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T://Land Development/New Mexico/Parcel H Geotechnical  
T://Land Development/New Mexico/Parcel I Geotechnical  
T://Land Development/New Mexico/Parcel J Geotechnical  
T://Land Development/New Mexico/Parcel K Geotechnical  
T://Land Development/New Mexico/Parcel L Geotechnical

Document Name: Preliminary Geotechnical Investigation Fiesta Development Parcels C, D, E, G, H, I, J, K and L

Document Date: 08-04-05

Geotechnical Engineering • Materials Testing • Environmental Engineering

**PRELIMINARY**  
**GEOTECHNICAL INVESTIGATION**  
**FIESTA DEVELOPMENT**  
**PARCELS C, D, E, G, H, I, J, K AND L**

**Prepared for:**  
**Sivage Community Development, LLC**

**Project No.: 05-1-255**

**August 4, 2005**

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**1.0 INTRODUCTION**

This report presents the results of our preliminary geotechnical investigation for Parcels C, D, E, G, H, I, J, K and L of the Fiesta Development in Los Lunas, New Mexico. A schematic drawing of the various parcels is presented on Figure 1B. Layout of the site and topography are indicated on Figure 1.

The investigation was performed to determine site subsurface conditions; and, based upon the conditions observed in the test holes, to develop preliminary geotechnical recommendations for:

- Foundation Design;
- Slabs-on-Grade;
- Lateral Earth Pressures;
- Site Grading; and
- Earthwork Construction.

The conclusions and recommendations presented are based on information provided to us regarding the proposed development, on subsurface conditions disclosed by the test holes, on laboratory testing, and upon the local standards of our profession at the time this report was prepared.

This investigation was not performed to determine the presence of potentially hazardous waste or radon gas. Determination of the presence of potentially

hazardous materials was beyond the scope of this investigation and requires the use of exploration techniques and analytic testing which were not appropriate for this investigation. If desired, Vinyard & Associates, Inc. will perform an environmental audit of the site.

## **2.0 PROPOSED CONSTRUCTION**

We anticipate all of the parcels, except Parcel L, will be developed with single-family residences. Parcel L will probably be developed with a church or light retail buildings. The proposed single-family residences will be constructed utilizing conventional wood-frame construction. Framing and construction details of the future commercial structures on Parcel L have not been determined. We anticipate the retail/commercial buildings will be light wood or metal frame. The proposed church may be steel frame or masonry. The ground floor will be a conventional concrete slab-on-grade. No basements or below grade structures are anticipated. The maximum column and bearing wall loads (dead plus live) for the residences are not anticipated to exceed ten kips and two kips per linear foot, respectively. The maximum column and bearing wall loads (dead plus live) for the commercial structures and the church are not anticipated to exceed thirty kips and two kips per linear foot, respectively. If structure loads or configuration differ from those indicated in this report, this office should be notified.

Final site grading plans were not available during preparation of this report. We anticipate that moderate to substantial cut/fill earthwork will be required to develop the site.

### **3.0 SITE CONDITIONS**

The study area is bound to the north by the Isleta Pueblo and to the south by the Buena Vista subdivision. The study area is bound to the east by the Belen Highline Canal and to the west by I-25. The western portion of the study area is relatively flat. The remainder of the site descends steeply to the east along hills and through arroyos. Relief from east to west is approximately 100'. Slopes are very steep where arroyos have cut through clay beds.

Configuration and topography of the proposed development are indicated on the Site Plan, Figure 1.

### **4.0 SITE SUBSURFACE CONDITIONS**

To explore the site subsurface conditions, twenty-six test holes were drilled at the approximate locations shown on the Site Plan, Figure 1. Logs of the Test Holes are presented on Figures 2 through 27. The majority of the soils encountered were slightly silty to silty sands. The sands were fine to medium grained. The sands were generally medium dense with occasional loose and dense layers. The sands were slightly moist. Frequent layers and lenses of clay and sandy clay were encountered

in the test holes. The clay was firm to stiff, slightly moist to moist, and slightly to highly plastic. Significant clay layers encountered are summarized below.

Test Hole	Depth of Clay Layer
13	2' - 7'
15	2' - 8'
16	5' - 10'
17	2' - 4'
18	2' - 21'
19	2' - 5'
23	2' - 13'
26	4' - 13'

No Significant clay layers were encountered in Parcels E, D, J, and L.

Neither flowing groundwater nor bedrock was encountered in the test holes to a depth of twenty-one feet, the maximum depth of exploration. However, groundwater conditions may change with time due to precipitation, variations in groundwater level, seepage from ponding areas, or leaking utilities.

The soils encountered in the test holes exhibit a limited consolidation potential under the anticipated structural loads. Limited to substantial consolidation (collapse) occurs when silty sand, sandy silt, and sand soils increase in moisture



content. The clay soils are moderately expansive upon an increase in moisture content. Refer to Figures 29 through 39.

The test holes allow observation of a very small portion of the soils below the site. Significant variations in subsurface conditions may occur across the site, which were not disclosed by the test holes.

## **5.0 LABORATORY TESTING**

A laboratory testing program was performed on samples obtained during the field investigation which appeared representative of the soils encountered in the test holes. The laboratory testing program was structured to determine the physical properties of the soils encountered in the test holes necessary for development of geotechnical recommendations.

The laboratory testing program included:

- Moisture Content;
- Dry Density;
- Sieve Analysis;
- Atterberg Limits; and
- Consolidation/Collapse.

Moisture Content and Dry Density tests were performed to evaluate the in-place soil density and moisture content. Test results help to evaluate settlement potential. Test results indicate the soils encountered in the test holes are loose to medium dense with an average dry density of approximately 106 pcf. Natural moisture content of the sands and clays averaged approximately three percent and twelve percent respectively. Test results are presented on the Logs of Test Holes, Figures 2 through 27, and are summarized on Table 1.

Sieve Analysis and Atterberg Limits tests were performed to confirm field soil classifications and to provide information on general physical soil properties. Test results are presented on Table 1.

Consolidation/Collapse tests were performed to evaluate structure settlement and to determine the effect of water on site soils. The tests indicate the tested soils are slightly compressible under anticipated loads. Limited to substantial consolidation (collapse) occurs when silty sand, sandy silt and sand soils increase in moisture content. The clay soils are moderately expansive upon an increase in moisture content. Refer to Figures 29 through 39.

## **6.0 FOUNDATIONS**

Based upon the results of this preliminary investigation, it appears the proposed structures may be supported on either conventional spread and strip footings or a monolithic slab with turned down edges. Depending upon the site

specific soil conditions, some remedial earthwork will be required due to moisture sensitive soils. Specific remedial earthwork for each Parcel is detailed in the "Earthwork" section of this report. These recommendations are preliminary in nature and may change based upon the final investigation.

Foundations may be designed for an allowable bearing pressure of 1500 pounds per square foot. This value may be increased by one-third for short-term loads due to wind and earthquakes. If it is not feasible to implement the site grading, drainage, and landscaping recommendations presented herein, an alternate foundation system may be required. This office should be contacted for additional recommendations.

The base of exterior footings should be embedded eighteen inches below lowest adjacent grade. The base of interior footings should be embedded a minimum of twelve inches below finish pad grade. Spread and strip footings should be a minimum of twenty-four and eighteen inches wide, respectively. Turned down edges should be a minimum of twelve inches wide. However, local building codes may require greater dimensions.

Lateral foundation loads will be resisted by a combination of passive soil pressure against the sides of footings and friction along the base. A passive soil resistance of 300 pounds per cubic foot may be utilized for design. Frictional resistance may be determined by multiplying foundation dead load by a coefficient of friction of 0.40.

Prior to fill placement and following footing excavation, the natural soils should be scarified to a depth of eight inches and moistened to a near optimum moisture content ( $\pm 3\%$ ). The exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557. All fill below structures should be placed and compacted as detailed in the attached Appendix. Prior to pouring concrete footing excavations should be cleaned of any slough, loose soil, or debris. Footing excavations should be compacted as detailed in the attached Appendix.

Foundations designed and constructed as described herein are not anticipated to settle more than one inch. Differential settlement between adjacent column footings should not exceed one-half of the above value. The above settlement estimates are based on the assumption the site soils will not be allowed to increase in moisture content and that the site grading, drainage, earthwork, and landscaping recommendations presented in this report will be fully implemented.

The site soils are moisture sensitive. If the soils below the structural fill are allowed to increase in moisture content, additional movement 1/4 inch per foot of wetted soil could occur.

Foundations should be designed and constructed to tolerate the above settlement. Foundations should be designed by a qualified structural engineer.

To reduce the affect of settlement on the structure, we suggest that all stucco be fiberglass reinforced. Periodic control joints should be utilized in the stucco particularly at window and door corners. Periodic control joints should also be utilized in masonry walls.

## **7.0 CONCRETE SLABS-ON-GRADE**

Concrete slabs-on-grade may be utilized. Conventional slabs should be isolated from all foundations, stem walls, and utility lines. Monolithic slabs should be isolated from all utilities. Frequent joints should be scored or cut in slabs to control the location of cracks.

Thickened slabs may be utilized to support interior partitions. Thickened slabs should be a minimum of twelve inches in width and should be designed to exert a maximum earth pressure of 500 pounds per square foot. Wall loads on thickened slabs should not exceed 800 pounds per linear foot. The thickness and reinforcement should be determined by a qualified structural engineer.

Slabs should be adequately reinforced with steel. Reinforcement should be placed in the middle of the slab. Steel reinforcement should be turned down into turned down edges.

If moisture-sensitive floor covering is utilized, the flooring manufacturer should be contacted to determine the necessity of a vapor retarder. The vapor

retarder may consist of a 6-mil polyethylene film or equivalent. To provide a working surface and to reduce shrinkage cracking and slab curl, the barrier may be overlain with four inches of trimmable, compactable, granular fill. Refer to the ACI "Manual of Concrete Practice" Sections 3.2.3 and 4.1.5.

Remedial earthwork required to support slabs is detailed in the "Earthwork" section of this report. Prior to placing slabs or structural fill, the natural soils should be stripped of vegetation, scarified to a depth of eight inches, and moistened to a near optimum ( $\pm 3\%$ ) moisture content. The exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557. All fill below slabs should be placed and compacted as detailed in the attached Appendix.

### **8.0 RETAINING WALLS**

Retaining walls constructed in conjunction with this project are not anticipated to exceed five feet in height. If higher walls or unusual loading conditions such as sloping backfill, slopes below retaining wall footings or surcharges are anticipated, this office should be contacted for supplemental recommendations.

Foundations for retaining walls may be designed for a maximum toe bearing pressure of 1500 pounds per square foot. Retaining wall footings should be embedded a minimum of eighteen inches below lowest adjacent grade. If clay soils

are encountered in footing excavations the clay should be removed to a minimum depth of two feet and replaced with structural fill. Prior to placing footings, the exposed soils should be scarified to a depth of eight inches, moisture conditioned to a near optimum ( $\pm 3\%$ ) moisture content, and compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

We recommend that the following equivalent fluid pressures be utilized for design of retaining walls:

<u>Loading Condition</u>	<u>Equivalent Fluid Pressure*</u>
Active Earth Pressure	34 pcf
Passive Earth Pressure	
Undisturbed Natural Soils	300 pcf
Structural Fill	400 pcf
Earth Pressure at Rest	60 pcf

\* Does not include a factor of safety or hydrostatic pressure.

The above earth pressures do not include a factor of safety or hydrostatic pressure. If retaining walls are restrained against rotation (corners of basements, upper floors, etc.) the earth pressure at rest should be utilized for design.

Lateral retaining wall loads will be resisted by passive earth pressure at the toe and friction along the base of the wall. A coefficient of friction between soil and concrete of 0.4 may be used for design.

Backfill adjacent to retaining walls should be placed and compacted as detailed in the attached Appendix. Backfill adjacent to walls should be compacted with relatively light, hand-operated equipment to prevent overstressing the wall and excessive lateral deflections.

To prevent staining of concrete, the back of retaining walls should be waterproofed prior to backfilling. Weep holes should be constructed near the base of exterior walls. Perimeter drains may be necessary around interior walls.

## **9.0 EARTHWORK**

### **9.1 General**

The recommendations presented in this report are based upon the assumption that site earthwork will be performed as recommended in this report and the attached Appendix. Presented below is a summary of the site earthwork recommendations. Detailed earthwork procedures are presented in the attached Appendix.

### **9.2 Clearing and Grubbing**

Prior to placing structural fill, all borrow and fill areas should be stripped of vegetation and deleterious materials. All strippings should be hauled off-site or utilized in landscaped areas.



All existing fill, utilities, leach fields, and disturbed soil should be removed from below the proposed structure. The resulting excavations should be backfilled with compacted fill as detailed in the attached Appendix.

