CARSON CITY PURCHASING AND CONTRACTS
201 North Carson Street, Suite 3
Carson City, NV 89701
775-283-7137/FAX 887-2107
http://www.carson.org/index.aspx?page=998
NOTICE TO CONTRACTORS
BID #1415-019
Fleet Facility Expansion
PWP # CC-2014-289

August 19, 2014

Addendum No. 1

Please make the following additions/changes/clarifications to the above referenced project:

1. There will be a pre-bid meeting at Carson City Public Works, 3505 Butti Way, Carson City NV, on August 25th at 10am. The scope of the project will be discussed and there will be a project site walk.

2. A geotechnical report from the project site is included in this addendum for your reference.

3. A DBE reference sheet is attached that will direct Prime Contractors on how to contact and utilize Disadvantaged Business Enterprises.

4. Instruction to Bidder page 5, section P states "Bidder agrees that he/she will perform work totaling at least Fifty per cent (50%) of the Bid amount and will not subcontract work totaling more than Fifty per cent (50%) of the Bid amount." The percentage that the Bidder agrees to perform shall be reduced to 10%.

5. Both Davis Bacon and State Prevailing Wage Rate requirements shall be followed for this project. Information on the rates can be found in Attachment A and B of the bid document.

Geotechnical Engineering Report

Fleet Services Expansion
3505 Butti Way
Carson City, Nevada

February 25, 2014
Terracon Project No. 67145001

Prepared for:
Carson City, Public Works
Carson City, Nevada 89701

Prepared by:
Terracon Consultants, Inc.
Reno, Nevada

February 25, 2014

Terracon

Carson City, Public Works
3505 Butti Way
Carson City, Nevada 897013

Attn: Mr. Darren Anderson
DAnderson@carson.org
775.283.7584

Re: Geotechnical Engineering Report
Fleet Services Expansion
Carson City, Nevada 89701
Terracon Project No. 67145001

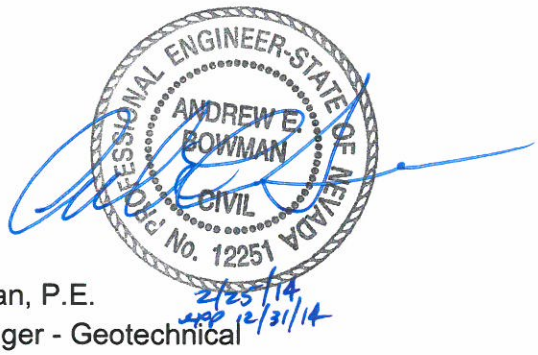
Dear Mr. Anderson:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. Our services were performed in general accordance with the Professional Services Agreement Related to Construction Projects, Contract No. 1314-138 and Terracon proposal number P67130013 authorized on January 2, 2014. This geotechnical engineering report presents the results of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. Terracon can provide materials testing services (third party inspections) for your project once it is in the construction phase. Should you require these services, please contact us and we would be glad to discuss them with you.

Sincerely,
Terracon Consultants, Inc.

Jennifer La Putt, E.I.
Staff Engineer



Andrew E. Bowman, P.E.
Department Manager - Geotechnical

2/25/14
exp 12/31/14

TABLE OF CONTENTS

TABLE OF CONTENTS– continued

Exhibit No.

Appendix A – Field Exploration Description

Appendix B – Laboratory Testing

Appendix C – Supporting Documents

GEOTECHNICAL ENGINEERING REPORT
FLEET SERVICES EXPANSION
3505 BUTTI WAY
CARSON CITY, NEVADA 89701
Terracon Project No. 67145001
FEBRUARY 25, 2014

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the proposed Fleet Services Expansion project for Carson City, Public Works. This structure will be on the Carson City Public Works Corporate Yard located at 3505 Butti Way in Carson City, Nevada 89701.

Our geotechnical engineering scope of work for this project included advancing four (4) borings to a depth of approximately 20 feet below the existing ground surface (bgs). Logs of the borings along with a site location map and boring location plan are included in Appendix A of this report. Also, the results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included in Appendix B of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to the proposed project:

- subsurface soil conditions
- earthwork
- seismic considerations
- groundwater conditions
- foundation design and construction
- concrete slab design and construction

2.0 PROJECT INFORMATION

2.1 Project Description

ITEM	DESCRIPTION
Structures	An expansion to the northeast of the existing Fleet Building.
Maximum loads	Columns: 75 kips, Walls: 6 klf and Slabs: 100 psf (assumed).
Cut and fill slopes	Unknown.

2.2 Site Location and Description

ITEM	DESCRIPTION
Location	Southeast of the intersection of Butti Way and Airport Road in Carson City, Nevada. Refer to the site location map and boring location plan in Appendix A.
Current ground cover	Asphalt Concrete and Gravel
Improvements	Existing Fleet Building.
Existing topography	The project site and surrounding area is generally flat.
Nearest mapped fault [1]	Located approximately 800 feet to the west. This fault is mapped as mid to late Pleistocene.

3.0 SUBSURFACE CONDITIONS

3.1 Site Geology

The project site is located in the eastern portion of the Carson City. According to a geologic map of the area[2], the site surface geology developed from a transition from older pediment gravel (identified as Qop) into what is now known as older alluvial plain deposits identified as Qoa.

Qoa consists of grayish-orange to dark yellow-brown cobble to sandy pebble gravel and some boulder cobble gravel. Clasts are typically similar to nearby bedrock and have angular and sub-rounded shape characteristics. These surficial soils are finer-grained, better bedded and sorted and thicker than those found within the older pediment gravel.

[1] *Bell, J.W. and Trexier D.T., 1979, New Empire Quad, Earthquake Hazards: Nevada Bureau of Mines and Geology, Map 1Bi, scale 1:24,000.*
[2] *Bingler, E.C., 1977, Geologic Map of the New Empire Quadrangle: Nevada Bureau of Mines and Geology, Map 59, scale 1:24,000.*

3.2 Typical Subsurface Profile

Specific conditions encountered at the boring locations are indicated on the boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ transition between materials may be gradual. Details of the borings can be found on the boring logs included in Appendix A of this report. Based on the results of the borings, subsurface conditions on the project site we have generalized the conditions as follows:

Description	Approximate Depths of Stratum (feet)	Material Encountered	Consistency/Soil Type
AC	5 inches	Asphalt Concrete	-
Fill	4.0	Silty Sand	-
Stratum 1	12.5	Silty Sand	Loose to Very Dense
Stratum 2	18.5	Sandy Gravel, Clayey Sand and Gravel, Well and Poorly-Graded Sand	Medium Dense to Dense
Stratum 3	To depth explored	Sandy Clay	Very Stiff to Hard

1. The maximum depth explored for all borings 20 feet bgs.

Laboratory tests were conducted on selected soil samples and the test results are presented in Appendix B.

3.3 Groundwater

Groundwater was measured at an approximate depth of 15.5 feet below the original site grades. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the boring was performed. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Geotechnical engineering recommendations for foundation systems and other earthwork connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing (which are presented in Appendices A and B), engineering analyses, and our current understanding of the proposed project.

The proposed addition may be supported on a shallow foundation slab on grade system. A subgrade prepared and tested as recommended in this report should provide adequate support for this foundation system.

4.1.1 Existing Fill and Structures

Fill was encountered in all of the borings advanced at the site. Uncontrolled fill refers to any existing fill that was not properly placed, observed, and tested by an engineering firm. Any uncontrolled fill at the site should be removed. If laboratory testing of the fill satisfies the requirements of Section 4.2.2, the fill may be utilized as recommended in the Earthwork section of this report.

4.2 Earthwork

The following section presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of slabs on grade are contingent upon following the recommendations outlined in this section.

Earthwork for the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of any engineered fill placed, subgrade preparation, slab bearing soils, and other geotechnical conditions exposed during the construction of the project.

