

**SOIL-CEMENT MIX DESIGNS
ADDITIONAL INVESTIGATION - DESERT GREENBELT
REATA PASS WASH CHANNELIZATION
BETWEEN PINNACLE PEAK ROAD &
EXTENSION OF DEER VALLEY ROAD
SCOTTSDALE, ARIZONA**

Flood Con

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AGRA Earth & Environmental

ENGINEERING GLOBAL SOLUTIONS



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December 30, 1997
AEE Job No. 7-117-000062
Report No. 4
Addendum No. 1

Simons, Li & Associates, Inc.
4600 South Mill Avenue
Suite 200
Tempe, Arizona 85282-6759

Attention: Randall Beck, P.E.

Gentlemen:

**RE: ADDITIONAL INVESTIGATION - DESERT GREENBELT
REATA PASS WASH CHANNELIZATION
BETWEEN PINNACLE PEAK ROAD &
EXTENSION OF DEER VALLEY ROAD
SCOTTSDALE, ARIZONA**

Pursuant to a 29 December 1997 letter from Randall Beck, P.E. with Simons, Li & Associates (SLA), to Keith H. Dahlen, P.E. of AGRA Earth & Environmental, Inc. (AEE), presented herein are revised recommendations for the excavation of temporary slopes for construction of soil-cement embankments, which were presented in our Report No. 4, dated December 15, 1997. Also presented are revised recommendations for placement of bedding mortar between lifts of soil-cement for various project elements. Item 3 of the letter from Mr. Beck also requested that permanent excavation and fill slopes that are planned be evaluated for stability. The individual cases will be analyzed upon receipt of the design plans from SLA.

A clarification also was requested regarding the surcharge pressure assumed for vehicle loads adjacent to the excavation slopes. A surcharge pressure of 300 pounds per square foot (psf) was utilized for all stability analyses performed to date, not 500 psf as stated in the Section 4.2 of the report.

1.0 REVISED STABILITY ANALYSES

A review of the stability analyses presented in Report No. 4, was performed pursuant to the request of SLA. Three additional stability cases were computed using PC STABL5M as

depth of 20 feet and respective slopes of 1.2H:1V (horizontal to vertical) and 1H:1V. The third case assumed an excavation depth of 18 feet and a 1H:1V slope. The soil parameters and surcharge loading conditions were the same as utilized for analysis of all cases in Report No. 4, including a unit weight of 115 pounds per cubic foot (pcf), a friction angle of 35 , a cohesion intercept of 50 psf and a vehicle surcharge pressure of 300 psf (10 feet from the crest of the excavation). The results of the analyses are as follows:

Results of Stability Analysis

Case No.	Total Depth (feet)	Slope Configuration	Minimum Computed Safety Factor
1A	20	1H:1V	1.15
1B	20	1.2H:1V	1.27
2A	18	1H:1V	1.24

The results of the analyses are plotted in the attached Figures 1 through 3. The results indicate safe excavation slopes (greater than 1.2 for temporary conditions) of 1H:1V up to a depth of 18 feet. A flatter slope (1.2H:1V) should be considered for excavations deeper than 18 feet to reduce the amount of shallow surficial failures and sloughing. Some areas of the project contain soils which are less or more cohesive than used for the analyses. Therefore, some areas will stand at 1H:1V with little or no sloughing and other areas will slough and possibly experience shallow failures if left exposed for extended periods.

2.0 BEDDING MORTAR

Based upon a 29 December 1997 conversation with Mr. Beck, it is understood that the aprons just downstream of the grade control structures located within Upper Reatta Wash will be constructed of concrete. The aprons apparently will extend downstream of the grade control a sufficient distance such that hydraulic jumps will occur on the concrete and that the velocity and turbulence will be reduced substantially downstream of the aprons.

In Section 3.0 of our report, it was recommended that Portland cement/sand bonding mortar possessing a 28-day compressive strength of at least 2,500 psi be used between successive lifts of soil-cement for the channel inverts to be constructed within Upper Reatta. It was also recommended that bonding mortar be used between the lifts of soil-cement placed for channel embankments within Upper Reatta. Provided that concrete is used for the grade control aprons, it is recommended that the bedding mortar be used only in areas where flow velocities are anticipated to exceed 20 feet per second (fps). Such areas likely will be limited to the

Additional Investigation - Desert Greenbelt
Reatta Pass Wash Channelization
Between Pinnacle Peak Road &
Extension of Deer Valley Road
Scottsdale, Arizona

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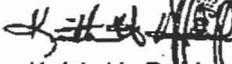
are anticipated to exceed 20 feet per second (fps). Such areas likely will be limited to the downstream face of all grade control structures and the channel embankments adjacent to the grade controls.