### **9.3 Excavation**

We anticipate that on-site soils can be excavated with conventional earthwork equipment. Occasional cobbles or boulders may be encountered during excavation. Cobbles and boulders should be disposed of off-site or utilized for landscaping. Cobbles and boulders should not be placed within structural fills.

### **9.4 Natural Ground Preparation**

Prior to placing structural fill and subsequent to final grading in cut areas, the exposed soils should be scarified to a depth of eight inches and moisture conditioned to a near optimum ( $\pm 3\%$ ) moisture content. The exposed soils should then be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557. If vibratory compaction poses a threat to nearby structures, static compaction should be utilized.

### **9.5 Fill Placement and Compaction**

Structural fill should be placed in horizontal lifts a maximum of eight inches in loose thickness, moisture conditioned to a near optimum moisture content and

mechanically compacted. Fill below footings and slabs should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557. On-site native soils appear suitable for re-use as engineered fill. Blending of clean sands, clayey sand and sandy clay with suitable material will be necessary to meet the criteria in the attached Appendix. Clay soils should be thoroughly blended with granular material — no clay balls should be present.

## **9.6 Observation**

Placement and compaction of structural fill should be observed and tested by a qualified geotechnical engineer or his representative. The purpose of the observation and testing is to confirm that the recommendations presented herein are followed and to provide supplemental recommendations, if subsurface conditions differ from those anticipated.

Foundation excavations should be observed by a qualified geotechnical engineer, or his representative, prior to placement of reinforcement or concrete. The purpose of the observation is to determine if the exposed soils are similar to those anticipated.

## **9.7 Frequency of Testing**

Earthwork should be tested periodically to confirm the fill is compacted to the criteria presented in this report. Prior to placing fill, the natural ground should be

moisture conditioned, compacted and tested to confirm it is properly compacted. Fill should be placed in maximum eight-inch thick loose lifts. But in no case thicker than can be compacted with the equipment being utilized. Fill should be moisture conditioned and compacted as detailed in this report. Fill areas should be tested at maximum one-foot vertical intervals. If fill areas are worked at different times, each individual area should be tested. Following finish grading, the final surface should be tested. Following foundation excavation, the footing excavations should be tested. Utility trench backfill should be tested as necessary.

## **9.8 Remedial Earthwork**

### **9.8.1 General**

No significant clay layers were encountered in Parcels D, E, J, and L. Limited clay was encountered in Parcels C and I, and significant quantities of clay were encountered in Parcels G, H, and K. Preliminary remedial earthwork recommendations for the various parcels are presented below.

Prior to fill placement, the existing slopes and arroyo walls should be laid back no steeper than 2:1 (horizontal:vertical). During fill placement slopes should be deeply benched with horizontal benches at no more than two-foot vertical intervals.

**9.8.2 Parcels D, E, J and L**

Due to moisture-sensitive soils, a minimum of three feet of structural fill should be placed on all building pads. Structural fill should extend a minimum of five feet laterally beyond the building perimeter.

**9.8.3 Parcels C, G, H, I and K**

Due to the presence of potentially expansive clay soils, building pads should be over excavated as necessary to allow placement of a minimum of six feet of structural fill on all building pads. The structural fill should extend a minimum of five feet laterally beyond the building perimeter. If clay soils are encountered at the base of the excavation, the clay should be removed.

Limited clay was encountered in Parcels C and I. In these areas it may be cost effective to excavate backhoe pits on individual lots. If clay is encountered, it should be removed as detailed above. If no clay is present, a minimum of three feet of structural fill should be placed on the building pad.

**10.0 SITE GRADING AND DRAINAGE**

The site soils are moisture sensitive. To reduce the risk of structure movement, the site should be graded to rapidly drain away from structures. We suggest a minimum four percent gradient within at least the first ten feet away from

structures in areas not protected by sidewalks and pavement. Splash blocks should be utilized below down spouts and canales.

If ponding areas are required, they should be located as far away from structures as possible, a minimum of ten feet. If this criteria cannot be met, this office should be contacted for supplemental recommendations.

Roof gutters and downspouts should be utilized. Roof gutters should discharge to the front of the structures. Water should run off rapidly.

### **11.0 LANDSCAPING**

Landscaping adjacent to structures should be designed and constructed to minimize the potential for wetting of soils supporting the proposed facilities. If soils supporting the proposed facilities are allowed to increase in moisture content, significant localized settlement could occur.

Trees and shrubs within five feet of structures should be hand watered or watered using controlled drip irrigation. If drip irrigation is used, emitters should discharge no more than one gallon per hour. If grass must be planted within five feet of structures, watering should be carefully controlled to prevent overwatering. Grassed areas adjacent to structures should be sloped so that excess irrigation water will run off promptly. Sprinkler lines and drip irrigation mains should be located a minimum of five feet away from foundations.

Mowing strips, planters and sidewalks should not "dam" water adjacent to structures. If necessary, mowing strips should be perforated to allow water to flow away from structures.

All interior planters should be closed bottom and watertight.

## **12.0 UTILITIES**

The site soils are moisture sensitive. If post-construction water or sewer line leaks occur, localized movement may result. Following installation, all water and sewer lines should be pressure checked for leaks. Any leaks found should be repaired.

Backfill in utility line trenches below slabs, driveways, and pavement should be compacted to a minimum of 90% of maximum density as determined by ASTM D-1557. Utility trenches should be as narrow as can be properly compacted. To reduce the possibility of breaking utility lines with compaction equipment, heavy compactors should not be utilized.

Utility trenches may not be compacted to the same degree as the remainder of the building pad. Therefore, wall footings and thickened slabs should not be placed longitudinally over utility lines. Additionally, column footings should not be placed over utility trenches.

**13.0 TRENCHES AND EXCAVATIONS**

All trenches greater than four feet in depth must be sloped, shored or braced or otherwise supported according to OSHA Construction and Safety Standards. Material excavated from the trench or spoil must be placed a minimum of two feet from the edge of the excavation. The spoil should be retained in an effective manner such that no loose material can fall into the excavation.

Temporary construction excavations less than eight feet deep should be sloped no steeper than 1½:1 (horizontal:vertical). If deeper excavations are required, this office should be contacted for supplemental recommendations. Limited raveling of slopes will occur particularly as the exposed soils dry out. Heavy equipment and material stockpiles should be located a minimum of five feet from the top of slope.

**14.0 CLOSURE**

The recommendations presented in this report are based upon the subsurface conditions disclosed by the test holes. Soil and groundwater conditions may vary between test holes and with time.

This report reflects our interpretation of the site subsurface conditions. We strongly recommend that prior to bidding all contractors perform their own subsurface investigation to form their own opinion of the site soil, rock, and

groundwater conditions. Should contractors elect to use this report for construction, bidding or estimating purposes, they do so at their own risk.

In a southwest climate it is particularly important to protect the soils supporting the proposed structure from an increase in moisture content. If soils supporting the structure increase in moisture content due to any cause such as poor site drainage, ponding areas, or leaking utility lines, significant structural settlement and distress may occur.

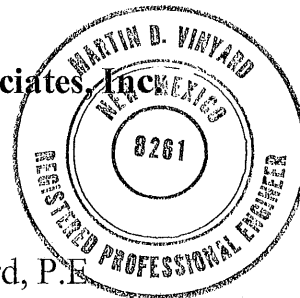
If conditions are encountered during construction which differ from those presented herein, this office should be contacted for supplemental recommendations. The staff of **Vinyard & Associates, Inc.** is available for supplemental consultation as necessary.

This office would be pleased to review site grading and drainage plans to evaluate conformance with the recommendations presented herein. All site earthwork should be observed by a qualified geotechnical engineer or his representative. **Vinyard & Associates, Inc.** would be pleased to provide these services.

Vinyard & Associates, Inc.

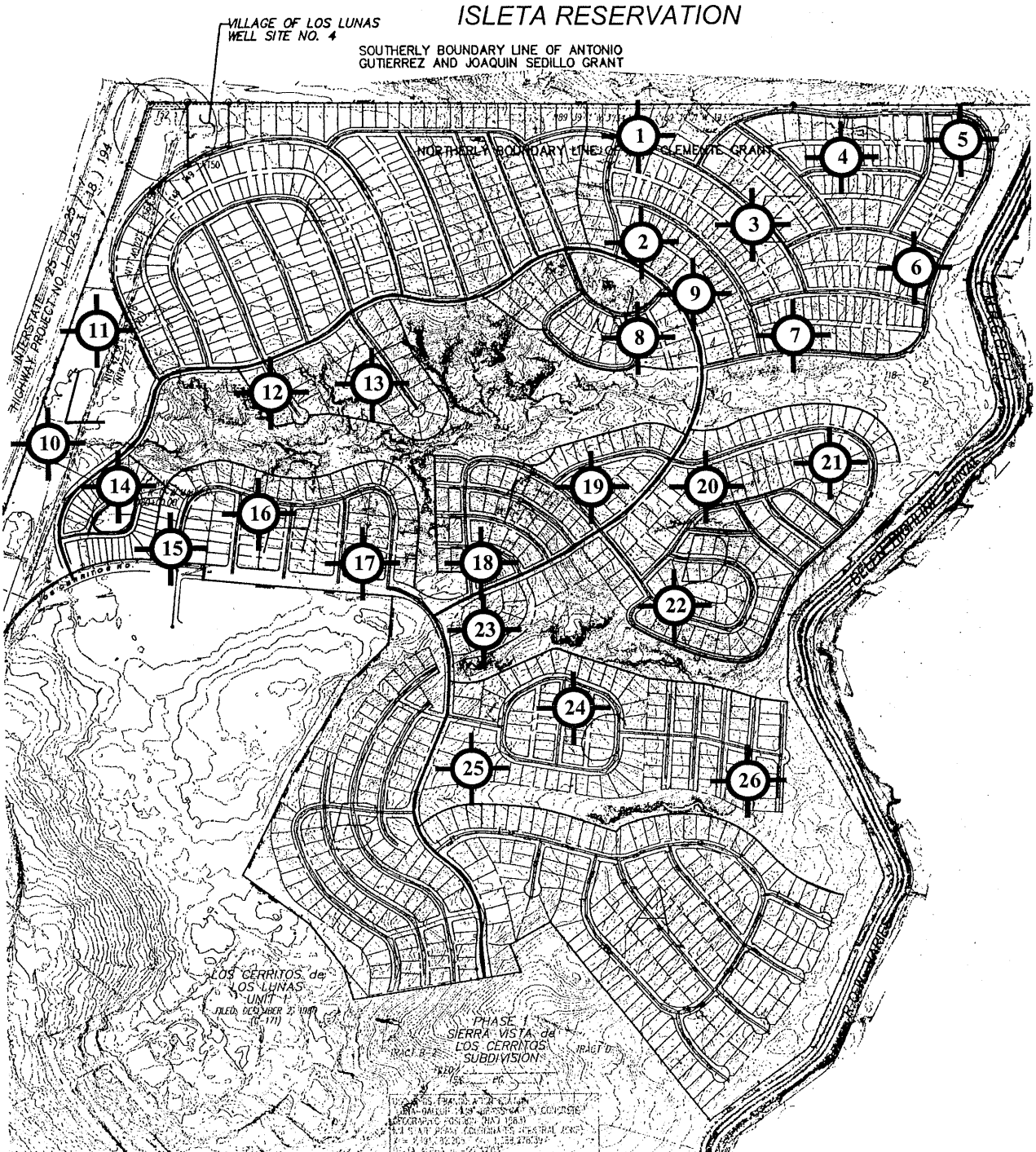


Martin D. Vinyard, P.E.



