SOLICITATION AMENDMENT

Solicitation No:	P14-0002
Description:	Westgreen Estates Unit 9 Soundwall, Phase I
Amendment No:	One (1)
Solicitation Due Date:	December 4, 2013
Solicitation Due Time:	2:00 p.m.

Materials Management Procurement
9875 N. 85th Ave., 2nd Fl.
Peoria, Arizona 85345-6560
Telephone: (623) 773-7115
Fax: (623) 773-7118

Buyer: Jennifer Miller

A signed copy of this Amendment shall be received by the City of Peoria, Materials Management no later than the Solicitation Due Date and Time.

The solicitation is amended to include the following:

- Pre-bid sign-in sheet
- Geotechnical Report
- Pre-bid power point presentation
- Revised plan sheets attached 8 of 10 (revised joint detail), and 10 of 10 (revised pattern dimensions)
- Questions and Clarification

Staging area is available to contractor as a courtesy, however there is no requirement to use this area and if contractor does use this area, it is at contractor's risk.

If needed, hydrant meter cost shall be at contractor's expense.

All other provisions of this Solicitation shall remain in their entirety.

Vendor hereby acknowledges receipt and agreement with the amendment.

_____
Signature Date

_____
Typed Name and Title

_____
Company Name

_____
Address

_____
City State Zip

The above referenced Solicitation Amendment is hereby Executed

November 21, 2013

at Peoria, Arizona

Jennifer Miller, Contract Administrator

SIGN-IN SHEET

Solicitation Number: P14-0002

Materials Management
Procurement
9875 N. 85th Avenue
Peoria, Arizona 85345-6560
Phone: (623) 773-7115
Fax: (623) 773-7118

Date:	11/21/13	Time:	9:00 AM
Re:	Westgreen Estates Sound Wall Construction	Location:	Point of View Conf Room

PLEASE PRINT

Name	Company	Telephone	E-Mail Address
ROB ANTONIAK	CLASS V LLC	602-369-3681	ROB@CLASSVCOMM.COM
Bob Maurer	DBA Const.	602-315-9844	bobmaurer@dbaconstruction.net
Paul Peterson	PRPC	602-248-7085	Kpeterson@prpcaz.com
CRAIG BORGER	POINT ENGRS	602 814 0653	cborger@pointengineers.com
Ryan Dale	Cornerstone Masonry	520 245 8126	ryan@cornerstonemasonrysystems.com

SIGN-IN SHEET

Solicitation Number: P14-0002

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Date:	11/21/13	Time:	9:00 AM
Re:	Westgreen Estates Sound Wall Construction	Location:	Point of View Conf Room

PLEASE PRINT

Name	Company	Telephone	E-Mail Address
Keith Sowers	Mule-Wall Systems	602-763-1508	Keith@Metal-Weld.com
Lance Guest	ITSA Contracting	481-226-2208	lguest@itsahomes.com
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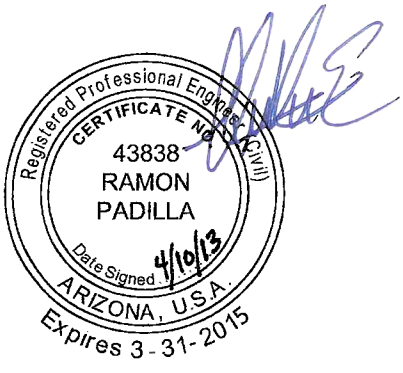
Steve Green	Gold Horizon Contracting	(602)413-2013	goldhorizoncontracting@gmail.com
JIM BOWERS	SKY CONSTRUCTION	602-692-6120	JIMBOWERS@SKYLEVELENGINEERING.NET
JEFF RITTER	PROTEX	480-772-7092	JEFF.RITTER@PROTEX-AZ.COM
			eric@cornerstonemasonrysystems.com

GEOTECHNICAL EXPLORATION REPORT
WESTGREEN ESTATES PHASE I NOISE WALL
SE OF 95TH AVE. AND LAS PALMARITAS DR.
PEORIA, ARIZONA

Kleinfelder Project No.: 133119

April 10, 2013

Prepared for:
Mr Craig Borger, P.E.
Point Engineers
7600 North 16th Street, Suite 202
Phoenix, Arizona 85020



Ramon Padilla, P.E.
Geotechnical Project Manager

Reviewed By:
Keith H. Dahlen, P.E.
Senior Geotechnical Engineer

KLEINFELDER
Bright People. Right Solutions.

April 10, 2013
Project No. 133119

Mr. Craig Borger, P.E.
Point Engineers
7600 North 16th Street, Suite 202
Phoenix, Arizona 85020

SUBJECT: Geotechnical Exploration Report
Westgreen Estates Phase I Noise Wall
SE of 95th Avenue and Las Palmaritas Drive
Peoria, Arizona

Dear Mr Borger·

This report transmits the findings of the geotechnical evaluation for the proposed Westgreen Estates Phase I Noise Wall located southeast of 95th Avenue and Las Palmaritas Drive in Peoria, Arizona. Our services were performed in general accordance with the scope of services presented in our Proposal No. 118166\TEM13P0102, dated January 3, 2013. We received Notice-to-Proceed in an email from Point Engineers dated March 7, 2013.

We appreciate the opportunity to be of service on this project. If we can be of additional assistance as the design progresses, please do not hesitate to contact us.

Sincerely,

KLEINFELDER WEST, INC.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
43838
RAMON
PADILLA
Date Signed 4/10/13
ARIZONA, U.S.A.
Expires 3 31-2015

Ramon Padilla, P.E.
Geotechnical Project Manager

Reviewed By:
Keith H. Dahlen, P.E.
Senior Geotechnical Engineer

1335 West Auto Drive, Tempe, AZ 85284 p | 480.763.1200 f | 480.763.1212

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USCS and Log Key (A1 – A2)

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Laboratory Test Results (B1 – B6)

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1 INTRODUCTION

1 1 GENERAL

This report presents the results of our geotechnical exploration for the proposed Westgreen Estates Phase I Noise Wall located southeast of 95th Avenue and Las Palmaritas Drive in Peoria, Arizona. The approximate location of the site is shown on the Boring Location Map, Figure 1

The exploration included observing site conditions, subsurface exploration, soil sampling, field and laboratory testing, engineering analyses, and preparation of this report. This report provides geotechnical recommendations for design and construction of the proposed noise wall.

The recommendations contained in this report are subject to the limitations presented in the 'Limitations' section of this report. In addition, as a member of ASFE (The Association of Engineering Firms Practicing the Geosciences), we included a brochure prepared by ASFE in this report. We recommend that all individuals using this report read the limitations along with the accompanying ASFE document.

1.2 PROJECT DESCRIPTION

We understand that a new noise wall is planned along the southern property line of the Sun Valley Elementary School which is located adjacent to the SR 101 Freeway and just east of 95th Avenue in Peoria, Arizona. The proposed noise wall will be located southeast of 95th Avenue and Las Palmaritas Drive. The noise wall will provide a sound buffer between the freeway and the school. The wall will be approximately 650 feet in length and likely be 12 to 14 feet in height. We understand the steel reinforced masonry wall will be designed to current ADOT standards. Loading information was not provided. We anticipate relatively light loads typically associated with noise walls.

2 FIELD EXPLORATION

The field investigation was performed on March 13, 2013 by Rollina Katako, E.I.T., of Kleinfelder The field exploration included drilling 2 exploratory borings (designated as Nos. B1 and B2) in the proposed wall area. Prior to the start of drilling, the Arizona Blue Stake Center was contacted to locate the existing public utilities at the site. The approximate boring locations are presented on Figure 1, Boring Location Map.

The borings were drilled using a truck-mounted CME-75 drill rig and crew supplied by D&S Drilling, Inc. The borings were drilled using 8-inch outside diameter (OD) hollow-stem augers to depths of approximately 15 feet below the existing ground surface (bgs). During the field exploration, the soils encountered were visually classified, logged, and sampled by Kleinfelder's field engineer Disturbed samples of soils were obtained using a standard penetration test (SPT) split spoon sampler (1.375-inch inside diameter (ID) and 2-inch OD). Relatively undisturbed samples of the subsurface materials were obtained using a ring sampler (2.42-inch ID and 3-inch OD). Bulk samples of drill cuttings were also collected at selected depths from the borings. The SPT and ring samplers were driven 18 and 12 inches, respectively, using a hydraulic actuated 140-pound hammer free falling 30 inches. Unless noted otherwise on the boring logs, the sample driving resistance was recorded as number of blows per six inches of penetration. The penetration results are presented on the borings logs adjacent to each noted sample. The recovered soil samples were removed from the sampler, sealed in plastic bags to reduce moisture loss, and transported to our laboratory for additional testing. The borings were backfilled with soil cuttings upon completion. The logs of the exploratory borings are presented in Appendix A.

3 LABORATORY TESTING

Selected laboratory tests were performed on representative samples recovered from the field exploration to support our field classification and to provide information regarding engineering characteristics and properties of the subsurface soils. The laboratory testing program consisted of the following:

Table 3.1 – Laboratory Testing Program

Laboratory Test	Sample Type	Number of Tests	Purpose of Test
Sieve Analysis (ASTM C136)	Bulk	2	Soil Classification
Atterberg Limits (ASTM D4318)	Bulk	2	Soil Classification
Compression Test (ASTM D2435)	Bulk	2	Soil Settlement Characteristics
pH and Resistivity (Ariz 236)	Bulk	1	Soil Corrosion Characteristics
Sulfates, Chlorides & Salts (Ariz 733/736/237b)	Bulk	1	Soil Corrosion Characteristics
Moisture/Density* (ASTM D2216/D2937)	Ring	4	In-Situ Density and/or Moisture Conditions

* Dry density and moisture content information is presented on the boring logs.

The results of the laboratory tests are presented on the laboratory test data sheets in Appendix B. The laboratory test results are also summarized on the boring logs in Appendix A.

