30.3
	(ML) Sansy silt, fine / Undisturbed							
■	5	10	105.0	14.0	26.0	31.4	0.0	29.9
	(SM) Silty sand / Undisturbed							

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-4

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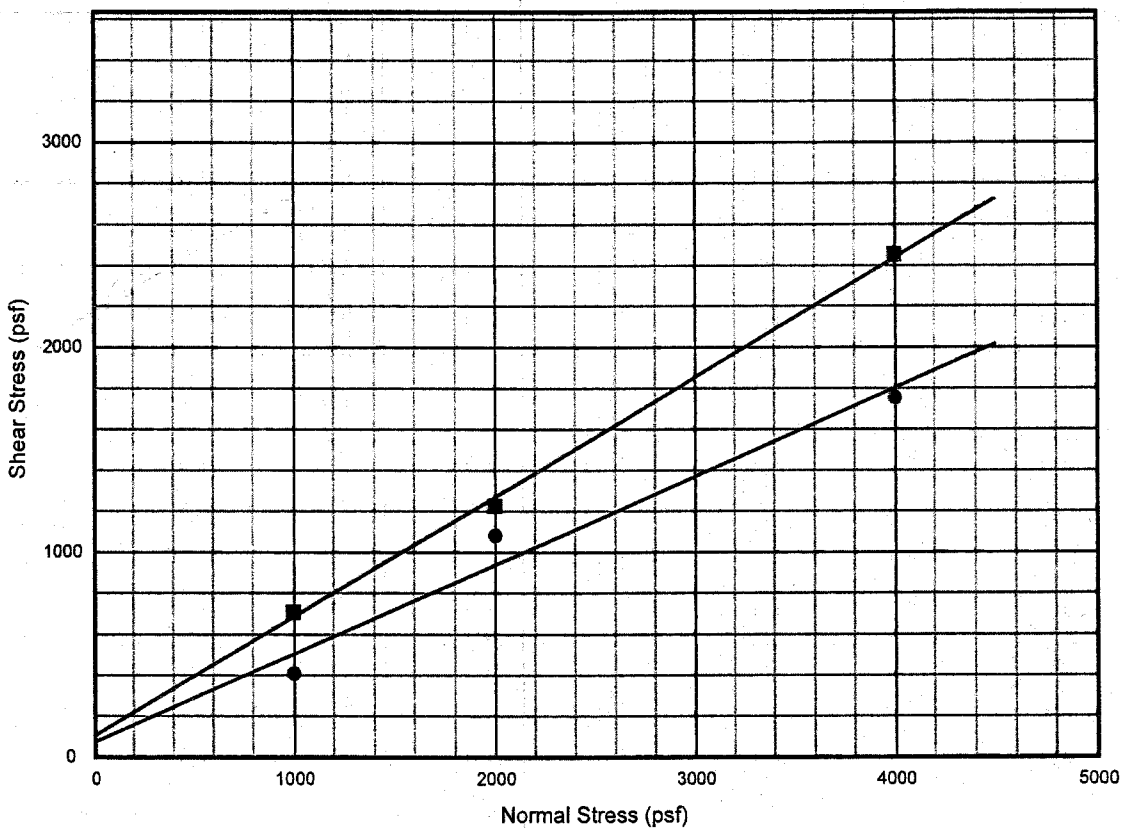

	Boring No.	Depth (ft)	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	6	20	96.0	19.0	153.7	23.3	74.1	23.3
	(ML) Sandy silt, fine / Undisturbed							
■	7	30	108.0	5.1	308.5	35.7	97.5	30.3
	(SP-SM) Sand with silt, fine / Undisturbed							

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-5

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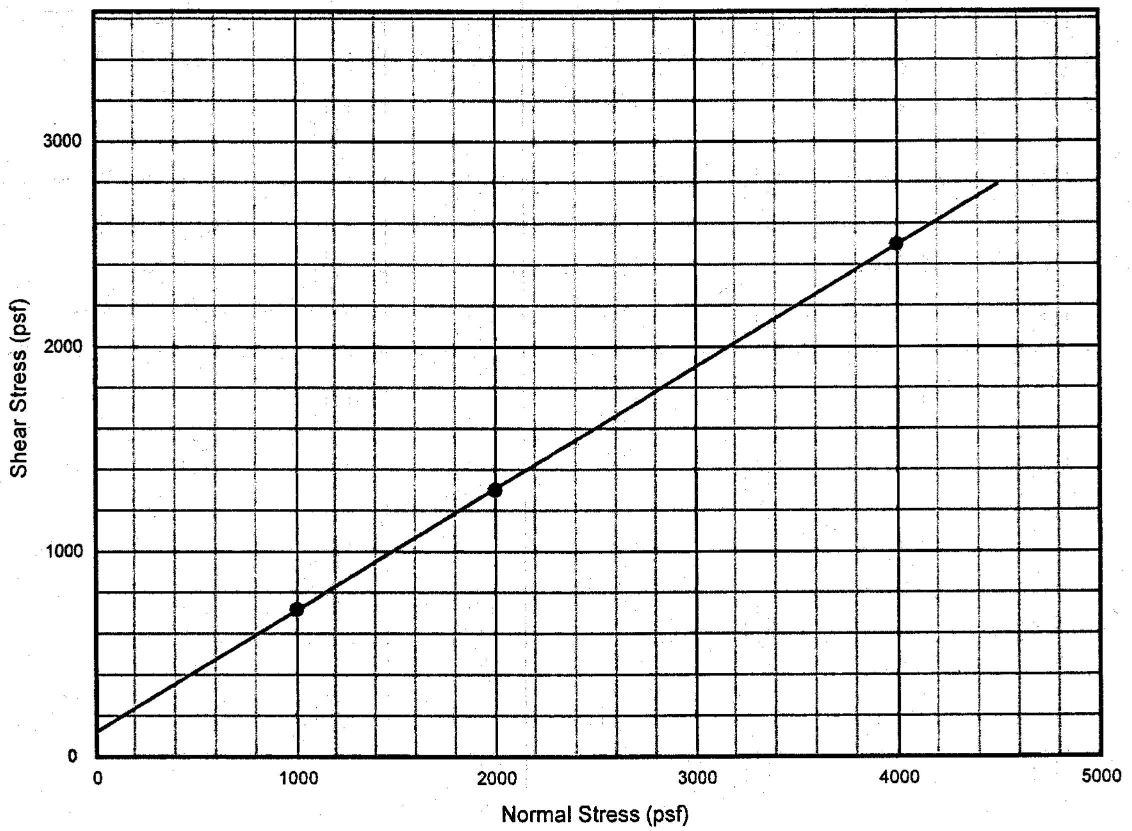

	Boring No.	Depth (ft)	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	4B & 6B to 9B	3 - 8	107.0	12.0	233.1	29.8	119.7	30.7
	(ML) Sandy Silt, fine / Remolded (RC=90%)							

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DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-6

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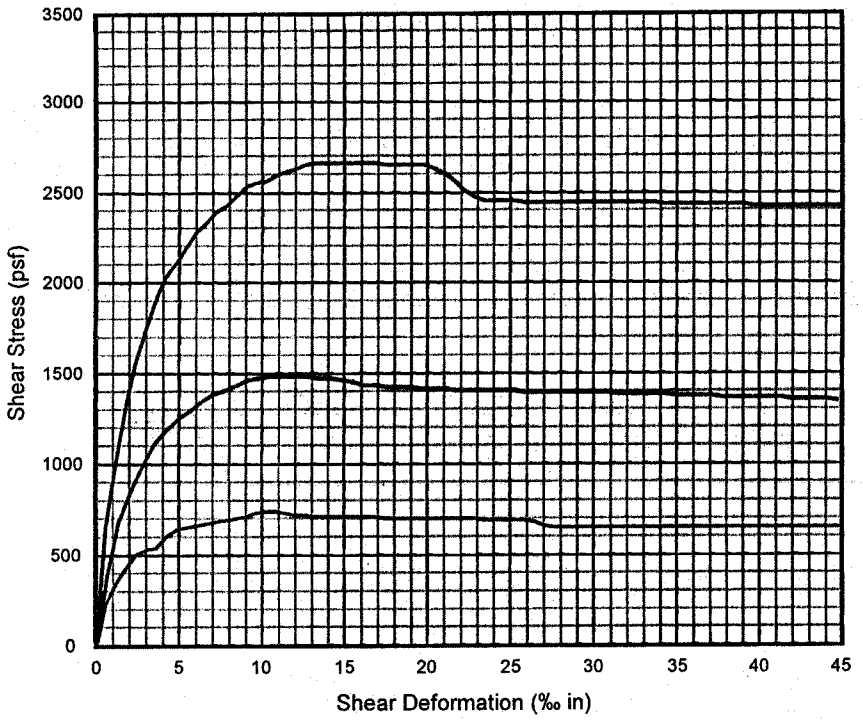

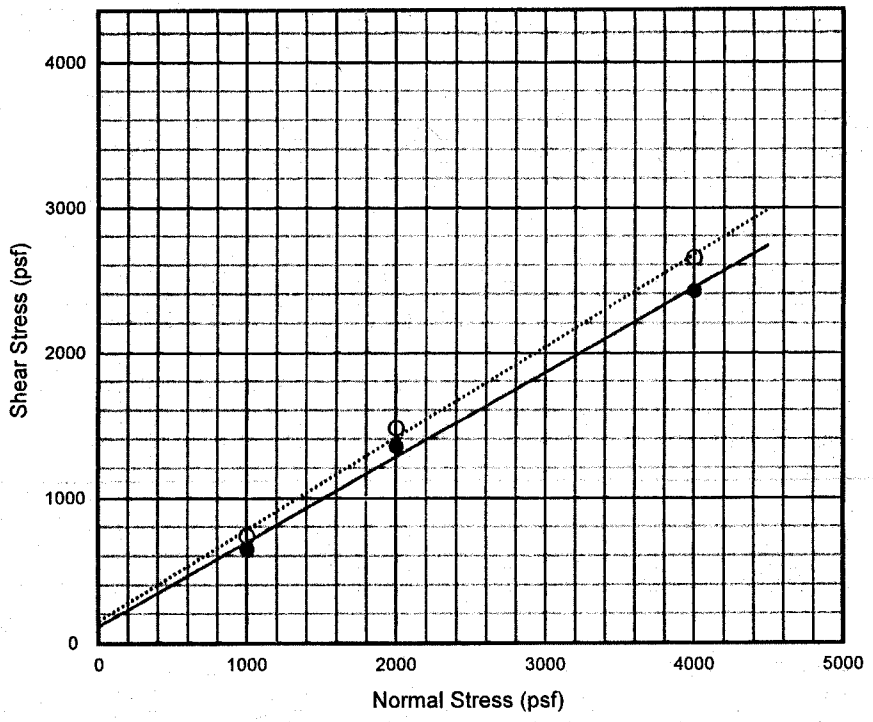

	Boring No.	Depth (ft)	USCS	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	4	5	(ML) Sansy silt, fine / Undisturbed	98.0	3.1	151.8	32.3	108.2	30.3

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-7

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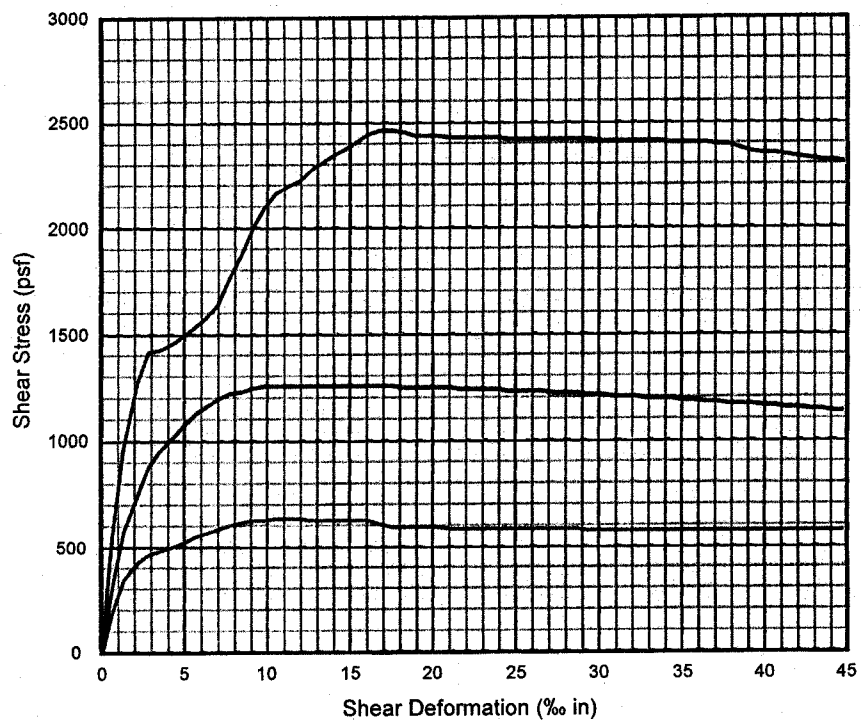

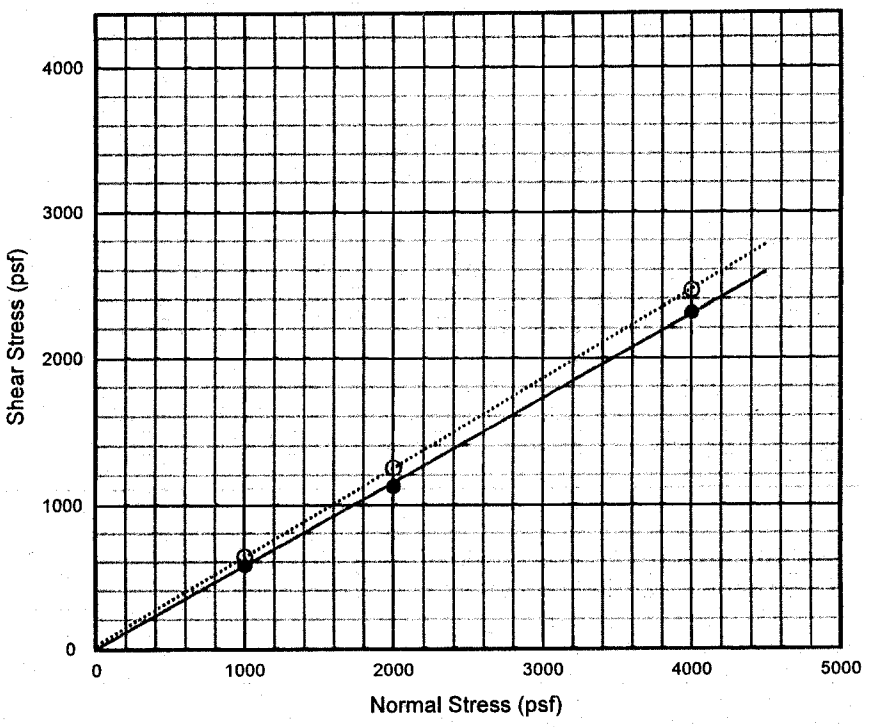

	Boring No.	Depth (ft)	USCS	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	5	10	(SM) Silty sand / Undisturbed	105.0	14.0	26.0	31.4	0.0	29.9