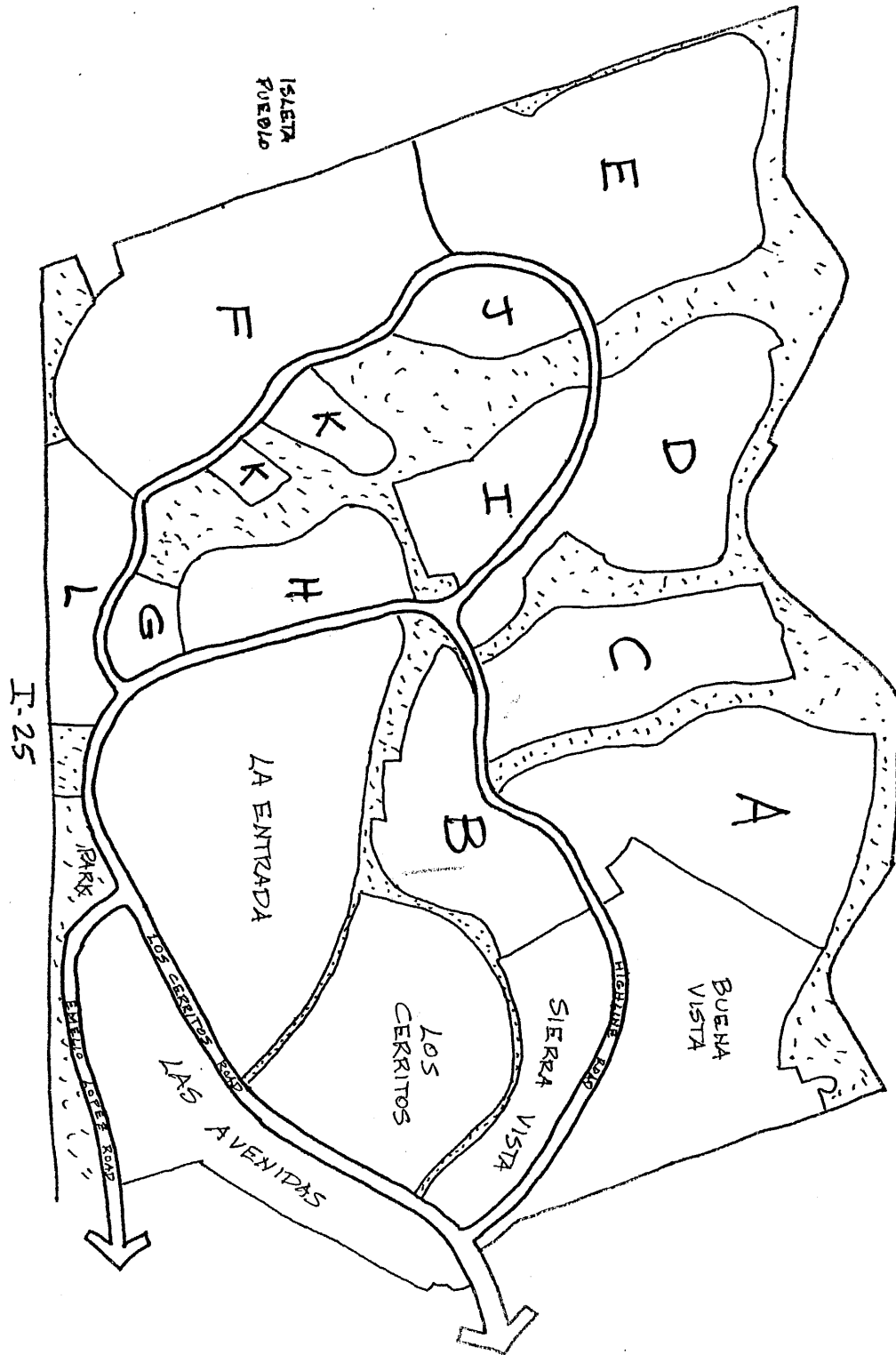


# “Fiesta” Development-Final-Parcels C,D,E,G,H,I,J,K,L



Site Plan

FIGURE 1



SITE PLAN  
 FIGURE NO.: 1B

V

LOG OF TEST HOLE NO. 1

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/25/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	19	R	115	1.7	1	SP	SAND, silty, fine to medium grained, slightly moist, light brown Silty to slightly silty, medium dense
10	15	R	96	1.9	1	SP-SM	SAND, slightly silty, fine grained, medium dense, slightly moist, very light brown
15	10	S		4.7			With thin lens of CLAY
20	31	S		0.9		SP	SAND, trace silt, fine grained, dense, slightly moist, very light brown
	21	S		2.5			Medium dense, with thin lens of SILT
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 2

V

LOG OF TEST HOLE NO. 2

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/25/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, slightly moist, light brown
5	11	R	104	3.1	1,2,5	SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, light brown
10	33	R	117	3.0	1	SM	SAND, silty to very silty, fine to medium grained, dense, slightly moist, light brown
15	17	S		1.6	1		Silty, medium dense, very light brown
20	14	S		1.3		SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, light brown
	14	S		1.1		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 3

V

LOG OF TEST HOLE NO. 3

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/25/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP- SM	SAND, slightly silty, fine grained, slightly moist, light brown
5	23	R	108	4.0	1	SM	SAND, silty, fine to medium grained, medium dense, slightly moist, light brown, with clayey lens
10	32	R	104	0.8	1	SP- SM	SAND, slightly silty, fine to medium grained, dense, slightly moist, very light brown
15	9	S		1.3		SP	SAND, trace silt, fine to medium grained, loose, slightly moist, very light brown
	16	S		1.6			Trace gravel, medium dense, with thin lens of clay
20	27	S		0.8			Fine grained, no gravel, no clay
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 4

V

LOG OF TEST HOLE NO. 4

&amp;

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/25/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
0						SP	SAND, slightly silty, fine grained, slightly moist, light brown
5	16	R	105	2.6	1,2,5	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown
	23	R	111	2.2	1		Silty
10	14	S		1.9	1		Silty to slightly silty, fine to coarse grained, trace gravel, medium moist
15							
	13	S		1.9		SP-SM	SAND, slightly silty, fine to coarse grained, trace gravel, medium dense, medium moist, light brown
20	10	S		2.0			Fine grained, no gravel, no clay
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 5

V

LOG OF TEST HOLE NO. 5

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/25/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine to medium grained, slightly moist, light brown
5	14	R	104	1.6	1	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown
	16	R	111	1.8	1,2,5		Silty, trace gravel
10	11	S		2.7			Slightly silty to silty
15	16	S		2.1		SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, light brown
20	21	S		2.0			
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 6

V

LOG OF TEST HOLE NO. 6

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/25/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, slightly moist, light brown
5	18	R	110	2.4	1	SM	SAND, silty, fine to medium grained, medium dense, slightly moist, light brown
	16	R	108	2.6	1		Slightly silty to silty
10	14	S		17.7			
15	15	S		2.2		SP- SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, light brown
20	13	S		4.2		SM	SAND, silty, fine to coarse grained, medium dense, slightly moist, light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 7



V

LOG OF TEST HOLE NO. 7

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/25/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, dry, very light brown
5	18	R	107	2.4	1	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown
	17	R	108	1.8	1	SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, light brown
10	8	S		1.6			Loose
15	6	S		1.8			
20	12	S		1.5			Medium dense, medium moist
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 8

V

**LOG OF TEST HOLE NO. 8**

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/25/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, dry, very light brown
5	9	R	102	1.3	1,2,5	SM	SAND, silty, fine to medium grained, loose, slightly moist, very light brown
	24	R	104	0.6	1		Silty to slightly silty, medium dense
10							
	11	S		2.3		SP-SM	SAND, slightly silty, fine to medium grained, trace gravel, medium dense, slightly moist, very light brown
15							
	20	S		1.6			Medium moist
20							
	19	S		1.6			
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

V

LOG OF TEST HOLE NO. 9

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/25/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine to medium grained, slightly moist, very light brown
5	19	R	100	3.1	1	SM	SAND, slightly silty to very silty, fine grained, medium dense, slightly moist, very light brown
	21	R	105	4.8	1,2,5		Silty, with lens of CLAY
10							
	20	S		1.1		SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, very light brown
15							
	14	S		1.2			
20							
	20	S		1.5		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
25							
							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 10

V

LOG OF TEST HOLE NO. 10

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/25/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	22	R	108	2.1	1	SM	SAND, silty, fine to medium grained, slightly moist, light brown Silty to slightly silty, trace gravel, medium dense, very light brown
10	25	R	109	4.3	1	SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, very light brown
15	15	S		1.9		SP	SAND, trace silt, fine to medium grained, trace gravel, medium dense, slightly moist, very light brown
20	16	S		15.5	1		With 3" lens of CLAY
	18	S		2.6			With silty lens
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 11

V

## LOG OF TEST HOLE NO. 11

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/26/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	26	R	102	3.7	1,2,5	SM	SAND, slightly silty to silty, fine grained, slightly moist, light brown Silty to very silty, medium dense
	24	R	109	1.6	1		Silty to slightly silty, fine to medium grained
15	11	S		1.2		SP	SAND, trace silt, fine to medium grained, medium dense, medium moist, very light brown
	21	S		1.4			
25	23	S		5.3		SP-SM	SAND, slightly silty, fine to coarse grained, trace gravel, medium dense, medium moist, very light brown, with thin lenses of CLAY
							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 12

V

## LOG OF TEST HOLE NO. 12

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K &amp; L

Project No.: 05-1-255

A Elevation - Top of Test Hole: Natural Ground

Date Drilled: 7/26/2005

Depth to Groundwater: Not Encountered

Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	39	R	113	3.1	1,2	SM	SAND, slightly silty to trace silt, fine grained, slightly moist, light brown Silty to very silty, dense
		R	103	2.7	1,2,5		Medium dense
15	22	S		1.2		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown, with very thin lens of CLAY
20	26	S		4.6		SM	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown, with very thin lens of CLAY
25	22	S		1.1		SP-SM	SAND, slightly silty, fine to coarse grained, trace gravel, medium dense, medium moist, very light brown, with thin lenses of CLAY
							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 13

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

13

"Fiesta" Development - Preliminary

Project: \_\_\_\_\_

Parcels C, D, E, G, H, I, J, K &amp; L

Project No.: \_\_\_\_\_

05-1-255

A Elevation - Top of Test Hole: \_\_\_\_\_

Natural Ground

Date Drilled: \_\_\_\_\_

7/26/2005

Depth to Groundwater: \_\_\_\_\_

Not Encountered

Drilling Method: \_\_\_\_\_

7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine grained, slightly moist, light brown
	35	R	107	10.5	1,2	SC-SM	SAND, clayey-silty, fine to medium grained, dense, slightly moist, light brown
5						CL	CLAY, silty, fine grained, slightly moist, brown
	15	R	10.8	3.2	1,2	SC-SM	SAND, very clayey-silty, fine to medium grained, medium dense, slightly moist, light pinkish gray
10	9	S		1.0		SP	SAND, trace silt, fine to medium grained, slightly moist, very light brown
							Loose
15	18	S		0.9			Medium dense
20	26	S		1.2			Fine to coarse grained, trace gravel, with 4" lens of CLAY
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 14

V

**LOG OF TEST HOLE NO.**

14

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L

Project No.: 05-1-255

A Elevation - Top of Test Hole: Natural Ground

Date Drilled: 7/26/2005

Depth to Groundwater: Not Encountered

Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	27	R	112	6.0	1	SM	SAND, slightly silty to silty, fine to medium grained, slightly moist, light brown Silty, medium dense, medium moist
	34	R	109	2.8	1		Dense Calcareous
15	11	S		2.3		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
	18	S		0.7			
	21	S		1.1			With silty lens
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 15



V

## LOG OF TEST HOLE NO. 15

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 A Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/26/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SM	SAND, slightly silty to silty, fine to medium grained, slightly moist, light brown
5	19	R	87	13.5	1,2,5	CL	CLAY, sandy, fine grained, very stiff, slightly moist, light brown
		B					
	17	R	110	3.4	1,2	SC	SAND, clayey, fine to medium grained, medium dense, slightly moist, brown
10	16	S		1.4		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown Medium dense
15		S					
20	13	S		0.8			
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 16

V

## LOG OF TEST HOLE NO. 16

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/26/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	38	R	111	2.2	1	SM	SAND, silty, fine grained, slightly moist, light brown Dense
	33	R	106	14.8	1,2	CL	CLAY, sandy, fine grained, hard, slightly moist, light brown
10		B		4.7	1,2	SC	SAND, very clayey, fine grained, slightly moist, light brown
15	14	S		1.1		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
20	15	S		3.1		SM	SAND, silty, fine grained, medium dense, slightly moist, very light brown
25	18	S		2.5		SP-SM	SAND, slightly silty, fine to coarse grained, trace gravel, medium dense, slightly moist, very light brown, with 2" CLAY lens Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 17

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

17

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/27/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
	16	R	107	3.5	1,2	SP-SM	SAND, slightly silty, fine to medium grained, slightly moist, light brown
						CH	CLAY, sandy, fine grained, very stiff, slightly moist, brown
5	16 NR	R		1.8	1	SP-SM	SAND, slightly silty, fine to medium grained, trace gravel, medium dense, slightly moist, light brown
		B					
10							
	17	S		1.2	1	SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
15							
	36	S		1.4		SP-SM	SAND, slightly silty, fine grained, dense, slightly moist, very light brown Very thin clay lenses
20							
	32	S		1.7		SP	SAND, trace silt, fine to medium grained, dense, slightly moist, very light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 18