4 GENERAL SITE CONDITIONS

4.1 GENERAL SITE GEOLOGY

The site is located in the Salt River Valley, which is a broad alluvial basin within the Basin and Range physiographic province. The basin is almost completely surrounded by mountains composed primarily of granite, metamorphic, and volcanic rocks and minor amounts of consolidated sedimentary rocks. The valley floor is underlain by basin-fill sediments. Additionally, in the Salt River Valley, alluvial deposits form the main water-bearing units and consist mainly of clay, silt, sand, and gravel.

The basin-filled sediments range in thickness from a few tens of feet near the mountains to more than 1,200 feet in the central part of the area (Cooley, M.E., 1973, map showing distribution and estimated thickness of alluvial deposits in the Phoenix area Arizona. U.S. Geological Survey Miscellaneous Investigations Series Map I-845-C). Crystalline rocks, which consist mainly of schist, gneiss, granite, and felsic to mafic volcanic rocks, are present in the mountains that border the alluvial deposits. Well-cemented conglomerate and sandstone may also be present in some areas (Lancy, R.L., Ross, P.P.; and Littin, G.R.; April 1978; maps showing Ground-Water Conditions in the Eastern Part of the Salt River Valley)

4.2 SURFACE CONDITIONS

The proposed noise wall is planned along the southern property line of the Sun Valley Elementary School. The southern portion of the Sun Valley Elementary School consists of a storm-water retention basin, which is mostly enclosed by a chain-link fence. The site area is bounded on the north by grass areas followed by school building structures; on the west by the roadway alignment of 95th Avenue followed by residences; on the east by an existing sound wall followed by (State Route) Loop 101, and on the south by vacant land. The ground surface across the storm-water retention basin was generally flat and sloped down a few feet around the perimeter of the basin. Vegetation across the site was variable and generally ranged from non-existent to areas with a moderate growth of shrubs and weeds. The following are a few typical pictures of the site.

Picture 1
Boring 1 Facing North

Picture 2
Boring 2 Facing East

Picture 3
Boring 2 Facing West

4.3 SUBSURFACE CONDITIONS

The subsurface profiles encountered at the boring locations were found to be relatively similar Individual boring logs with detailed descriptions are presented in Appendix A of this report.

At the location of Borings B1 and B2 we encountered native deposits of clayey sand with gravel (SC) extending from the ground surface to depths ranging from approximately 6 to 7 feet bgs. Beginning at depths ranging from about 6 to 7 feet bgs, the surface and near surface clayey sand soils were underlain by deposits of silty sand with gravel (SM) At the location of Boring 2, the silty sand soils extended to the final depth of exploration (approximately 15 feet bgs). At the location of Boring 1, practical auger refusal was encountered at a depth of approximately 13 feet in a deposit of silty gravel (GM), which extended to the final depth of exploration (approximately 14.5 feet bgs). The clayey sand soils exhibited plasticities in the medium range and the silty sand and silty gravel soils were non-plastic. The soils encountered throughout the depths explored had apparent relative densities in the loose to very dense range (generally increasing with depth). These soils contained variable amounts of gravel and also contained no to weak calcium carbonate cementation (caliche).

Groundwater was not encountered at the boring explorations to the depths explored. Based on available data on the Arizona Department of Water Resources (ADWR) website, groundwater is anticipated at depths greater than 150 feet bgs. It is possible that variations in groundwater elevations may occur due to seasonal changes, run-off, precipitation, perching, and irrigation

and/or construction activities. In general, it is not expected that groundwater would impact construction of this project.

4.4 COLLAPSE POTENTIAL CHARACTERISTICS

In arid regions, shallow natural soils often settle a significant amount quickly when wetted. This condition is generally referred to as "collapse." The collapse potential is usually intensified when the collapsible soils are supporting foundations or other surcharges. These collapsible soils are generally able to support structural loads with tolerable settlements under consistent dry conditions. However, once these soils are wetted, they will typically collapse. Based on the results of our field exploration and laboratory compression testing, the natural surface and near surface soils beneath the site are expected to exhibit moderate collapse potentials when wetted under foundation loads. One of the laboratory compression tests indicated significant collapse potential; however, we believe the majority of the collapse exhibited on this sample was due to gravel content, poor sample recovery, and sample disturbance. In keeping with local practice, the foundation, site grading, and drainage recommendations presented in this report are intended to reduce the potential for structural settlements to estimated limits which are typically considered to be structurally acceptable and tolerable.

5 ENGINEERING ANALYSES AND RECOMMENDATIONS

5.1 GENERAL

Geotechnical engineering recommendations for the support of the proposed noise wall are presented in the following sections. These recommendations are based on our understanding of the project, and the results of our field exploration and laboratory testing for the site. The following sections of this report present our recommendations regarding foundations, lateral design parameters, moisture protection, construction considerations, engineered fill, and site preparation and grading.

5.2 FOUNDATIONS

This section includes recommendations for design and construction of shallow foundations at the site using the Load and Resistance Factor Design (LRFD) approach. The recommendations were developed per the requirements and procedures of "Section 10· Foundations" in the American Association of State and Transportation Officials (AASHTO) LRFD Bridge Design Specifications (2010), and the Arizona Department of Transportation (ADOT) Materials Group – Geotechnical Design Section's Design Policy SF-1 (December 1, 2010).

The strength and service limit state design analyses for spread footings were completed per the methods presented in Sections 10.5 and 10.6, respectively, of AASHTO LRFD (2010), and ADOT Geotechnical Design Policy SF-1 (2010).

The factored net bearing resistance, q_{Rn}, for the strength limit state design was determined using the net nominal bearing resistance (ultimate bearing capacity), q_n, calculated per Section 10.6.3.1.2a and bearing resistance factor, φ_b, from Section 10.5.5.2.2 of AASHTO LRFD (2010). The parameters presented below in Table 6.2.1 were assumed for the nominal resistance and strength limit state analyses. The assumed soil parameters were based on the conditions encountered in the borings drilled at the proposed noise wall area.

Table 6.2.1
Spread Footing Analysis Parameters –
Strength Limit State Design for Bearing

Parameter	Symbol	Value
Soil Angle of Internal Friction	ϕ_f	32°
Soil Unit Weight	γ	100 to 115 pcf
Cohesion/Cementation	C	0 psf
Footing Length	L	200 ft
Footing Bearing Depth	D_f	2 ft
Footing Width	B	1.5 to 5 ft
Bearing Resistance Factor	φ_b	0 45

The resulting factored net bearing resistance, q_{Rn}, versus effective footing width, B_f, is shown as the "Strength Limit State" line in Figure C1 presented in Appendix C. Per the ADOT Geotechnical Design Policy SF-1 (2010), the Schmertmann method presented in Section 8.5 of the Federal Highway Administration (FHWA, 2006) Soils and Foundation Reference Manual was used to calculate settlements for the service limit state analysis. The parameters assumed for this analysis are presented in Table 6.2.2.

Table 6.2.2
Spread Footing Analysis Parameters - Service Limit State Design for Bearing

Parameter	Symbol	Depth Interval (ft)		
		0-3	3-10	10-15
Soil Type	--	Clayey Sand (SC)	Clayey/Silty Sand (SC/SM)	Silty Sand (SM)
Soil Unit Weight (pcf)	γ	100	110	115
Overburden-normalized Energy-corrected SPT N-value	$N1_{60}$	14	30	45
Elastic Modulus (ksf)	E_s	$3N1_{60}$	$3.5N1_{60}$	$3.5N1_{60}$

The parameters are based on estimated soil densities, $N1_{60}$ values, and on the E_s-$N1_{60}$ correlations from Section 5.9 of FHWA (2006). Figure C1 presents the family of service limit state curves developed per ADOT Geotechnical Design Policy SF-1 (2010) for design settlements of 0.25 inches and effective footing width, B_f.

Based on the results of the field exploration and laboratory testing, we recommend foundations be supported on properly placed and compacted engineered fill. The minimum depth of engineered (compacted) fill beneath foundations should be 1.5 feet. The engineered fill should be prepared and placed as recommended in the "Site Preparation and Grading" section of this report.

Based on the information obtained during our geotechnical evaluation and our understanding of the general soil and geologic conditions at the site, the site can be classified as a default Site Class D (stiff soil profile), as defined by Table 1613.5.2 of the 2006 International Building Code (IBC).

Foundations and associated structural elements should be reinforced, as designed by the structural engineer Where appropriate, the structural elements should include frequent joints and reinforcement to help distribute stress in the event of differential foundation movements. Where possible, site drainage sloping away from structures will also be required to reduce potentials for moisture increases in bearing soils.

Foundation excavations should be observed by the geotechnical engineer or their qualified representative to evaluate the bearing conditions prior to the placement of reinforcement and concrete. Footing embedment depth is defined as the depth of the footing base below finished grade or lowest adjacent grade within 5 feet of the footing edge, whichever is deeper

Total settlements for foundations designed and constructed in accordance with the recommendations presented in this report were estimated and presented in Figure C1, provided foundation bearing soils remain at their present and natural moisture conditions. Differential foundation settlements should be approximately half of the total settlements. Additional post-construction movements of similar or greater magnitude could occur if the compacted fill and/or natural soils beneath the foundation level were to experience an increase in moisture content

5.3 MOISTURE PROTECTION

An important feature of the project is to provide positive drainage away from the noise wall. Water should not be allowed to pond adjacent to or near the walls. If water is permitted to pond, infiltrate, or soak into the ground next to or near the structures, soil movements greater than those calculated can occur as the bearing soils are subjected to an increase in moisture

content. A minimum slope of 5 percent should be provided on the grade adjacent to the noise wall, such that the soil slopes down away from the noise wall and other structural elements. A well-designed site drainage plan is critical and surface drainage shall be provided during construction and maintained throughout the life of the structure.

5.4 LATERAL DESIGN PARAMETERS

Horizontal loads acting on foundations cast in open excavations against undisturbed native soil or properly placed and compacted fill will be resisted by friction acting along the base of the footing and by passive earth pressures against the loaded side of the footing. If design makes use of passive earth pressure against backfill, it is important that a representative of the engineer of record be present to monitor and test backfill placement and compaction. Foundations designed to provide passive resistance should have the backfill soils adjacent to the footings compacted to a minimum of 95 percent of the maximum ASTM D698 dry density in order to develop passive resistance with low strains.

