GEOTECHNICAL ENGINEERING STUDY

for the proposed
Durock Road Widening
Barnett Business Park, Unit II
Shingle Springs, El Dorado County, California

CARLTON
Engineering Inc.

Prepared for:
KRFD Investments
P. O. Box 1983
Placerville, CA 95667

February 2004
Project No. 3065-02-03

3883 Ponderosa Road Shingle Springs, CA 95682 Tel: (530) 677-5515 Fax: (530) 677-6645 www.carlton-engineering.com

February 24, 2004

Project No. 3065-02-03

KRFD Investments
P. O. Box 1983
Placerville, California 95667

CARLTON
Engineering Inc.

Attention: Mr. Ken Wilkinson

Re: Geotechnical Engineering Study
Proposed Durock Road Widening
Shingle Springs, California

Dear Mr. Wilkinson:

Carlton Engineering, Inc. (Carlton) is pleased to present the attached report containing the results of our geotechnical engineering study for the proposed Durock Road Widening project at the intersection of Durock Road and Business Drive in El Dorado County, California. It is our understanding that the proposed site improvements include the construction of a new turnout lane and a signalized intersection. The study was conducted in accordance with the Scope of Work presented in our Additional Work Authorization, dated September 22, 2003.

The accompanying report presents our findings, conclusions and recommendations developed from our geotechnical engineering study. Contained in the report are geotechnical design criteria and recommendations for site grading and earthwork, as well as recommendations for design of the proposed pavement section. The results of subsurface exploration and laboratory testing programs, which form the basis of our conclusions and recommendations, are also included in the report. On the basis of our study, the site is suitable, from a geotechnical perspective, to receive the planned improvements provided the recommendations included in this report are adhered to.

If you have any questions regarding the information contained in this report, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
CARLTON ENGINEERING, INC.

Dana Dean, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
DANA A. DEAN
58888
Exp. 06/30/07
CIVIL
STATE OF CALIFORNIA

Richard Church
Senior Staff EIT

TABLE OF CONTENTS

This report presents our findings, conclusions, and recommendations developed from our geotechnical study. The study was conducted in accordance the Scope of Work presented in our Additional Work Authorization, dated September 22, 2003. The report also contains the results of the field exploration and laboratory testing programs upon which our recommendations are based.

1.1 PROJECT DESCRIPTION

Our understanding of the proposed project is based on a preliminary grading plan prepared by Carlton Engineering Inc. (Carlton), undated, for the proposed project, and on conversations with Mssrs. Carl Damoude and Austin Roundtree of Carlton. The project consists of constructing a new turnout lane and signals at the intersection of Durock Road and Business Drive. Cuts and fills on the order of 10 feet are expected. It is our understanding that the existing drive lanes of Durock Road will receive a 2-inch-thick Asphalt Concrete (AC) overlay and approximately 50 centerline feet of Business Drive will be reconstructed. Drainage improvements will comprise the remainder of the project.

1.2 PURPOSE AND SCOPE OF WORK

The purpose of this study was to evaluate the suitability of the project site, from a geotechnical perspective, for the proposed improvements. The main objectives of the study were to characterize the subsurface materials, perform engineering analyses, develop geotechnical recommendations and criteria to be used for design and construction, and document our findings, conclusions and recommendations in this report.

The scope of our geotechnical study included the following:

- a review of published geologic material pertaining to the site vicinity;
- a review of preliminary site grading plans prepared by Carlton, undated;
- a field exploration program consisting of 3 exploratory test pits excavated to depths of about 2 feet within the site;
- collecting soil samples from the test pits for laboratory testing;
- engineering analyses to develop geotechnical design criteria and recommendations for the proposed project; and
- preparation of this report.

The following design information and recommendations are presented in this report:

- site plan showing the locations of the exploratory test pits performed by Carlton;
- logs of test pits and laboratory test results;
- description of subsurface soil and groundwater conditions found in our test pits;
- recommendations for site earthwork;
- recommendations for pavement design;
- discussion of surface drainage and erosion control.

2.1 FIELD EXPLORATION

Three test pits were excavated on January 27, 2004 within the site area at the approximate locations shown in Figure 2. The test pits were located in the field based on estimated distances to prominent terrain features. The test pits were excavated with hand tools to a depth of about 2 feet under the supervision of Mr. Richard Church of Carlton. Disturbed samples were collected and visually classified based on the Unified Soil Classification System (USCS).

Logs of the test pits were prepared based on the field logging, visual examination of the soil samples in the laboratory and the results of the laboratory testing. The test pit explanation and the test pit logs are presented in Appendix A.

2.2 LABORATORY TESTING

Laboratory testing was conducted on disturbed soil samples recovered during the site investigation. Tests conducted include:

- Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (ASTM D 1557);
- Standard Test Method for Particle-Size Analysis of Soils (ASTM D 422); and
- Standard Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils (ASTM D 2844).

Laboratory test results are presented in Appendix B, as well as shown on the logs of test pits at the corresponding sample locations.

3.1 SITE CONDITIONS

The site extends along Durock Road for approximately 500 center line feet in either direction from its intersection with Business Drive. The proposed improvements are located on or adjacent to the existing roadway. Vegetation along the existing roadway included grass, brush, and trees. The ground surface generally sloped down from the roadway on the south side, and up from the roadway on the north side.

3.2 SUBSURFACE CONDITIONS

3.2.1 Subsurface Materials

The results of our field exploration indicate that the site is overlain in areas by a layer of clayey sand with varying amounts of gravel. Weathered metavolcanic rock was exposed in an existing road cut on the north side of the existing road approximately 100 feet west of the intersection of Durock Road and Business Drive.

3.2.2 Groundwater Conditions

Groundwater was not encountered during our exploration. Groundwater may become perched on shallow bedrock during and shortly after rainstorms.