V

## LOG OF TEST HOLE NO. 18

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 A Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/27/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description		
5	20	R	100	7.9	1	SM	SAND, silty, fine to medium grained, trace gravel, slightly moist, very light brown		
						CL	Medium dense CLAY, sandy, fine grained, slightly moist, brown		
10	31	R	99	11.5	1,2,5				
		B				14.0		CH	CLAY, sandy, fine grained, slightly moist, brown
		S				15.3	1,2		Hard
		B				15.2	1,2		
15	27	S	18.4				Very stiff, interbedded with fine grained sand		
20	24	S	15.1		1,2				
25							Bottom of hole at 21½'		
30									
35									

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 19

V

## LOG OF TEST HOLE NO. 19

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K &amp; L

Project No.: 05-1-255

A Elevation - Top of Test Hole: Natural Ground

Date Drilled: 7/27/2005

Depth to Groundwater: Not Encountered

Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SM	SAND, silty, fine to medium grained, trace gravel, slightly moist, very light brown
5	12	R	100	9.4	1,2	SC	SAND, clayey, fine to medium grained, trace gravel, medium dense, medium moist, light brown
10	16	R	103	0.9	1	SP-SM	SAND, slightly silty to trace silt, fine to medium grained, medium dense, medium moist, very light brown
15	13	S		1.9		SP	SAND, trace silt, fine to medium grained, medium dense, medium moist, very light brown, with very thin lens of CLAY
20	21	S		1.0			Fine grained
25	21	S		1.7			Fine to medium grained
30							Bottom of hole at 21½'
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 20

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

20

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/27/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine grained, slightly moist, light brown
5	20	R	109	2.3	1	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown
	17	R	109	2.1	1		
10	12	S		3.6	1		
15							
	17	S		1.0		SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, very light brown
20							
	19	S		0.5		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 21

V

## LOG OF TEST HOLE NO.

21

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/27/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description	
5	16	R	106	3.5	1	SP-SM	SAND, slightly silty, fine grained, slightly moist, light brown	
							Fine to medium grained, medium dense, with clayey lens	
10	17	R	112	2.8	1	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown	
	11	S					3.3	Silty, with very thin lens of sandy SILT
	14	S					2.8	
15	15	S		4.1		SC	SAND, clayey, fine to medium grained, medium dense, medium moist, light brown	
25							Bottom of hole at 21½'	
30								
35								

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 22

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

22

"Fiesta" Development - Preliminary

Project: Parcels C, D, E, G, H, I, J, K & L Project No.: 05-1-255  
 A Elevation - Top of Test Hole: Natural Ground Date Drilled: 7/27/2005  
 Depth to Groundwater: Not Encountered Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, slightly moist, light brown
5	19	R	107	2.7	1,2,5	SM	SAND, silty, fine to medium grained, medium dense, slightly moist, light brown
10	21	R	101	3.6	1	SP-SM	SAND, slightly silty to silty, fine grained, medium dense, slightly moist, very light brown, with lens of CLAY
15	15	S		1.3			
20	16	S		1.0		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
	27	S		1.0			
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 23



V

## LOG OF TEST HOLE NO.

23

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K &amp; L

Project No.: 05-1-255

A Elevation - Top of Test Hole: Natural Ground

Date Drilled: 7/27/2005

Depth to Groundwater: Not Encountered

Drilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine to medium grained, dry, very light brown
5	37	R	100	9.2	1,2	CL	CLAY, sandy, fine grained, hard, slightly moist, light brown, interbedded with fine grained SAND
	27	R	101	17.0	1,2,5	CH	CLAY, sandy, fine grained, very stiff, slightly moist, brown, with lens of fine grained SAND
10	28	S		17.0	1,2		
15		B		11.3	1	SC	SAND, very clayey, fine grained, slightly moist, brown
	20	S		0.9		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
20							
	26	S		0.8		SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, very light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 24

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

24

"Fiesta" Development - Preliminary

&amp;

Project: \_\_\_\_\_ Parcels C, D, E, G, H, I, J, K &amp; L

Project No.: \_\_\_\_\_ 05-1-255

A Elevation - Top of Test Hole: \_\_\_\_\_ Natural Ground

Date Drilled: \_\_\_\_\_ 7/27/2005

Depth to Groundwater: \_\_\_\_\_ Not Encountered

Drilling Method: \_\_\_\_\_ 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
5	14	R	104	5.7	1	SP- SM	SAND, slightly silty, fine to medium grained, slightly moist, light brown Medium dense, with CLAY lens
	9 NR	R	1.2				Loose
		B					
15	14	S		1.1		SP	SAND, trace silt, fine to medium grained, medium dense, slightly moist, very light brown
	23	S		0.7			
20	23	S		12.2			With 6" lens of CLAY
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 25

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

25

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/27/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP-SM	SAND, slightly silty, fine to medium grained, slightly moist, light brown
5	21	R	105	2.9	1	SM	SAND, silty, fine to medium grained, medium dense, slightly moist, light brown
10	16	R	103	0.7	1	SP-SM	SAND, slightly silty, fine to medium grained, trace gravel, slightly moist, light brown
15	9	S		0.9			Fine to coarse grained, loose, medium moist, very light brown
20	20	S		1.8			Fine grained, medium dense, slightly moist, with 6" lens of CLAY
	34	S		1.4		SP	SAND, trace silt, fine to medium grained, dense, medium moist, very light brown
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: \_\_\_\_\_ 26

V

## LOG OF TEST HOLE NO. \_\_\_\_\_

26

"Fiesta" Development - Preliminary

&amp;

Project: Parcels C, D, E, G, H, I, J, K & LProject No.: 05-1-255A Elevation - Top of Test Hole: Natural GroundDate Drilled: 7/27/2005Depth to Groundwater: Not EncounteredDrilling Method: 7" H.S.A.

Depth, feet	Blows/Foot	Sample Type	Dry Density pcf	Water Content, %	Additional Testing	Unified Classification	Material Description
						SP	SAND, trace silt, fine to medium grained, slightly moist, light brown
	16	R	110	2.2	1	SM	SAND, slightly silty to silty, fine to medium grained, medium dense, slightly moist, light brown
5						CL	CLAY, sandy, fine grained, very stiff, slightly moist, light brown
	27	R	101	8.4	1,2,5		Interbedded with fine grained SAND
10							
	30	S		19.0	1,2	CH	CLAY, sandy, fine grained, hard, slightly moist, brown
15						SC	SAND, clayey, fine grained, slightly moist, light brown
	15	S		0.9		SP- SM	SAND, slightly silty, fine grained, medium dense, slightly moist, very light brown
20							
	15 NR	S					
25							Bottom of hole at 21½'
30							
35							

ADDITIONAL TESTS: 1= Sieve Analysis 2= Atterberg Limits 3=Direct Shear 4=R-Value 5=Other

Figure: 27

## NOTES - LOGS OF TEST HOLES

Test hole locations were determined by compass bearing and pacing distances from known topographic points.

"Drilling Method" refers to the equipment utilized to advance the test hole. A six-inch outside diameter, continuous flight, hollowstem auger was utilized.

"S" under "Sample Type" indicates a Standard Penetration test (ASTM D-1586). The Standard Penetration sampler is 2 inches in outside diameter and 1 3/8 inches inside diameter.

"R" under "Sample Type" indicates a 3-inch outside diameter by 2.5-inch inside diameter sampler. The sampler is lined with 1-inch high brass rings.

"B" under "Sample Type" indicates a bulk sample.

"Blows Per Foot" indicates the number of blows of a 140-pound hammer falling 30 inches required to drive the indicated sampler 12 inches.

"NR" under "Blows/Foot" indicates that no sample was recovered.

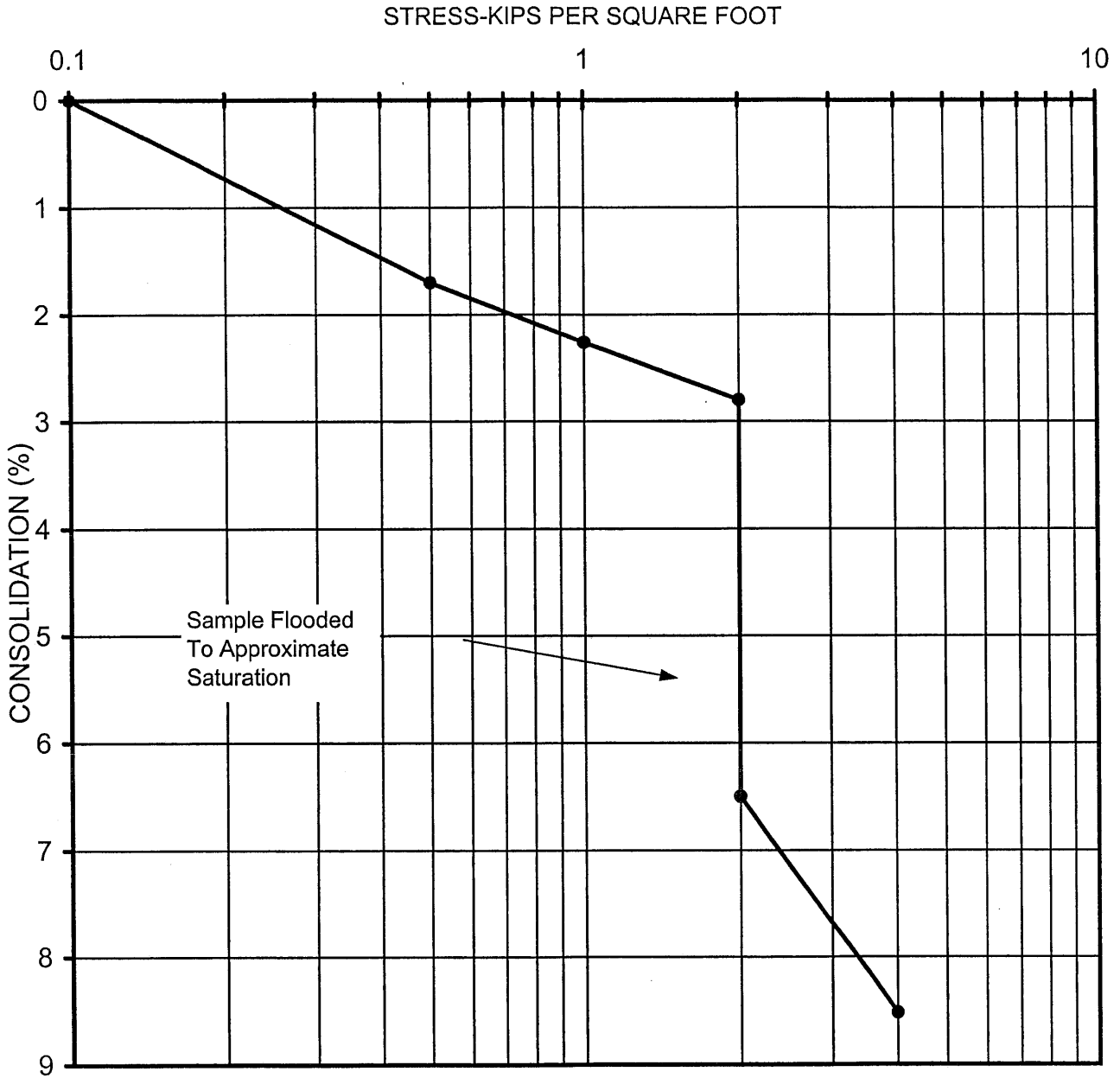
"Dry Density PCF" indicates the laboratory determined soil dry density in pounds per cubic foot.

"Water Content %" indicates the laboratory determined soil moisture content in percent (ASTM D-2216).

"Unified Classification" indicates the field soil classification as per ASTM D-2488. When appropriate, the field classification is modified based upon subsequent laboratory tests.

Variations in soil profile, consistency, and moisture content may occur between test holes. Subsurface conditions may also vary between test holes and with time.