The friction acting along the base of the footings founded on compacted engineered fill soils may be computed using a coefficient of friction equal to 0.42. An ultimate lateral passive earth pressure may be computed using an equivalent fluid weighing 330 pcf for the sides of footings cast against undisturbed soil or properly placed and compacted backfill. The maximum allowable passive pressure for shallow foundations should not exceed 1,500 pounds per square foot. Passive pressure in the upper foot should be neglected unless confined by concrete slab-on-grade or pavement.

5.5 EXCAVATION CHARACTERISTICS

We anticipate excavations at the site for the proposed noise wall will be on the order of 4 to 5 feet bgs. The following general comments regarding excavation conditions are based on boring data. Based on the subsurface conditions encountered within the borings, excavations within the upper roughly 6 to 7 feet bgs should be possible using conventional earth excavating equipment capable of handling medium dense to very dense soils with variable amounts of gravel. Deeper excavations may require heavier excavating equipment due to denser soils with increased gravel contents. We recommend that the earthwork contractor make his own assessment to satisfy himself as to the type of equipment required to excavate through these deposits.

Based on our field observations and test results, temporary excavations in native soils may be cut at a maximum inclination of 1.5.1 (horizontal:vertical). Excavations up to 4 feet deep may be unshored provided they are sloped back at a ratio of no steeper than 1.5:1 (horizontal:vertical). Slopes may need to be further flattened or shored based on conditions encountered during construction. All excavations should be planned and executed in accordance with current OSHA recommendations for a type C soil (Federal Register 29 CFR Part 1926) and applicable local governing agency standards and procedures. All parties should understand that safety of construction personnel is the sole responsibility of the Contractor If trench shoring is used to reduce the excavation width, the Engineer of Record should review shoring designs and soil parameters utilized by the shoring designer

All construction surcharge loads and traffic loads should be kept a distance equal to the depth of the excavation away from the edge of the trench excavations, unless specifically designed for in the shoring design.

5.6 PRELIMINARY SOIL CORROSION CHARACTERISTICS

Corrosion is most likely to occur in soils with high moisture contents. Limited laboratory tests were performed on a sample of the site soils to determine their pH, laboratory minimum resistivity, and soluble sulfate, chloride and salts contents. The results of these laboratory tests are included in Appendix B.

We recommend that the results of our laboratory testing be reviewed by a person or firm experienced in corrosion protection designs for the actual construction at the site, and/or by the appropriate pipe or material manufacturer These results are general in nature and may not be representative of site conditions. A qualified corrosion engineer should be consulted if corrosion of underground utilities is a concern or if a detailed evaluation is necessary

6 SITE PREPARATION AND GRADING RECOMMENDATIONS

6.1 ENGINEERED FILL

All fill materials used within the proposed noise wall areas, weather on-site soils or imported fill, placed at the site for the support of structural elements should be inorganic soils and should exclude vegetation, debris, and fragments larger than 4 inches. Pea gravel or similar poorly-graded materials should not be used as fill or backfill without the prior approval of the project geotechnical engineer Engineered fill materials used at the site should meet the following criteria.

- maximum particle size of 4 inches
- fines content (percentage passing #200 sieve) not exceeding one of the following:
  - 40% with a maximum Plastic Index (PI) of 12
  - 35% with a maximum PI of 20
  - 20% with a maximum PI of 22
- maximum Liquid Limit (LL) of 40

The on-site soils encountered at the proposed noise wall borings generally consisted of clayey and silty sands with no to medium plasticities and variable amounts of gravel. These on-site soils are suitable to be reused as engineered fill at the site provided they meet the criteria listed above.

6.2 SITE GRADING

The following site grading recommendations are intended to provide support for the proposed new noise wall foundations at the site. Therefore, the grading activities at the site should be performed under observation and testing directed by the geotechnical engineer.

Trash, debris, vegetation (including roots) and other organics, any existing spread fill, any unstable (soft, loose, disturbed, water softened, etc.) soils, and other deleterious materials should be removed from proposed structure areas prior to construction. This site grading should extend laterally a minimum of 1 foot beyond the edges of wall footings. The foundation excavations should extend completely through any existing fill, backfill, disturbed soils, or other unsuitable material. All areas of excavation should be observed and approved by a

representative of the geotechnical engineer after clearing and before any filling operations begin at the site.

Within proposed noise wall foundation areas, excavate the soils to a minimum of 1.5 feet below the proposed bottom of footing or 2 feet below the existing ground surface at the time of our field exploration, the greater depth to govern. The over-excavation for engineered fill should also extend laterally a minimum of 1.5 feet away from the foundation edges. Proof-roll the exposed native soils at the base of the foundation excavation section under the direct supervision of the geotechnical engineer

For any other cleared or over-excavated areas that will receive engineered fill, proof-roll the exposed native soils at the base of the cleared or over-excavated section under the direct supervision of the geotechnical engineer Following the approval of the geotechnical engineer, backfill the cleared or over-excavated areas with approved on-site or imported engineered fill soils compacted as recommended in the following section.

If soft, loose, disturbed, water softened, low density, or other undesirable materials are encountered in proposed structure areas, the area should be deepened to extend through these undesirable materials. A lean concrete (Controlled Low Strength Material – MAG Section 728, 1 sack slurry mix) may be used to backfill with the approval of the geotechnical engineer Alternatively, the deepened area could be backfilled with on-site soils or structural fill with the approval of the geotechnical engineer The extent of removal of unsuitable materials should be indicated by the geotechnical engineer

6.3 FILL PLACEMENT AND COMPACTION

Moisture conditioned on-site or imported engineered fill materials should be placed in 6 to 8-inch thick loose lifts and compacted to elevate the site to specified finished grade. The materials should be uniform with respect to material type and moisture content. The moisture content must be maintained until covered by the placement of the next lift.

In proposed noise wall foundation areas, the lifts of approved on-site or imported engineered fill soils should be moisture conditioned within 2 percentage points from their optimum moisture content, and uniformly compacted to a minimum of 95 percent of their maximum dry density as determined by ASTM D698. Engineered fills placed at depths greater than 5 feet below grade

should be compacted to a minimum of 100 percent of their maximum dry density as determined by ASTM D698.

Observation and testing should be performed as necessary in order to meet the project requirements and the recommendations presented in this report.

7 CLOSURE

7 1 LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions, and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than two (2) years from the date of the report.

The work performed was based on project information provided by the Client. If the Client does not retain Kleinfelder to review any plans and specifications, including any revisions or modifications to the plans and specifications, Kleinfelder assumes no responsibility for the suitability of our recommendations. In addition, if there are any changes in the field to the plans and specifications, the Client must obtain written approval from Kleinfelder's engineer that such changes do not affect our recommendations. Failure to do so will vitiate Kleinfelder's recommendations.

This report may be used only by the Client and their representatives, and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site), or other factors may change over time, and additional work may be required with the passage of time. Any party other than the Client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that the Client has reviewed the document and determined that it does not need or want a greater level of service than provided.

7.2 ADDITIONAL SERVICES

The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be performed during the construction process to verify compliance with these recommendations. These tests and observations should include, but not necessarily be limited to, the following:

- Observations and testing during the site grading, preparation and earthwork.
- Consultation as may be required during construction.

We also recommend that project plans and specifications be reviewed by us to verify compatibility with our conclusions and recommendations. Additional information concerning the scope and cost of these services can be obtained from our office.

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant, ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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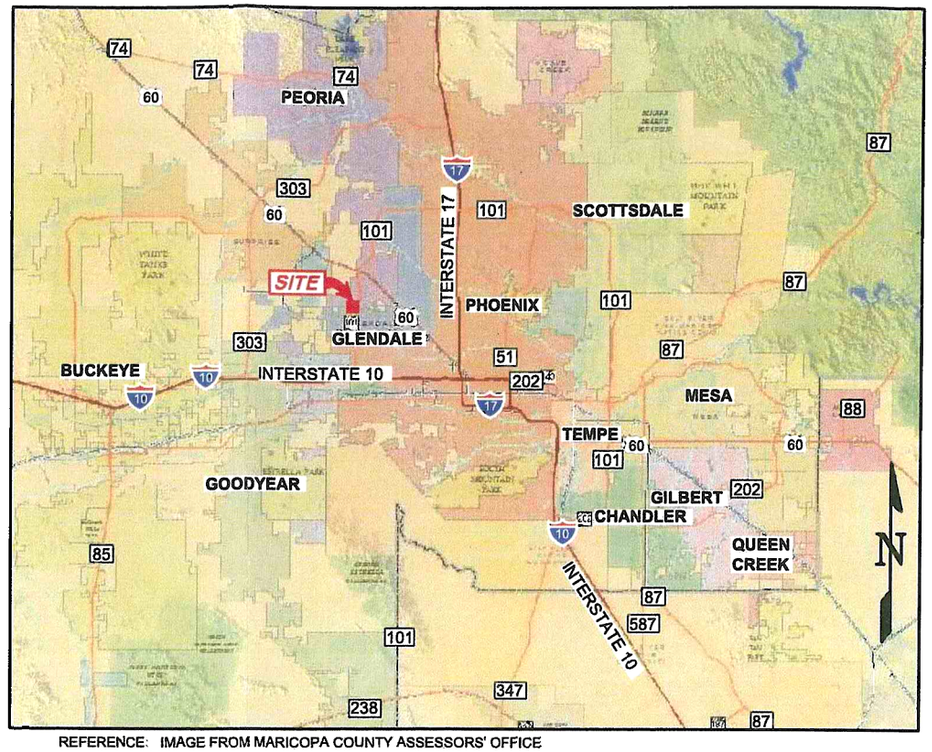
Telephone 301/565-2733 Facsimile 301/589-2017
e-mail info@asfe.org www.asfe.org