4.1 EXPANSIVE SOILS

Expansive soils are defined as soils that undergo large volume changes (shrink or swell) due to variations in moisture content. Such volume changes may cause damaging settlement and/or heave of foundations, slabs-on-grade, pavements, etc.

The soils at the site generally consist of low plasticity materials. These soils are expected to have low shrink-swell potential.

4.2 EXCAVATION

It is our understanding that cuts and fills on the order of 10 feet are proposed. We anticipate that excavations will expose generally loose to medium dense soils and highly to moderately weathered bedrock. Temporary and permanent excavations should be sloped back at an inclination of not steeper than 2:1 (H:V). Excavation slopes in rock may be steepened with the approval of Carlton on a case-by-case basis.

We anticipate that much of the near surface material (soil and weathered bedrock) can be economically mass excavated with conventional equipment such as a CAT D8 dozer equipped with a single- or double-shank ripper. However, making relatively small, deep, and/or well-controlled excavations in the bedrock may be difficult, if not impractical, with conventional excavators. Well controlled pattern blasting, hoe-ramming, jack hammering, etc., may be required to complete such excavations that extend more than a few feet into bedrock. Additionally, isolated zones of hard rock requiring a hoe-ram or blasting may be encountered during construction. Excavation conditions in bedrock are anticipated to vary widely, and will be dependent on the equipment used and how tightly the excavation dimensions must be controlled.

5.1 SITE PREPARATION AND EARTHWORK

5.1.1 Site Preparation

General site preparation is expected to be minimal and should include removal of trash and debris, and stripping of any surface vegetation (including the root zone). Roots larger than 1 inch in diameter should be removed. Abandoned underground structures such as culverts or utility vaults should be removed and replaced with engineered fill, placed and compacted as recommended in Section 5.1.2.

5.2.2 Earthwork

General Subgrade Preparation

To provide uniform conditions for the improvements, areas to receive fill should be prepared as described above, scarified a minimum of 8 inches, and be compacted as engineered fill as described below. A keyway or bench should be constructed in those areas where fill is placed on sloping ground, as shown in Figure 3. Fills should then be constructed as engineered fill as described below.

Engineered Fill

In general, fill material should consist of the clayey sand and rock native material, or import material meeting the specifications given below. Engineered fill should not contain rocks or lumps greater than 6 inches in largest dimension, and no more than 15 percent by weight of the material should be larger than 2-½ inches in largest dimension. Import material to be used as engineered fill should meet the specifications listed below:

R-value[1] (Cal 301)	Plasticity/Liquid Limit Indicies (ASTM D 4318)	Particle Size (ASTM C 136 or D 422)
> 30	PI < 15 LL < 35	< 15% by weight larger than 2-1/2 in. < 30% passing #200 sieve

Engineered fill should be placed in loose lifts not exceeding 8 inches in thickness, moisture conditioned as necessary and compacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D 1557 test method.

5.2 PAVEMENT

A traffic index (TI) of 8.5 was provided by El Dorado County DOT for both Durock Road and Business Drive. Changes to the site plan or use that alter the traffic indices could change the required pavement sections. An R-value test was conducted on samples of near surface soil considered to be representative of subgrade material at the site. The R-values ranged between 33 and 42. Based on the results of the tests, and possible variability of materials within the site, an R-value of 30 was assumed for design. The Caltrans Gravel Equivalency method was used in our flexible pavement design analysis. The following table presents recommended structural pavement designs for asphaltic concrete (AC) pavements:

Recommended Pavement Sections

Subgrade	R-Value	Traffic Index	Flexible Pavement (in.)	
			A.C.	A.B.
SC	30	8.5	6.0	10.5

After construction of fills and underground utilities, and prior to constructing the pavement section, the roadway subgrade soils should be scarified to a depth of 8 inches, moisture conditioned as necessary, and compacted to a minimum relative compaction of 95 percent based on the ASTM D 1557 test method. The pavement section should be constructed immediately after compaction of the subgrade to minimize drying of the subgrade soils or disturbance of the subgrade by construction traffic or activities. The aggregate base (AB) should be moisture conditioned as necessary and compacted to a minimum relative compaction of 95 percent based on the ASTM D 1557 test method. Subgrade should be stable (not pumping/yielding) at the time AB is placed. Pavement materials should be designed to meet the applicable Caltrans specifications. AB should be stable (not pumping/yielding) at the time AC is placed.

A frequent cause of pavement failures is saturated, and therefore weakened, subgrade. All pavement surfaces should have a minimum slope of 1 percent to minimize water infiltration and subsequent saturation of the subgrade. Pavement should be sloped away from structures to reduce potential for saturation of foundation soils.

Another common problem with AC pavement is early fatigue failure. In particular, pavement at intersections is susceptible to shear deformation and/or rutting due to high shear stresses imparted to the pavement by stop-and-go traffic; especially heavy truck traffic. A properly designed AC mix and adequate AC compaction (in addition to proper subgrade preparation) are essential components for reducing premature pavement failure. It should be noted that even with proper construction as discussed above, a longitudinal crack between the existing and proposed sections is likely to develop due to high shear stresses concentrated at the transition between sections of varying thickness and stress history.

5.3 SURFACE DRAINAGE AND EROSION CONTROL

Drainage and erosion control measures should be incorporated from Section 1812, Chapter 18, Division II of the *2001 CBC*. Erosion control measures should be implemented for exposed surfaces, which may be subject to soil erosion during periods of intensive rainfall. If improvements cannot be completed prior to the rainy season, erosion control and subgrade mitigation measures may be necessary. In general, all construction surfaces should be graded to drain to prevent water from ponding.

5.4 PLAN REVIEW AND CONSTRUCTION OBSERVATION

Our conclusions and recommendations are contingent upon Carlton being retained to review project plans and specifications to evaluate if they are consistent with our recommendations. They are also contingent upon Carlton being retained to provide intermittent observation, and appropriate field and laboratory testing during site preparation and grading, foundation excavation, and fill placement and compaction to evaluate if the subsurface conditions are as anticipated and to check for conformance with our recommendations.