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-8

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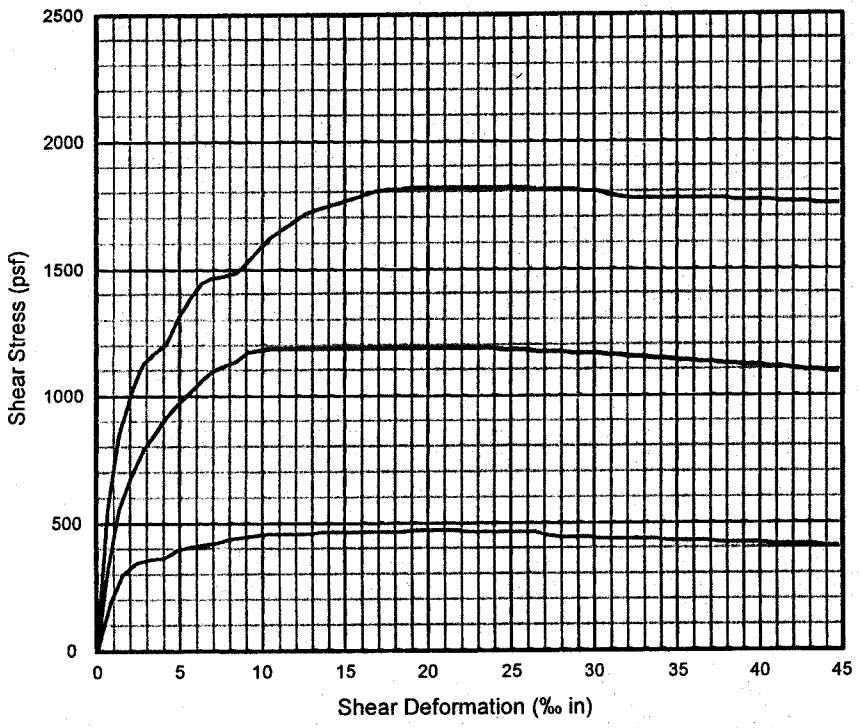

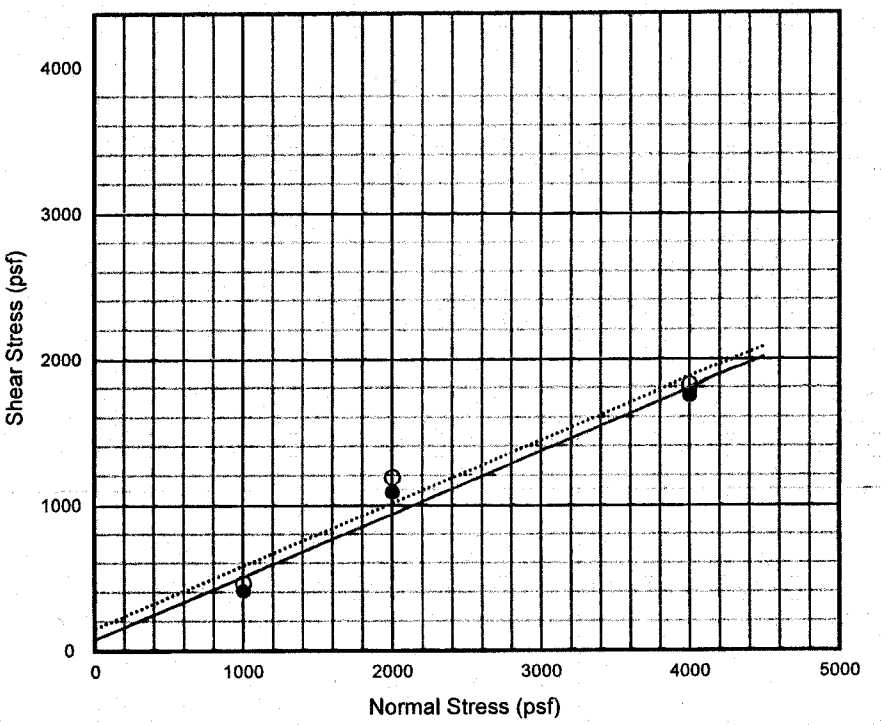

	Boring No.	Depth (ft)	USCS	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	6	20	(ML) Sandy silt, fine / Undisturbed	96.0	19.0	153.7	23.3	74.1	23.3

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-9

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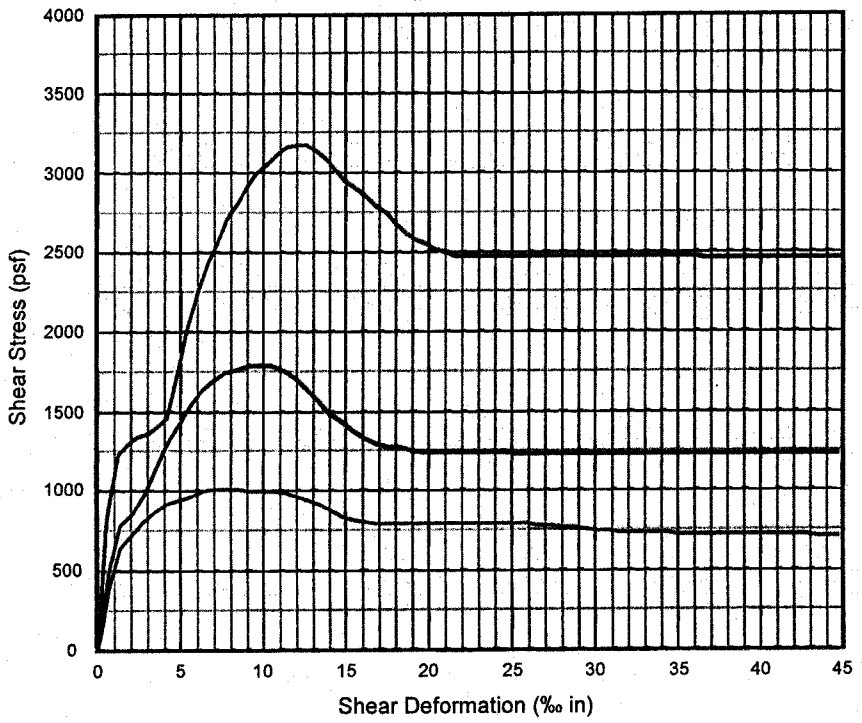

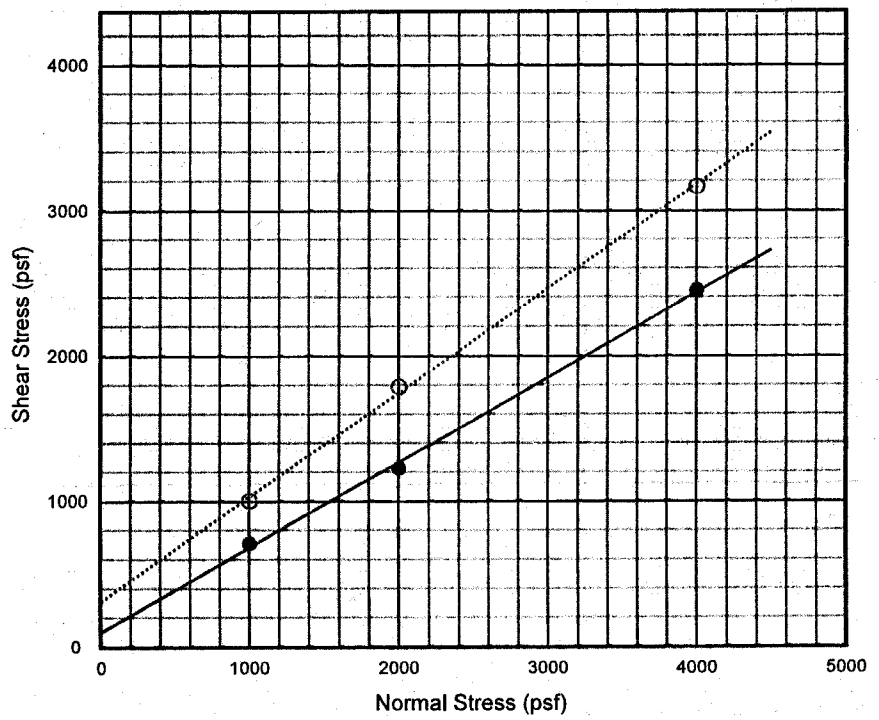

	Boring No.	Depth (ft)	USCS	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	7	30	(SP-SM) Sand with silt, fine / Undisturbed	108.0	5.1	308.5	35.7	97.5	30.3

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-10

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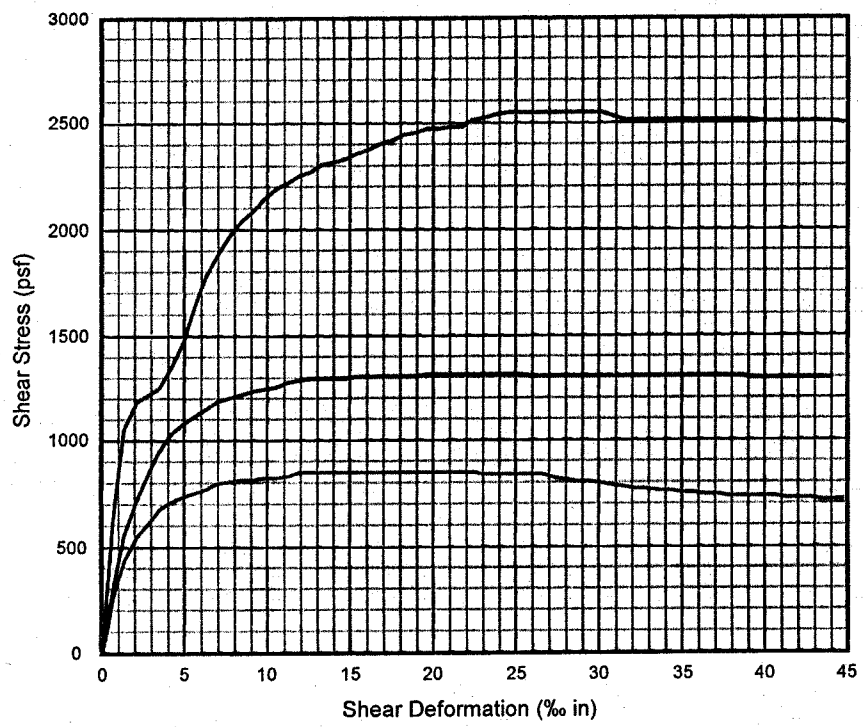

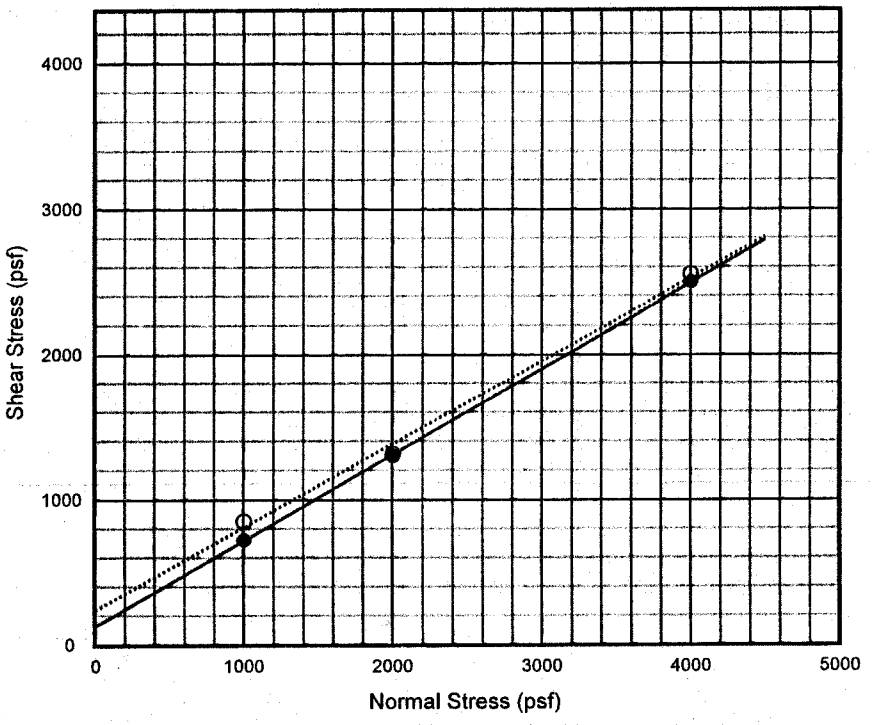

	Boring No.	Depth (ft)	USCS	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	4B & 6B to 9B	3 - 8	(ML) Sandy Silt, fine / Remolded (RC=90%)	107.0	12.0	233.1	29.8	119.7	30.7

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-11

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FINES CONTENT (ASTM C117)

Boring No.	1	1	1	1	1	1	1	1	1
Depth (ft)	1	5	10	15 - 25	25	30 - 40	40	45	50
Fine Contents (%)	22	88	44	85	20	78	14	63	81
Classification	SM	ML	SM	ML	SM	ML	SM	ML	ML
Boring No.	1	1	2	2	2	2	2	2	2
Depth (ft)	55	60 - 76.5	1	10	15 - 25	30	35	40 - 55	55 - 65
Fine Contents (%)	84	39	22	20	60	59	90	50	35
Classification	ML	SM	SM	SM	ML	ML	ML	SM	SM
Boring No.	2	2	3	3	3	3	3	3	3
Depth (ft)	65	70 - 76.5	1	5	10	15 - 25	25	30 - 40	40
Fine Contents (%)	9	9.3	22	64	29	79	37	76	14
Classification	SP - SM	SP - SM	SM	ML	SM	ML	SM	ML	SM
Boring No.	3	3	3	3	3	3			
Depth (ft)	45	50	55	60	65	70 - 76.5			
Fine Contents (%)	84	61	69	57	4.7	23			
Classification	ML	ML	ML	ML	SP	SM			

EXPANSION INDEX (ASTM D 4829)

Sample No.	4B & 6B to 9B
Depth (ft)	3 - 8
Initial Moisture (%)	12.1
Final Moisture (%)	20.5
Degree of Saturation (%)	50
Expansion Index	2
Expansion Potential	Very low

R-VALUE (CALTRANS 301)

Sample No.	1A to 9A
Depth (ft)	0.5 - 1.5
Classification	SM
Sand Equivalent	-
R-value	64

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TEST DATA SUMMARY					
Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Engineer:	fy	Enclosure:	C-12

HDR | SCHIFF

www.hdrinc.com
Corrosion Control and Condition Assessment (C3A) Department

Table 1 - Laboratory Tests on Soil Samples

C.H.J. Consultants
East County Detention Center Parking Structure
Your #13143-3, HDR\|Schiff #13-0262LAB
27-Mar-13

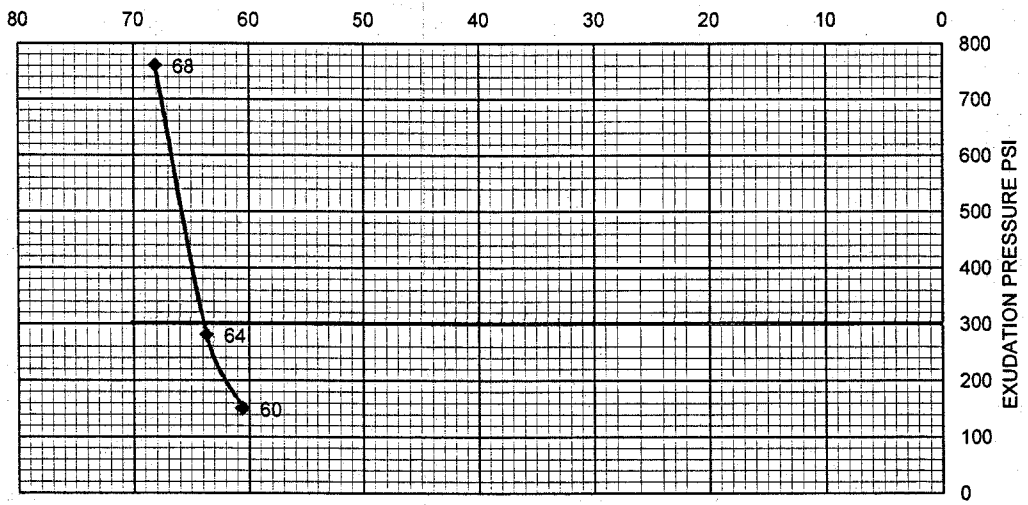
Sample ID			1A to 9A 4B + 6B to 9B	
Resistivity		**Units**		
as-received		ohm-cm	18,000	21,200
saturated		ohm-cm	1,160	1,400
pH			7.3	8.0
Electrical Conductivity		mS/cm	0.37	0.30
Chemical Analyses				
Cations				
calcium	Ca^{2+}	mg/kg	161	66
magnesium	Mg^{2+}	mg/kg	23	5.7
sodium	Na^{1+}	mg/kg	150	272
potassium	K^{1+}	mg/kg	66	22
Anions				
carbonate	CO_3^{2-}	mg/kg	9.0	51
bicarbonate	HCO_3^{1-}	mg/kg	78	174
fluoride	F^{1-}	mg/kg	2.5	8.4
chloride	Cl^{1-}	mg/kg	112	120
sulfate	SO_4^{2-}	mg/kg	362	234
phosphate	PO_4^{3-}	mg/kg	ND	ND
Other Tests				
ammonium	NH_4^{1+}	mg/kg	ND	ND
nitrate	NO_3^{1-}	mg/kg	244	53
sulfide	S^{2-}	qual	na	na
Redox		mV	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