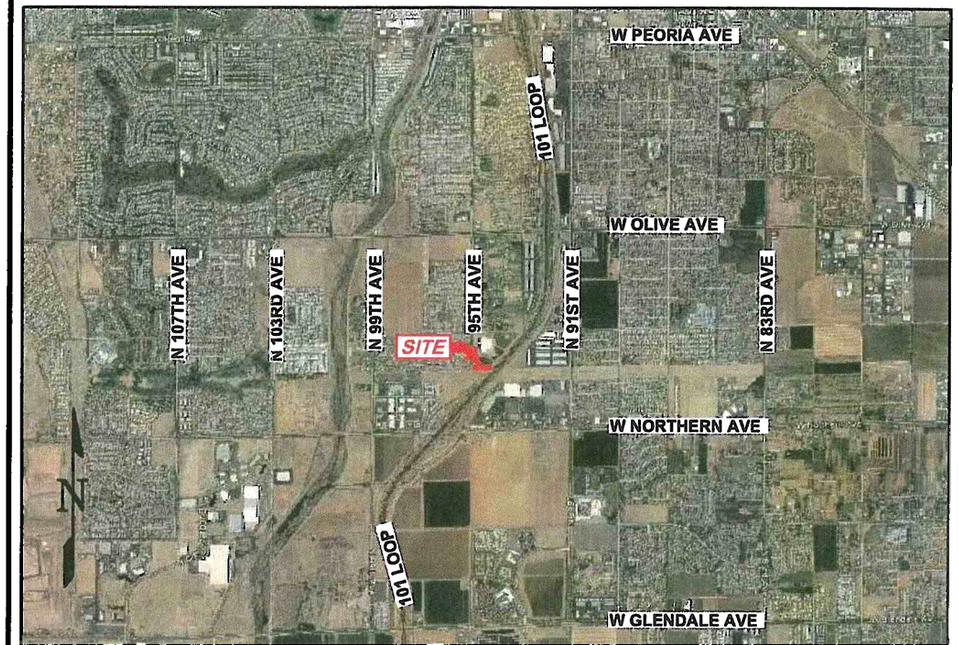
IIGFR06045.0M

FIGURES

E EARTH PRO, DATED 06/08/12



REFERENCE: IMAGE FROM MARICOPA COUNTY ASSESSORS' OFFICE



APPENDIX A

Logs of Borings

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			USCS SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVELS WITH LESS THAN 5% PASSING NO. 200 SIEVE	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH OVER 12% PASSING NO. 200 SIEVE	GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH LESS THAN 5% PASSING NO. 200 SIEVE	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH OVER 12% PASSING NO. 200 SIEVE	SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY. GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
			CH	INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS
			OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

Note: Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing No. 200 sieve require dual USCS symbols. (See KEY A3 if provided)

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Report Date:	Project Number:
April 2013	133119

UNIFIED SOIL CLASSIFICATION SYSTEM

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
A1

GEO-KEY_A1_SOIL 133119 WESTGREEN NOISE WALL.GPJ 4/3/2013

LOG SYMBOLS

BULK / GRAB SAMPLE

MODIFIED CALIFORNIA SAMPLER
(2 inch inside diameter)

RING (PORTER) SAMPLER
(2-1/2 inch inside diameter)

STANDARD PENETRATION
SPLIT SPOON SAMPLER
(1.4 inch inside diameter)

SHELBY TUBE
(3 inch outside diameter)

HQ-3 SIZE CORE BARREL
(2.4 inch inside diameter)

WATER LEVEL
(level after completion)

WATER LEVEL
(level where first encountered)

GENERAL NOTES

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
3. Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
4. In general, Unified Soil Classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.
5. NA = Not Analyzed

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Report Date:	Project Number:
April 2013	133119

LOG KEY

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
A2

GEO-KEY_A2_LOG 133119 WESTGREEN NOISE WALL.GPJ 4/3/2013

Boring Location:	Latitude: 33.55626° Longitude: -112.2636°			Date Started:	3/13/2013
Groundwater (ft):	No Groundwater Encountered			Date Completed:	3/13/2013
Drilling Company:	D&S Drilling, Inc.	Equipment:	CME-75	Logged By:	R. Katako, E.I.T.
Hole Diameter (in):	8	Drilling Method:	Hollow Stem Auger		
Hammer Type:	Automatic	Elevation (ft):	N/A	Total Depth (ft):	14.5

ELEVATION (ft)	DEPTH (ft)	FIELD: Sample Interval	FIELD: Blow Count	FIELD: Continuous Pen. Bullnose (bpf)	LABORATORY: Insitu Dry Density (pcf)	LABORATORY: Field Moisture Content (%)	LABORATORY: Liquid Limit	LABORATORY: Plasticity Index	LABORATORY: Passing #4 Sieve (%)	LABORATORY: Passing #200 Sieve (%)	LABORATORY: Other Tests	Graphical Log	USCS Classification	DESCRIPTION (0.0 to 14.5 feet)
				2			41	20	83	35	Sulfates = 47ppm Chlorides = 2ppm Soluble Salts = 211ppm pH = 8.4 Min Resist = 1,342 ohms-cm Collapse = 2.7%		SC	**CLAYEY SAND with GRAVEL:** brown; loose to medium dense; medium plasticity; no to weak cementation; damp; upper roughly 12 inches disturbed by previous grading.
				10										
			21/12"	11	12	102								
				9										
			15-17-18	18										dense below about 4 feet.
	5			28										
				19									SM	**SILTY SAND with GRAVEL:** brown; dense; non-plastic; no to weak cementation; damp; stratified with thin layers of silty gravel.
				35										
				38										
			46/12"		12	116								
	10													
			18-16-20										GM	**SILTY GRAVEL:** brown; dense; non-plastic; no to weak cementation; damp; stratified with thin layers of poorly graded sand.
	15													Auger refusal at about 13 feet. Stopped sampling at about 14.5 feet. No groundwater encountered in test boring. Cave in to about 8 feet.

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LOG OF BORING B1

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
A3

Report Date: April 2013
Project Number: 133119

GEO_ADOT_EW/EL_R 133119 WESTGREEN NOISE WALL.GPJ 4/3/2013

Boring Location:	Latitude: 33.55617° Longitude: -112.26279°			Date Started:	3/13/2013
Groundwater (ft):	No Groundwater Encountered			Date Completed:	3/13/2013
Drilling Company:	D&S Drilling, Inc.	Equipment:	CME-75	Logged By:	R. Katako, E.I.T.
Hole Diameter (in):	8	Drilling Method:	Hollow Stem Auger		
Hammer Type:	Automatic	Elevation (ft):	N/A	Total Depth (ft):	15.0

ELEVATION (ft)	DEPTH (ft)	FIELD: Sample Interval	FIELD: Blow Count	FIELD: Continuous Pen. Bullnose (bpf)	LABORATORY: Insitu Dry Density (pcf)	LABORATORY: Field Moisture Content (%)	LABORATORY: Liquid Limit	LABORATORY: Plasticity Index	LABORATORY: Passing #4 Sieve (%)	LABORATORY: Passing #200 Sieve (%)	LABORATORY: Other Tests	Graphical Log	USCS Classification	DESCRIPTION (0.0 to 15.0 feet)
			12/12 "	5	88	8							SC	**CLAYEY SAND with GRAVEL:** brown; loose to medium dense; medium plasticity; no to weak cementation; damp; upper roughly 12 inches disturbed by previous grading.
				14										
				11										
				11										
			32/12 "	25	84	8	40	22	80	18	Collapse = 18.0%			poor ring sample recovery.
	5			17										
				16										
				32									SM	**SILTY SAND with GRAVEL:** brown; variable medium dense to very dense; non-plastic; no to weak cementation; damp; stratified with thin layers of silty gravel.
				50/6"										
			7-8-7											
	10													
			70/12 "											
	15													Stopped drilling at 14 feet. Stopped sampling at 15 feet. No groundwater encountered in test boring. Cave in to about 7.5 feet.

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LOG OF BORING B2

PLATE
A4

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

Report Date:	Project Number:
April 2013	133119

GEO_ADOT_EWEL_R 133119 WESTGREEN NOISE WALL.GPJ 4/3/2013

APPENDIX B

Laboratory Testing

SAMPLE LOCATION	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			OTHER TESTS[1]	UNIFIED SOIL CLASSIFICATION (USCS)
			GRAVEL (%)	SAND (%)	FINES (%)	LL	PL	PI		
B1 @ 0-4'			17	48	35	41	21	20	SULF = 47 CHLO = 2 SS = 211 pH = 8.4 RESIS = 1,342	CLAYEY SAND with GRAVEL (SC)
B1 @ 2-3'	11.6	101.7							C = 2.7	
B1 @ 9-10'	11.6	115.9								
B2 @ 0-1'	8.0	87.6								
B2 @ 4-7'			20	62	18	40	18	22		CLAYEY SAND with GRAVEL (SC)
B2 @ 4-5'	7.7	84.3							C = 18.0	

NOTES
(1) C = Collapse (%) when wetted at 2 ksf
SULF = Sulfates (ppm)
CHLO = Chlorides (ppm)
SS = Soluble Salts (ppm)
RESIS = Minimum Resistivity (ohms-cm)

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SUMMARY OF LABORATORY TESTING
Westgreen Estates Phase 1 Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
B1