If the subsurface conditions are observed to be different from those described in this report, we should be notified immediately so that the changed conditions can be evaluated and our recommendations revised, if appropriate. The recommendations in this report are contingent upon our notification and review of changed conditions.

These services are performed on an as-requested basis and are in addition to this geotechnical study. We cannot provide comment on conditions, situations or stages of construction that we are not notified to observe.

LIMITATIONS

This report has been prepared by Carlton Engineering, Inc. (Carlton) under the professional supervision of those senior partners and/or senior staff whose seals and signatures appear herein. The geotechnical engineering study upon which this report is based was conducted for the proposed improvements at the project site described in this report. The conclusions and recommendations contained in this report are not valid for other improvements and/or project sites. If the proposed project is modified or relocated, or if the subsurface conditions found during construction differ from those described in this report, Carlton should be provided the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations need revision.

The interpretations of data, findings, conclusions, recommendations and professional opinions in this report are based on the available information, site conditions and samples collected during our field exploration, and were developed in accordance with generally accepted geotechnical engineering principles and practices, and as prescribed by the client. There is no warranty, either expressed or implied. Carlton accepts no liability regarding completeness or accuracy of the information presented and/or provided to us, or any conclusions and decisions which may be made by the client or others regarding the subject site/project. Verification of our conclusions and recommendations is subject to our review of the project plans and specifications, and our observations of construction.

This report is considered valid for the proposed project for a period of two years from the report date provided that the site conditions and development plans remain unchanged. With the passage of time, changes in the conditions of a property can occur due to natural processes or the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Depending on the magnitude of any changes, Carlton may require that additional studies (at additional cost) be performed and that an updated report be issued. Additional studies may disclose information which may significantly modify the findings of this report. Carlton will retain untested samples collected during our field study for a period not to exceed 90 days unless other arrangements are made with the client.

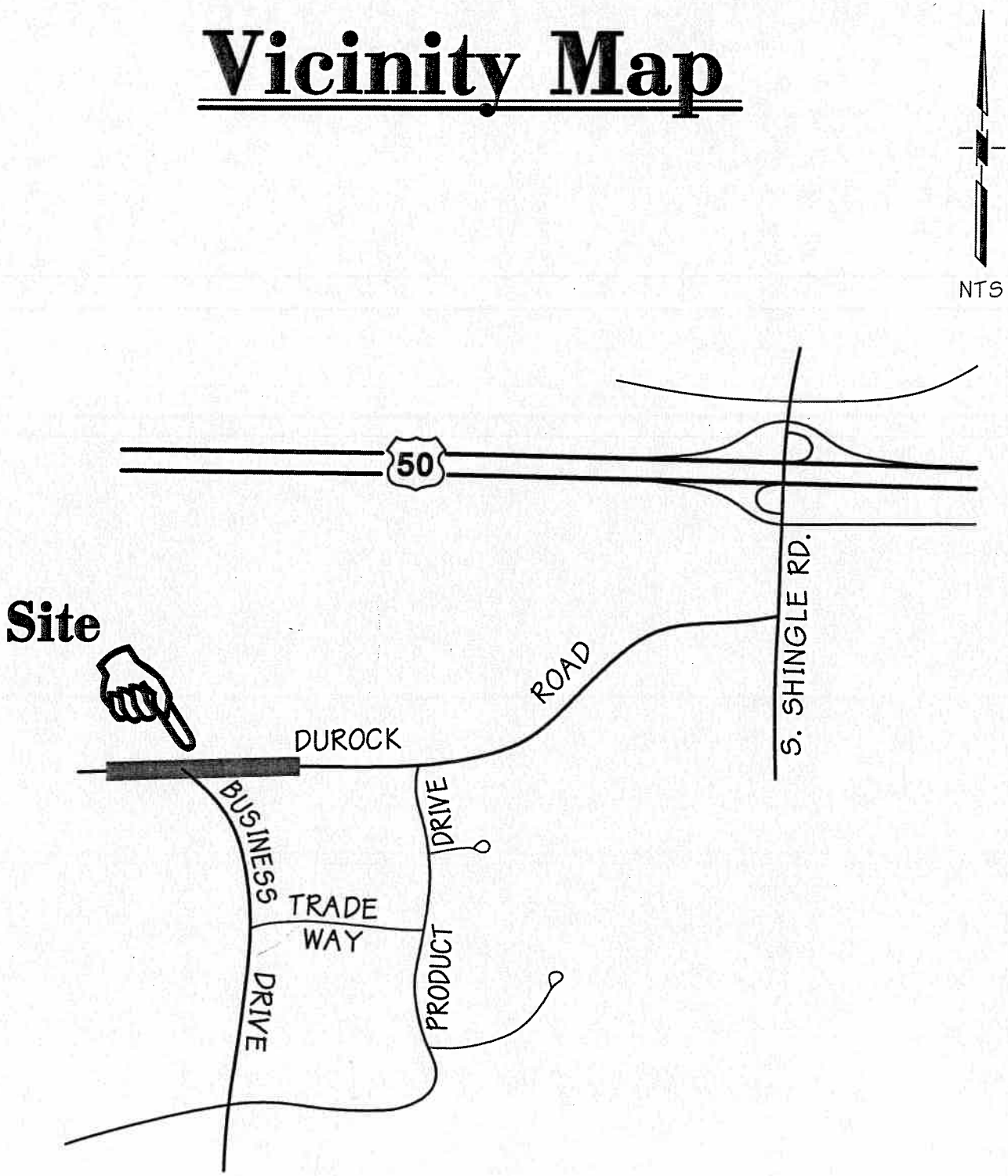
Our scope of services was limited to the proposed work described in this report, and did not address other items or areas. Our scope of services did not include environmental site assessments or an investigation of the presence or absence of hazardous, toxic or corrosive materials in the soil, surface water, ground water or air, on or below, or around the site. Our scope of services did not include an evaluation or investigation of the presence or absence of wetlands.