Traffic Index (T.I.) 5.0	A	B	C	D
COMPACTOR AIR PRESSURE P.S.I.	250	350	350	
INITIAL MOISTURE %	4.3	4.3	4.3	
WATER ADDED, ML	90	75	70	
WATER ADDED %	8.8	7.4	6.7	
MOISTURE AT COMPACTION %	13.1	11.7	11.0	
HEIGHT OF BRIQUETTE	2.47	2.45	2.49	
WET WEIGHT OF BRIQUETTE	1070	1059	1085	
DENSITY LB. PER CU.FT.	116.1	117.3	118.9	
STABILOMETER PH AT 1000 LBS.	25	22	20	
2000 LBS.	40	38	35	
DISPLACEMENT	4.90	4.60	4.20	
R-VALUE	60	64	68	
EXUDATION PRESSURE	150	280	760	
THICK. INDICATED BY STAB.	0.63	0.58	0.51	
EXPANSION PRESSURE	0	0.1	2	
THICK. INDICATED BY E.P.	0.00	0.00	0.07	

EXUDATION CHART

R-VALUE



R-Value: 63

Sample No.	Depth (ft)	Soil/Sample Type	SE	w_0(%)
1A to 9A	0.5 to 1.5	(SM) Silty sand		4.3

CHJ Consultants

R-VALUE TEST

Project:	Proposed East County Detention Center Parking Structure		
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California		
Job No.:	13143-3	Enclosure:	C-14

Prepared at 3/27/2013

ASPHALT CONCRETE STRUCTURAL SECTION DESIGN

R-Value used	50

Traffic Index (T.I.)	Recommended Street Sections	
5.00	0.25' AC / 0.35' AB Class 2	0.35' AC / Native
5.50	0.25' AC / 0.35' AB Class 2	0.40' AC / Native
6.00	0.25' AC / 0.35' AB Class 2	0.45' AC / Native
6.50	0.30' AC / 0.35' AB Class 2	0.50' AC / Native
7.00	0.30' AC / 0.40' AB Class 2	0.55' AC / Native
7.50	0.35' AC / 0.45' AB Class 2	0.65' AC / Native
8.00	0.40' AC / 0.45' AB Class 2	0.70' AC / Native
8.50	0.40' AC / 0.50' AB Class 2	0.75' AC / Native
9.00	0.45' AC / 0.55' AB Class 2	0.80' AC / Native
9.50	0.45' AC / 0.60' AB Class 2	0.90' AC / Native
10.00	0.50' AC / 0.65' AB Class 2	0.95' AC / Native
10.50	0.55' AC / 0.65' AB Class 2	1.00' AC / Native
11.00	0.55' AC / 0.70' AB Class 2	1.05' AC / Native
11.50	0.60' AC / 0.75' AB Class 2	1.10' AC / Native
12.00	0.60' AC / 0.80' AB Class 2	1.20' AC / Native
12.50	0.65' AC / 0.85' AB Class 2	1.25' AC / Native
13.00	0.65' AC / 0.90' AB Class 2	1.30' AC / Native
13.50	0.70' AC / 0.90' AB Class 2	1.35' AC / Native
14.00	0.70' AC / 0.95' AB Class 2	1.40' AC / Native

NOTE: MIN. A.C. THICKNESS IS 0.25' MIN. A.B. THICKNESS IS 0.35'

All thicknesses arerounded to the nearest 0.05 foot.

The above values may not reflect applicable county or city minimum standards.

A safety factor of 0.20 for the G.E. of the A.C. is included as per Caltrans.

The values also include a safety factor of 0.10 for A.C./ native soil.

Some agencies do not permit placing A.C. over native soil.

PARKING LOT PCC SECTION DESIGN

R-Value	Concrete Compressive Strength, f_c (psi)	Flexural Strength, M_r (psi)
50	*3500*	*530*
Traffic Category	**ADTT**	**PCC Section (in)**
A	0	4
A-1	1	4.5
A-1	10	5.5
B	25	6
B	300	6.5
C	100	6.5
C	300	7
C	700	7
D	700	7

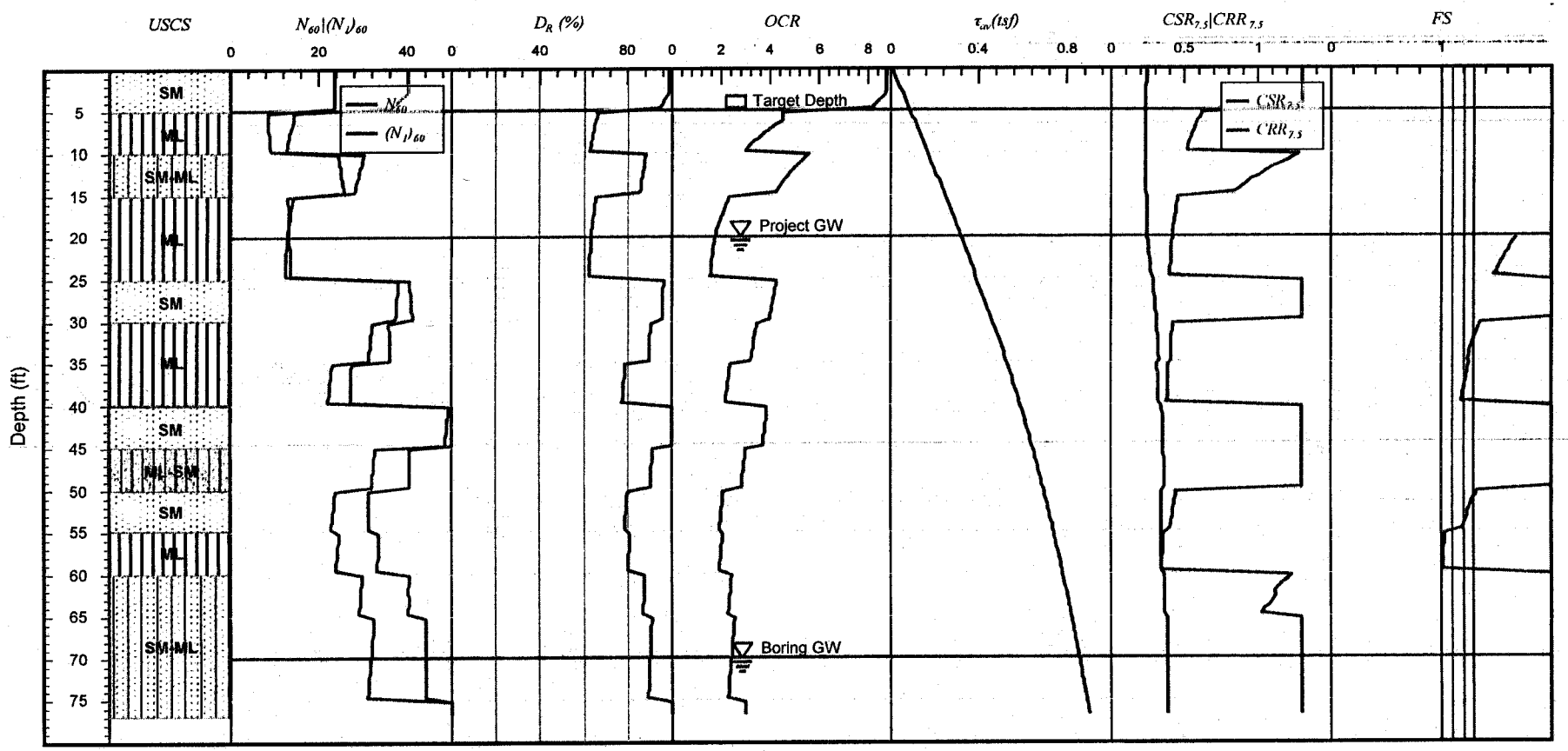
CHJ Consultants

AC & PCC STRUCTURAL SECTION DESIGN

Project:	Proposed East County Detention Center Parking Structure		
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California		
Job No.:	13143-3	Enclosure:	C-15

APPENDIX "D"

GEOTECHNICAL CALCULATIONS



Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 1.25 in
Settlement at Target Depth = 1.25 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

CHJ Consultants

Liquefaction Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-1	Enclosure:	D-1

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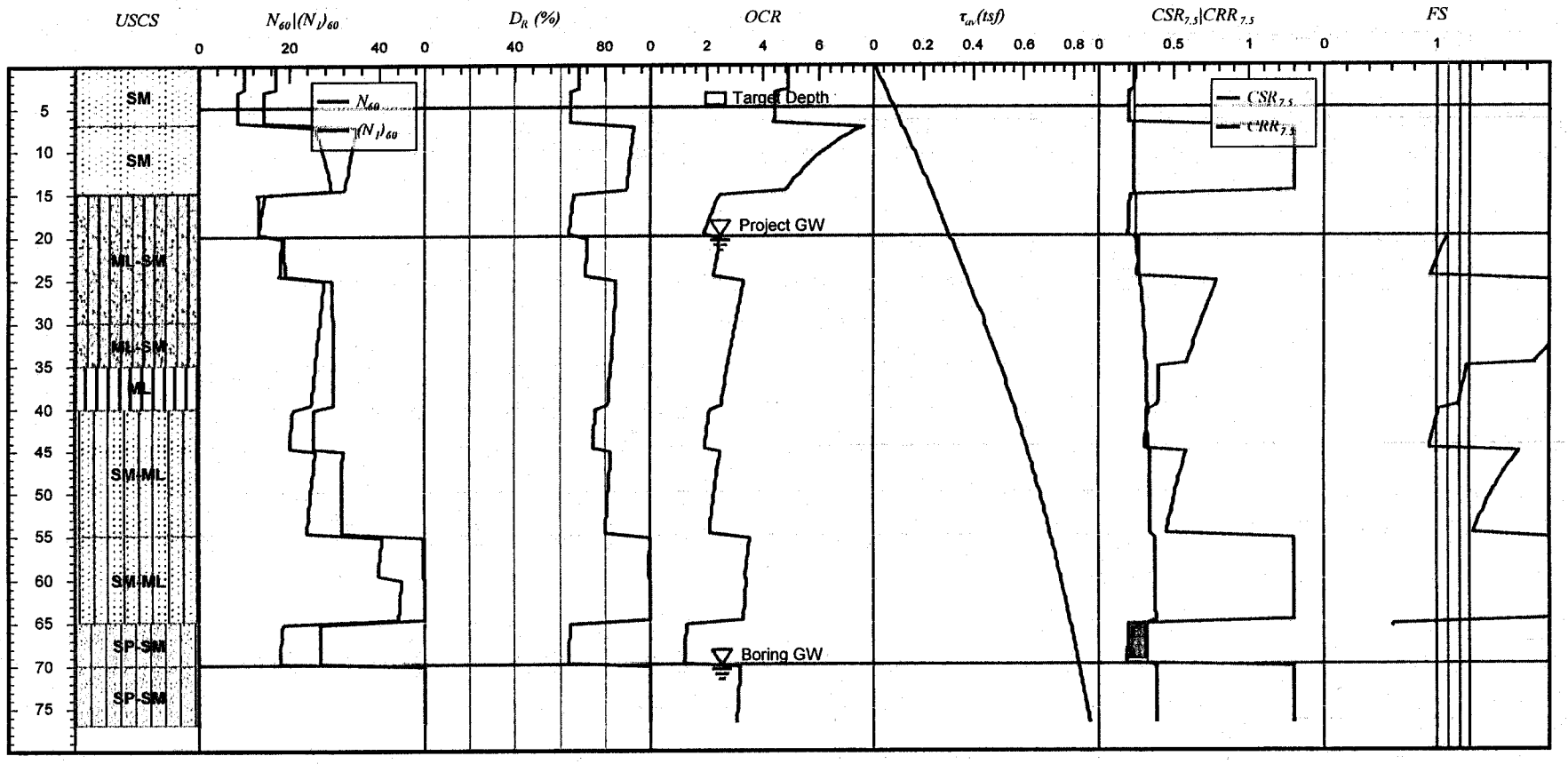

SM | ML | SP-SM

ML-SM | SM-ML

Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 1.91 in
Settlement at Target Depth = 1.90 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

CHJ Consultants

Liquefaction Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-2	Enclosure:	D-2

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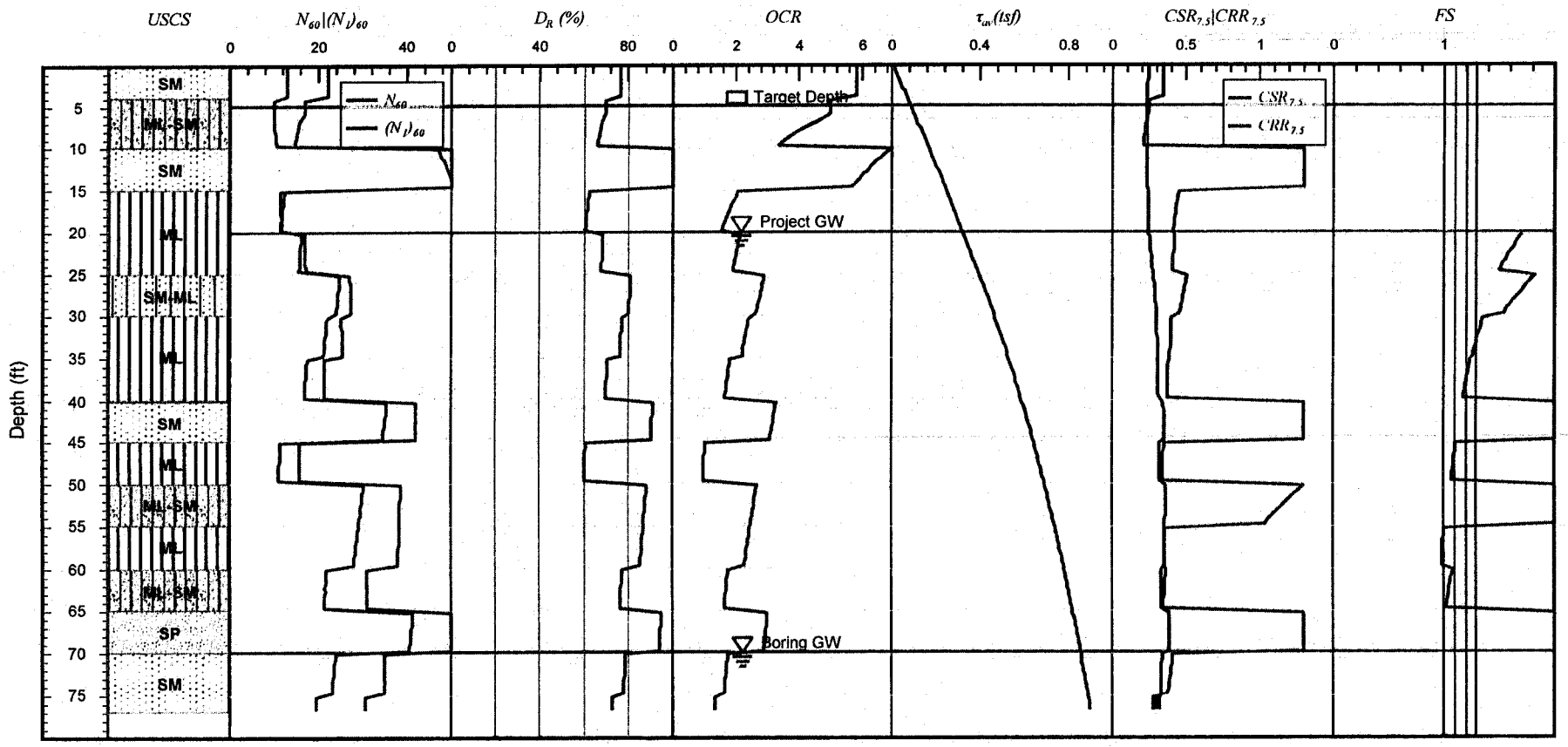

Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 2.02 in
Settlement at Target Depth = 2.01 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

CHJ Consultants

Liquefaction Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-3	Enclosure:	D-3

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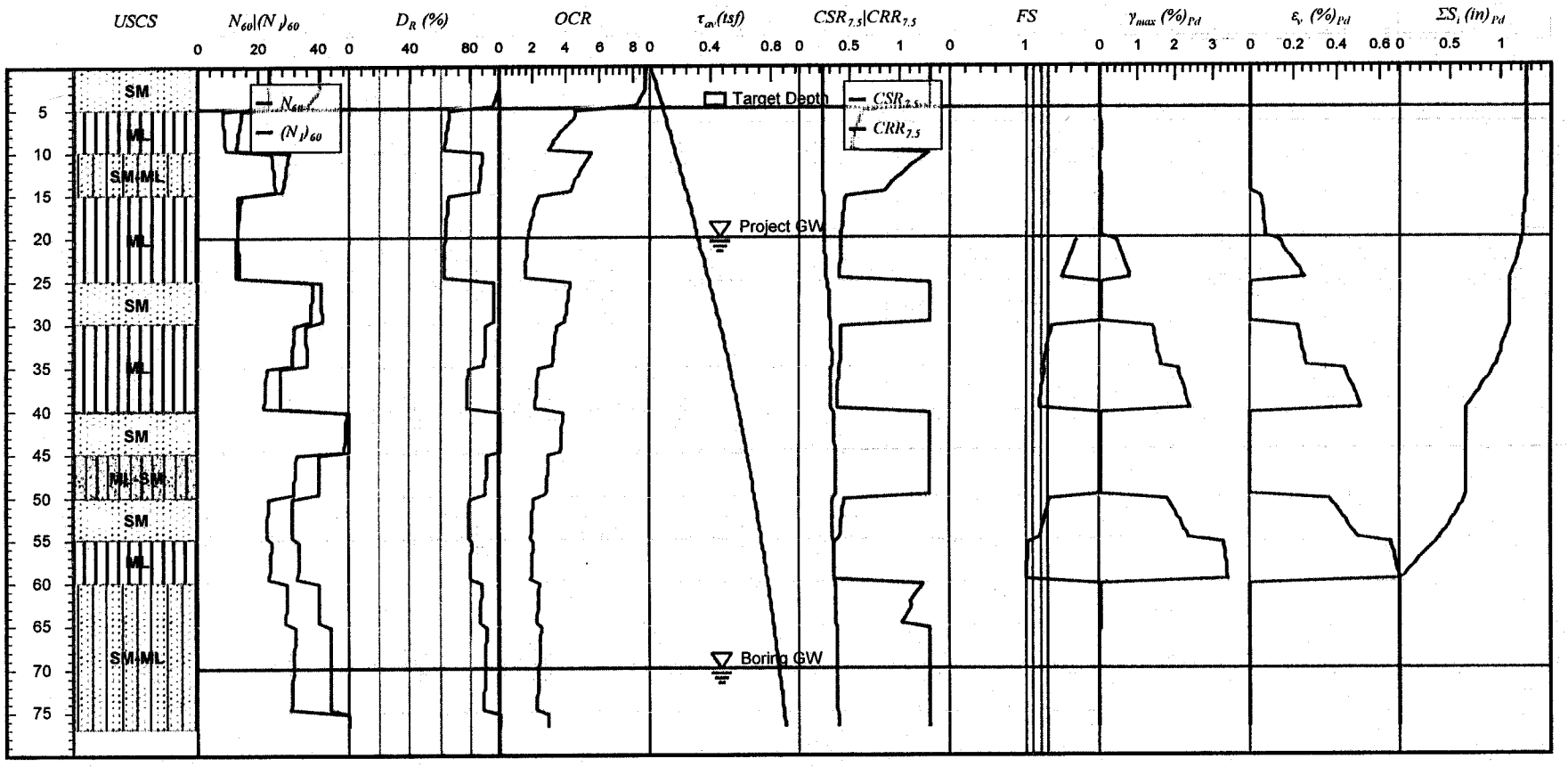

Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 1.25 in
Settlement at Target Depth = 1.25 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

CHJ Consultants

Seismic Settlement Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-1	Enclosure:	D-4

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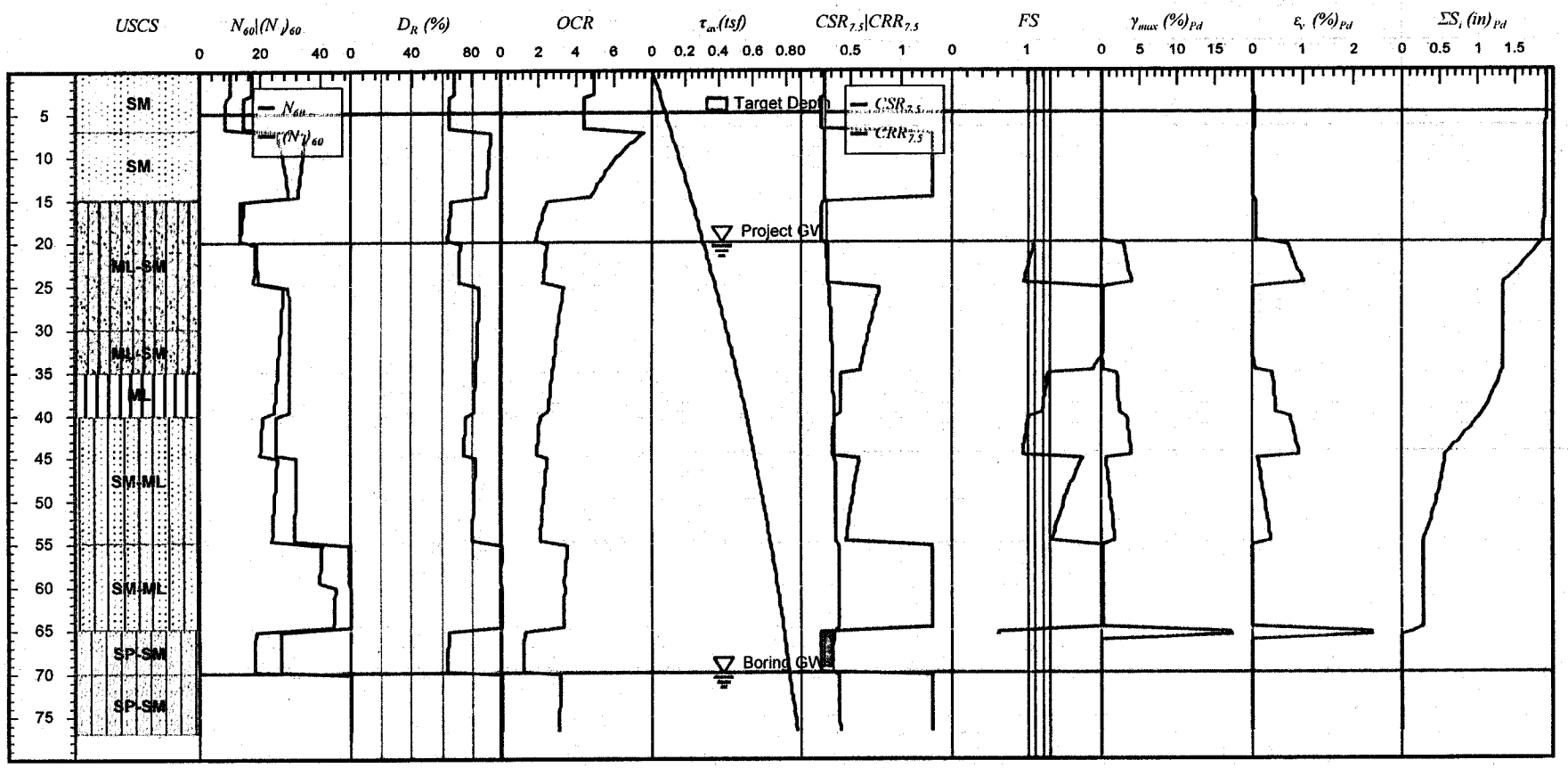

SM ML SP-SM

ML-SM SM-ML

Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 1.91 in
Settlement at Target Depth = 1.90 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

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Seismic Settlement Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-2	Enclosure:	D-5

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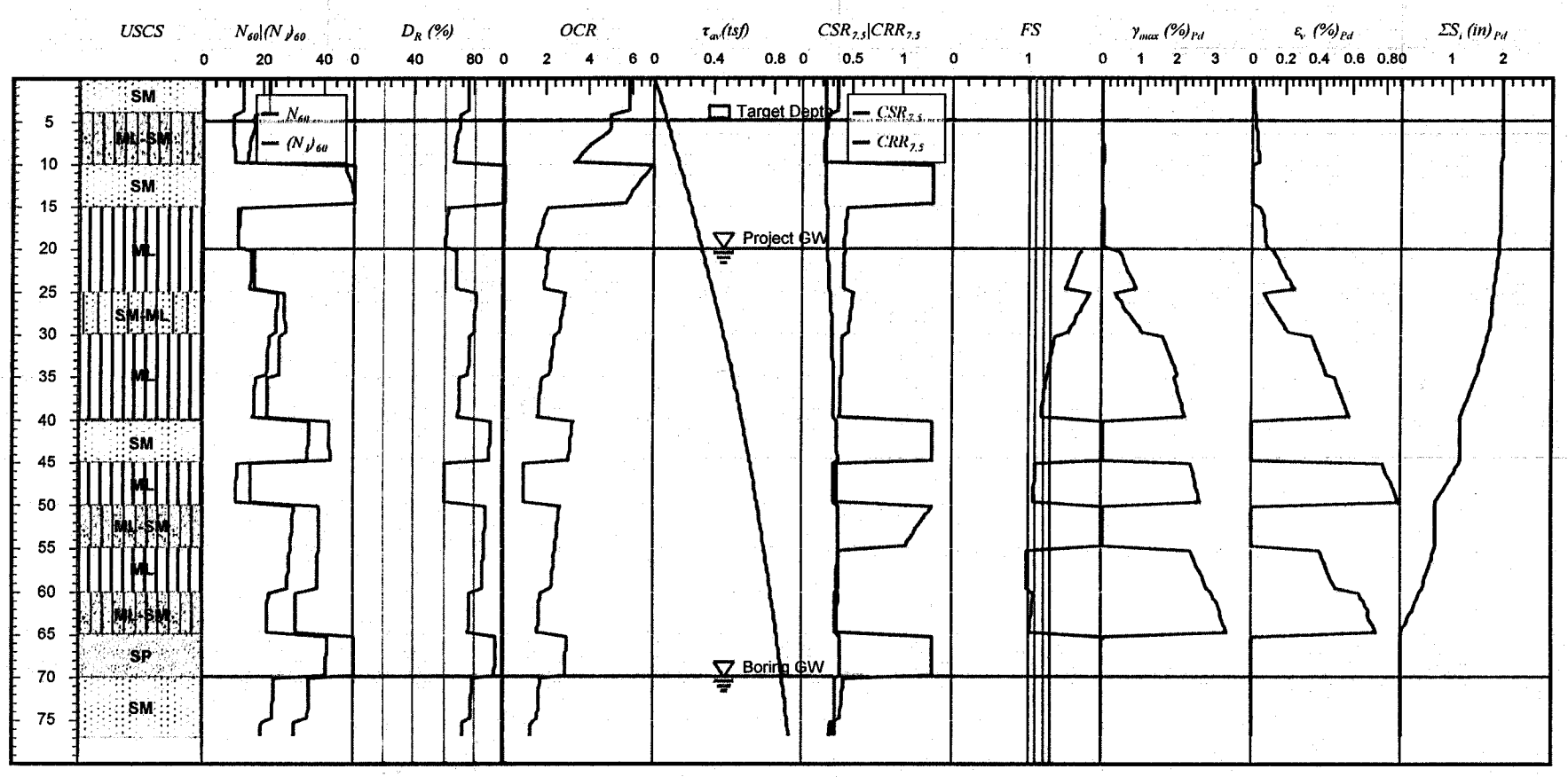

Earthquake & Groundwater Information:
Magnitude = 7
Max. Acceleration = 0.46 g
Project GW = 20 ft
Maximum Settlement = 2.02 in
Settlement at Target Depth = 2.01 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat] Idriss & Boulanger (2008)
Lateral spreading: Idriss & Boulanger (2008)
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

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Seismic Settlement Potential - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-3	Enclosure:	D-6

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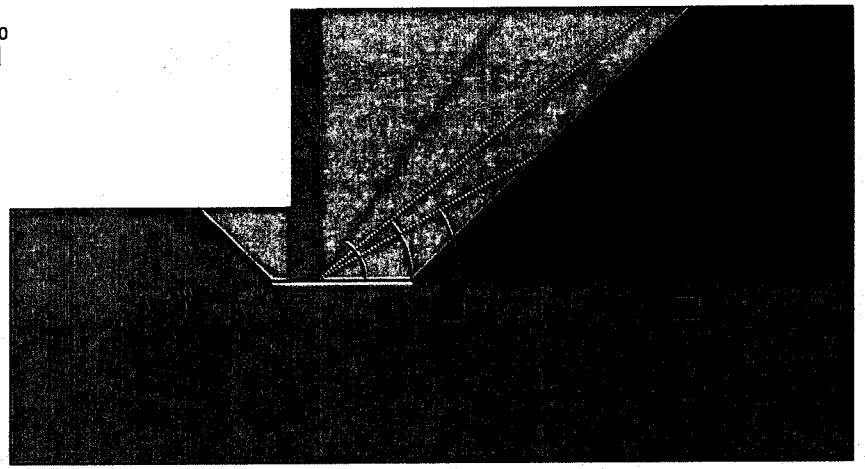
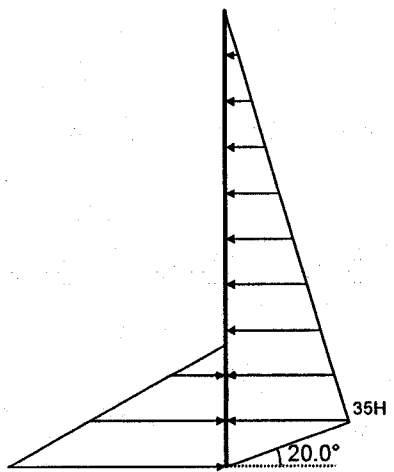
0 10

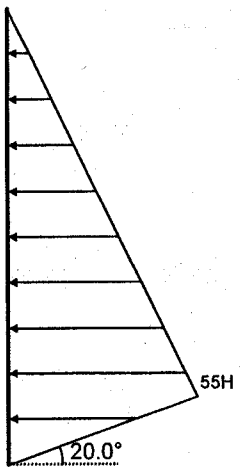
H=15 (ft)
H1=4.0 (ft)
α=0 (°)
δ=20.0 (°)
k_H=0.23
k_V=0.115



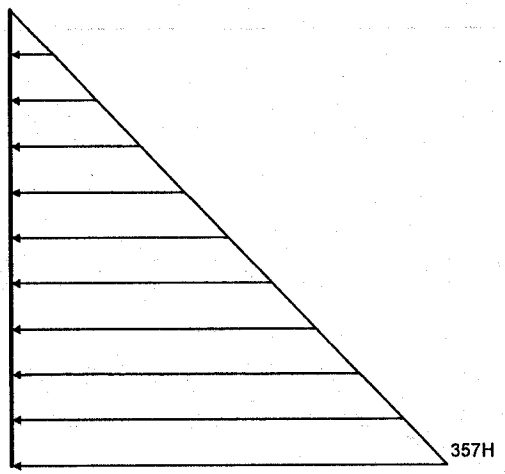
	P_{pL}	P_a	P_{aE}	P_{pR}
H (ft)	4	15	15	15
Z_c(ft)	-	0	0	-
Total	357	35	55	357
Hori.	357	33	51	357
Vert.	-	12	19	-
ω (°)	30.00	56.00	39.75	29.75
Restrained (Level Backfill)				60
Base Friction Coefficient				0.36