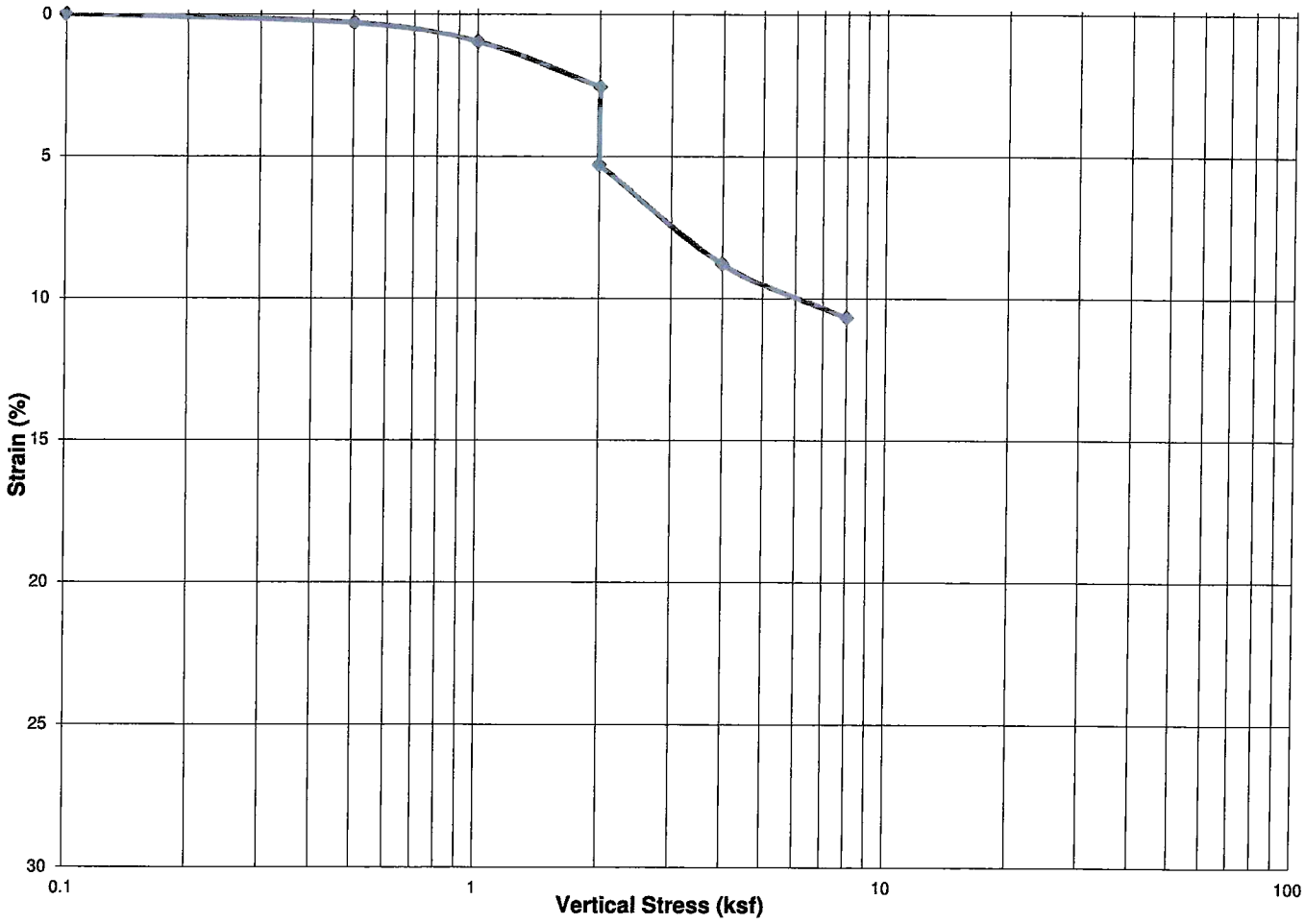
Report Date:	Project Number:
Apr 2013	133119

SAMPLE SOURCE: **B1 @ 2-3'**

SPECIFIC GRAVITY: 2.65 (estimated)

	INITIAL	FINAL
Volume (in^3)	4.60	4.11
Moisture Content (%)	13.2	18.5
Dry Density (pcf)	98.4	110.2
Void Ratio	0.7	0.5
Degree of Saturation (%)	51	100

Saturated at 2 ksf: 2.7% Collapse



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ONE-DIMENSIONAL CONSOLIDATION (ASTM D 2435)
Westgreen Estates Phase 1 Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
B2

Report Date:	Project Number:
April 2013	133119

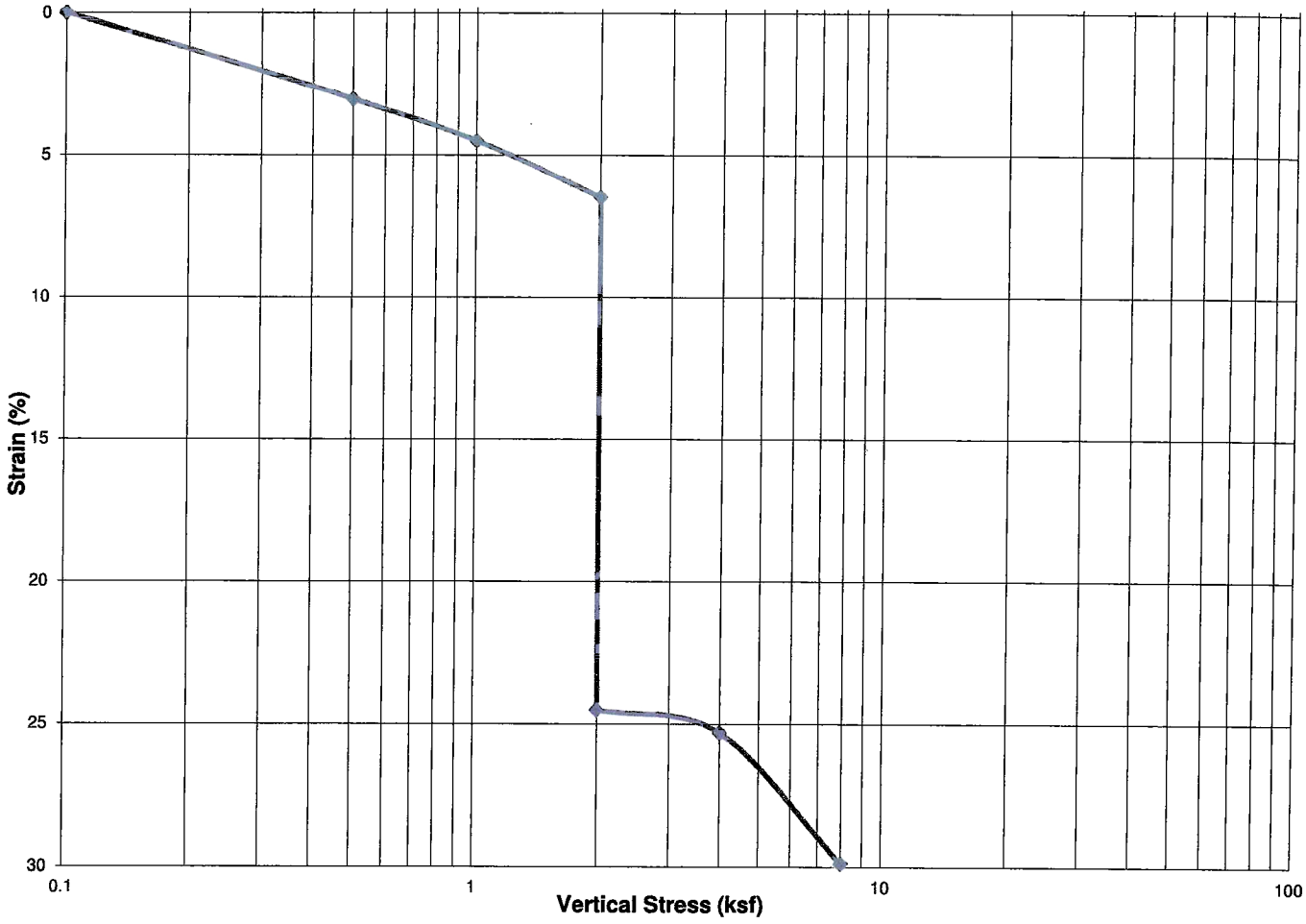
13146-1

SAMPLE SOURCE **B2 @ 4-5'**

SPECIFIC GRAVITY· 2.65 (estimated)

	INITIAL	FINAL
Volume (in^3)	4.60	3.23
Moisture Content (%)	8.1	15.4
Dry Density (pcf)	81.1	115.7
Void Ratio	1.0	0.4
Degree of Saturation (%)	21	100

Saturated at 2 ksf: 18.0% Collapse



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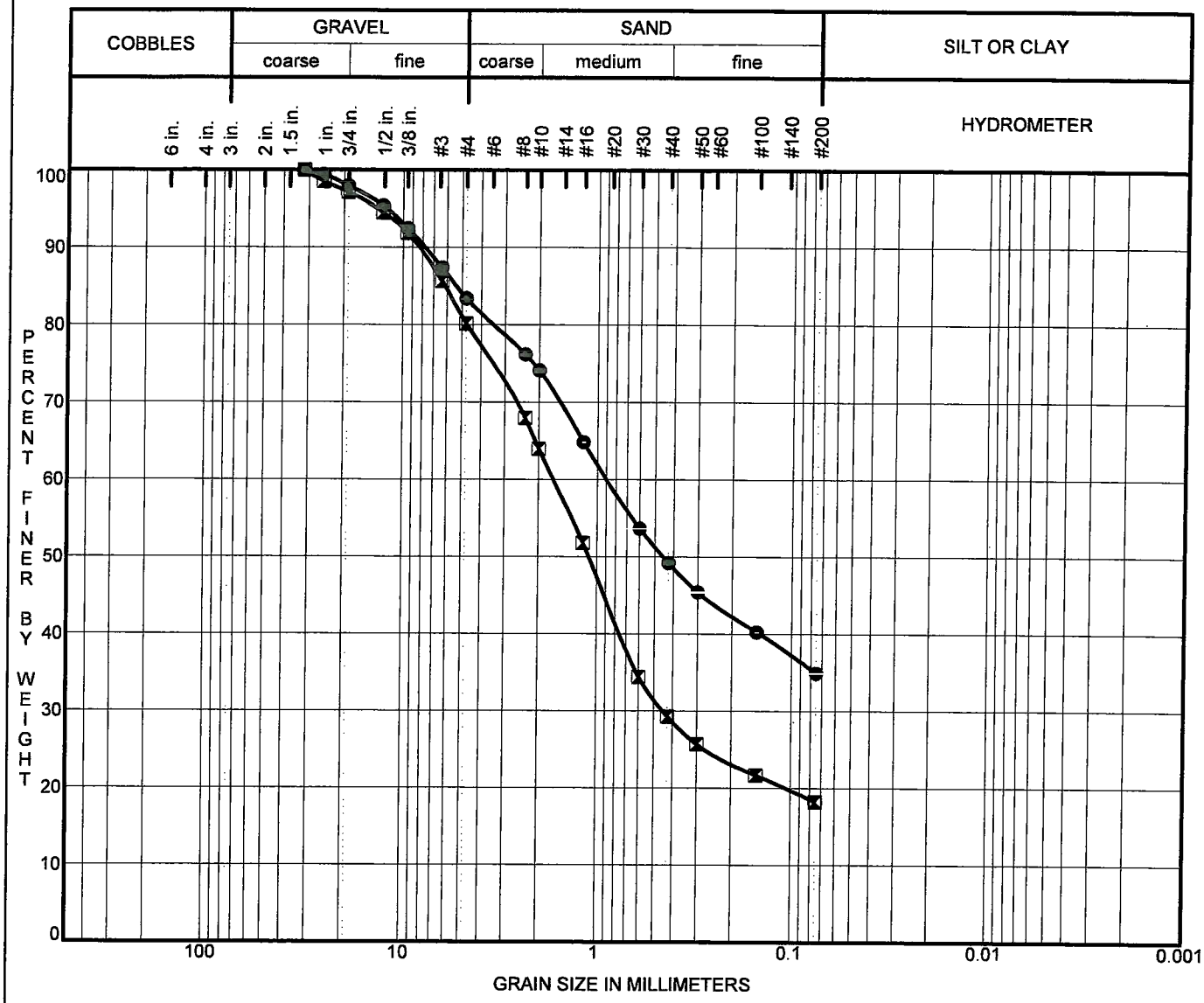
ONE-DIMENSIONAL CONSOLIDATION (ASTM D 2435)
Westgreen Estates Phase 1 Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
B3