This report was prepared solely for the use of Mr. Ken Wilkinson (the client). The use of, or reliance upon, this report by any party, other than the client, shall be solely at the risk of such party. The client is responsible to ensure that all relevant parties to the project, including designers, contractors, subcontractors, etc., are made aware of this report in its entirety. No other entity or person shall use or rely upon this report, or any of Carlton's work products, unless expressly authorized by Carlton.

Caltrans, 1995. Highway Design Manual, Chapter 600.

International Conference of Building Officials, 2002. California Building Code, Vol. 2.

Vicinity Map



3065-02-03	24 FEB 2004

CARLTON
Engineering Inc.
3883 Ponderosa Road, Shingle Springs, CA 95682
Voice 530.677.5515 Fax 530.677.6645

DUROCK ROAD WIDENING
Shingle Spring, CA

FIGURE
1

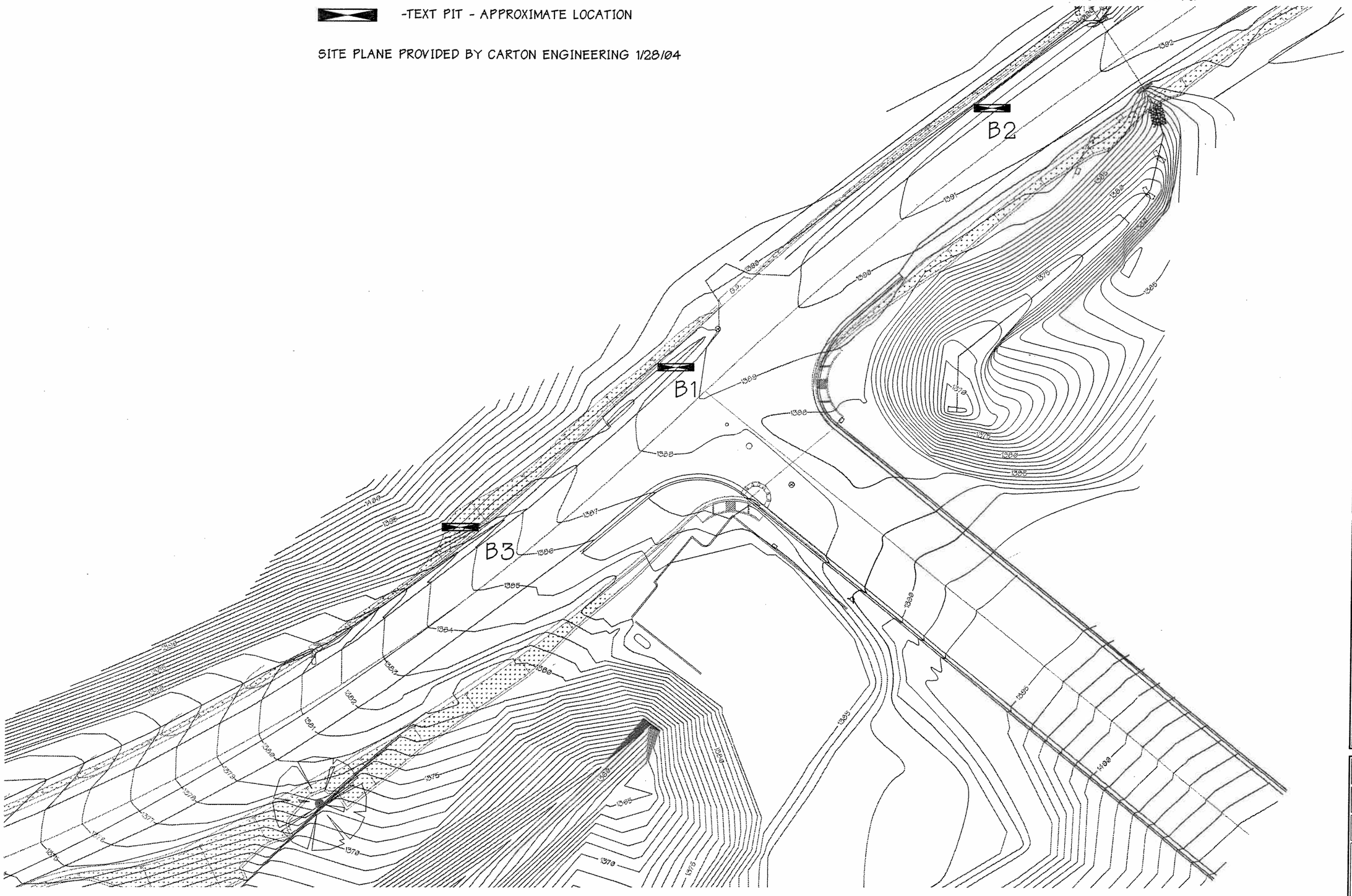
Legend

-TEXT PIT - APPROXIMATE LOCATION

SITE PLANE PROVIDED BY CARTON ENGINEERING 1/28/04

40 0 20 40 80

1 inch = 40 ft.