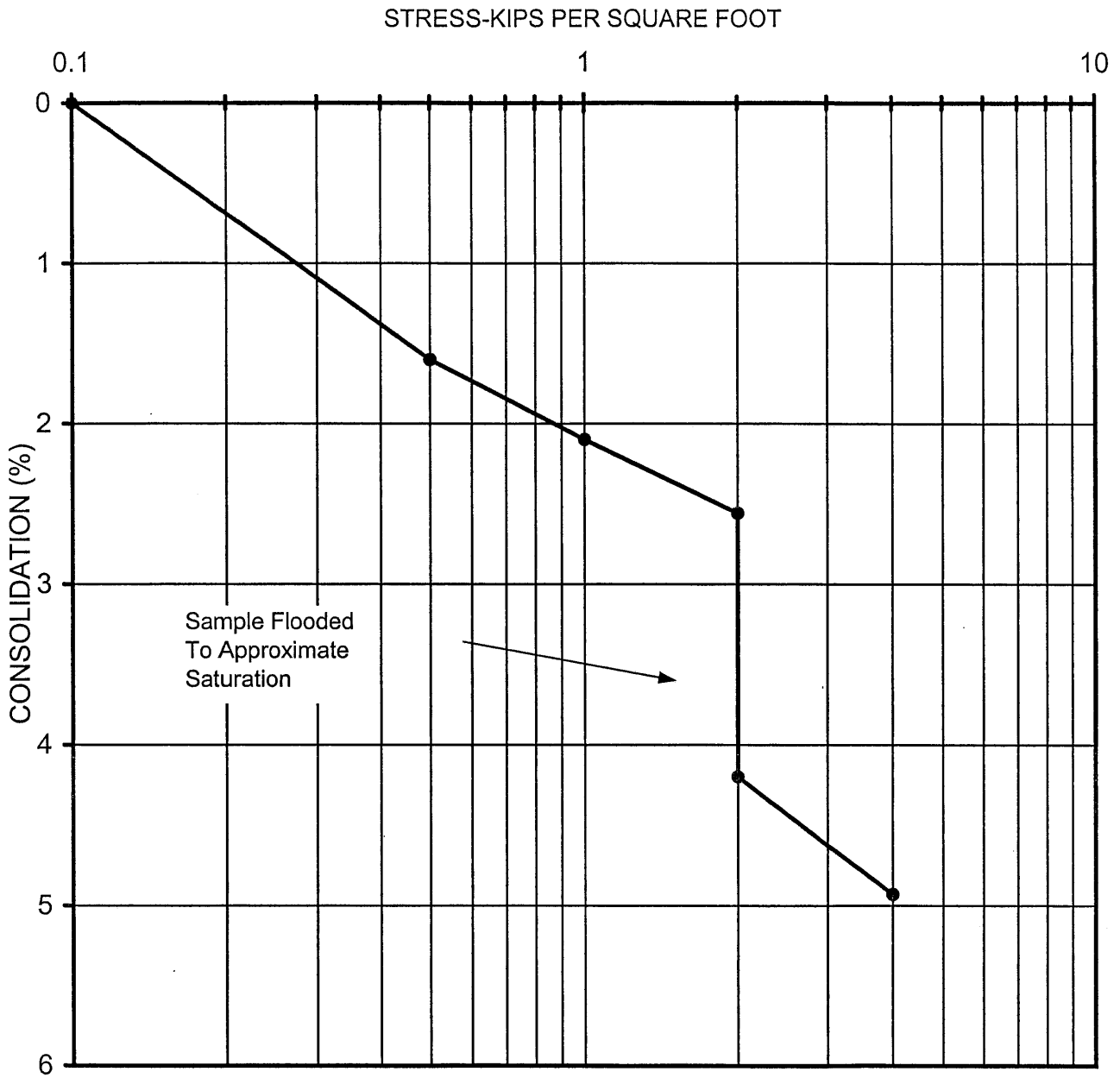
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 2  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: SM  
SOIL DESCRIPTION: SAND, silty  
MOISTURE CONTENT (%): 3.1  
DRY DENSITY: 104 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-255  
Figure Number : 29

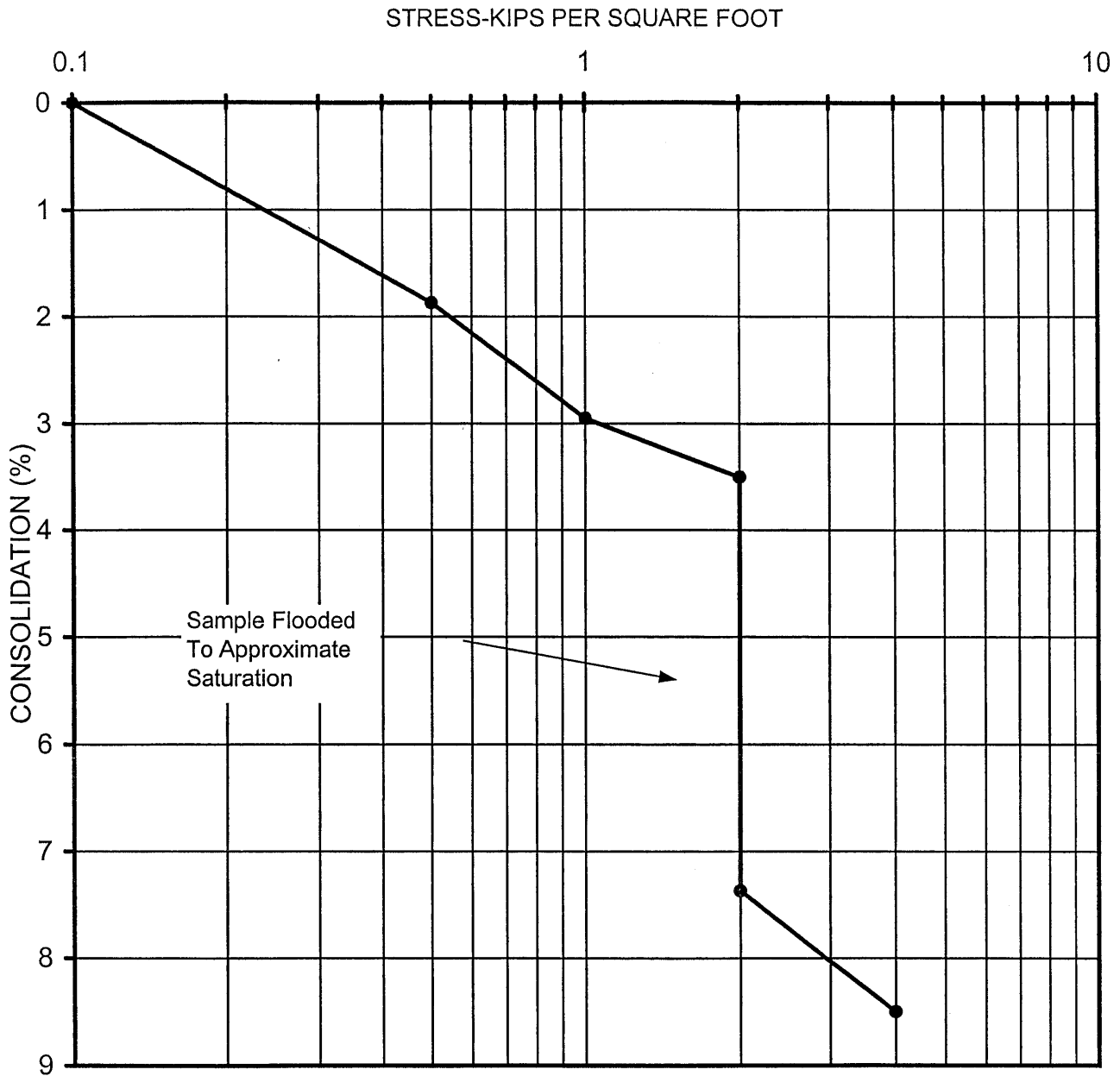
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 4  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: SP-SM  
SOIL DESCRIPTION: SAND, slightly silty  
MOISTURE CONTENT (%): 2.6  
DRY DENSITY: 105 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-255  
Figure Number : 30

# CONSOLIDATION TEST RESULTS

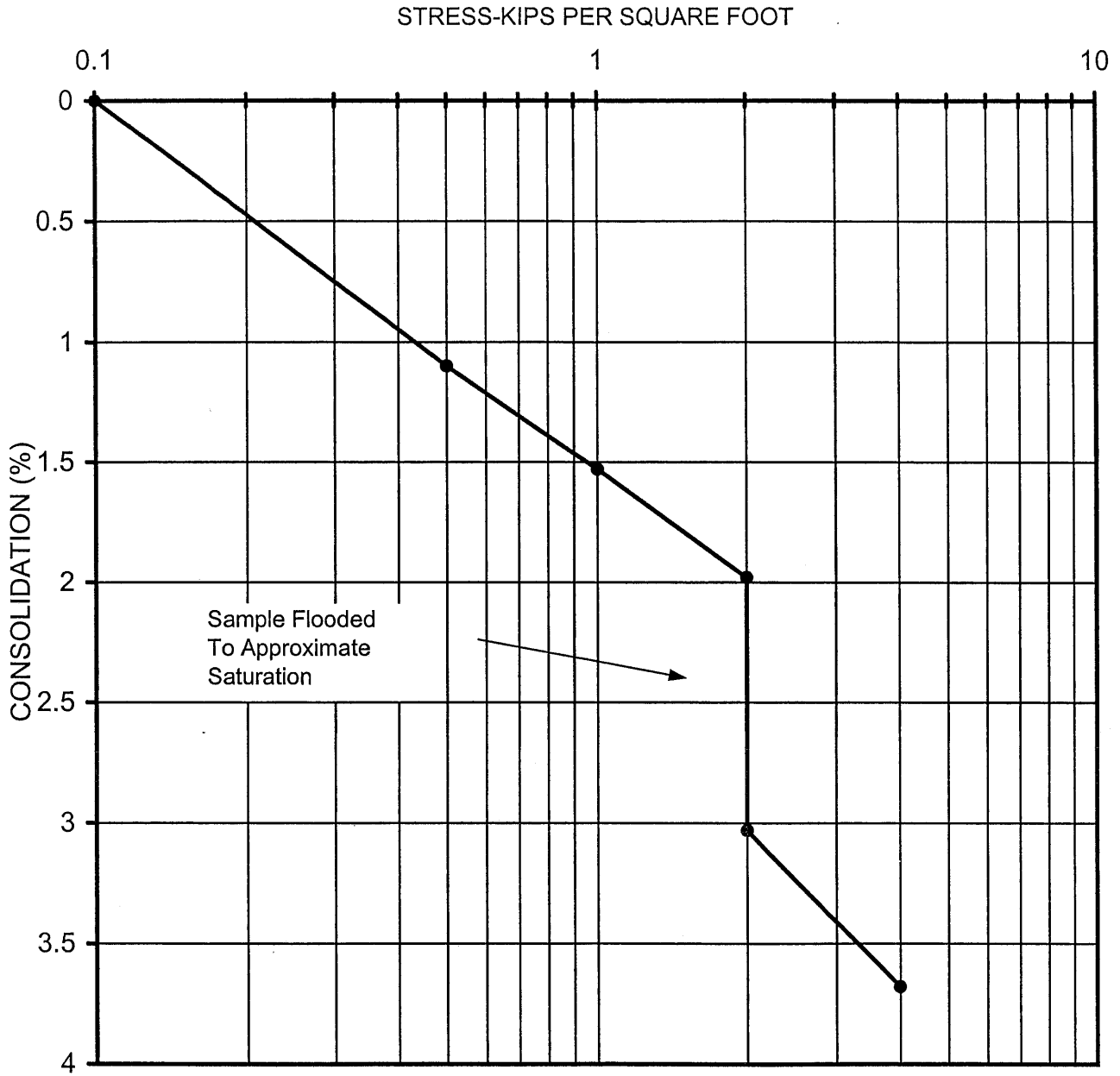


TEST HOLE NUMBER: 5  
SAMPLE DEPTH: 5 FEET  
SOIL CLASSIFICATION: SP-SM  
SOIL DESCRIPTION: SAND, slightly silty  
MOISTURE CONTENT (%): 1.8  
DRY DENSITY: 111 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-255  
Figure Number : 31