4.2.1 Site Preparation

Prior to placing any fill, all unsuitable material should be removed from the construction areas. Unsuitable material includes any existing uncontrolled fill, loose to soft soils, or any other deleterious material. Wet or dry material should be removed. The surface preparation should extend at least 5 feet beyond the exterior edges of building lines and 2 feet beyond exterior concrete flatwork, block wall and pavement areas, or to a distance equal to the depth of structural fill, whichever is greater. However, removals should not extend beneath or undermine existing structures' foundations. After removals, the existing soils should be scarified, moisture conditioned and compacted. The subgrade should be proof-rolled to aid in locating loose or soft areas. Soft, dry and low-density soil should be removed or compacted in place prior to placing fill. Grading should not be performed on or with frozen soils. Areas to receive fill soils or aggregate base materials should be scarified to a minimum depth of eight inches and compacted to a minimum of 90 percent relative compaction (ASTM D1557).

In areas where grading will occur adjacent to, or grading may expose existing foundations, care should be taken during exposure of the adjacent building's foundation. Excavations along the existing building should be exposed, when necessary, in slots of eight feet wide or less. We recommend A-B-C sequence slot cuts along the existing building. Proposed slot exposures should be marked out in eight-foot intervals. Each proposed slot cut should be marked as A, B,

or C in repeating order. During the excavation stage, only one slot, i.e. slot cuts A, should be excavated at one time. No other slots should be excavated until the excavated slots are backfilled with engineered fill. The slots should be excavated first, leaving the B and C slots intact. The A slot excavations should then be backfilled with engineered fill. The procedure should be repeated with the B slots, then C slots until all the required excavations have been completed and replaced with engineered structural fill. All slot-cutting operations should be performed under the observation of Terracon.

If unexpected fills or underground facilities are encountered during site clearing, such features should be removed and the excavation thoroughly cleaned and backfilled. All excavations should be observed by the geotechnical engineer prior to backfill placement.

Demolition of existing structures should include removal of any foundation system and utilities. Any excavations as a result of demolition and removal should be properly filled. All materials derived from the demolition of existing structures should be removed from the site and not be allowed for use in any fills or crushed appropriately to meet the import fill requirements.

We anticipate that site grading can be performed with conventional earthmoving equipment. Due to the cohesionless nature of the site soils near the surface, shoring or sloping of the excavation sides may be required. Excavations at depths below five feet may be more difficult due to the hard soils encountered in our borings.

4.2.2 Fill Materials and Placement

Engineered fill should meet the following material property requirements:

- On-site soils may be used in required fills provided that they are free of any debris, organic matter, and do not contain oversized material (greater than 6 inches).

- Imported soils used as engineered fill should conform to the following:

Gradation(ASTM C 136)	**Percent Finer by Weight**
6”	100
No. 4 Sieve	35-100
No. 200 Sieve	0-35

- Maximum liquid limit (LL) 35
- Maximum plasticity index (PI) 15
- Maximum expansive potential (%) 2.0
- Maximum sulfate content (%) 0.2
- Maximum solubility (%) 2.0

Engineered fill should be placed and compacted in horizontal lifts using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed eight inches loose thickness.

4.2.3 Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Material Type and Location	In accordance with the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
Structural fill or approved imported fill soils meeting criteria given in Table 1, beneath foundations, pavements, or concrete slabs	90	-3%	+3%
Aggregate base (beneath concrete slabs and pavements)	95	-3%	+3%

4.2.4 Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately two percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be properly compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Downspouts, roof drains or scuppers should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems should not be installed within five feet of foundation walls. Landscaped irrigation adjacent to the foundation systems should be minimized or eliminated.

4.3 Foundation Recommendations

Foundation excavations and bearing soils should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

The building addition may be supported by a shallow, spread footing slab-on-grade foundation system. Design recommendations for foundations for the proposed structures and related structural elements are presented in the following paragraphs. Subgrades should be prepared in accordance with the earthwork section of this report.

4.3.1 Design Recommendations

The design recommendations for shallow foundations are presented in the following paragraphs.

DESCRIPTION	Column	Wall
Net allowable bearing pressure [1]	2,500 psf	2,500 psf
Minimum dimensions	24 inches	18 inches
Minimum embedment below finished grade [2]	24 inches	24 inches
Frost Depth	24 inches	
Allowable passive pressure [3]	315 pcf	
Ultimate coefficient of sliding friction [3]	0.3	

1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. It may be increased by $^1/_3$ for transient loading conditions, such as wind or seismic loads. Assumes any unsuitable fill, gypsum or soft soils, if encountered, will be undercut and replaced with engineered fill.
2. Minimum embedment is 24 inches below finished grade. Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings and finished floor level for interior footings.
3. The sides of the excavation for the spread footing foundation must be nearly vertical and the concrete should be placed neat against these vertical faces for the passive earth pressure values to be valid. If the loaded side is sloped or benched, and then backfilled, the allowable passive pressure will be significantly reduced. Passive resistance in the upper 3 feet of the soil profile should be neglected. If passive resistance is used to resist lateral loads, the base friction should be neglected.

`

4.4 Seismic Considerations

The mapped and design spectral response accelerations in the following table were obtained from the United Stated Geological Survey (USGS) website[1] with the U.S. Seismic Design Maps application. The values for spectral response accelerations are based on the 2012 IBC design code reference with a risk category of I or II or III.

DESCRIPTION	VALUE
Site Latitude	39.1669° N
Site Longitude	119.7320° W
2012 International Building Code Classification (IBC) [1]	D[2]
Spectral Response Acceleration at Short Period (0.2 second), Ss (for Site Class B)	2.333
Spectral Response Acceleration at 1-Second Period, S1 (for Site Class B)	0.812
Site Coefficient, Fa (Site class B)	1.0
Site Coefficient, Fv (Site class B)	1.0
Site Spectral Response Acceleration at Short Period, Sms (Adjusted to Site Class D)	2.333
Site Spectral Response Acceleration at Long Period, Sm1 (Adjusted to Site Class D)	1.217
Design Spectral Response Acceleration at short periods, Sds (Adj. to site class D)	1.555
Design Spectral Response Acceleration at 1-Second period, Sd1 (Adj. to site class D)	0.812

[1] Note: In general accordance with the *2012 International Building Code,* Table 1613.5.2. The IBC Site Class is based on the average characteristics of the upper 100 feet of the subsurface profile.
[2] Note: The 2012 International Building Code (IBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100 foot soil profile determination. The boring extended to a maximum depth of 20 feet, and this seismic site class definition considers that stiff soil profiles continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.

4.4.1 Soil Liquefaction

Liquefaction hazards are typically associated with saturated sandy soils with low plasticity and density in the upper 30 to 50 feet of the soil profile that are subjected to a significant seismic event. Cohesive soils, soils with clayey contents greater than 15%, dense soils, and non-saturated soils are generally not considered susceptible to soil liquefaction. Borings drilled for this current study were advanced to a depth of 20 feet below grade. Based on the soil types encountered, the results of the field and laboratory tests performed, and the depth of groundwater encountered, it is our opinion that the soils encountered would have a low risk of liquefaction. If a more detailed study is desired, deeper borings (up to 50 feet) should be advanced at the site.

[1] http://geohazards.usgs.gov/designmaps/us/application.php.

4.5 Floor Slab

4.5.1 Design Recommendations

DESCRIPTION	VALUE
Interior floor system	Slab-on-grade concrete.
Floor slab support	Existing subgrade after preparation as discussed in Section 4.
Base	6-inches of Aggregate Base.
Modulus of subgrade reaction	100 pounds per square inch per inch (psi/in).

Concrete slabs should consist of a minimum 5-inch-thick reinforced concrete. The concrete slab should be supported on a minimum 6 inches compacted aggregate base. The slab designer and slab contractor should refer to ACI 302 and ACI 360 for procedures and cautions regarding the use and placement of a vapor barrier. The aggregate base should be compacted in accordance to the section 4.2.4 of this report.

In areas of exposed concrete, control joints should be saw-cut into the slab after concrete placement in accordance with ACI Design Manual, Section 302 (tooled control joints are not recommended). To control the width of cracking (should it occur), continuous slab reinforcement should be considered in exposed concrete slabs.