TEAM DRIVEN SOLUTIONS FOR THE BUILT ENVIRONMENT
CARLTON
Engineering Inc.
3883 Ponderosa Road, Shingle Springs, CA 95682
Voice 530.677.5515 Fax 530.677.6845

DUROCK ROAD WIDENING
SHINGLE SPRING, CA

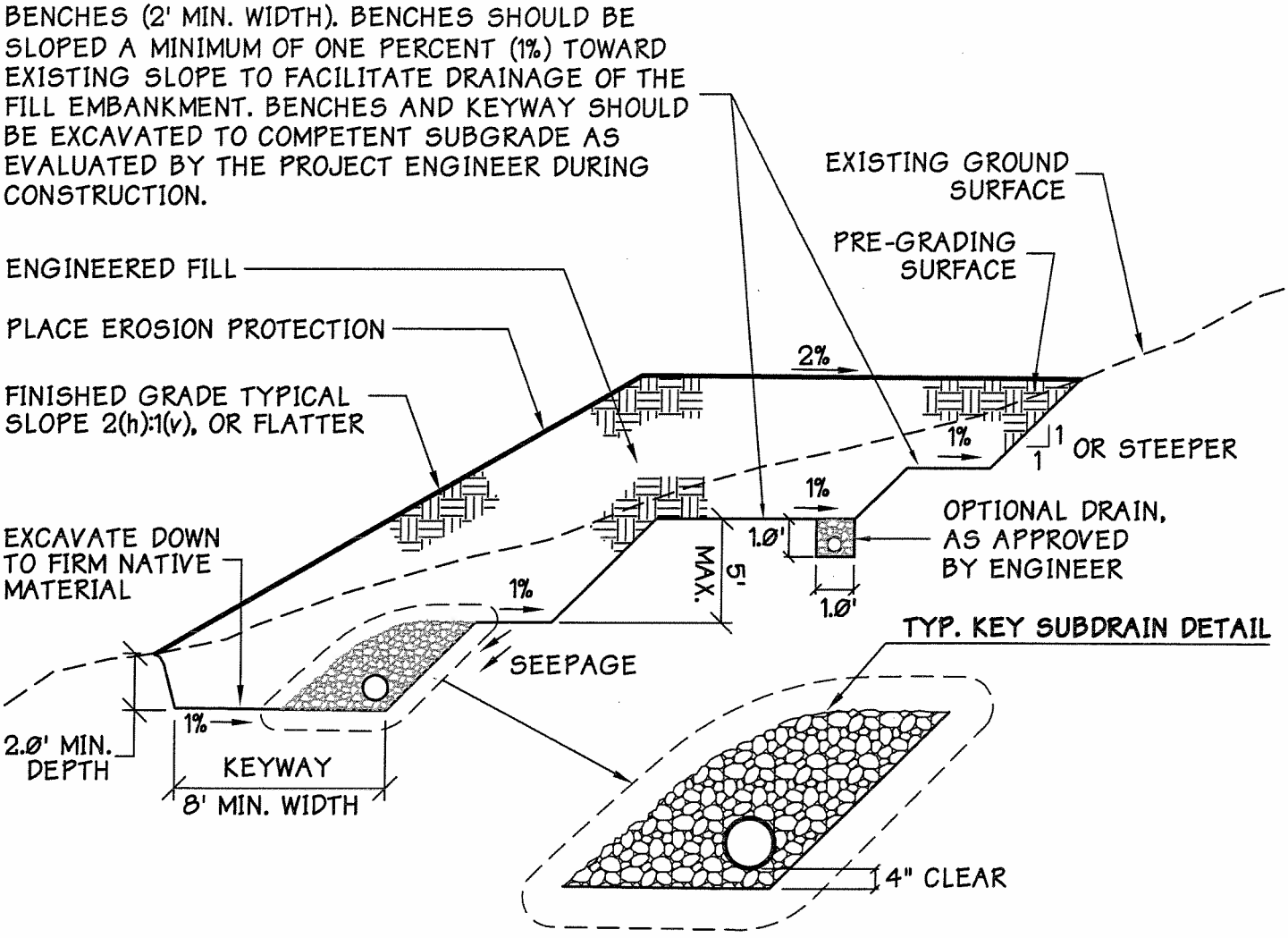
SITE PLAN

Project Location:
Durock Road
Shingle Spring, CA

DESIGNED RC	DATE 2-24-04
DRAWN BA	Horz. SCALE 1"=40'
PROJECT 3065-02-03	Vert. SCALE NA

FIGURE
2

30650_G2
022404:1354



DRAINS

1. INSTALL SUBDRAIN WHERE SUBSURFACE SATURATION IS ENCOUNTERED, OR SUSPECTED TO BE A POTENTIAL CONDITION OF CONCERN.
2. ALL DRAIN ROCK SHALL BE CALTRANS SECTION 68, CLASS 2 PERMEABLE MATERIAL, OR AS APPROVED BY CEI.
3. PERFORATED PIPE, (ADS N-12, OR APPROVED EQUAL), SLOPE 1% MIN. TO DRAIN. PIPE DRAINAGE SHOULD BE COLLECTED IN A SOLID CONDUIT AND DIRECTED TO A SUITABLE LOCATION FOR DRAINAGE. PIPE DIAMETER TO BE DETERMINED BY ENGINEER ON CASE-BY-CASE BASIS.

3065-02-03	24 FEB 2004		
CARLTON Engineering Inc.		DUROCK ROAD WIDENING	FIGURE 3
3883 Ponderosa Road, Shingle Springs, CA 95682 Voice 530.677.5515 Fax 530.677.6645		Shingle Spring, CA KEYWAY	