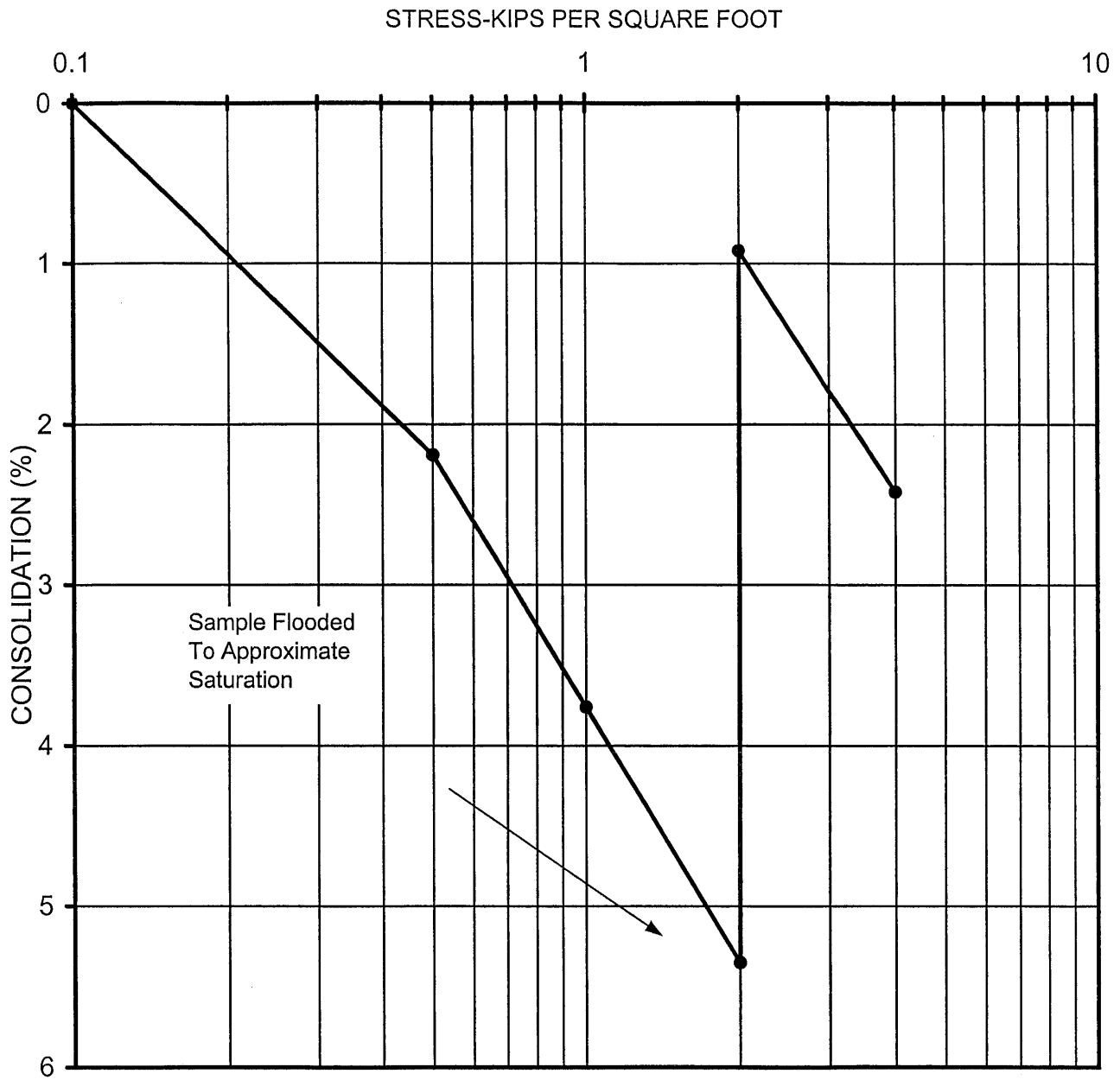
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 8  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: SP-SM  
SOIL DESCRIPTION: SAND, slightly silty  
MOISTURE CONTENT (%): 1.3  
DRY DENSITY: 102 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-255  
Figure Number : 32

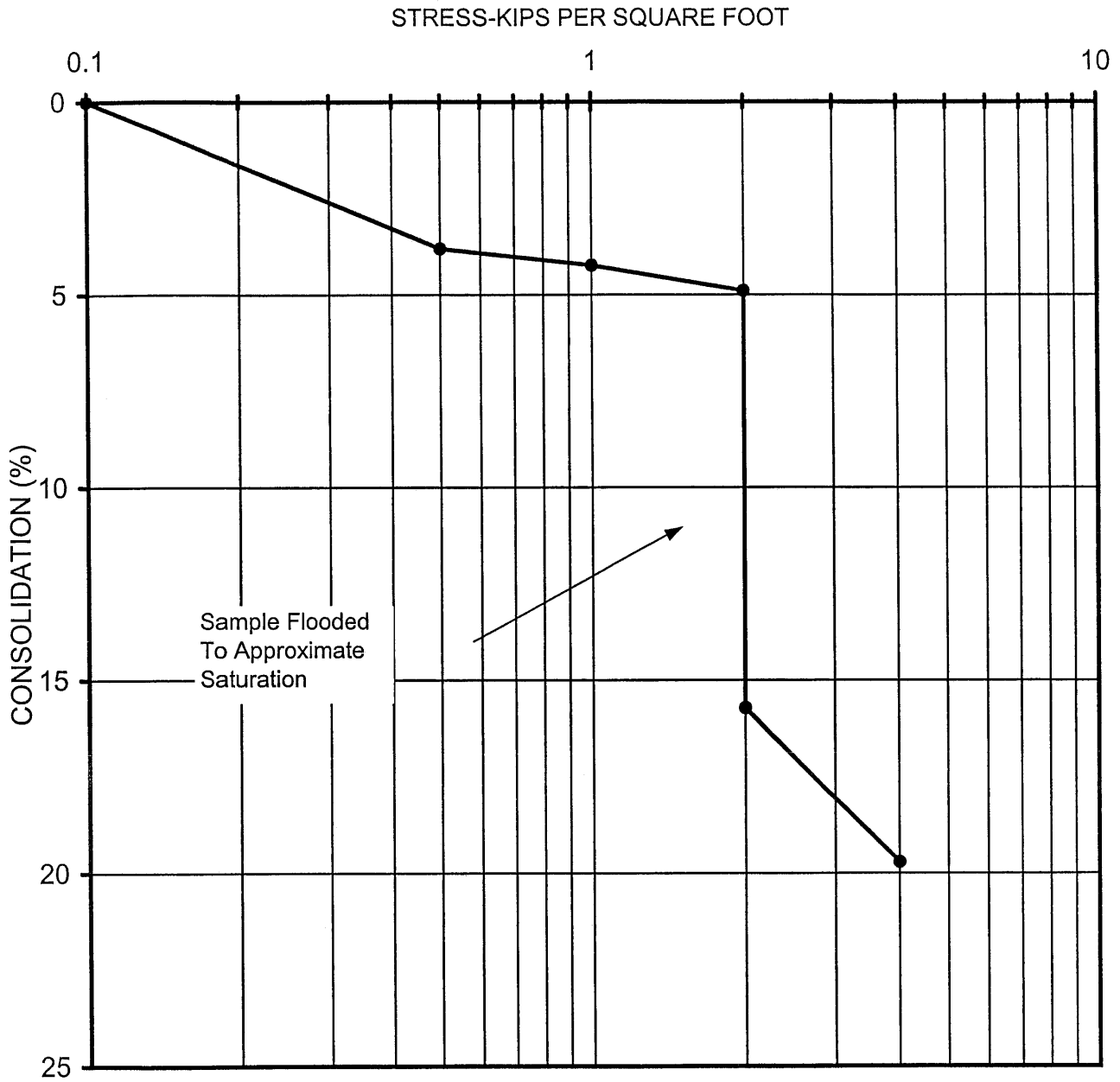
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 9  
SAMPLE DEPTH: 5 FEET  
SOIL CLASSIFICATION: CL-CH  
SOIL DESCRIPTION: CLAY

Vinyard & Associates, Inc.  
Project No. 05-1-255  
Figure Number : 33

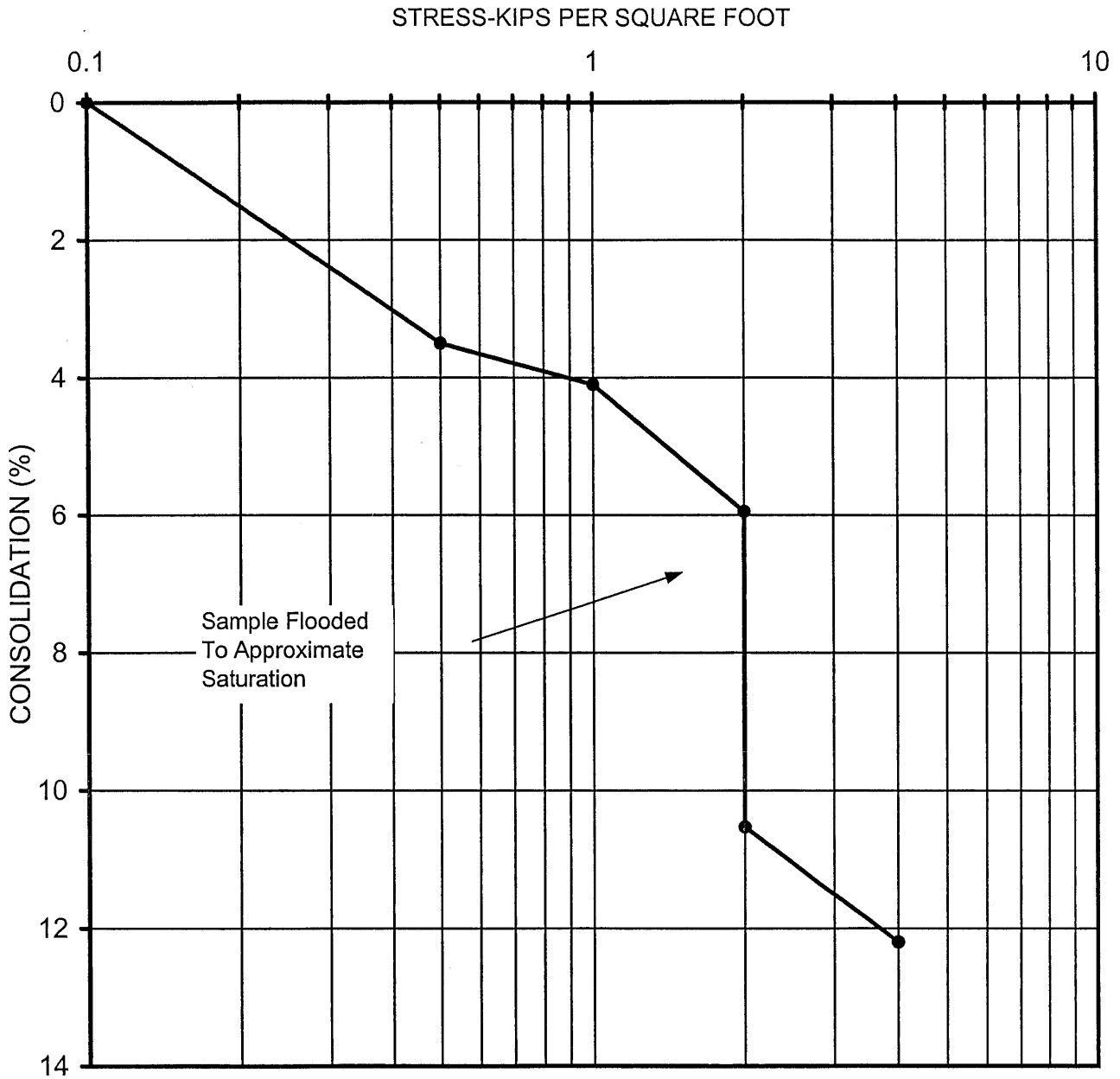
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 11  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: SP  
SOIL DESCRIPTION: SAND  
MOISTURE CONTENT (%): 3.7  
DRY DENSITY: 102 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 34

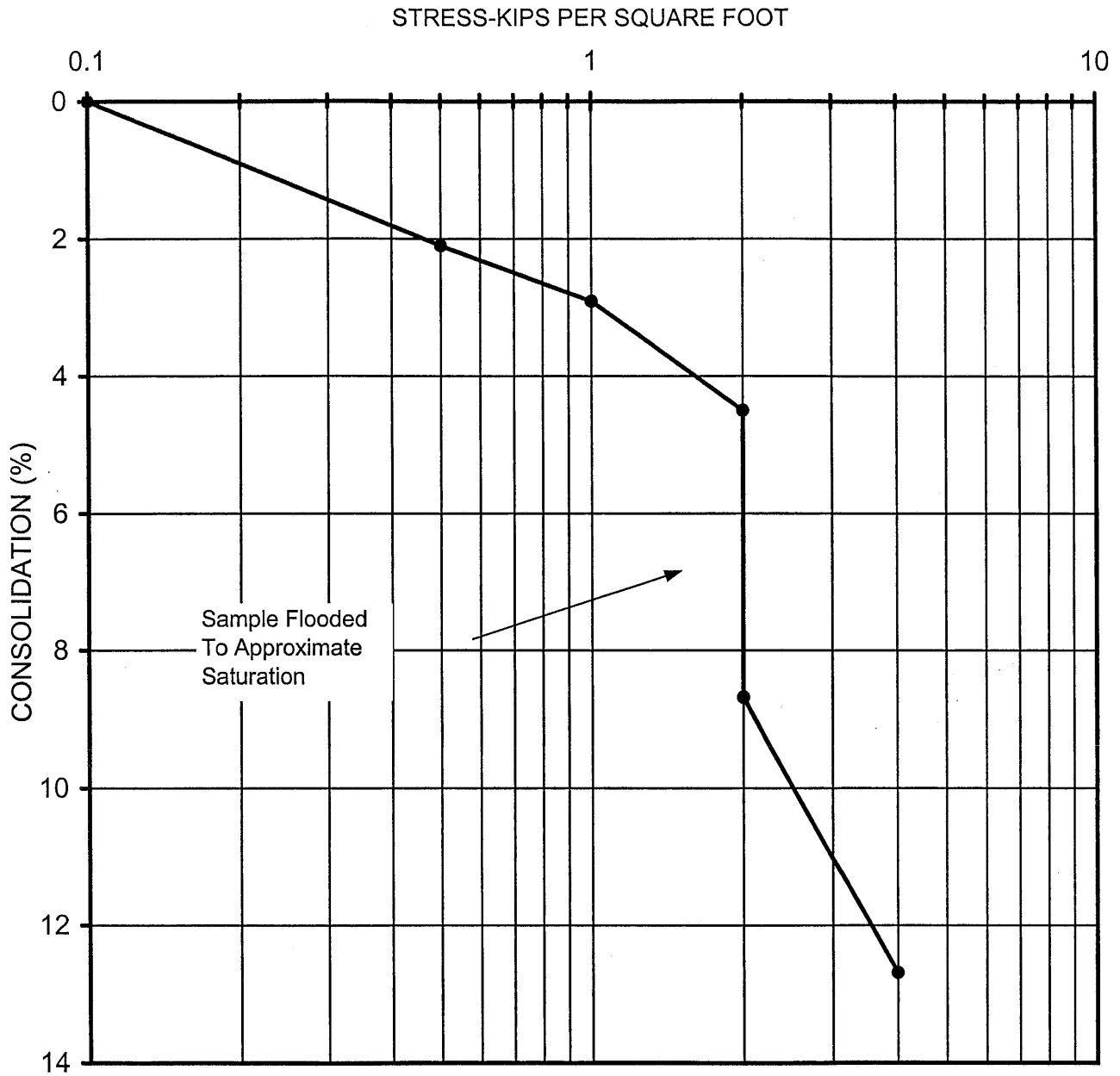
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 12  
SAMPLE DEPTH: 5 FEET  
SOIL CLASSIFICATION: SM  
SOIL DESCRIPTION: SAND, silty  
MOISTURE CONTENT (%): 2.7  
DRY DENSITY: 103 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 35