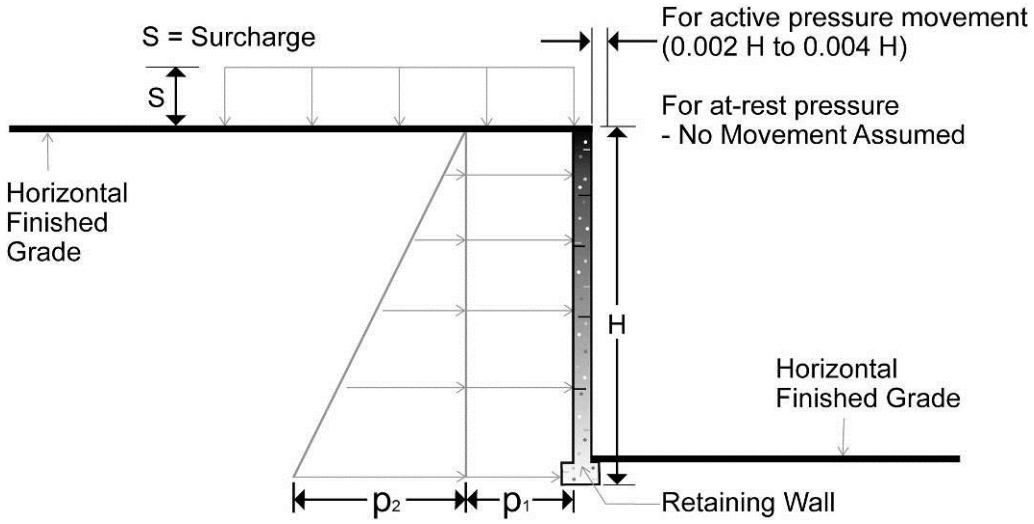
Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement. Interior trench backfill placed beneath slabs should be compacted in accordance with recommendations outlined in the Earthwork section of this report. Other design and construction considerations, as outlined in the ACI Design Manual, Section 302 are recommended.

4.5.2 Construction Considerations

Some differential movement of a slab-on-grade floor system is possible should the subgrade soils become elevated in moisture content. Such movements are anticipated to be within general tolerance for normal slab-on-grade construction. To reduce potential slab movements, the subgrade soils should be prepared as outlined in the Earthwork section of this report.

4.6 Lateral Earth Pressures

Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



ncgEarth Pressure Coefficients

Earth Pressure Conditions	Coefficient for Backfill Type	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (Ka)	0.27	35	(0.27)S	(35)H
At-Rest (Ko)	0.43	55	(0.43)S	(55)H
Passive (Kp)	3.7	478	---	---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 **H** to 0.004 **H**, where **H** is wall height;
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance;
- Uniform surcharge, where S is surcharge pressure;
- In-situ soil backfill weight a maximum of 130 pcf;
- Horizontal backfill, compacted between 95 percent of modified Proctor maximum dry density;

- Loading from heavy compaction equipment not included;
- No hydrostatic pressures acting on wall;
- No dynamic loading; and
- No safety factor included.

Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively. To calculate the resistance to sliding, a value of 0.3 should be used as the ultimate coefficient of friction between the footing and the underlying soil.

To control hydrostatic pressure behind the wall we recommend that a drain be installed at the foundation wall with a collection pipe leading to a reliable discharge. If this is not possible, then combined hydrostatic and lateral earth pressures should be calculated for lean clay backfill using an equivalent fluid weighing 90 and 100 pcf for active and at-rest conditions, respectively. For granular backfill, an equivalent fluid weighing 85 and 90 pcf should be used for active and at-rest, respectively. These pressures do not include the influence of surcharge, equipment or floor loading, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of retaining walls to prevent lateral pressures more than those provided.

The seismic load due to lateral earth pressure may be defined in accordance with Section 1610.1.1 of the 2012 SNBCA. The dynamic component for yielding walls, $\Delta P_{AE} = {}^{3}/_{8}(k_h)H^2\gamma$; and the dynamic component for non-yielding walls is $\Delta P_E = k_h H^2 \gamma$, where,

- k_h is equal to $S_{DS}/2.5$;
- H is the height of the wall in feet; and
- γ is equal to the unit weight of the backfill material in pcf.

The resultant dynamic force acts at a distance of 0.6H above the base of the wall.

k_h (g)	0.622
γ (pcf)	130
ΔP_{AE} (lb/linear foot of wall)	$30.3*H^2$
ΔP_E (lb/linear foot of wall)	$80.9*H^2$

The dynamic forces are considered a short-term loading condition; therefore, a one-third increase in the bearing pressure and passive resistance may be allowed for dynamic analysis.

4.7 Concrete Corrosivity

Terracon conducted chemical laboratory tests on the soil samples obtained from the subsurface exploration. The on-site soils have a "Moderate" (S1) classification for sulfate exposure according to ACI Design Manual, Section 318, Chapter 4. However, moderate to severe sulfate soils exist throughout the valley, therefore, consideration should be given to using cement Type V, a water-cement ratio of 0.45, and minimum compressive strength of 4500 psi for this project in order to reduce sulfate attack as recommended in Table 4.3.1 of the ACI. Consideration should be given to providing protection to buried metal pipes or use of non-metallic pipes, where permitted by local building codes.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

6.0 REFERENCES

American Concrete Institute, 318-11: Building Code Requirements for Structural Concrete and Commentary, 2011

USGS Seismic Hazard Curves and Uniform Hazard Response Spectra, Earthquake Ground Motion Parameters Version: 5.1.0 – 02/10/2011

Bell, J. W., 1984, *Quaternary Fault Map of Nevada, Reno Sheet,* Nevada Bureau of Mines and Geology (NBMG) Map 79

2012 International Building Code, Chapter 16 Structural Design, Section 1613 – Earthquake Loads

Standard Specifications for Public Works Construction 2004, Washoe County Regional Transportation Commission.

APPENDIX A
FIELD EXPLORATION

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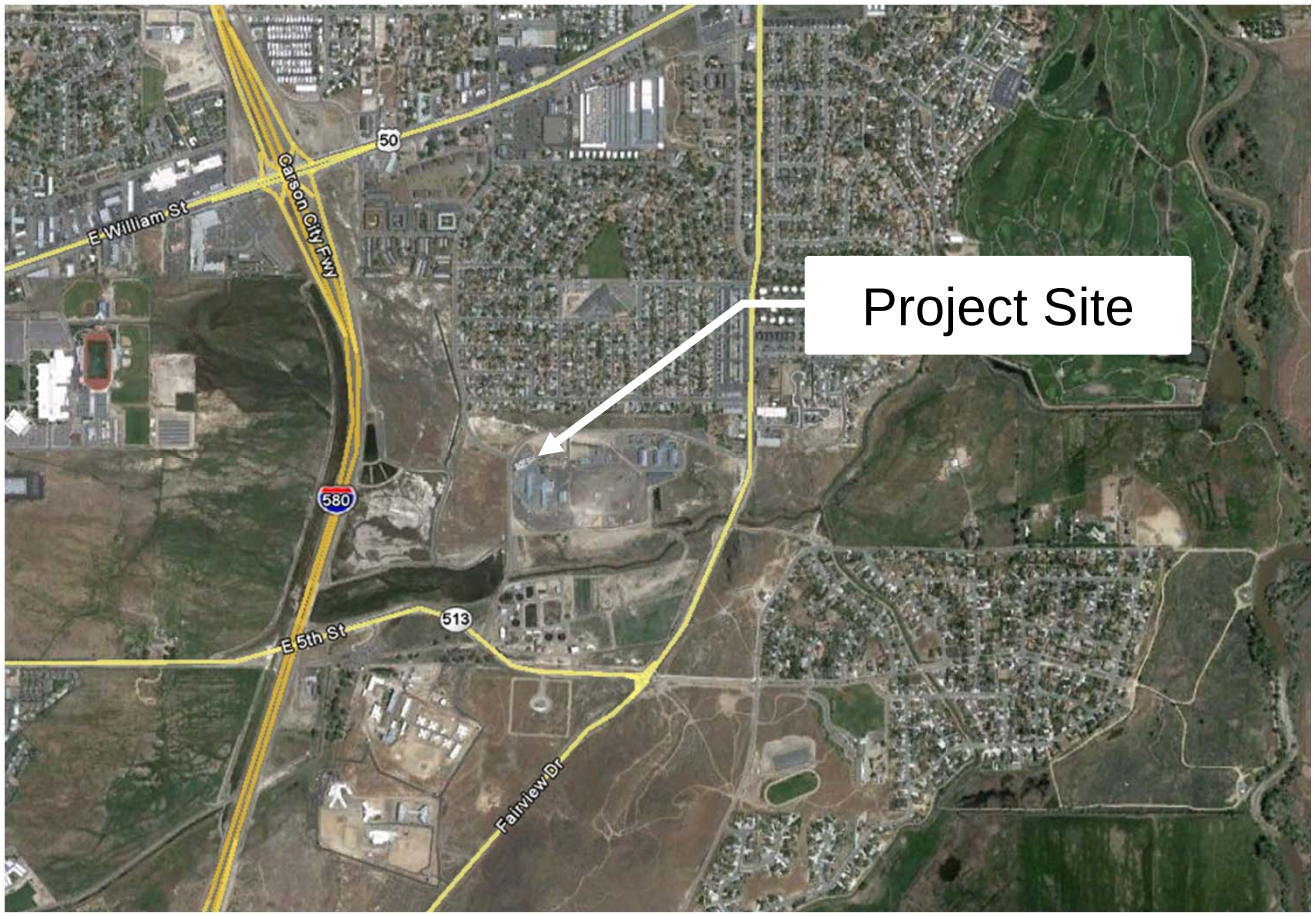