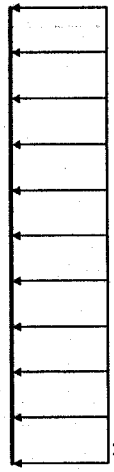
(a) Passive (L) (b) Active



(c) Seismic



(d) Passive (R)



(e) Apparent Pressure

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Earth Pressures

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-1	Enclosure:	D-7

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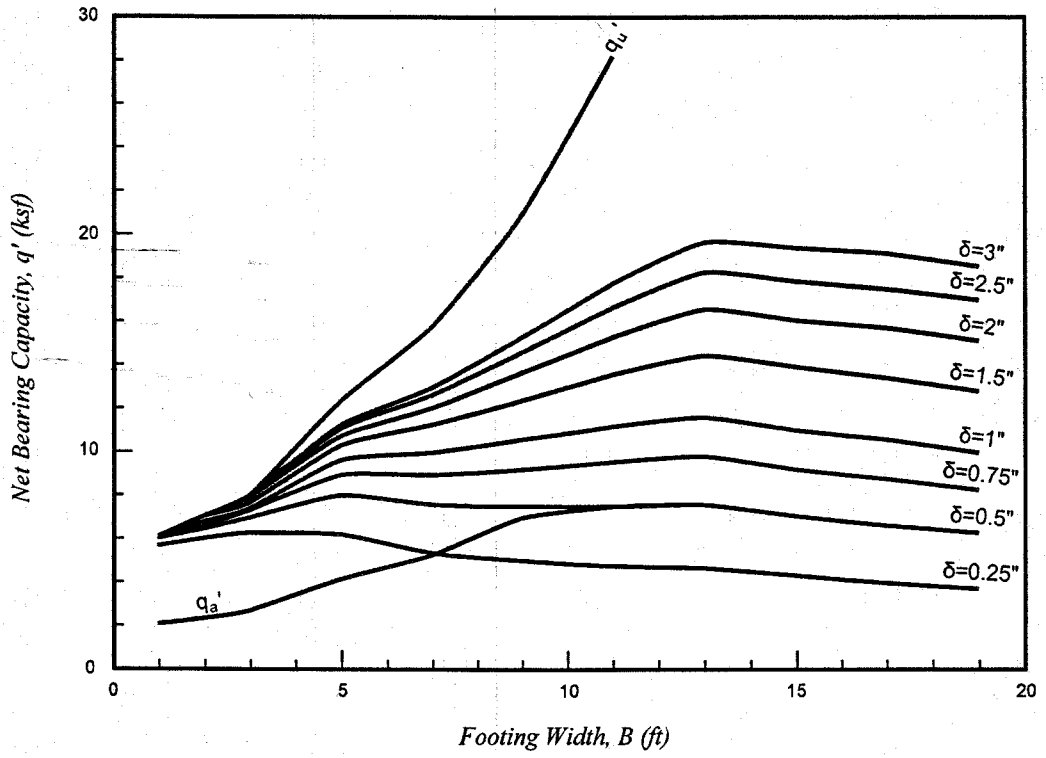
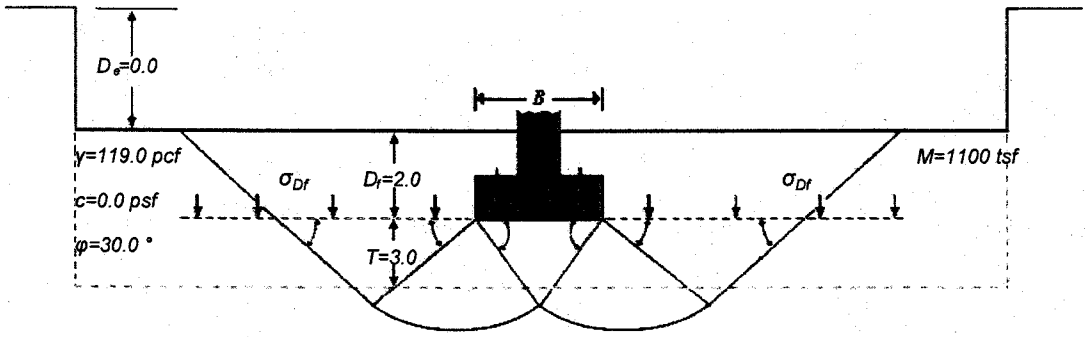


Bearing Capacity vs. Footing Width



B	1	2	3	5	11	19
q_u'(ksf)	6.06	7.02	7.98	12.38	28.21	41.79
q_a'(ksf)	2.02	2.34	2.66	4.13	7.49	6.22
k_v(kcf)	143.64	154.52	167.17	191.36	179.70	149.24

1. Net Bearing Capacity, Terzaghi (1943).
2. FS=3 or δ=0.50 in.
3. Footing shape = Square.
4. Effective Stress at footing depth, σ_{Df} = 0.24ksf.
5. Compression Deformation: Nonlinear (Yi 2011)

Bearing Capacity vs. Footing Width - SPT Data

Project:	Proposed East County Detention Center Parking Structure				
Location:	Southeast of Oasis Street and Plaza Avenue, Indio, California				
Job Number:	13143-3	Boring No.:	B-1	Enclosure:	D-8

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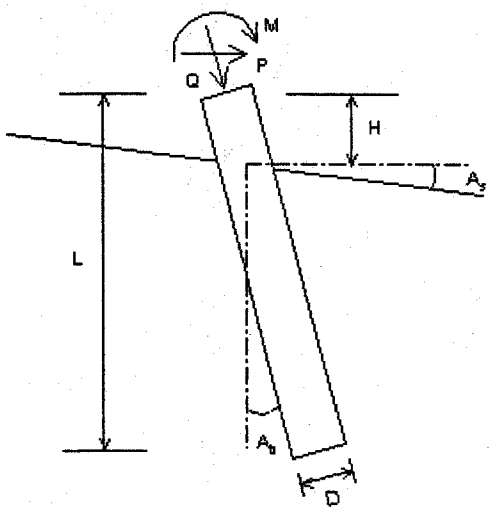
APPENDIX "E"

PILE CALCULATIONS

VERTICAL ANALYSIS



Drilled Pile (dia <=24 in. or 61 cm)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Cyclic
Number of Cycles: 15

(with Load Factor)
Vertical Load, Q= 200.0 -kp
Shear Load, P= 130.0 -kp
Moment, M= 0.0 -kp-f

Profile:
Pile Length, L= 50.0 -ft
Top Height, H= -6 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0
Free Head Condition

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	114	30.3	.1	166.7	0.80	12
10	115.6	29.9	0	134.8	60.29	25
15	117.7	23	.074	59.5	1.19	14
20	61.5	23	.074	76.1	0.68	24
40	56.2	30	.097	82.8	60.75	25
45	59	30	.097	76.1	0.62	16
50	63.4	32	.2	795.6	0.39	38
60	62.3	32	.2	616.8	0.44	31
65	56.1	33	0.00	86.6	62.29	27
70	62.7	34	0.00	104.7	69.20	34

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	24	507.2	75.4	16325.7	3000	0.486
50.0						

Vertical Capacity:
Weight above Ground= 0.00 Total Weight= 17.23-kp *Soil Weight is not included
Side Resistance (Down)= 263.375-kp Side Resistance (Up)= 162.388-kp
Tip Resistance (Down)= 164.082-kp Tip Resistance (Up)= 0.000-kp
Total Ultimate Capacity (Down) Qult= 427.456-kp Total Ultimate Capacity (Up)= 179.618-kp
Total Allowable Capacity (Down) Qallow= 186.381-kp Total Allowable Capacity (Up) Qallow= 62.744-kp
N/G! Qallow < Q

Settlement Calculation:
At Q= 200.00-kp Settlement= 0.08202-in
At Xallow= 1.00-in Qallow= 369.84030-kp

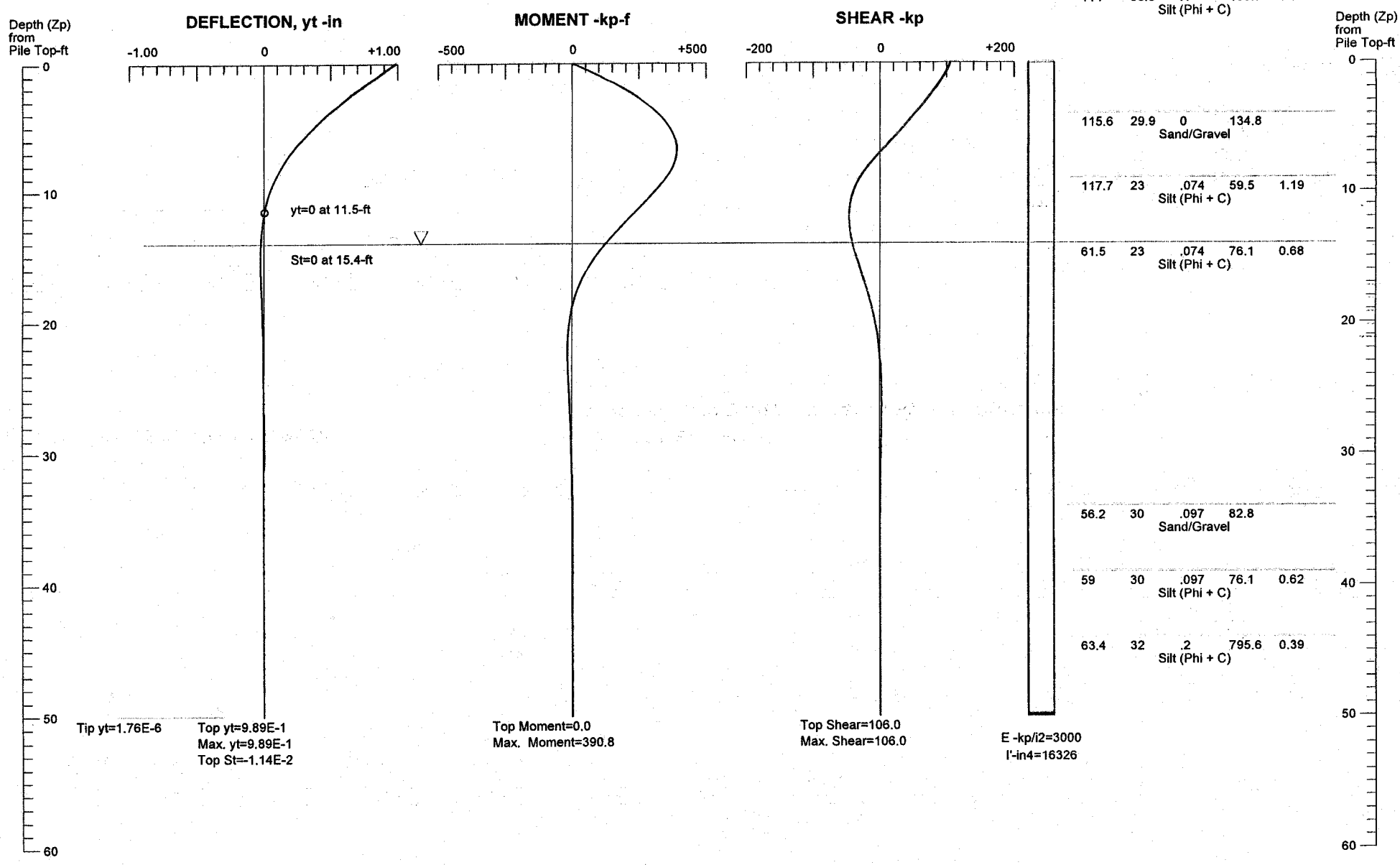
Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=2, Kbc=1

Pile below Ground (not to scale)

not to scale



G-lb/f3	Phi	C-kp/f2	k-lb/i3	e50 %	
114	30.3	.1	166.7	0.80	Silt (Phi + C)
115.6	29.9	0	134.8		Sand/Gravel
117.7	23	.074	59.5	1.19	Silt (Phi + C)
61.5	23	.074	76.1	0.68	Silt (Phi + C)
56.2	30	.097	82.8		Sand/Gravel
59	30	.097	76.1	0.62	Silt (Phi + C)
63.4	32	.2	795.6	0.39	Silt (Phi + C)

CHJ Consultants

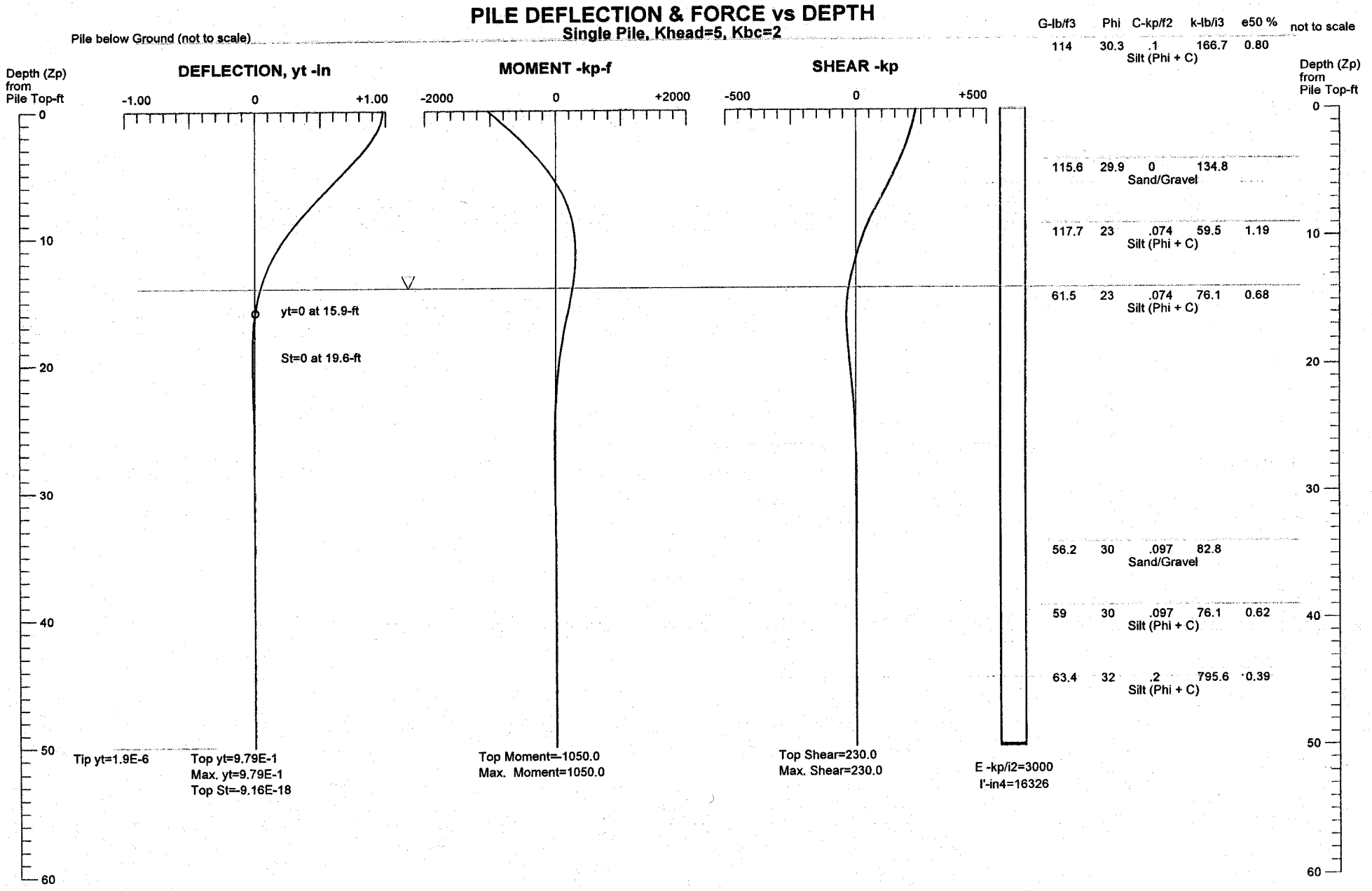
13143-3 Proposed Indio Detention Center Parking Structure