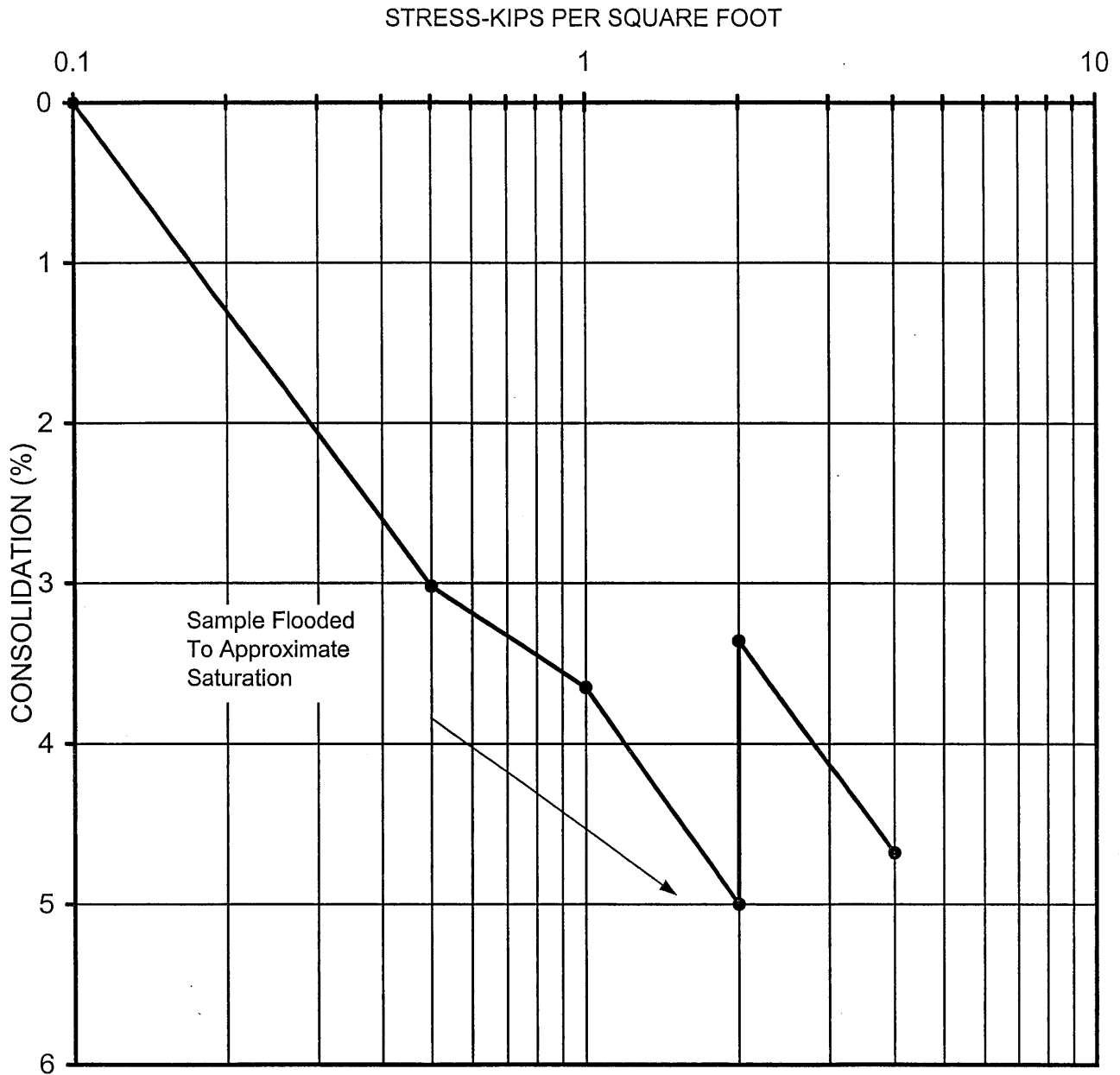
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 15  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: CH  
SOIL DESCRIPTION: CLAY  
MOISTURE CONTENT (%): 13.5  
DRY DENSITY: 87 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 36

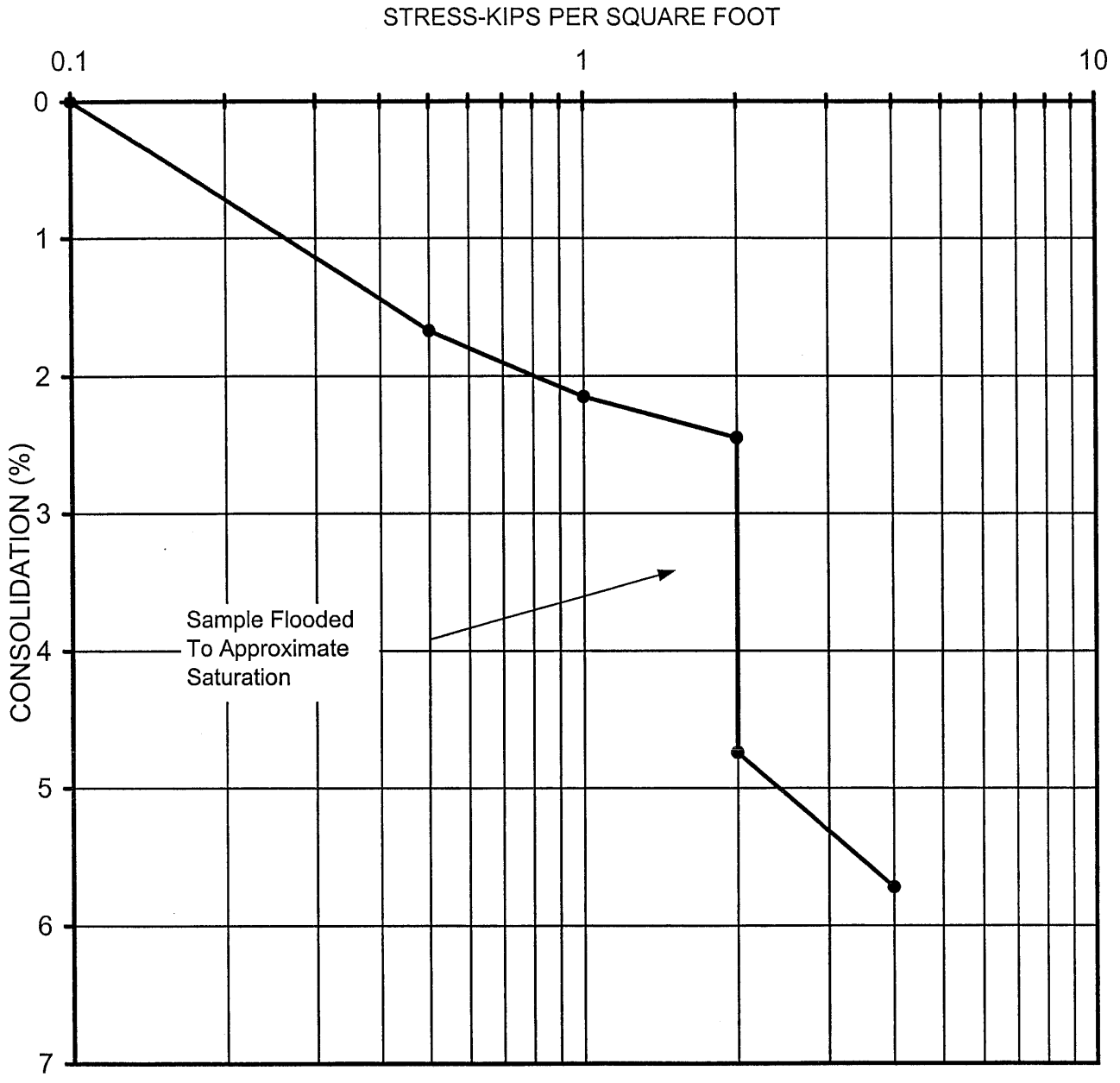
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 18  
SAMPLE DEPTH: 5 FEET  
SOIL CLASSIFICATION: CL  
SOIL DESCRIPTION: CLAY  
MOISTURE CONTENT (%): 11.5  
DRY DENSITY: 99 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 37

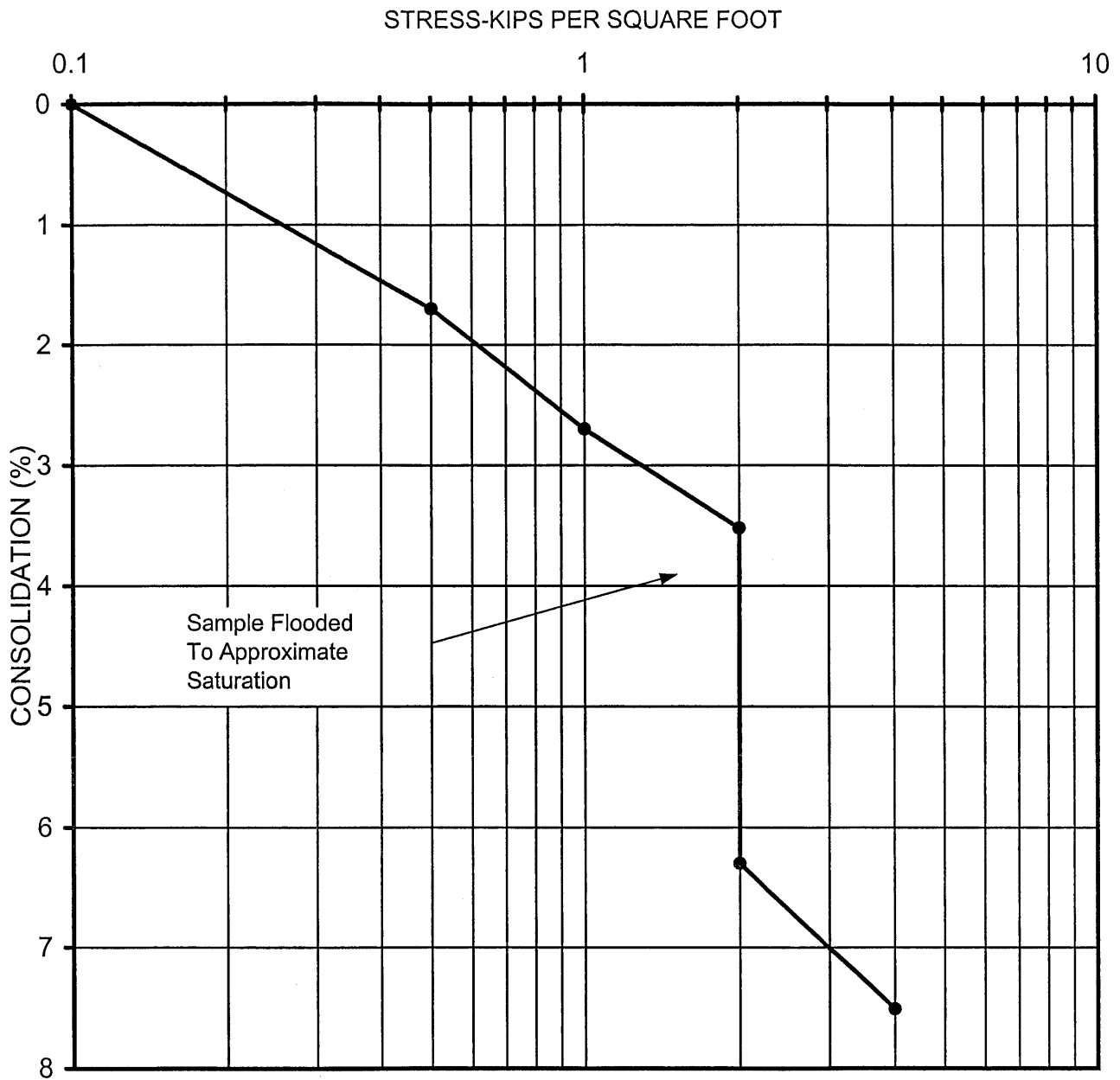
# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 22  
SAMPLE DEPTH: 2 FEET  
SOIL CLASSIFICATION: SM  
SOIL DESCRIPTION: SAND, silty  
MOISTURE CONTENT (%): 2.7  
DRY DENSITY: 107 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 38