Source: Google Earth Pro, accessed on 02-24-2014

N

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: AEB Drawn by: JTL Checked by: AEB Approved by: AEB	Project No.: 67145001 Scale: NTS File Name: EXHIBITS Date: FEB 2014	Terracon 750 Pilot Road, Suite F Las Vegas, Nevada 89119 PH. (702) 597-9393 FAX. (702) 597-9009	SITE LOCATION MAP FLEET SERVICES EXPANSION 3505 Butti Way Carson City, Nevada	Exhibit A-1

Source: Google Earth Pro, 02-24-2014
Image Overlay: Carson City Fleet Maintenance Facility Expansion drawing by GML Architects LLC, Sheet A2, dated 11-6-13

N

B-4

BORING DESIGNATION AND APPROXIMATE LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: AEB	Project No.: 67145001	Terracon	BORING LOCATION PLAN
Drawn by: JTL	Scale: NTS	750 Pilot Road, Suite F Las Vegas, Nevada 89119	FLEET SERVICES EXPANSION 3505 Butti Way Carson City, Nevada
Checked by: AEB	File Name: EXHIBITS	PH. (702) 597-9393 FAX. (702) 597-9009	Exhibit A-2
Approved by: AEB	Date: FEB 2014		

Field Exploration Description

Terracon personnel marked the boring locations in the field. The site was cleared for buried utilities by "One Call" prior to our arrival onsite for drilling. Ground surface elevations indicated on the boring logs were estimated from available maps, and were rounded to the nearest foot. The locations and elevations indicated on our boring logs may be considered accurate only to the degree implied by the means and methods used to define them.

The borings were drilled with a CME 55 truck-mounted drill rig utilizing 8-inch diameter hollow-stem auger techniques to advance the boreholes. Samples of the soil encountered in the borings were obtained by the Standard Penetration Test (SPT) method with standard split spoon and California modified split spoon (with brass rings) sampling procedures.

In the SPT sampling procedure, the number of blows required to advance a standard 2-inch O.D. split barrel sampler the last 12 inches of the typical total 18-inch penetration or the middle 12 inches of total 24 inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (SPT-N).

An automatic SPT hammer was used to advance the sampler in the borings performed on this site. A significantly improved precision and predictable efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report. However, the penetration resistance values presented on the boring logs are not adjusted for sampler diameter or calibrated hammer efficiency.

The samples obtained with the samplers were marked for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification. Information provided on the boring logs attached to this report includes soil descriptions, consistency interpretations, boring depths, sampling intervals, and groundwater conditions. The borings were backfilled with auger cuttings prior to the drill crew leaving the site.

Terracon field staff prepared a field log of each boring during drilling. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples.

Final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on laboratory observation and tests performed on the samples at the sampling depth. The boring logs are presented on boring logs B-1 through B-4 in Appendix A.

BORING LOG NO. B-1

PROJECT: Fleet Services Expansion

CLIENT: Carson City Public Works
Carson City, Nevada

SITE: 3505 Butti Way
Carson City, Nevada

LOCATION See Exhibit A-2

Latitude: 39.1669° Longitude: -119.7318°

Approximate Surface Elev: 4633 (Ft.) +/-

DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.3	**ASPHALT CONCRETE**, 4 inches	4632.5+/-					
	FILL - SILTY SAND, trace gravel, dark brown, moist, fine to medium grained						
3.5		4629.5+/-				18	5-4-5 N=9
	SILTY SAND (SM), trace gravel, light brown, moist, loose, fine to medium grained						
	Very dense		5			6	22-50/4" N=50/4"
						10	22-50/4" N=50/4"
						10	22-50/5" N=50/5"
10.0	With gravel, medium grained	4623+/-					
	SANDY GRAVEL (GP), trace silt, light brown, moist, medium dense, medium grained		10			18	11-13-15 N=28
14.0		4619+/-					
	CLAYEY SAND (SC), light brown, wet, dense, fine grained						
15.5		4617.5+/-	15	▽		13	7-17-26 N=43
	SANDY GRAVEL (GP), light brown, wet, dense, medium to coarse grained						
18.5		4614.5+/-					
	SANDY CLAY (CL), olive gray, medium to high plasticity, wet, hard					18	21-32-18 N=50
20.0		4613+/-	20				
	Boring Terminated at 20 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Observed at approximately 15.58 feet bgs.*

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada

Boring Started: 1/24/2014 Boring Completed: 1/24/2014

Drill Rig: CME-55 Driller: Andresen Drilling

Project No.: 67145001 Exhibit: A-4

BORING LOG NO. B-2

PROJECT: Fleet Services Expansion

CLIENT: Carson City Public Works
Carson City, Nevada

SITE: 3505 Butti Way
Carson City, Nevada

LOCATION See Exhibit A-2

Latitude: 39.167° Longitude: -119.7319°

Approximate Surface Elev: 4633 (Ft.) +/-

DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.3	**ASPHALT CONCRETE**, 3.75 inches	4632.5+/-					
	FILL - SILTY SAND, with gravel, dark brown, moist, fine to medium grained						
2.0		4631+/-					
	FILL - CLAYEY SAND, with gravel, brown, moist, fine to medium grained					18	7-14-21 N=35
4.0		4629+/-					
	SILTY SAND (SM), with gravel, light brown, moist, medium dense, fine to medium grained		5			18	11-12-12 N=24
6.5		4626.5+/-					
	SANDY GRAVEL (GP), trace silt, light brown, moist, very dense, fine to coarse grained					6	22-50/5" N=50/5"
9.0		4624+/-					
	POORLY GRADED SAND (GP), trace silt, orange brown, moist, very dense, fine grained		10			18	13-33-30 N=63
15.0		4618+/-					
	WELL GRADED SAND (SW), trace silt, light brown, wet, dense, fine to medium grained		15	▽		18	11-19-25 N=44
18.5		4614.5+/-					
	SANDY CLAY (CL), olive gray, medium to high plasticity, wet, hard					18	11-20-23 N=43
20.0		4613+/-	20				
	Boring Terminated at 20 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Observed at approximately 15.42 feet bgs.*

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada

Boring Started: 1/24/2014 Boring Completed: 1/24/2014

Drill Rig: CME-55 Driller: Andresen Drilling

Project No.: 67145001 Exhibit: A-5

BORING LOG NO. B-3

PROJECT: Fleet Services Expansion

CLIENT: Carson City Public Works
Carson City, Nevada

SITE: 3505 Butti Way
Carson City, Nevada

LOCATION See Exhibit A-2

Latitude: 39.1669° Longitude: -119.7321°

Approximate Surface Elev: 4633 (Ft.) +/-

DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.3	**ASPHALT CONCRETE**, 3.75 inches	4632.5+/-				
	FILL - SILTY SAND, trace gravel, dark brown, moist, fine to medium grained					
					18	6-7-6 N=13
4.0		4629+/-				
	SILTY SAND (SM), dark brown, moist, medium dense, fine to medium grained		5			
					18	5-10-19 N=29
	Rig chatter					
7.5	Rig chatter	4625.5+/-				
	CLAYEY SAND (SC), dark brown, moist, dense, fine to medium grained					
					18	15-16-16 N=32
10.0		4623+/-				
	CLAYEY GRAVEL (GC), with sand, orange brown, moist, very dense, coarse grained		10			
					5	50/6" N=50/6"
	Drilling resistance was 0.5 feet/minute (10 to 14.5 feet)					
14.0		4619+/-				
	WELL GRADED SAND (GW), with silt, orange brown, wet, dense, fine to medium grained		15			
					18	10-16-27 N=43
18.5		4614.5+/-				
	SANDY CLAY (CL), olive gray, medium to high plasticity, wet, very stiff					
					18	7-11-15 N=26
20.0		4613+/-	20			
	Boring Terminated at 20 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Observed at approximately 15.42 feet bgs.