B-3, 24in CIDH Piles, Free Head

Enclosure "E-2"

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=5, Kbc=2



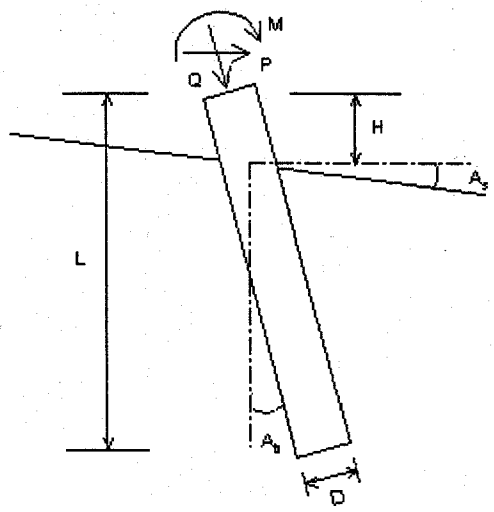
CHJ Consultants

13143-3 Proposed Indio Detention Center Parking Structure

B-3, 24in CIDH Piles, Fixed Head

Enclosure "E-3"

VERTICAL ANALYSIS



Drilled Shaft (dia >24 in. or 61 cm)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Cyclic
Number of Cycles: 15

(with Load Factor)
Vertical Load, Q= 200.0 -kp
Shear Load, P= 150.0 -kp
Moment, M= 0.0 -kp-f

Profile:
Pile Length, L= 50.0 -ft
Top Height, H= -6 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0
Free Head Condition

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	114	30.3	.1	166.7	0.80	12
10	115.6	29.9	0	134.8	60.29	25
15	117.7	23	.074	59.5	1.19	14
20	61.5	23	.074	76.1	0.68	24
40	56.2	30	.097	82.8	60.75	25
45	59	30	.097	76.1	0.62	16
50	63.4	32	.2	795.6	0.39	38
60	62.3	32	.2	616.8	0.44	31
65	56.1	33	0.00	86.6	62.29	27
70	62.7	34	0.00	104.7	69.20	34

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	30	775.3	94.2	39822.8	3000	0.755
50.0						

Vertical Capacity:
Weight above Ground= 0.00 Total Weight= 26.70-kp *Soil Weight is not included
Side Resistance (Down)= 345.096-kp Side Resistance (Up)= 212.049-kp
Tip Resistance (Down)= 300.594-kp Tip Resistance (Up)= 0.000-kp
Total Ultimate Capacity (Down) Qult= 645.690-kp Total Ultimate Capacity (Up)= 238.753-kp
Total Allowable Capacity (Down) Qallow= 272.746-kp Total Allowable Capacity (Up) Qallow= 84.035-kp
OK! Qallow > Q

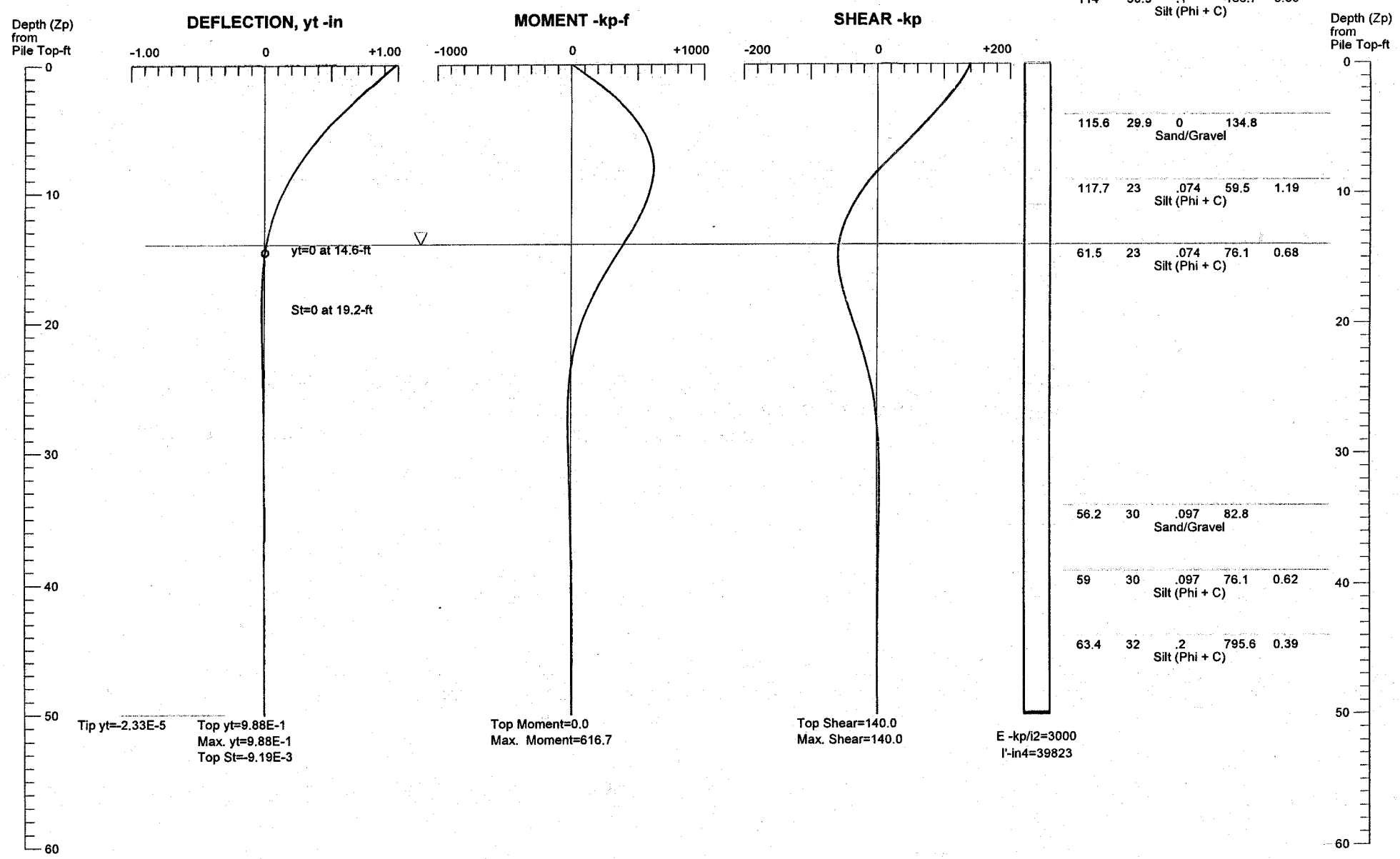
Settlement Calculation:
At Q= 200.00-kp Settlement= 0.06141-in
At Xallow= 1.00-in Qallow= 561.96234-kp

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=2, Kbc=1

Pile below Ground (not to scale)



G-lb/f3	Phi	C-kp/f2	k-lb/i3	e50 %	
114	30.3	.1	166.7	0.80	Silt (Phi + C)
115.6	29.9	0	134.8		Sand/Gravel
117.7	23	.074	59.5	1.19	Silt (Phi + C)
61.5	23	.074	76.1	0.68	Silt (Phi + C)
56.2	30	.097	82.8		Sand/Gravel
59	30	.097	76.1	0.62	Silt (Phi + C)
63.4	32	.2	795.6	0.39	Silt (Phi + C)

not to scale

CHJ Consultants

13143-3 Proposed Indio Detention Center Parking Structure

B-3, 30in CIDH Piles, Free Head

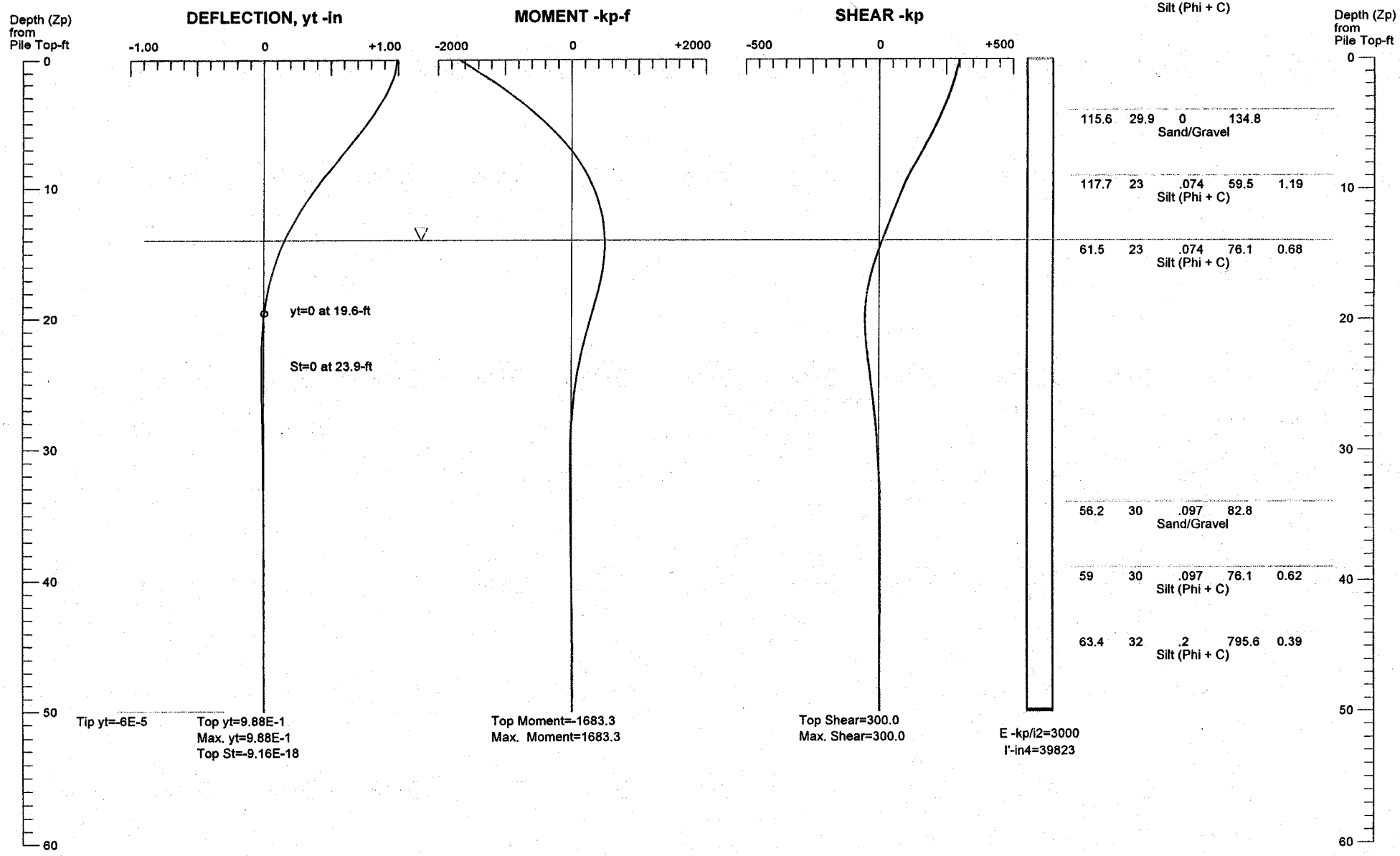
Enclosure "E-5"

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=5, Kbc=2

Pile below Ground (not to scale)

not to scale



G-lb/f3	Phi	C-kp/f2	k-lb/i3	e50 %	
114	30.3	.1	166.7	0.80	Silt (Phi + C)
115.6	29.9	0	134.8		Sand/Gravel
117.7	23	.074	59.5	1.19	Silt (Phi + C)
61.5	23	.074	76.1	0.68	Silt (Phi + C)
56.2	30	.097	82.8		Sand/Gravel
59	30	.097	76.1	0.62	Silt (Phi + C)
63.4	32	.2	795.6	0.39	Silt (Phi + C)

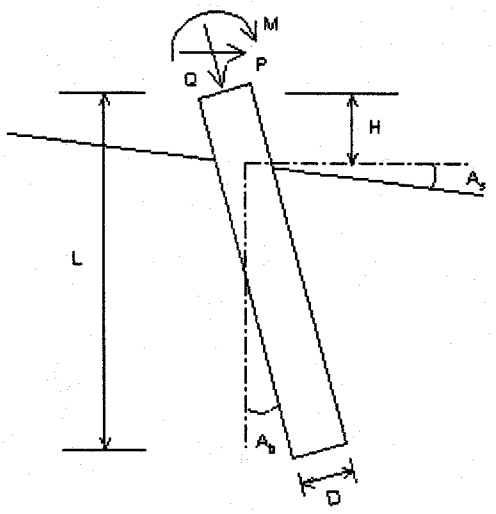
CHJ Consultants

13143-3 Proposed Indio Detention Center Parking Structure

B-3, 30in CIDH Piles, Fixed Head

Enclosure "E-6"

VERTICAL ANALYSIS



Drilled Shaft (dia >24 in. or 61 cm)

Loads:
Load Factor for Vertical Loads= 1.0
Load Factor for Lateral Loads= 1.0
Loads Supported by Pile Cap= 0 %
Shear Condition: Cyclic
Number of Cycles: 15

(with Load Factor)
Vertical Load, Q= 200.0 -kp
Shear Load, P= 180.0 -kp
Moment, M= 0.0 -kp-f

Profile:
Pile Length, L= 50.0 -ft
Top Height, H= -6 -ft
Slope Angle, As= 0
Batter Angle, Ab= 0
Free Head Condition

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	114	30.3	.1	166.7	0.80	12
10	115.6	29.9	0	134.8	60.29	25
15	117.7	23	.074	59.5	1.19	14
20	61.5	23	.074	76.1	0.68	24
40	56.2	30	.097	82.8	60.75	25
45	59	30	.097	76.1	0.62	16
50	63.4	32	.2	795.6	0.39	38
60	62.3	32	.2	616.8	0.44	31
65	56.1	33	0.00	86.6	62.29	27
70	62.7	34	0.00	104.7	69.20	34

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	36	1100.0	113.1	82537.2	3000	1.082
50.0						

Vertical Capacity:
Weight above Ground= 0.00 Total Weight= 38.19-kp *Soil Weight is not included
Side Resistance (Down)= 417.937-kp Side Resistance (Up)= 256.652-kp
Tip Resistance (Down)= 482.017-kp Tip Resistance (Up)= 0.000-kp
Total Ultimate Capacity (Down) Qult= 899.954-kp Total Ultimate Capacity (Up)= 294.847-kp
Total Allowable Capacity (Down) Qallow= 369.641-kp Total Allowable Capacity (Up) Qallow= 104.648-kp
OK! Qallow > Q