Report Date:	Project Number·
April 2013	133119

13146-1



	Source	Depth (ft)	%Cobbles	%Gravel	%Sand	%Silt	%Clay	D60	D30	D10
●	B1	0.0 - 4.0	0	17	48	35		0.9		
⊠	B2	4.0 - 7 0	0	20	62	18		1 7	0.4	

	Source	Depth (ft)	Classification	LL	PL	PI	Cu	Cc
●	B1	0.0 - 4.0	CLAYEY SAND with GRAVEL (SC)	41	21	20		
⊠	B2	4.0 - 7.0	CLAYEY SAND with GRAVEL (SC)	40	18	22		

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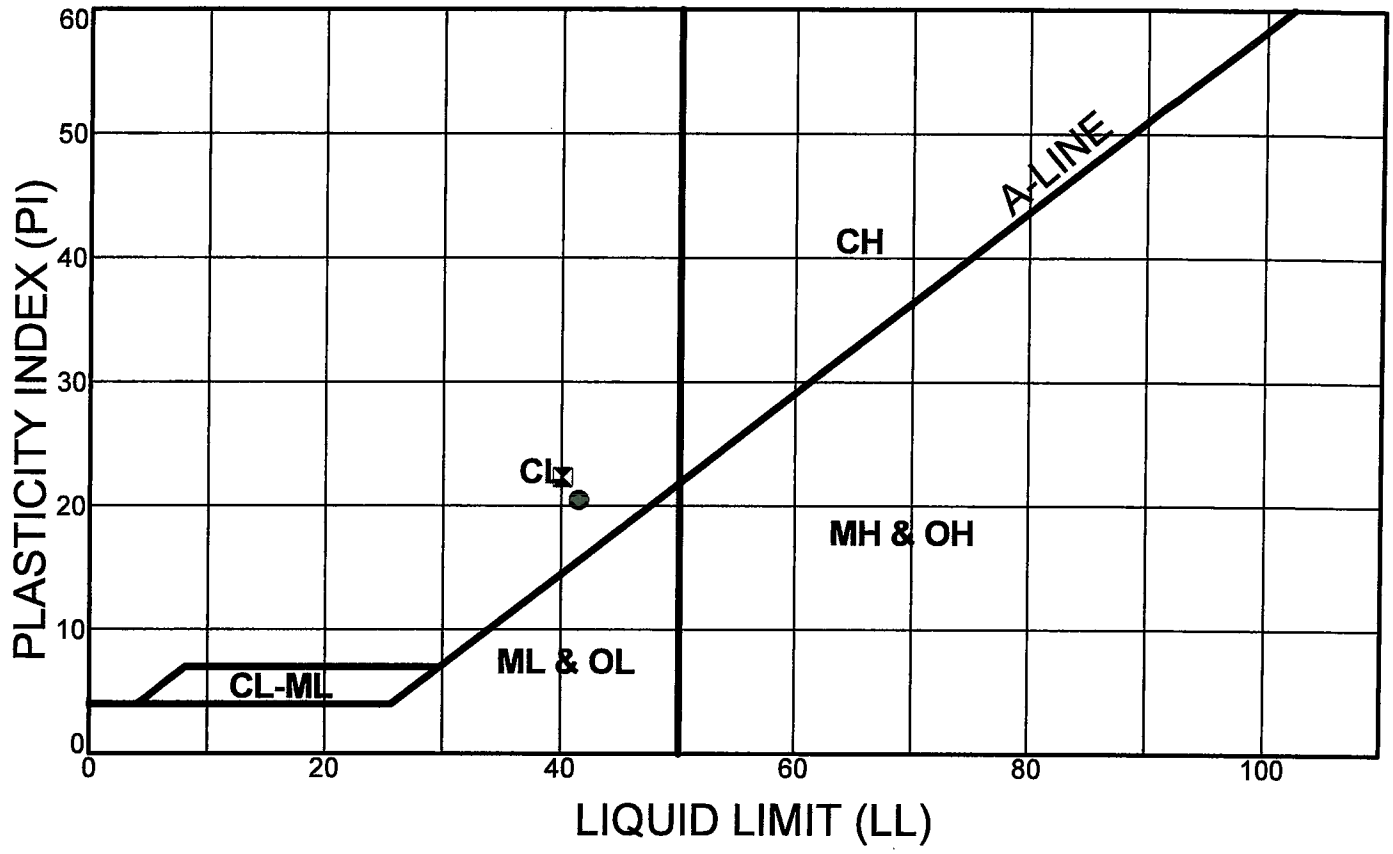
GRAIN SIZE ANALYSES (ASTM C117 and C136)

PLATE
B4

Report Date: April 2013
Project Number: 133119

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

GRAINSIZECOMPLETE 133119 WESTGREEN NOISE WALL.GPJ 04/03/13



LEGEND	BORING	DEPTH (ft)	LL	PL	PI
●	B1	0.0 4.0	41	21	20
⊠	B2	4.0 - 7.0	40	18	22

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Report Date:	Project Number:
April 2013	133119

ATTERBERG LIMITS (ASTM D 4318)

Westgreen Estates Phase I Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE

B5

ATTPLOT 133119 WESTGREEN NOISE WALL.GPJ 04/03/13

TEST METHOD:	ARIZ 236b	ARIZ 236b	ARIZ 733**	ARIZ 736**	ARIZ 237b**
SAMPLE LOCATION	pH	Minimum Resistivity (ohm-cm)	Sulfates (ppm)	Chlorides (ppm)	Soluble Salts (ppm)
B1 @ 0-4'	8.4	1,342	47	2	211

*** Testing performed by MotZZ Laboratory, Inc.*

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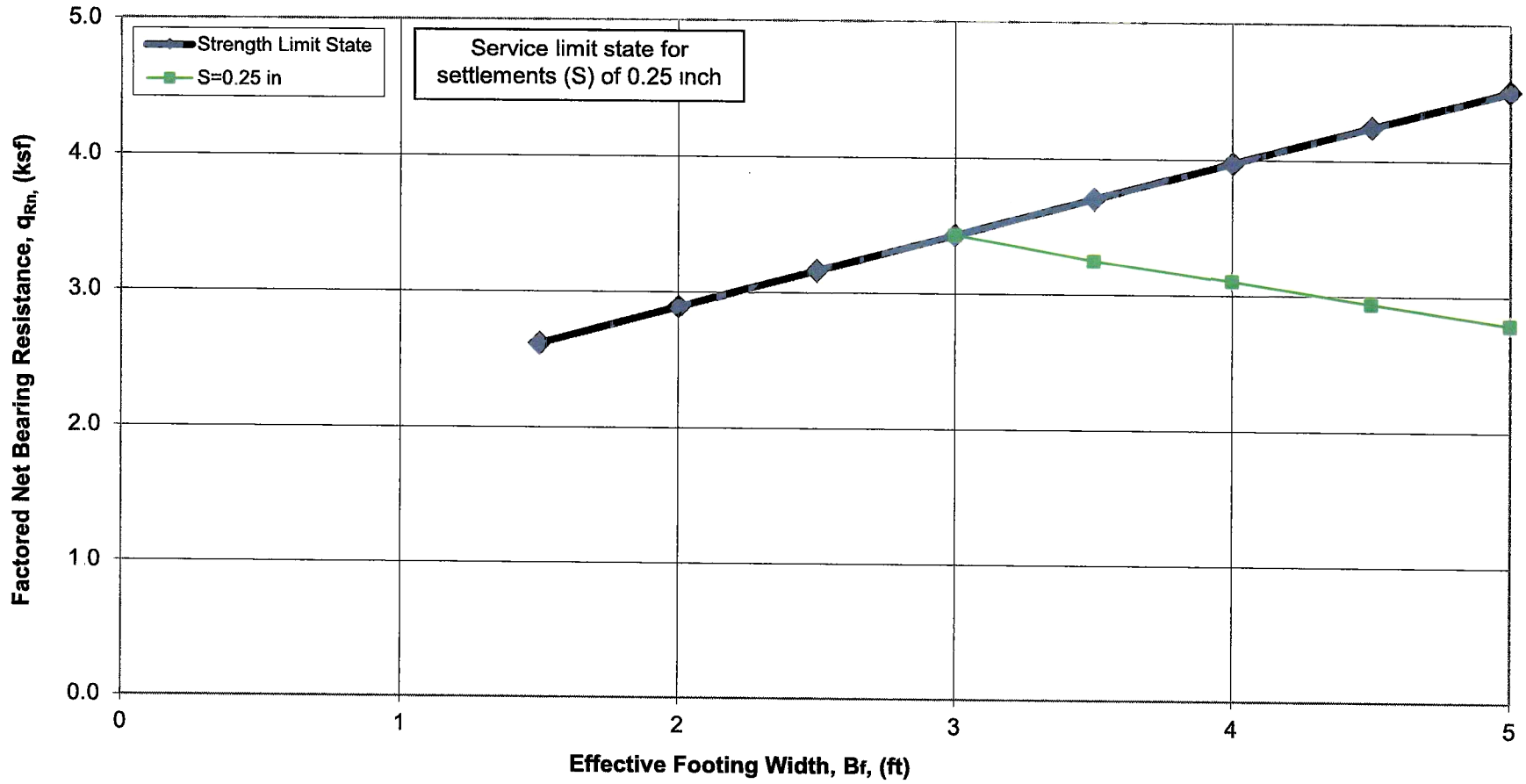
ADDITIONAL LABORATORY TESTING
Westgreen Estates Phase 1 Noise Wall
SE of 95th Avenue & Las Palmaritas Drive
Peoria, Arizona