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada

Boring Started: 1/24/2014 Boring Completed: 1/24/2014

Drill Rig: CME-55 Driller: Andresen Drilling

Project No.: 67145001 Exhibit: A-6

BORING LOG NO. B-4

PROJECT: Fleet Services Expansion

CLIENT: Carson City Public Works
Carson City, Nevada

SITE: 3505 Butti Way
Carson City, Nevada

LOCATION See Exhibit A-2

Latitude: 39.1668° Longitude: -119.7321°

Approximate Surface Elev: 4633 (Ft.) +/-

DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.4	**ASPHALT CONCRETE**, 5 inches	4632.5+/-				
	FILL - SILTY SAND, with gravel, dark brown, moist, fine to medium grained					
	Trace gravel				18	9-4-4 N=8
4.0		4629+/-				
	SILTY SAND (SM), dark brown, moist, medium dense, fine grained		5		18	5-9-16 N=25
	Rig chatter, trace gravel, very dense				11	15-50/5" N=50/5"
	Light brown, fine to medium grained		10		10	20-50/5" N=50/5"
12.5		4620.5+/-				
	SANDY CLAY (CL), slight mottling, brown, medium plasticity, moist, very stiff				18	6-9-15 N=24
16.0		4617+/-	15	▽		
	WELL GRADED SAND (SW), trace silt, light brown, wet, dense, fine to coarse grained					
19.0		4614+/-				
	Boring Terminated at 19 Feet				18	8-15-19 N=34

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Observed at approximately 15.25 feet bgs.*

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada

Boring Started: 1/24/2014 Boring Completed: 1/24/2014

Drill Rig: CME-55 Driller: Andresen Drilling

Project No.: 67145001 Exhibit: A-7

APPENDIX B
LABORATORY TESTING

Laboratory Testing

Samples retrieved during the field exploration were taken to the laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) described in Appendix C. At that time, the field descriptions were confirmed and/or modified as necessary and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

Laboratory tests were conducted on selected soil samples and the test results are presented in this appendix. The laboratory test results were used for the geotechnical engineering analyses and the development of foundation and earthwork recommendations. Laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.

Selected soil samples obtained from the site were tested for the following engineering properties:

- Grain Size Analysis
- Atterberg Limit
- Soil Direct Shear
- Compaction
- Chemical Laboratory tests

SUMMARY OF LABORATORY RESULTS

Borehole No.	Depth (ft.)	USCS Soil Class.	In-Situ Properties		Classification				Expansion Testing					Corrosivity			Remarks
			Dry Density (pcf)	Water Content (%)	Passing #200 Sieve (%)	Atterberg Limits			Dry Density (pcf)	Water Content (%)	Surcharge (psf)	Expansion (%)	Expansion Index EI_{50}	pH	Resistivity (ohm-cm)	Sulfates (ppm)	
						LL	PL	PI									
B-1/B-2 COMP	1	SM			31	19	17	2									
B-2	5				15												
B-4	5				23												

REMARKS

1. Dry Density and/or moisture determined from one or more rings of a multi-ring sample.
2. Visual Classification.
3. Submerged to approximate saturation.
4. Expansion Index in accordance with ASTM D4829-95.
5. Air-Dried Sample

PROJECT: Fleet Services Expansion

SITE: 3505 Butti Way
Carson City, Nevada

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada
PH. 775-351-2400 FAX. 775-351-2423

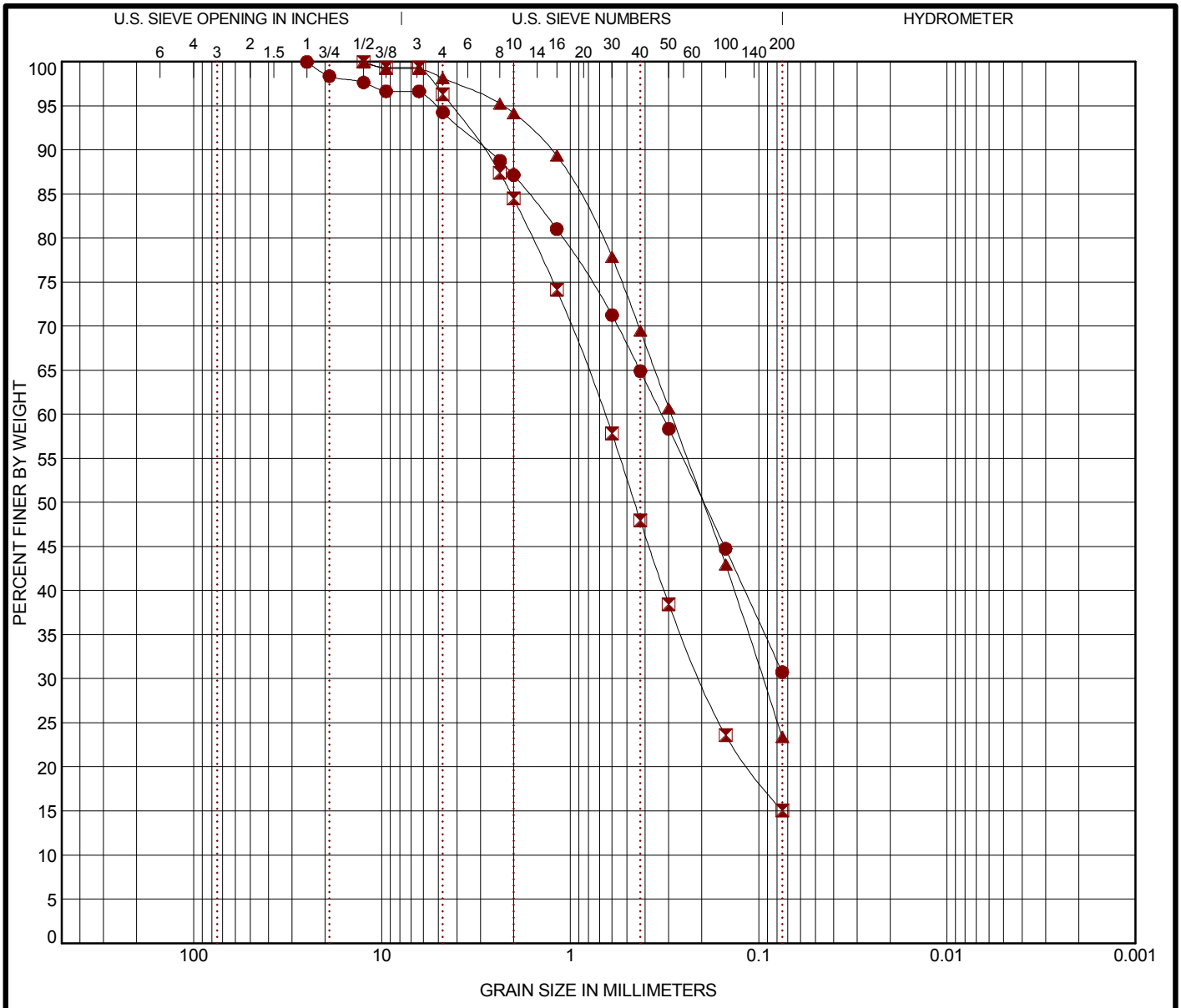
PROJECT NUMBER: 67145001

CLIENT: Carson City Public Works
Carson City, Nevada

EXHIBIT: B-2

GRAIN SIZE DISTRIBUTION

ASTM D42253



Boring ID	Depth	USCS Classification	LL	PL	PI	Cc	Cu
● B-1	1.0	SILTY SAND(SM)	19	17	2		
⊠ B-2	5.0						
▲ B-4	5.0						

Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Clay
● B-1	1.0	25	0.327			5.7	63.5	30.8	
⊠ B-2	5.0	12.5	0.656	0.202		3.6	81.3	15.0	
▲ B-4	5.0	12.5	0.292	0.095		1.8	74.8	23.4	

PROJECT: Fleet Services Expansion

SITE: 3505 Butti Way
Carson City, Nevada

Terracon
5301 Longley Lane, Suite 157
Reno, Nevada

PROJECT NUMBER: 67145001

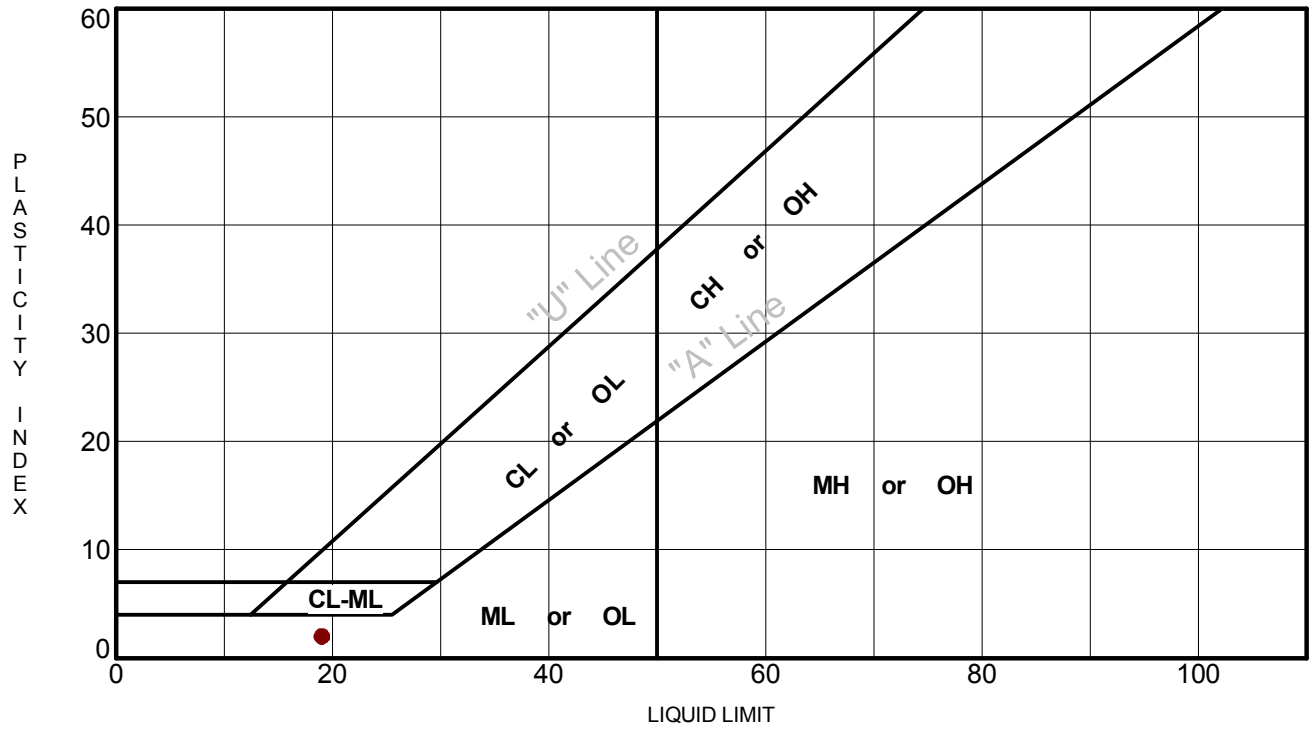
CLIENT: Carson City Public Works
Carson City, Nevada

EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 67145001.GPJ TERRACON2012.GDT 2/24/14

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
B-1	**1.0**	**19**	**17**	**2**	**31**	**SM**	**SILTY SAND**

PROJECT: Fleet Services Expansion

SITE: 3505 Butti Way
Carson City, Nevada

Terracon

PROJECT NUMBER: 67145001

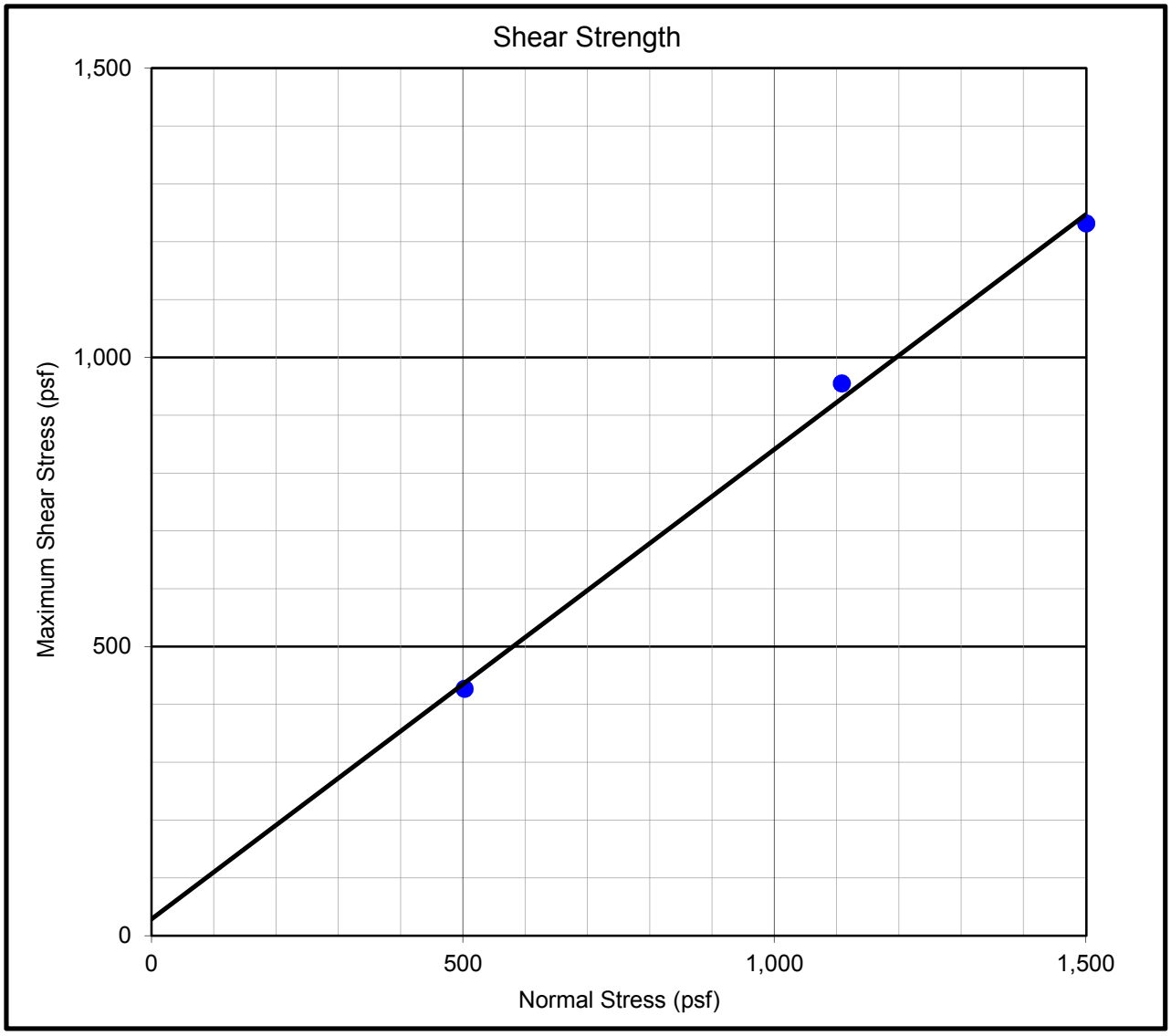
CLIENT: Carson City Public Works
Carson City, Nevada