APPENDIX A

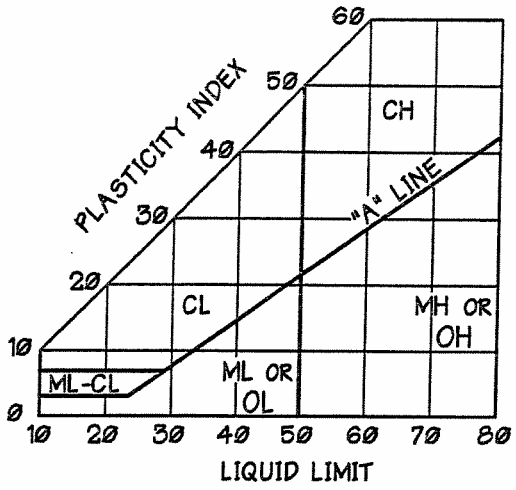
LOGS OF TEST PITS

Borelog Explanation

SYMBOLS

- WATER LEVEL AT TIME OF DRILLING
- WATER LEVEL AFTER DRILLING
- BULK, BAG, OR GRAB SAMPLE
- SHELBY TUBE (3" OUTSIDE DIAMETER)
- SPT SAMPLER (2" O.D.)
- MODIFIED CALIFORNIA SAMPLER (2.5" O.D.)
- CALIFORNIA SAMPLER (3" O.D.)
- U.S. ARMY CORPS SAMPLER (3" I.D.) USING HAND SAMPLING TOOLS

PLASTICITY CHART



SOIL CLASSIFICATION

COARSE GRAINED SOILS < 50% PASSES #200 SIEVE	GRAVELS < 50% COARSE FRACTION PASSES #4 SIEVE	GRAVELS LITTLE OR NO FINES		GW	WELL GRADED GRAVEL, GRAVEL/SAND MIXES
				GP	POORLY GRADED GRAVEL, GRAVEL/SAND MIXES
		GRAVELS > 12% FINES		GM	SILTY GRAVEL, POORLY GRADED GRAVEL/SAND/SILT MIXES
				GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL/SAND/CLAY MIXES
	SANDS < 50% COARSE FRACTION PASSES #4 SIEVE	SANDS LITTLE OR NO FINES		SW	WELL GRADED SAND, GRAVELLY SAND
				SP	POORLY GRADED SAND, GRAVELLEY SAND
		SANDS > 12% FINES		SM	SILTY SAND, POORLY GRADED SAND, SAND/GRAVEL/SILT MIXES
				SC	CLAYEY SAND, POORLY GRADED SAND/GRAVEL/CLAY MIXES
FINE GRAINED SOILS > 50% PASSES #200 SIEVE	SILTS & CLAYS LIQUID LIMIT < 50			ML	INORGANIC SILTS AND 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 CLAYS AND SILTS OF LOW PLASTICITY
	SILTS & CLAYS LIQUID LIMIT > 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC SILTS AND CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT

CARLTON
Engineering Inc.
3883 Ponderosa Road, Shingle Springs, CA 95682
Voice 530.677.5515 Fax 530.677.6645

CARLTON
Engineering
3883 Ponderosa Road, Shingle Springs, California 95682
Voice 530-677-5515 Fax 530-677-6645

LOG OF TEST PIT B1

Sheet 1 of 1

Project: Barnett Business Park Unit II, Durock Road Widening

Location: **Shingle Springs, CA** Project Number: **3065-02-03**

Start Date:	**1/27/04**	Finish Date:	**1/27/04**	Total Depth (ft bgs):	**2.0**
Backhoe/ Excavator:	**N/A**	Contractor:	**None**	Bucket Width:	**N/A**
Ground Surface Elevation (bgs):	**1388**	Coordinate Location:		Test Pit Orientation:	**N/A**
Logged By:	**R. Church**	Reviewed By: **D. Dean**	Test Pit Backfill:	**Spoils**	Natural Slope: **Flat**
Remarks:	**No groundwater observed.**				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	USCS Classification	Graphic Log	Sample Type	Sample No.	% Sand	% Passing No. 200 Sieve
1388.0	0.0	Topsoil.	TS					
1387.5	0.5	Red brown clayey sand (SC), with some fine gravel, moist to wet, loose, fine to coarse, angular. R-value = 42	SC		BK	1	45	46
1387.0	1.0							
1386.5	1.5							
1386.0	2.0	Terminated at 2 feet.						
1385.5	2.5							
1385.0	3.0							
1384.5	3.5							
1384.0	4.0							
1383.5	4.5							
1383.0	5.0							

TEST PIT BBP DUROCK PART2.GPJ TEST PIT.GDT 2/24/04

CARLTON
Engineering
3883 Ponderosa Road, Shingle Springs, California 95682
Voice 530-677-5515 Fax 530-677-6645

LOG OF TEST PIT B2

Sheet 1 of 1

Project: Barnett Business Park Unit II, Durock Road Widening

Location: **Shingle Springs, CA** Project Number: **3065-02-03**

Start Date:	1/27/04	Finish Date:	1/27/04	Total Depth (ft bgs):	2.0
Backhoe/ Excavator:	N/A	Contractor:	None	Bucket Width:	N/A
Ground Surface Elevation (bgs):	1391	Coordinate Location:		Test Pit Orientation:	N/A
Logged By:	R. Church	Reviewed By:	D. Dean	Test Pit Backfill:	Spoils
				Natural Slope:	Flat

Remarks: **No groundwater observed.**

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	USCS Classification	Graphic Log	Sample Type	Sample No.	% Sand	% Passing No. 200 Sieve
1391.0	0.0	Topsoil.	TS					
1390.5	0.5	Red brown clayey sand (SC) with some fine gravel, moist, loose, fine to coarse, angular. R-value = 33	SC		BK	2	42	50
1389.0	2.0	Terminated at 2 feet.						
1388.5	2.5							
1388.0	3.0							
1387.5	3.5							
1387.0	4.0							
1386.5	4.5							
1386.0	5.0							

TEST PIT BBP DUROCK PART2.GPJ TEST PIT.GDT 2/24/04

CARLTON
Engineering
3883 Ponderosa Road, Shingle Springs, California 95682
Voice 530-677-5515 · Fax 530-677-6645