PLATE
B6

Report Date:	Project Number:
April 2013	133119

APPENDIX C

Factored Bearing Resistance Chart



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Report Date:	Project Number
Apr 2013	133119

FACTORED BEARING RESISTANCE CHART
WESTGREEN ESTATES PHASE I NOISE WALL - SPREAD FOOTING
SE of 95th Avenue and Las Palmaritas Drive
Peoria, Arizona

FIGURE
C1

Westgreen Estates Unit 9
Soundwall
EN00324
Solicitation No. P14-0002

Westgreen Estates Unit 9
Soundwall

Westgreen Estates Wall Unit 9

Looking east along property line from 95th Avenue.

Chain link to be salvaged and given to PUSD.

New wall to match the existing along Loop101.

Access site through gate at street only.

Westgreen Estates Wall Unit 9

PROJECT INFORMATION

IGA with ADOT
for funding
City has already obtained an ADOT permit to perform the necessary work to tie into existing Loop101 wall.

IGA with PUSD
to use property

10’ TCE acquired in utility corridor
No storage of materials allowed

20’ Irrigation easement along west side
Stay off

Westgreen Estates Wall Unit 9

PROJECT INFORMATION

- School irrigation waterlines removed
- Remove and replace existing fence
- PUSD requested a track-out and leave it.
- Site access

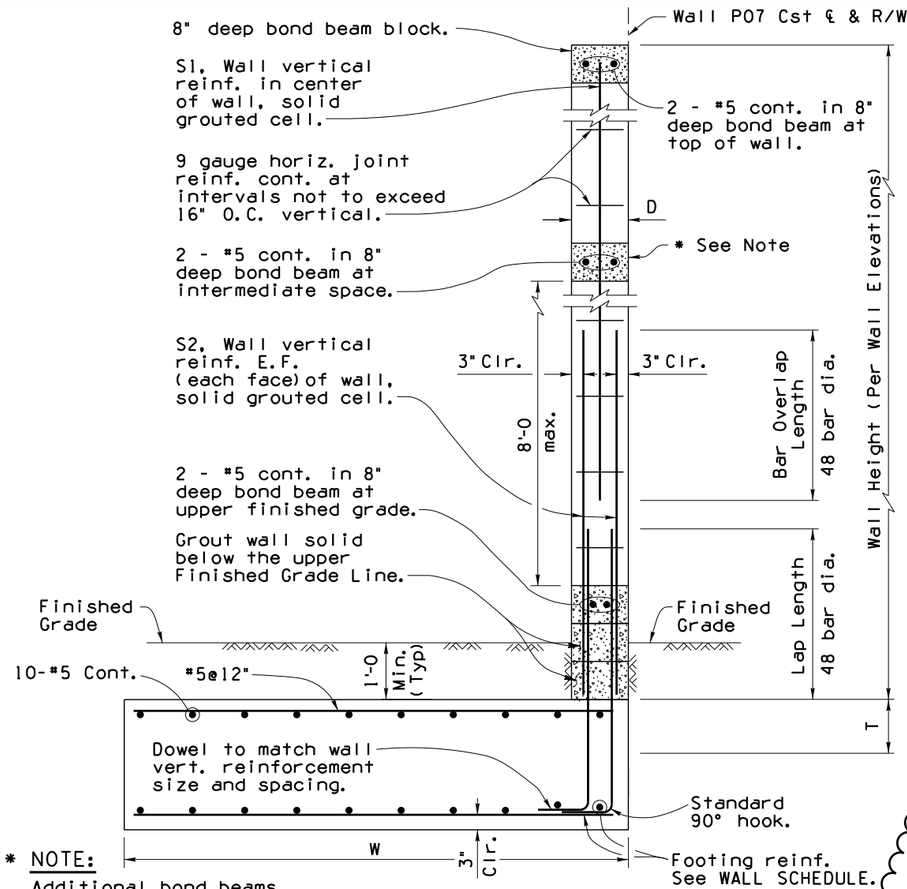
Westgreen Estates Wall Unit 9

QUESTIONS?

Westgreen Estates Wall Unit 9

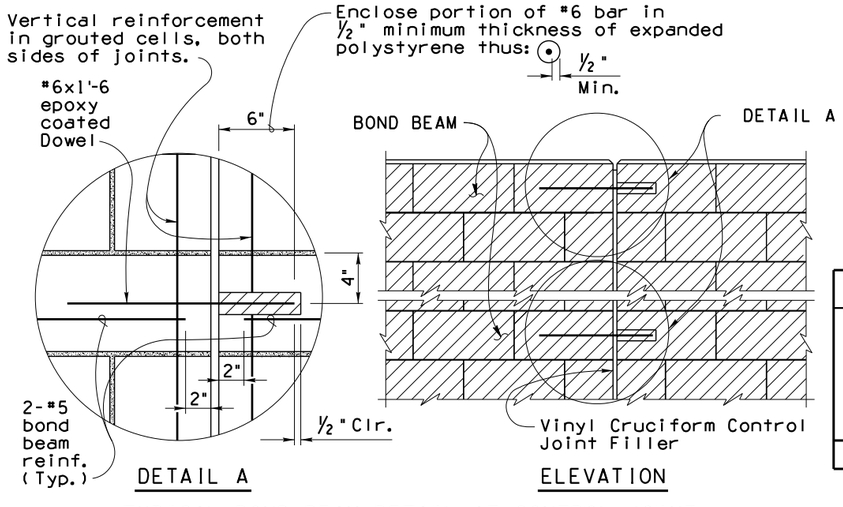
Westgreen Estates Wall Unit 9

Westgreen Estates Wall Unit 9



* NOTE:
Additional bond beams required for wall height H=12' and higher. Equally space bond beams at 8'-0 max.

TYPICAL WALL SECTION
(Looking East)

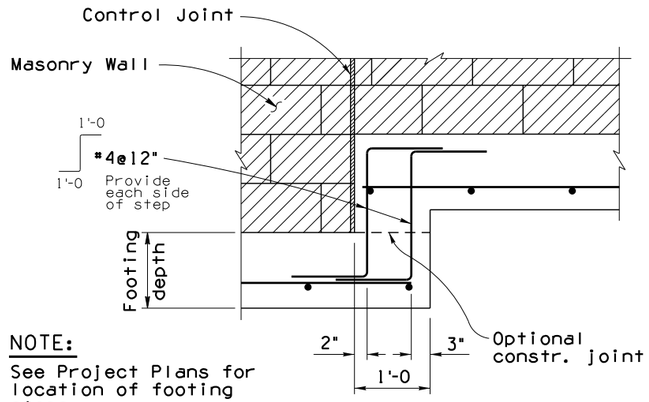


TYPICAL BOND BEAM DETAIL AT CONTROL JOINT
(For bond beams above the upper Finished Grade Line)

GENERAL NOTES:

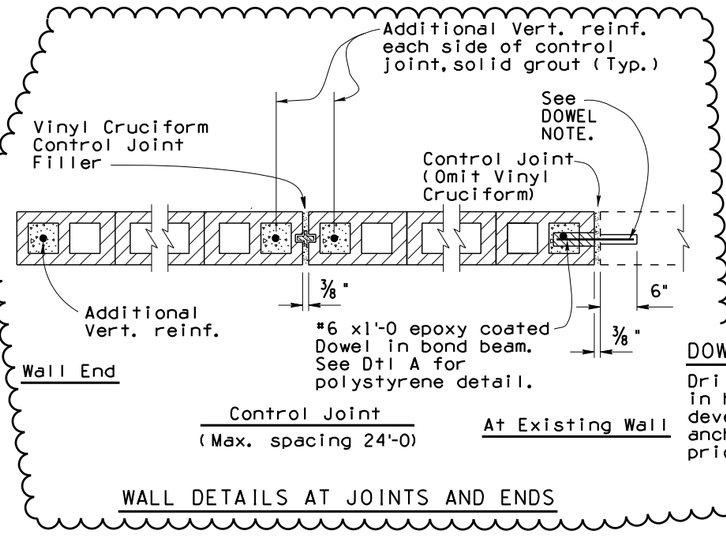
Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition. ACI 530.1, Specifications for Masonry Structures.

Design Specifications - AASHTO LRFD Bridge Design Specifications, 6th Edition 2012.



NOTE:
See Project Plans for location of footing steps.

FOOTING STEP DETAIL



WALL DETAILS AT JOINTS AND ENDS

Revision:	Date:
1 Revised Joint Detail	11/22/13 - CRB

GENERAL NOTES (Continued):

Wind Velocity 80 MPH, Exposure C.
Wind pressure 18.0 psf for wall height under 12'-0.
Wind pressure 25.0 psf for wall height over 12'-0.

Special Inspection is required for all masonry wall construction. Vertical Cells containing reinforcements shall be grouted solid full height. Bond Beams with reinforcements shall be grouted solid full length.

All Concrete shall be Class "S" (f'c = 3,000 psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60 (fy = 60,000 psi).

All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 2 inch clear cover unless noted otherwise.

Compact backfill for footing and wall base minimum 100 percent of ASTM D698 maximum dry density.

See S-2.2 for wall layout, top of footing and finished grade elevations, footing step and wall joint locations. Height of wall may vary ± 2 inches. Control joints shall occur at intervals not to exceed 24'-0. See S-2.3 for wall surface treatment and type of block.