EXHIBIT: B-4

Terracon
750 Pilot Road, Suite F Las Vegas, Nevada 89119
PH. (702) 597-9393 FAX. (702) 597-9009

SOIL DIRECT SHEAR RESULTS

Sample Location: B-3 & B-4



Test Parameters

Sample Information				Test Stresses		Initial Conditions			Final Conditions	
Test #	Sample Lab ID	Depth (ft)	Diameter (in)	Normal (psf)	Max Shear (psf)	Height (in)	Moisture (%)	Density (pcf)	Height (in)	Moisture (%)
1	B-3/B-4		2.41	502.9	426.8	1.00	7.5	134.0	1.00	15.7
2	B-3/B-4		2.41	1,108.7	955.0	1.00	7.5	126.8	1.00	19.7
3	B-3/B-4		2.41	1,500.9	1,231.5	1.00	7.5	131.3	1.00	14.2

Notes and Special Test Conditions

Project Information

Project Name	**CCPW Fleet Expansion**
Location	**3303 Butti Way, Building No. 2**
Client	**CCPW**
Project #	**67145001**

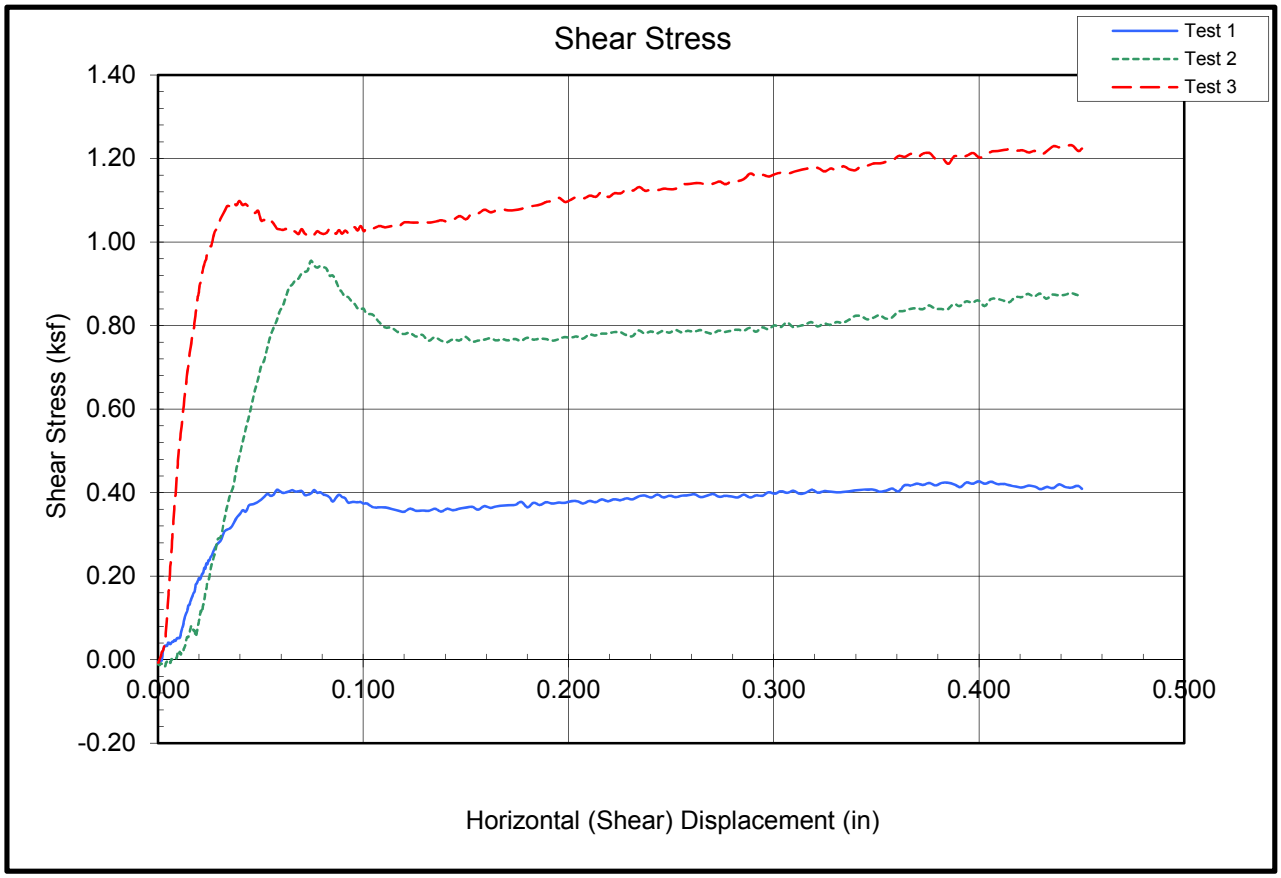
Test Results

Friction Angle (°)	**39**
Cohesion (psf)	**29**
Shear Rate (in/min)	0.01

Exhibit B-5

SOIL DIRECT SHEAR RESULTS (PAGE 2) B-3 & B-4

B-3 & B-4



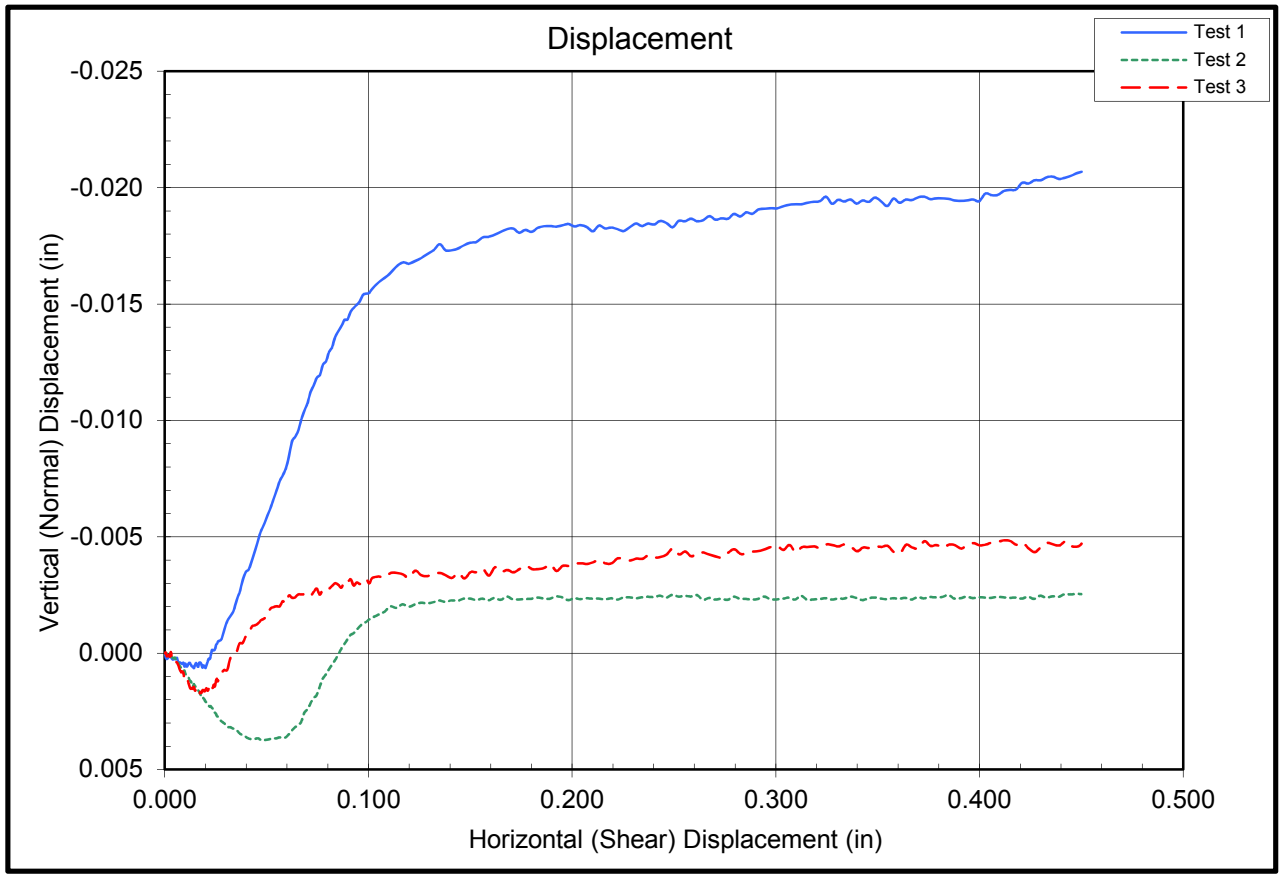


Exhibit B-6

Terracon
5301 Longley Lane, Suite 157
Reno, NV 89511
Phone (775) 351-2400
Fax (775) 351-2423