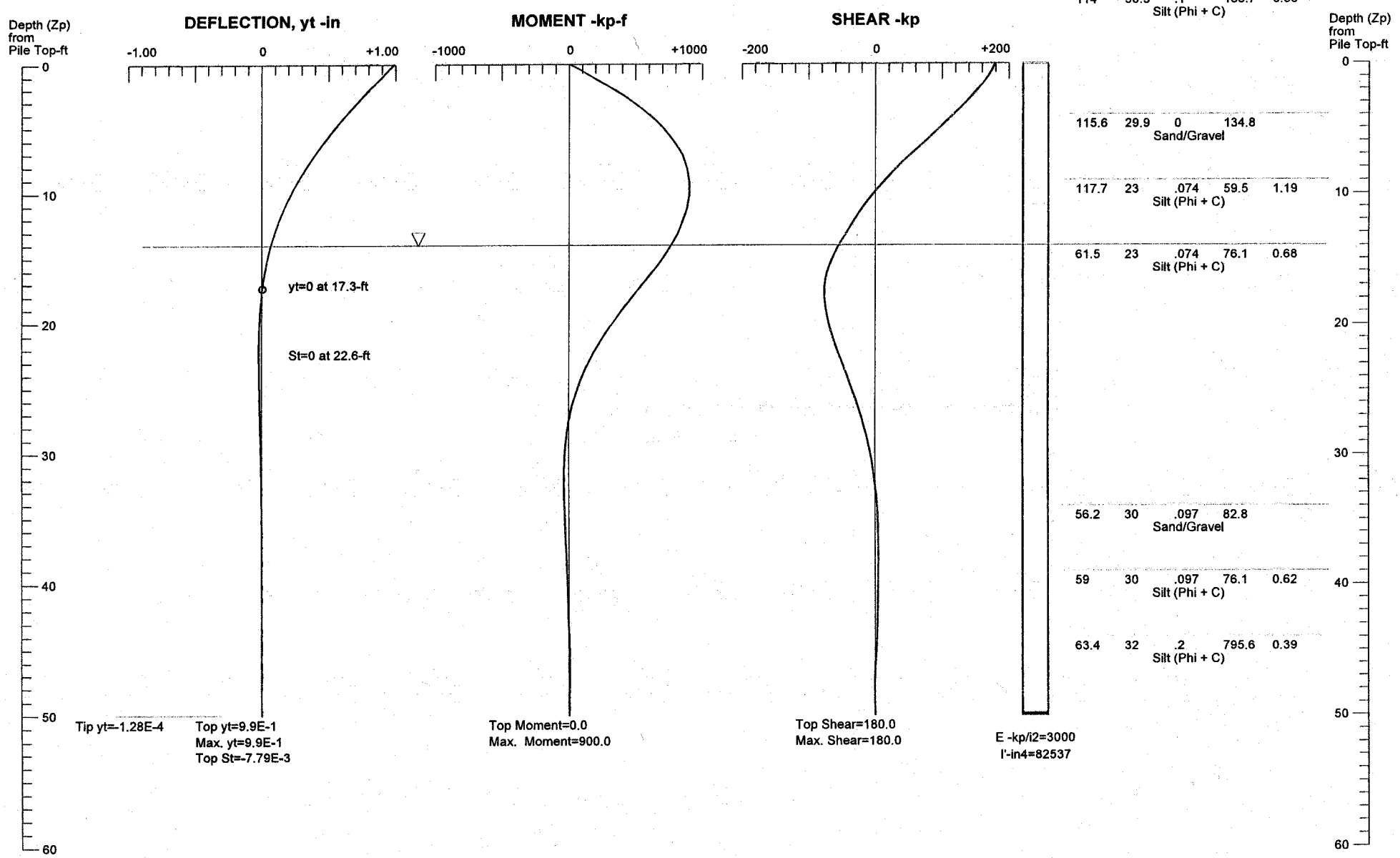
Settlement Calculation:
At Q= 200.00-kp Settlement= 0.05685-in
At Xallow= 1.00-in Qallow= 743.49396-kp

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=2, Kbc=1

Pile below Ground (not to scale)



G-lb/f3	Phi	C-kp/f2	k-lb/i3	e50 %	not to scale
114	30.3	.1	166.7	0.80	
		Silt (Phi + C)			
115.6	29.9	0	134.8		
		Sand/Gravel			
117.7	23	.074	59.5	1.19	
		Silt (Phi + C)			
61.5	23	.074	76.1	0.68	
		Silt (Phi + C)			
56.2	30	.097	82.8		
		Sand/Gravel			
59	30	.097	76.1	0.62	
		Silt (Phi + C)			
63.4	32	.2	795.6	0.39	
		Silt (Phi + C)			

CHJ Consultants

13143-3 Proposed Indio Detention Center Parking Structure

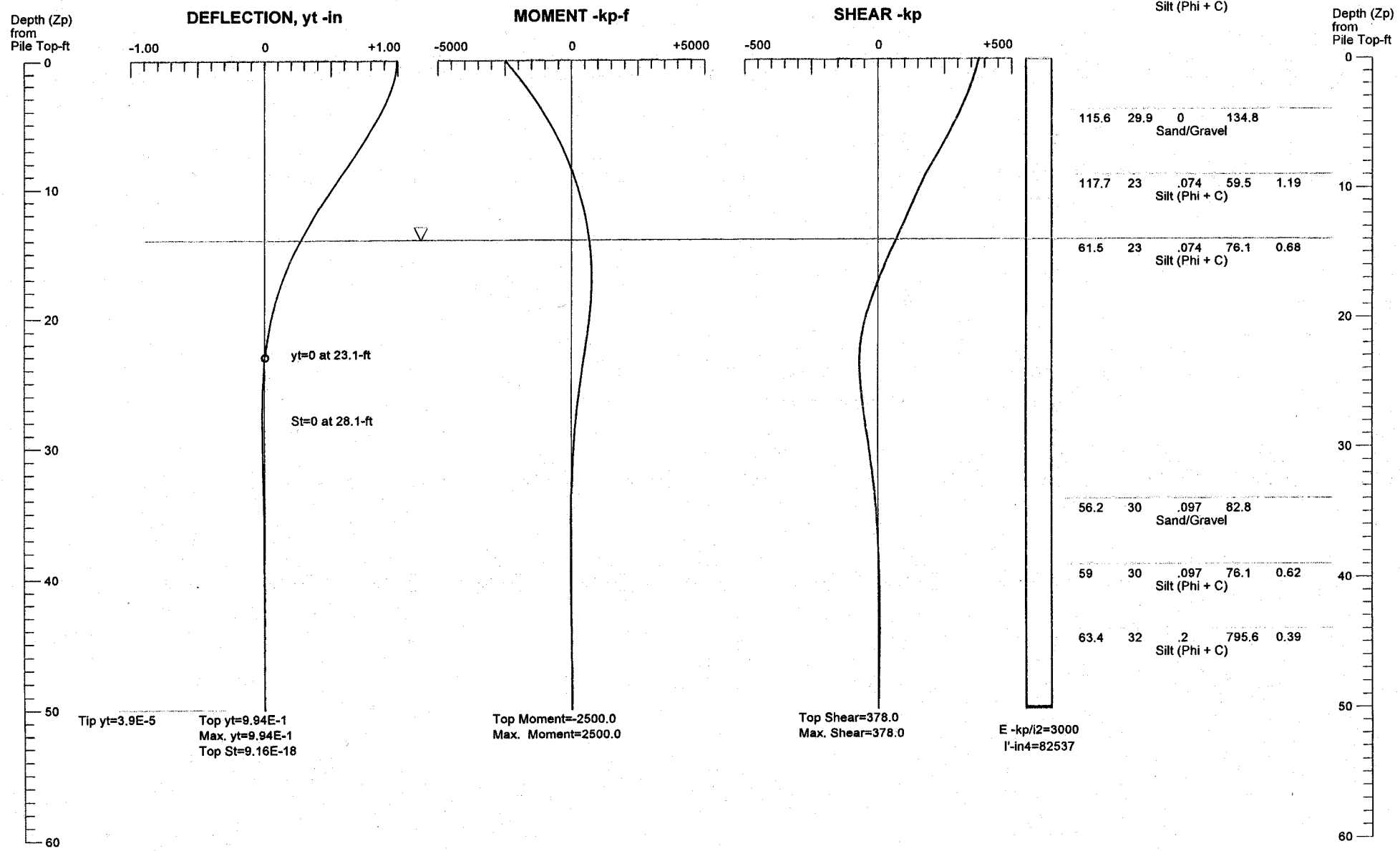
B-3, 36in CIDH Piles, Free Head

Enclosure "E-8"

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=5, Kbc=2

Pile below Ground (not to scale)



G-lb/f3	Phi	C-kp/f2	k-lb/i3	e50 %	
114	30.3	.1	166.7	0.80	Silt (Phi + C)
115.6	29.9	0	134.8		Sand/Gravel
117.7	23	.074	59.5	1.19	Silt (Phi + C)
61.5	23	.074	76.1	0.68	Silt (Phi + C)
56.2	30	.097	82.8		Sand/Gravel
59	30	.097	76.1	0.62	Silt (Phi + C)
63.4	32	.2	795.6	0.39	Silt (Phi + C)

not to scale

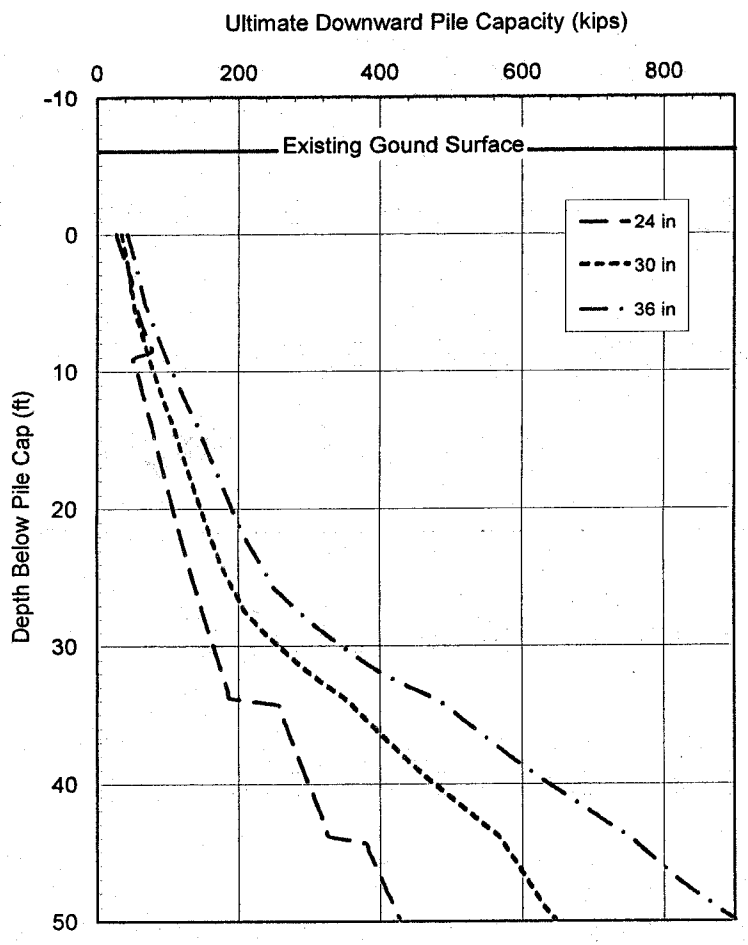
Depth (Zp) from Pile Top-ft

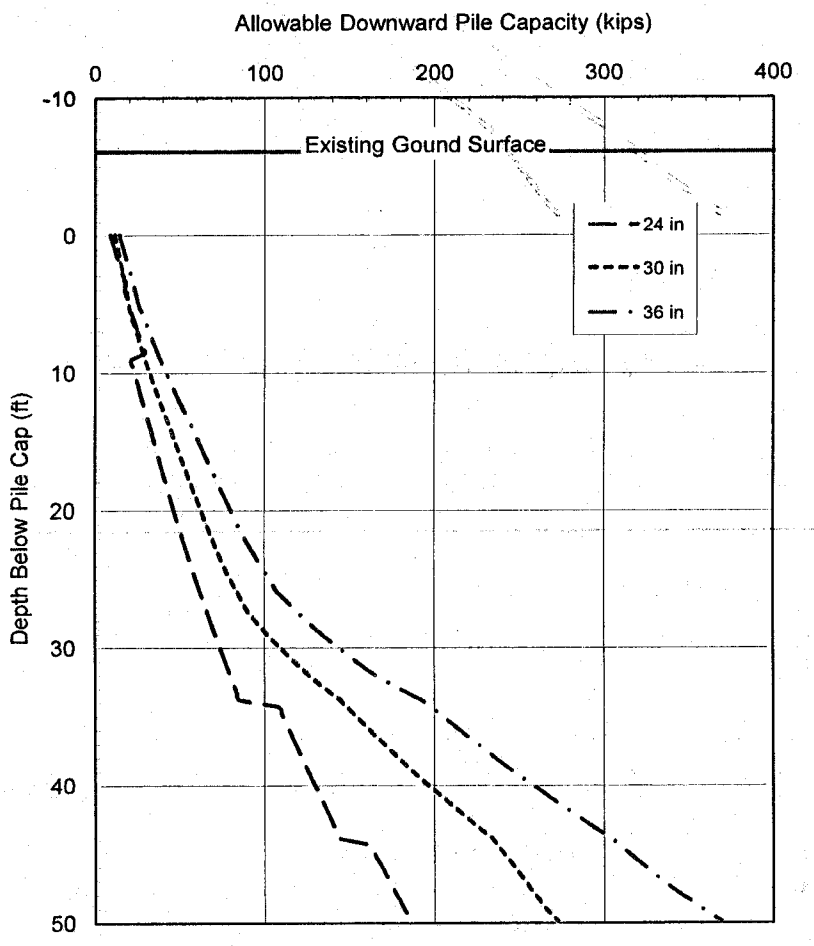
CHJ Consultants

13143-3 Proposed Indio Detention Center Parking Structure

B-3, 36in CIDH Piles, Fixed Head

Enclosure "E-9"

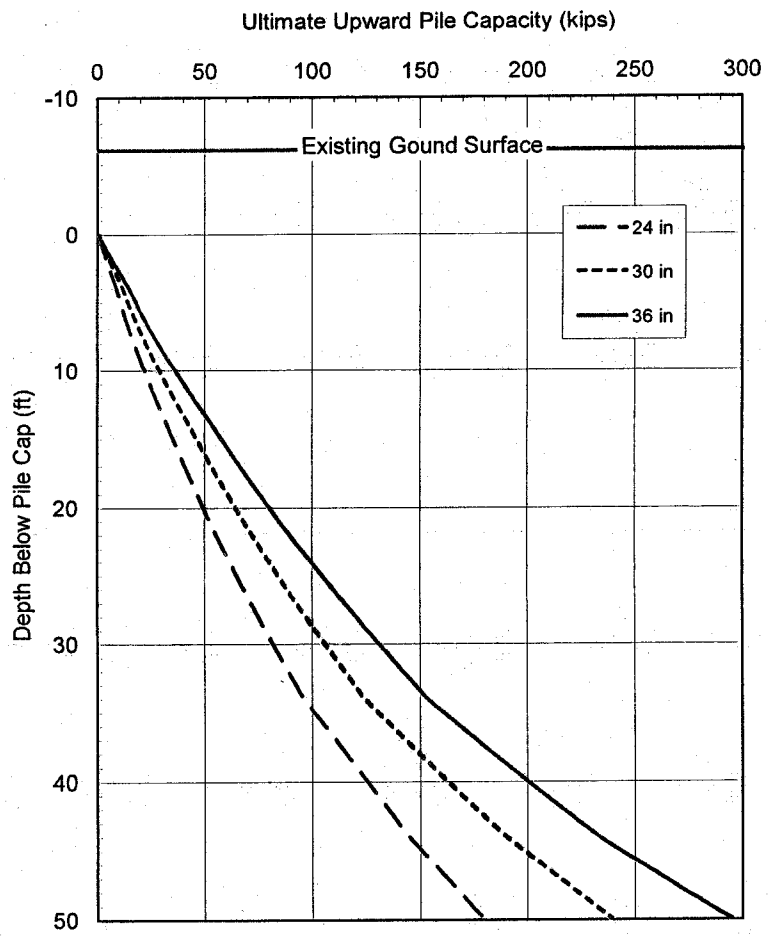


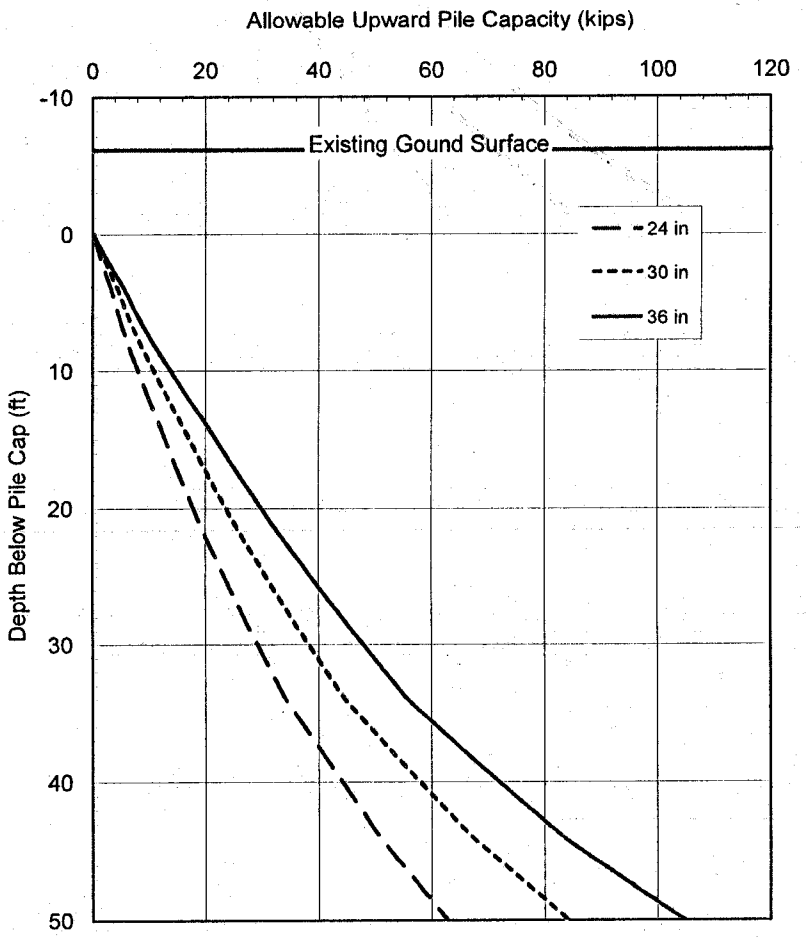


CHJ Consultants

Downward Pile Capacity

Project:	Proposed East County Detention Center Parking Structure		
Location	Southeast of Oasis Street and Plaza Avenue, Indio, California		
Job Number	13143-3	Enclosure	E-10