Pay item is measured as wall height (top of footing to top of wall) times length of wall, and pay item includes all labor and materials per Special Provisions.

Dimensions shall not be scaled from drawings.

(GENERAL NOTES Continued on S-2.2)

DOWEL NOTE:
Drill 1 inch diameter hole 6 inches deep for #6 dowel. Epoxy dowel in hole with an approved epoxy adhesive. Epoxy anchorage shall develop a tensile pullout strength of 13 kips. Details of the anchorage system shall be submitted to the Engineer for approval prior to installation.

WALL SCHEDULE

Design Wall Height H	Wall Thick D**	Ftg. Depth T	Ftg. Width W	Reinforcing***				Factored Average Soil Bearing Pressure (psf)
				Wall, Vertical		Footing		
				S1	S2			
				Size & Spacing	Size & Spacing E.F.	Bottom Trans.	Bottom Long.	
22'-0	12"	2'-6	10'-6	#8@16"	#6x7'-0 @ 16"	#6@16"	10-#6	1,700

** Nominal Dimension, *** Additional Reinf. required at Control Joints.

Registered Professional Engineer
32830
CRAIG R. BORGER
Date Signed 11/22/2013
ARIZONA, U.S.A.
EXPIRES 09/30/2016

POINT ENGINEERS

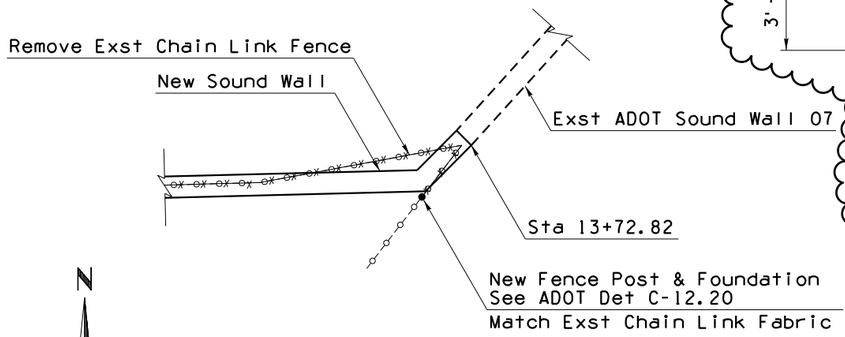
CITY OF PEORIA
ENGINEERING DEPARTMENT
9875 N. 85th Avenue Peoria, AZ 85345

Westgreen Estates Sound Wall, Phase 1
Project No. EN-00324

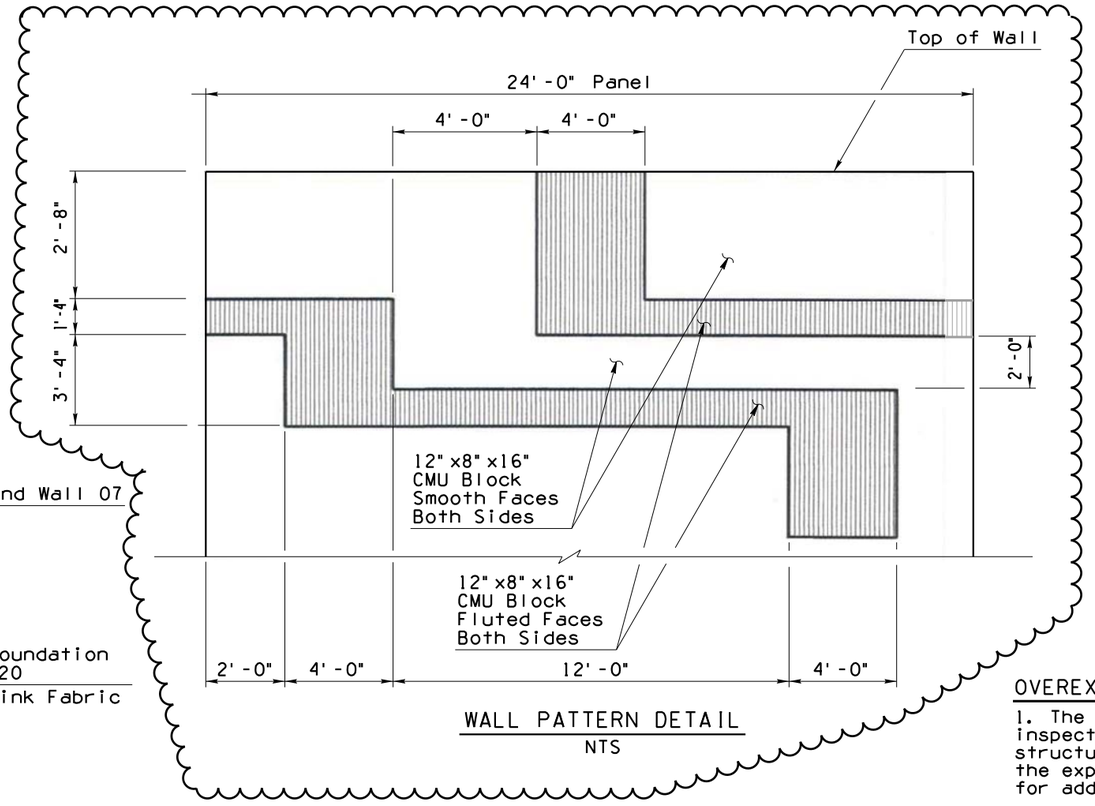
Designed JVG	Drawn NJO	Checked CRB	Date Checked 09/13

WALL DETAILS (1 OF 3) | DWG NO. S-2.1 | SHEET 8 OF 10

Revision:	Date:
1 Revise Pattern Dimensions	11/22/13 - CRB



EAST CHAIN LINK FENCE CONNECTION



WALL PATTERN DETAIL
NTS

NOTES:

1. Wall pattern, block, and color shall match the existing ADOT Sound Wall 07 as indicated on this sheet.

2. Where fluted is called out, this includes the following: Fluted, Sonoran or other block texture finishes as per the Engineers approval. Fluted block types are texture finished on both sides of blocks providing a vertical ribbed split face finishes.

3. Wall shall be painted both sides. Color should match existing ADOT Sound Wall 07 Federal Chip No. 30318 Standard Tan.

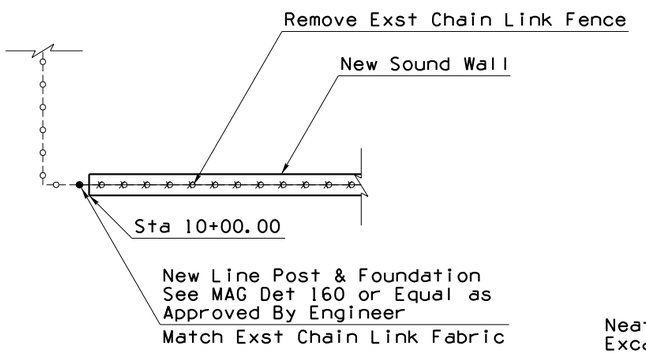
4. The contractor shall keep the project site clean of grout, concrete, and mortar spills.

OVEREXCAVATION NOTES:

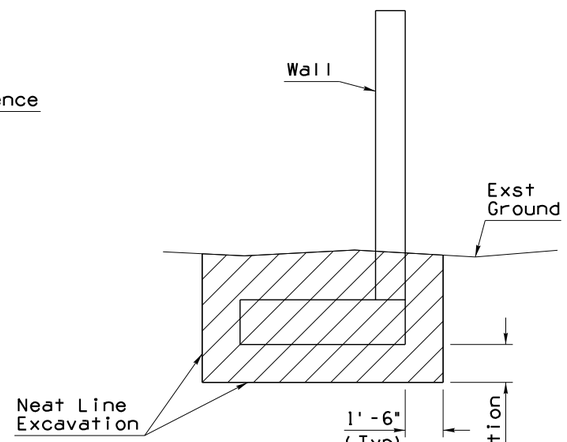
1. The completed foundation excavation shall be inspected by the Engineer prior to placement of the structure backfill to determine the acceptability of the exposed subgrade soil and the possible need for additional overexcavation.

2. All materials placed beneath footings within the zones of overexcavation shall meet the requirements for structure backfill (See Special Provisions).

3. 6" - 8" thick lifts of approved on-site soils or imported structure backfill (engineered fill) shall be moisture conditioned within 2% of the optimum moisture content and uniformly compacted to a minimum of 95% of the maximum dry density as determined by ASTM D698.



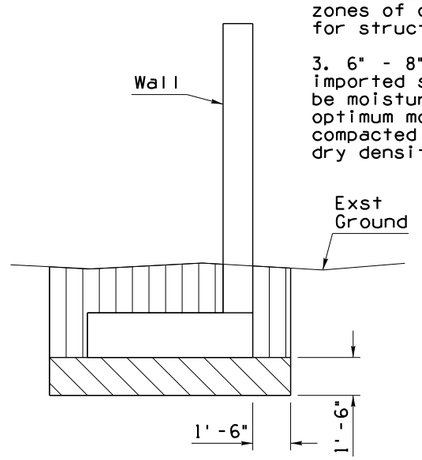
WEST CHAIN LINK FENCE CONNECTION



WALL EXCAVATION LIMITS
NTS

LEGEND

Indicates Wall Excavation



WALL BACKFILL LIMITS
NTS

LEGEND

Indicates Structure Backfill

Indicates Backfill (Native)

ARIZONA BLUE STAKE
CALL TWO WORKING DAYS BEFORE YOU DIG
Dial 811 or
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

Registered Professional Engineer
32830
CRAIG R. BORGER
Date Signed 11/22/2013
ARIZONA, U.S.A.
EXPIRES 09/30/2016

POINT ENGINEERS

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9875 N. 85th Avenue Peoria, AZ 85345

Westgreen Estates Sound Wall, Phase 1
Project No. EN-00324

Designed JVG	Drawn NJO	Checked CRB	Date Checked 09/13

WALL DETAILS (3 OF 3) | DWG NO. S-2.3 | SHEET 10 OF 10