LOG OF TEST PIT B3

Sheet 1 of 1

Project: Barnett Business Park Unit II, Durock Road Widening

Location: **Shingle Springs, CA** Project Number: **3065-02-03**

Start Date: **1/27/04**	Finish Date: **1/27/04**	Total Depth (ft bgs):	**1.5**
Backhoe/ Excavator: **N/A**	Contractor: **None**	Bucket Width:	**N/A**
Ground Surface Elevation (bgs): **1387**	Coordinate Location:	Test Pit Orientation:	**N/A**
Logged By: **R. Church** / Reviewed By: **D. Dean**	Test Pit Backfill: **Spoils**	Natural Slope:	**~3:1**
Remarks: **No groundwater observed.**			

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	USCS Classification	Graphic Log	Sample Type	Sample No.	% Sand	% Passing No. 200 Sieve
1387.0	0.0	Red brown clayey sand (SC) with fine to coarse gravel, moist, loose, fine to coarse, angular.						
		Max dry density = 129.8 pcf Optimum moisture content = 13.0%						
1386.5	0.5							
1386.0	1.0		SC		BK	3	36	41
1385.5	1.5	Terminated at 1.5 feet.						
1385.0	2.0							
1384.5	2.5							
1384.0	3.0							
1383.5	3.5							
1383.0	4.0							
1382.5	4.5							
1382.0	5.0							

TEST PIT BBP DUROCK PART2.GPJ TEST PIT.GDT 2/24/04

APPENDIX B

LABORATORY TEST RESULTS

BSK
ASSOCIATES

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date: 01/27/04

Subject: Bulk-1, Barnett Business Park Unit II/ Project # 3065-02-03
BSK Sample I.D.: 15422

Summary of Test Results

Sieve size	% passing by dry weight	Spec
21/2"	100	
2"	100	
11/2"	100	
1"	100	
3/4"	100	
1/2"	95	
3/8"	94	
# 4	91	
# 8	87	
# 16	81	
# 30	75	
# 50	65	
# 100	55	
# 200	46	

BSK
ASSOCIATES

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date: 01/27/04

Subject: Bulk-2, Barnett Business Park Unit II/ Project # 3065-02-03
BSK Sample I.D.: 15423

Summary of Test Results

Sieve size	% passing by dry weight	Spec
21/2"	100	
2"	100	
11/2"	100	
1"	100	
3/4"	98	
1/2"	97	
3/8"	95	
# 4	92	
# 8	87	
# 16	81	
# 30	74	
# 50	66	
# 100	57	
# 200	50	

BSK
ASSOCIATES

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date: 01/27/04

Subject: B-3, Barnett Business Park Unit II/ Project # 3065-02-03
BSK Sample I.D.: 15424

Summary of Test Results

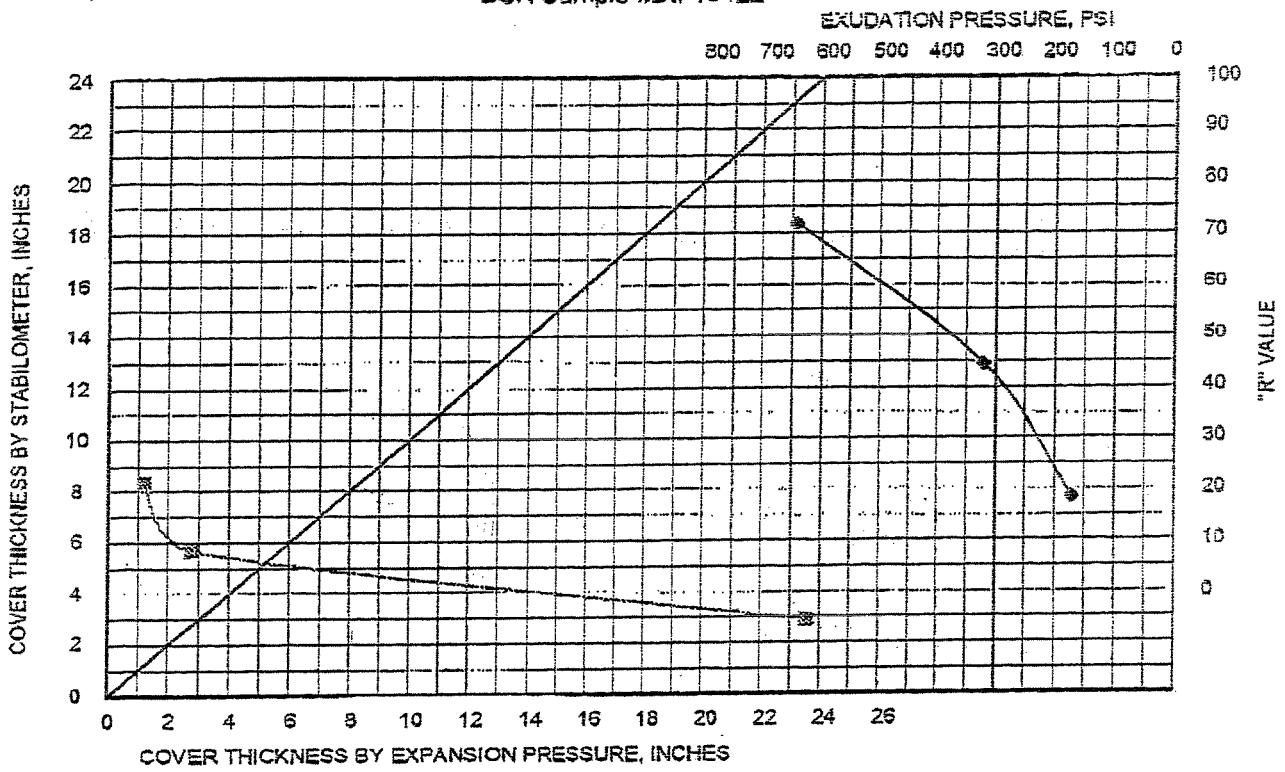
Sieve size	% passing by dry weight	Spec
21/2"	100	
2"	91	
11/2"	89	
1"	85	
3/4"	83	
1/2"	81	
3/8"	80	
# 4	77	
# 8	73	
# 16	68	
# 30	62	
# 50	55	
# 100	47	
# 200	41	

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date: 01/27/04
Test Date: 02/04/04

RESISTANCE VALUE TEST RESULTS

Sample No.: Bulk 1, 3065-02-03, Barnett Business Park Unit II
BSK Sample I.D.: 15422



Sample Description: Clayey Silty Sand, fine grained, drk. brn., micaceous, cohesive.