# CONSOLIDATION TEST RESULTS



TEST HOLE NUMBER: 23  
SAMPLE DEPTH: 5 FEET  
SOIL CLASSIFICATION: CH  
SOIL DESCRIPTION: CLAY  
MOISTURE CONTENT (%): 17.0  
DRY DENSITY: 101 lbs/cu ft

Vinyard & Associates, Inc.  
Project No. 05-1-189  
Figure Number : 39



# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
1	2	SP-SM	115	1.7			100	99	86	80	71	41	12	6.4	SAND, slightly silty		
1	5	SM	96	1.9								100	79	13.3	SAND, silty		
1	10			4.7													
1	15			0.9													
1	20			2.5													
2	2	SM	104	3.1	NV	NP				100	99	88	47	16.0	SAND, silty		
2	5	SM	117	3.0			100	99	99	97	93	69	30	14.1	SAND, silty		
2	10			1.6													
2	15			1.3													
2	20			1.1													
3	2	SM	108	4.0						100	98	87	50	31.6	SAND, silty		
3	5	SP	104	0.8							100	86	18	3.2	SAND		
3	10			1.3													
3	15			1.6													
3	20			0.8													
4	2	SP-SM	105	2.6	NV	NP					100	94	37	8.0	SAND, slightly silty		
4	5	SP-SM	111	2.2						100	99	75	30	11.0	SAND, slightly silty		
4	10			1.9													
4	15			1.9													
4	20			2.0													

V & A Project No.: 05-1-255

Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L

Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description							
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200								
5	2	SP-SM	104	1.6														100	99	68	24	7.6	SAND, slightly silty	
5	5	SP-SM	111	1.8	NV	NP												100	97	70	28	10.3	SAND, slightly silty	
5	10			2.7																				
5	15			2.1																				
5	20			2.0																				
6	2	SM	110	2.4														100	99	78	36	14.7	SAND, silty	
6	5	SM	108	2.6														100	99	86	39	14.7	SAND, silty	
6	10			17.7																				
6	15			2.2																				
6	20			4.2																				
7	2	SP-SM	107	2.4						100	99	99	98	97	87	52								SAND, slightly silty
7	5	SP-SM	103	1.8										100	95	52								SAND, slightly silty
7	10			1.6																				
7	15			1.8																				
7	20			1.5																				
8	2	SP-SM	102	1.3	NV	NP																		SAND, slightly silty
8	5	SP	104	0.6																				SAND
8	10			2.3																				
8	15			1.6																				
8	20			1.6																				

V & A Project No.: 05-1-255

Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description			
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200				
					9	2	SM	100	3.1											100
9	5	SM	105	4.8	NV	NP					100	99	99	98	89	46	23.7	SAND, silty		
9	10			1.1																
9	15			1.2																
9	20			1.5																
10	2	SM	108	2.1							100	99	99	96	73	28	14.7	SAND, silty		
10	5	SM	109	4.3							100	99	97	90	62	28	23.2	SAND, silty		
10	10			1.9																
10	15			15.5																
10	20			2.6																
11	2	SP	102	3.7	NV	NP					100	99	99	97	74	17	2.1	SAND		
11	5	SM	109	1.6										100	87	51	31.4	SAND, silty		
11	10			1.2																
11	15			1.4																
11	20			5.3																
12	2	SM	113	3.1	NV	NP								100	86	51	29.6	SAND, silty		
12	5	SM	103	2.7	NV	NP								100	89	54	27.2	SAND, silty		
12	10			1.2																
12	15			4.6																
12	20			1.1																

05-1-255

Project : "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L

Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description		
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200			
13	2	ML	107	10.5	NV	NP					100	99	98	95	85	67	59.6	SILT, very sandy	
13	5	SM	108	3.2	NV	NP						100	99	93	58	28	17.0	SAND, silty	
13	10			1.0															
13	15			0.9															
13	20			1.2															
14	2	SM	112	6.0								100	98	86	55	36.5		SAND, silty	
14	5	SM	109	2.8								100	99	80	39	21.4		SAND, silty	
14	10			2.3															
14	15			0.7															
14	20			1.1															
15	2	CH	87	13.5	59	43								100	98	95.5		CLAY	
15	4	CH		9.2										100	98	92	86.2		CLAY, sandy
15	5	ML	110	3.4	17	NP							100	99	90	87	50.7		SILT, very sandy
15	10			1.4															
15	15	CL		20.6	49	25					100	99	98	96	92	89	55.6		CLAY, very sandy
15	20			0.8															
16	2	SM	111	2.2									100	98	81	32	15.8		SAND, silty
16	5	CL	106	14.8	44	28								100	98	91	88.2		CLAY, sandy
16	7	SC		4.7	21	8						100	99	88	57	42.9			SAND, clayey
16	10			1.1															

V & A Project No.: 05-1-255

Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L

Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description							
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200								
16	15			3.1																				
16	20			2.5																				
17	2	SM	107	3.5	NV	NP											100	98	66	26	19.3	SAND, silty		
17	6	SP-SM		1.8													100	97	57	13	9.5	SAND, slightly silty		
17	10	SP		1.2													100	98	78	18	4.6	SAND, trace silt		
17	15			1.4																				
17	20			1.7																				
18	2	CL	100	7.9														100	95	78	72.7	CLAY, sandy		
18	5	CL	99	11.5	38	21														100	99.9	CLAY		
18	7			14.0																				
18	10	CL		15.3	41	22													100	98	95.0	CLAY		
18	13	CL		15.2	49	36													100	99	94.0	CLAY		
18	15			18.4																				
18	20	CL		15.1	36	19												100	99	98	95.5	CLAY		
19	2	SM-SC	100	9.4	19	6					100	99	99						75	50	46.4	SAND, silty-clayey		
19	5	SP	103	0.9															78	13	1.6	SAND		
19	10			1.9																				
19	15			1.0																				
19	20			1.7																				

V & A Project No.: 05-1-255

Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L

Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT									Description			
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100		No. 200		
20	2	SM	109	2.3											100	86	36	13.9	SAND, silty
20	5	SM	109	2.1				100	99	99					97	77	28	12.3	SAND, silty
20	10	SM		3.6						100				98	78	45	25.2		SAND, silty
20	15			1.0															
20	20			0.5															
21	2	SM	106	3.5										100	94	57	33.3		SAND, silty
21	5	SM	112	2.8				100	99	99				92	69	29	15.8		SAND, silty
21	10			3.3															
21	15			2.8															
21	20			4.1															
22	2	SM	107	2.7	NV	NP								100	99	44	14.9		SAND, silty
22	5	SM	101	3.6				100	99	99				99	90	30	17.5		SAND, silty
22	10			1.3															
22	15			1.0															
22	20			1.0															
23	2	ML-CL	100	9.2	30	7								100	99	99	94.3		SILT-CLAYEY
23	5	CH	101	17.0	50	36										100	99.1		CLAY
23	10	CL		17.0	22	12									100	97	94.9		CLAY
23	13	CL		11.3												98	83.5		CLAY
23	15			0.9															

V & A Project No.: 05-1-255

Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L

Table No. : 1

# SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT									Description					
					LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100		No. 200				
23	20			0.8																	
24	2	SM	104	5.7						100	99	98	93	74	41	30.4				SAND, silty	
24	6			1.2																	
24	10			1.1																	
24	15			0.7																	
24	20			12.2																	
25	2	SM	105	2.9								100	99	93	53	23.2				SAND, silty	
25	5	SP	103	0.7								100	99	71	9	2.3				SAND	
25	10			0.9																	
25	15			1.8																	
25	20			1.4																	
26	2	SM	110	2.2																	SAND, silty
26	5	CL	101	8.4										100	98	72.5					CLAY, sandy
26	10	CH		19.0										100	99	97.6					CLAY
26	15			0.9																	

V & A Project No.: 05-1-255  
 Project: "Fiesta" Development - Preliminary - Parcels C, D, E, G, H, I, J, K, L  
 Table No. : 1

## Appendix

### EARTHWORK PROCEDURES

#### General

The Geotechnical Engineer shall be the Owner's representative to observe and evaluate the earthwork operations. The Contractor shall cooperate with the Geotechnical Engineer in the performance of the Engineer's duties.

#### Clearing and Grubbing

Prior to placing structural fill all borrow areas and areas to receive structural fill shall be stripped of vegetation and deleterious materials. Strippings shall be hauled offsite or stockpiled for subsequent use in landscaped areas or non structural fill areas as designated by the Owner or his representative and approved by the Geotechnical Engineer.

#### Site Preparation - Fill Areas

Prior to placing structural fill the areas to be filled shall be scarified to a depth of eight inches and moisture conditioned as described below. The area to be filled shall then be compacted to a minimum of 95 percent of maximum density as determined by ASTM D-1557. If vibratory compaction techniques pose a threat to the structural integrity of near by facilities a static compactor shall be used. Any soft or "spongy" areas shall be removed as directed by the Geotechnical Engineer and replaced with structural fill as described herein.

#### Site Preparation - Cut Areas

Following excavation to rough grade all building and pavement areas shall be scarified to a depth of eight inches and moisture conditioned as described below. All building and paved areas shall be compacted to a minimum of 95 percent of maximum density as determined by ASTM D-1557. If vibratory compaction techniques pose a threat to the structural integrity of near by facilities a static compactor shall be used. Any soft or "spongy" areas shall be removed as directed



by the Geotechnical Engineer and replaced with structural fill as described herein.

### Foundation, Slab and Pavement Subgrade Preparation

Prior to placing reinforcement, footings, slabs, or pavement the supporting soils shall be prepared, moisture conditioned and compacted as described herein.

### Fill Material

Fill material shall be non expansive soil which may be gravel, sand, silt or clay or a combination there of.

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
4"	100
1"	90-100
No. 4	70-100
No. 200	10-40

Fill material shall exhibit a plasticity index of ten or less. No organic, frozen or decomposable material shall be utilized. All fill material shall be approved by the Geotechnical Engineer.

### Fill Placement

Fill material shall be blended as necessary to produce a homogeneous material. Fill material shall be spread in horizontal lifts no greater than eight inches in uncompacted thickness but in no case thicker than can be properly compacted with the equipment to be utilized. If fill is to be placed on slopes steeper than 5:1 (horizontal:vertical) the natural ground shall be benched with minimum three foot wide benches at maximum two foot vertical intervals.

## Moisture Conditioning

Fill material shall be dried or moistened as necessary, prior to compacting, to within  $\pm$  three percent of optimum moisture content as determined by ASTM D-1557. Moisture shall be distributed uniformly throughout each lift.

## Compaction

Structural fill shall be mechanically compacted to the following:

	Minimum Compaction <u>ASTM D-1557</u>
Foundation Support	95%
Slab Support	95%
Below Slab Utility Trenches	90%
General Site Grading	90%
Pavement Support	
Upper 8" of Subgrade	95%
All other fill below pavement	90%

Aggregate Base Course shall be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

Asphaltic concrete shall be compacted to a minimum of 96% of maximum Marshall Density (75 Blows).

Compaction by flooding and jetting is specifically prohibited unless authorized in advance by the Owner or his representative and the Geotechnical Engineer.

## Observation and Testing

The Geotechnical Engineer or his representative shall perform field density tests with a frequency and at the locations he feels appropriate. The Geotechnical Engineer or his representative will perform Proctor tests on representative samples of all fill material. To minimize delays the Earthwork Contractor is encouraged to submit soil samples prior to use for proctor testing.