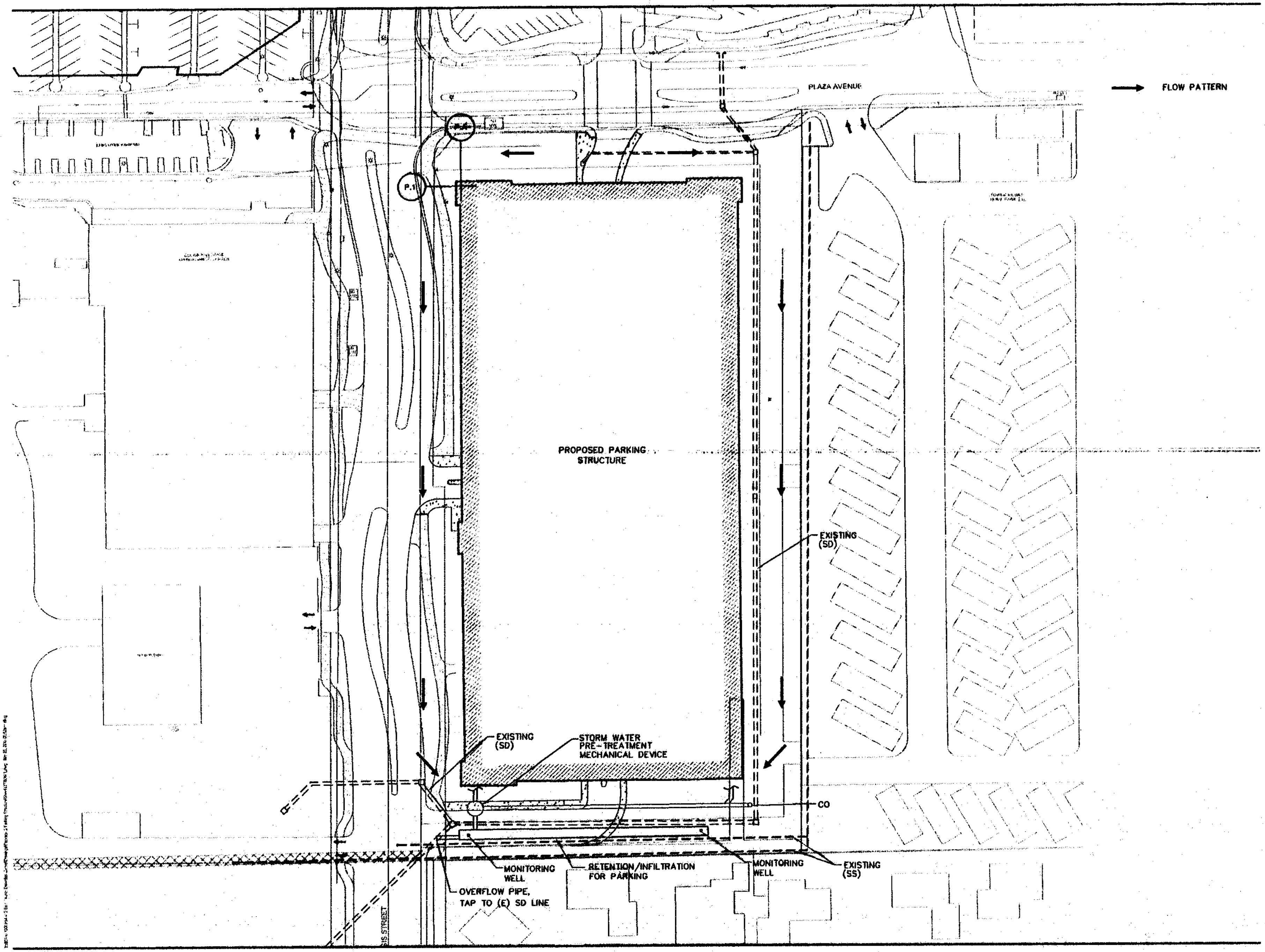
CHJ Consultants

Uplift Pile Capacity

Project:	Proposed East County Detention Center Parking Structure		
Location	Southeast of Oasis Street and Plaza Avenue, Indio, California		
Job Number	13143-3	Enclosure	E-11

EXHIBIT M

Utility Information



Project
EAST COUNTY
DETENTION CENTER

Prepared For
County of Riverside
3403 Tenth Street Suite 500
Riverside, CA 92501
Contract No: 12.24034.00

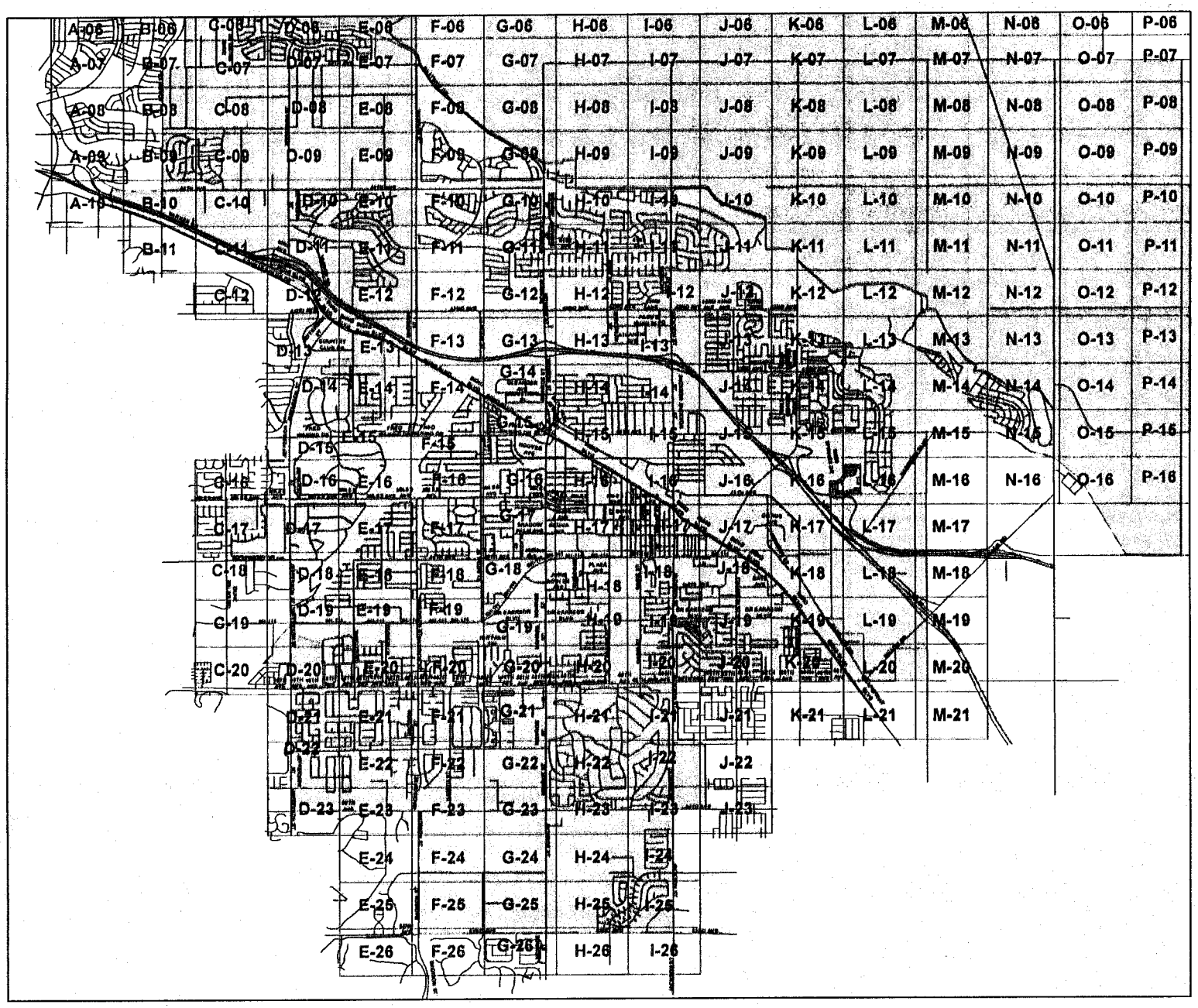
HOK
8530 Jefferson Boulevard
Culver City, CA 90232 USA

VCA Engineers, Inc.

Project No. 12.24034.00

PARKING STRUCTURE
STORM DRAIN SYSTEM

OPT 1



Indio Water Authority

Your Water. Our Responsibility.

Water Atlas Keymap

As of: 6/25/2012

Legend

- EnclosedStorageFacility
- ProductionWell
- StorageBasin
- TreatmentPlant
- BoosterStation
- wPump
- Storage
- Surge
- Bend
- Cap
- Cross
- Coupling
- ExpansionJoint
- Offset
- Reducer
- Riser
- Saddle
- Sleeve
- Tap
- Tee
- Weld
- Wye
- Unknown
- Flange
- Ball
- Butterfly
- Cone
- Gate
- PIV
- Plug
- Unknown
- AirControl
- AltitudeValve
- BackflowPreventor
- PressureControl
- wMeter
- wWholesaleMeter
- Flushing Hyd
- Standard Hyd
- Domestic
- Fire
- Commercial
- Irrigation
- Industrial
- Hydrant
- DistributionMain
- TransmissionMain
- Bypass
- ChemicalInjection
- Interconnect
- PipeBridge
- wAccessManhole
- wSamplingPoint
- wVault
- wCasing
- wEasement

wWaterStructure

SubtypeCode

- EnclosedStorageFacility
- ProductionWell
- PumpStation
- StorageBasin
- TreatmentPlant
- City_Boundary
- Scheme
- Centerline

Legend

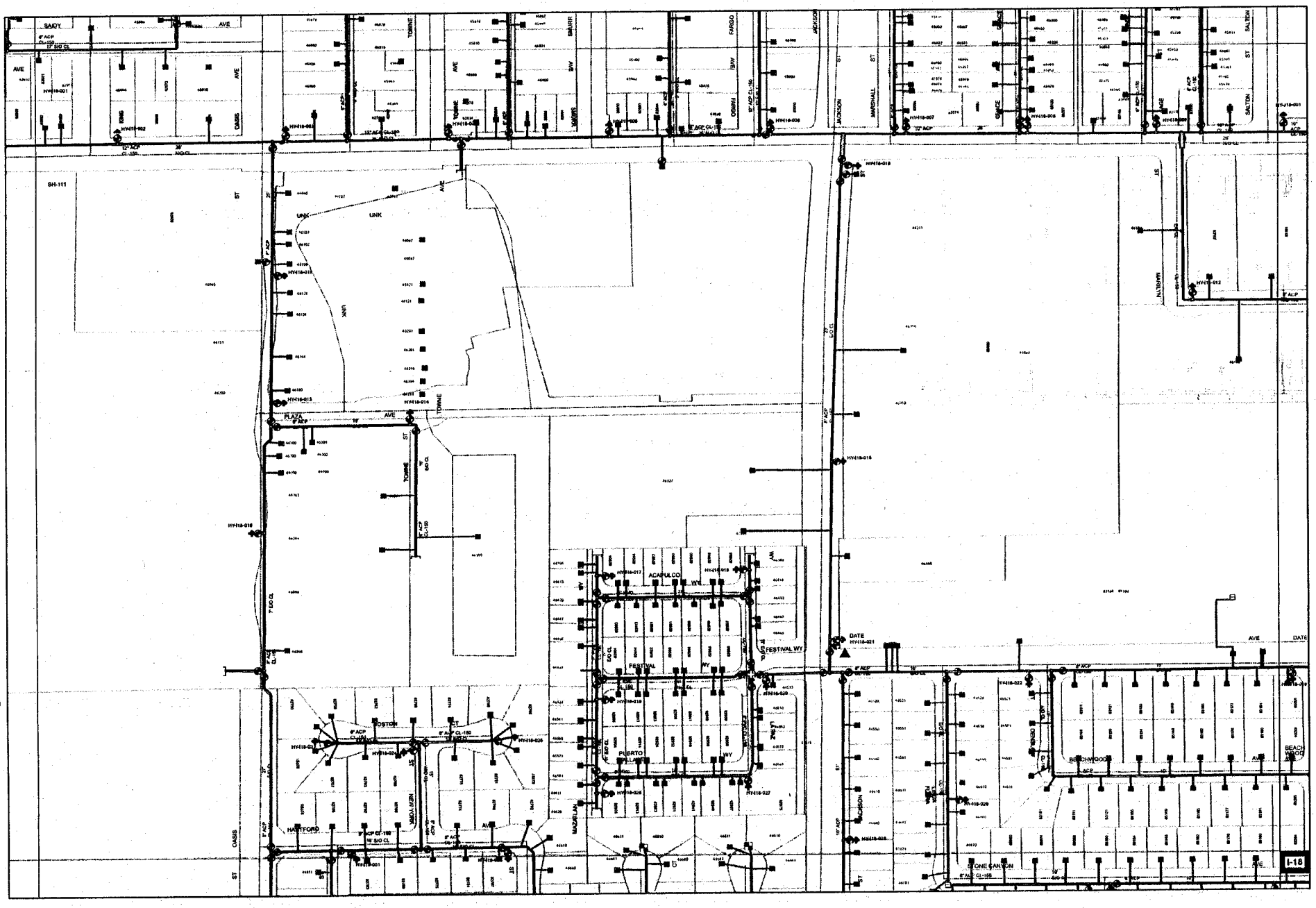
Service Areas

ServingUtilityName

- CVWD
- CVWD Proposed
- IWA
- IWA Proposed

Mile

1 0.5 0 1



T

adio Water Authority

Water Atlas
As of
7/12/2012

H-17	I-17	J-17
H-18	I-18	J-18
H-19	I-19	J-19

T

1 inch = 200 feet
On 11X17 Paper

Feet
0 100 200

T

T

ndio Water Authority

Water Atlas
As of
7/12/2012

H-18	I-18	J-18
H-19	I-19	J-19
H-20	I-20	J-20

T

1 inch = 200 feet
On 11X17 Paper

Feet
0 100 200

T