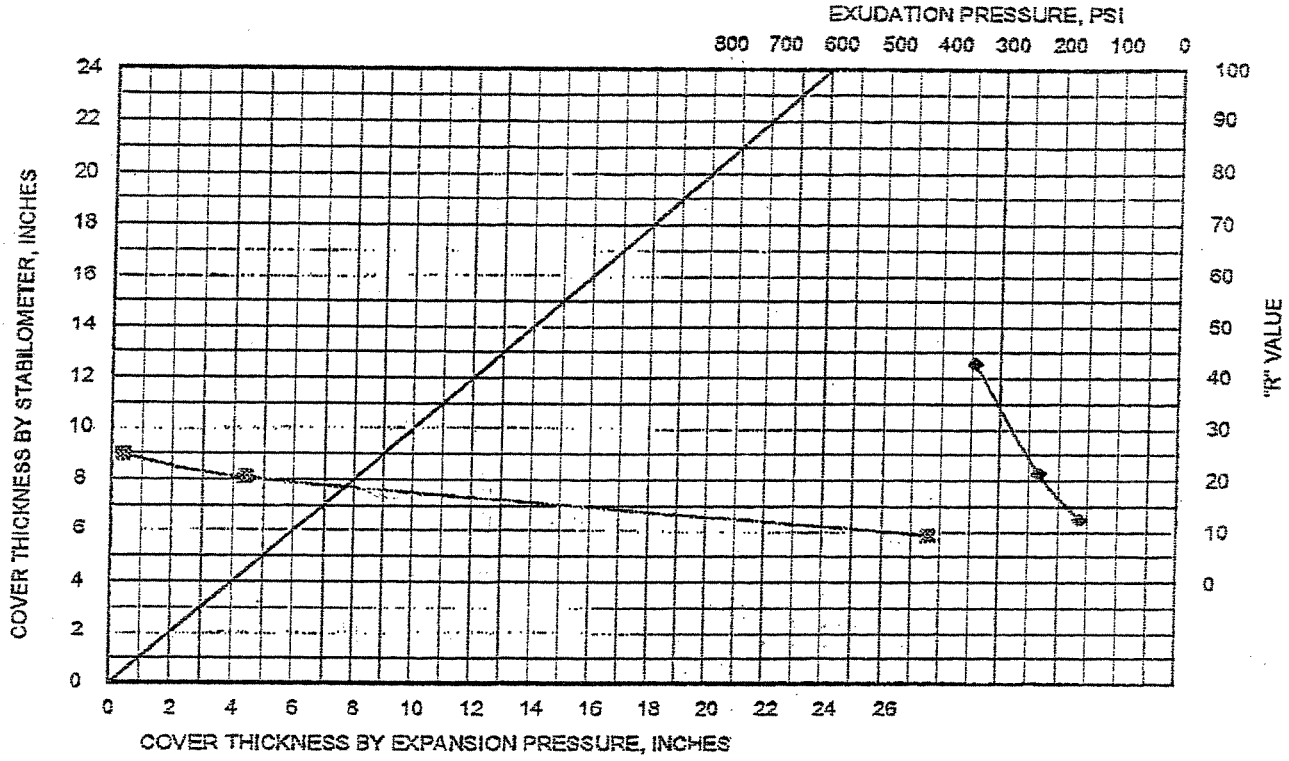
SPECIMEN	A	B	C
EXUDATION PRESSURE, LOAD (lb)	8068	4025	2136
EXUDATION PRESSURE, PSI	642	320	170
EXPANSION, * 0.0001 IN	59	7	3
EXPANSION PRESSURE, PSF	255	30	13
STABILOMETER PH AT 2000 LBS	32	70	105
DISPLACEMENT	3.92	4.03	5.87
RESISTANCE VALUE "R"	72	44	18
% MOISTURE AT TEST	11.0	12.8	14.6
DRY DENSITY AT TEST, PCF	135.4	130.6	125.7
"R" VALUE AT 300 PSI EXUDATION PRESSURE	42		
"R" VALUE BY EXPANSION PRESSURE TI=4.0, GF=1.50	48		

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date: 01/27/04
Test Date: 02/04/04

RESISTANCE VALUE TEST RESULTS

Sample No.: Bulk 2, 3065-02-03, Barnett Business Park Unit II
BSK Sample I.D. : 15423



Sample Description: Clayey Silty Sand, fine grained, drk. brn., micaceous, cohesive.

SPECIMEN	A	B	C
EXUDATION PRESSURE, LOAD (lb)	4331	2945	2037
EXUDATION PRESSURE, PSI	345	234	162
EXPANSION, * 0.0001 IN	69	11	1
EXPANSION PRESSURE, PSF	299	48	4
STABILOMETER PH AT 2000 LBS	81	115	128
DISPLACEMENT	3.24	3.61	4.45
RESISTANCE VALUE "R"	43	21	12
% MOISTURE AT TEST	13.6	15.6	17.4
DRY DENSITY AT TEST, PCF	131.0	125.7	119.8
"R" VALUE AT 300 PSI EXUDATION PRESSURE		33	
"R" VALUE BY EXPANSION PRESSURE TI=4.0, GF=1.50		23	

BSK
ASSOCIATES

BSK Project Name:
BSK Project No.: C03-557-60S

Report Date: 02/09/04
Sample Date:01/27/04
Test Date: 02/06/04