LABORATORY COMPACTION CHARACTERISTICS OF SOIL

CLIENT NAME:	CCPW
ADDRESS:	3303 Butti Way, Building No. 2
PROJECT NAME:	CCPW Fleet Expansion
PROJECT LOCATION:	3303 Butti Way, Building No. 2
SAMPLE LOCATION:	B-3 and B-4
PROJECT NUMBER:	67145001
MATERIAL SOURCE:	B-3 & B-4 Bulk Combo @ -1' to -3'
SOIL DESCRIPTION:	Dark Brown Silty Sand w/ Gravel
SOIL CLASSIFICATION:	SM
INTENDED USE:	Proposed Engineered Fill
TEST PROCEDURE:	ASTM D 1557 METHOD: A
COMPACTION RAMMER:	Mechanical
DATE PERFORMED:	January 28, 2014
LABORATORY TECHNICIAN:	JCK

CURVE NO.:	1 DATE: 01/29/14
In-Situ Moisture Content:	9.7%

TEST RESULTS

Oversize Correction Applied

MAXIMUM DRY DENSITY, pcf

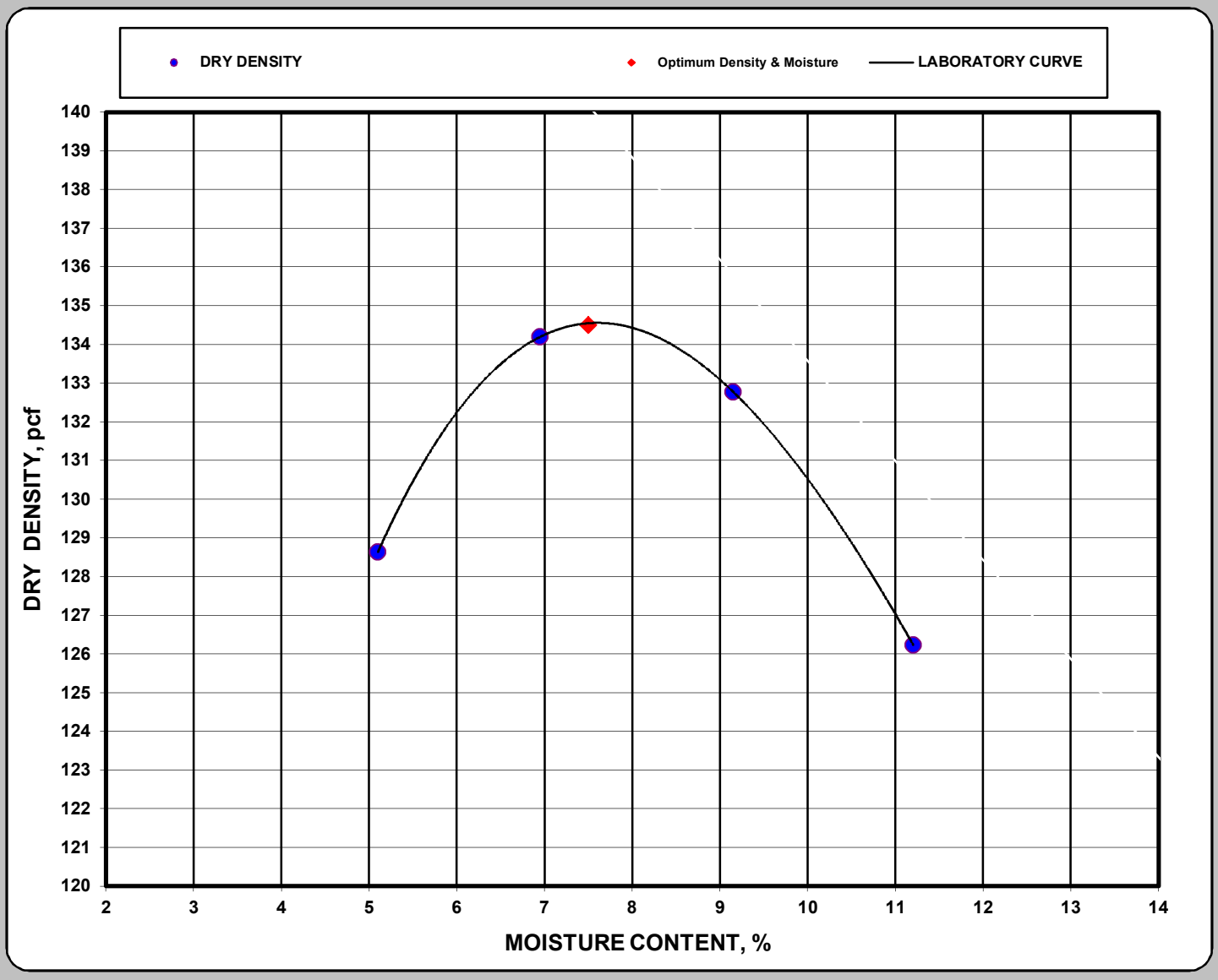
134.5

OPTIMUM MOISTURE, %

7.5

ATTERBERG LIMITS

LIQUID LIMIT:	NT
PLASTICITY INDEX:	NT
% PASSING #200:	NT
Reviewed By:	SMFB



*NT Denotes test procedure not performed *NV Denotes No Value *NP Denotes Non Plastic *NA Denotes Not Available

Exhibit B-7

CHEMICAL LABORATORY TEST REPORT

Project Number: 67145001
Service Date: 02/05/14
Report Date: 02/05/14

Terracon
750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client

Carson City Public Works
3505 Butti Way
Carson City, Nevada 89701

Project

Fleet Services Expansion
Carson City, Nevada

Sample Submitted By: Terrcon (67) **Date Received:** 2/4/2014 **Lab No.:** **14-0048**
Analyzed By: Kurt D. Ergun

Results of Resistivity Analysis

Sample Location	B-3
Sample Depth	1.0-2.5
pH Value	8.37
Water Soluble Sulfate (%)	0.121
Resistivity (ohm-cm)	2134

Notes: The Standard Test Methods used are AWWA 4500 H pH Value, AWWA 4500 E SO4, and ASTM G-57 Resistivity

Services:
Terracon Rep:
Reported To:
Contractor:

Reviewed By: Kurt D. Ergun
Chemist

Disadvantaged Business Enterprise Utilization
Guidance to Borrowers and Prime Contractors

Sources to Identify and Certify DBEs

Source	Phone	Website/E-mail
Nevada Department of Transportation Civil Rights Program (DBE assistance and list)	External Civil Rights and Contract Compliance-Nevada Unified Certification Program **800-267-1971**	http://nevadadbe.com
Nevada Department of Transportation DBE Program		http://nevadadot.com/nevadaDBE/dbe.aspx
Nevada Governor's Office of Economic Development – Procurement Outreach Program	800-336-1600	http://diversifynevada.com/programs-resources/procurement-outreach
Nevada Small Business Development Center (NSBDC)	800-240-7094 DBE assistance 775-687-9921	http://dbe.nsbdc.org/
Hispanic Business Nevada		http://hispanicbusinessnevada.com/
US Environmental Protection Agency Small Business Program		http://www.epa.gov/osbp/dbe_team.htm
US Small Business Admin. (SBA)		http://www.sba.gov/
Minority Business Development Agency-US Dept. of Commerce		http://www.mbda.gov/