This addendum should be attached to Report No. 4, and be made a part thereof.

Should you have any questions concerning this addendum, please do not hesitate to contact the undersigned.

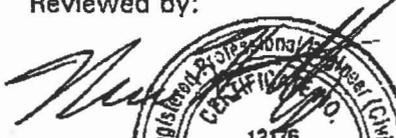
Respectfully submitted,

AGRA Earth & Environmental, Inc.


Keith H. Dahlen, P. E.
Senior Engineer
Date Signed 12/30/97


c: Addressee (5)
pm/J6-97/03-31:97

Reviewed by:


Norman F. Wetz
Senior Engineer
Date Signed 12/30/97

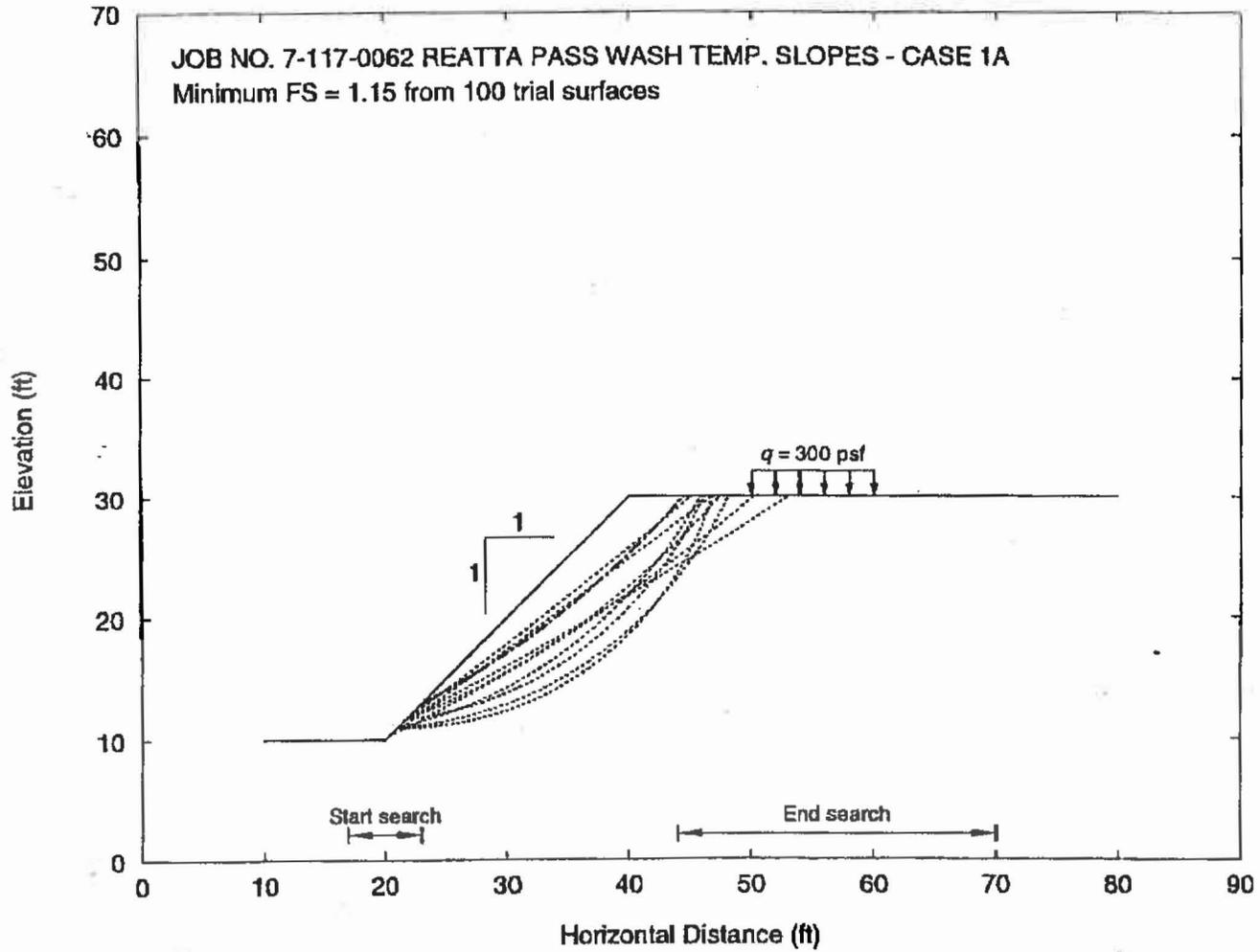



FIGURE 1

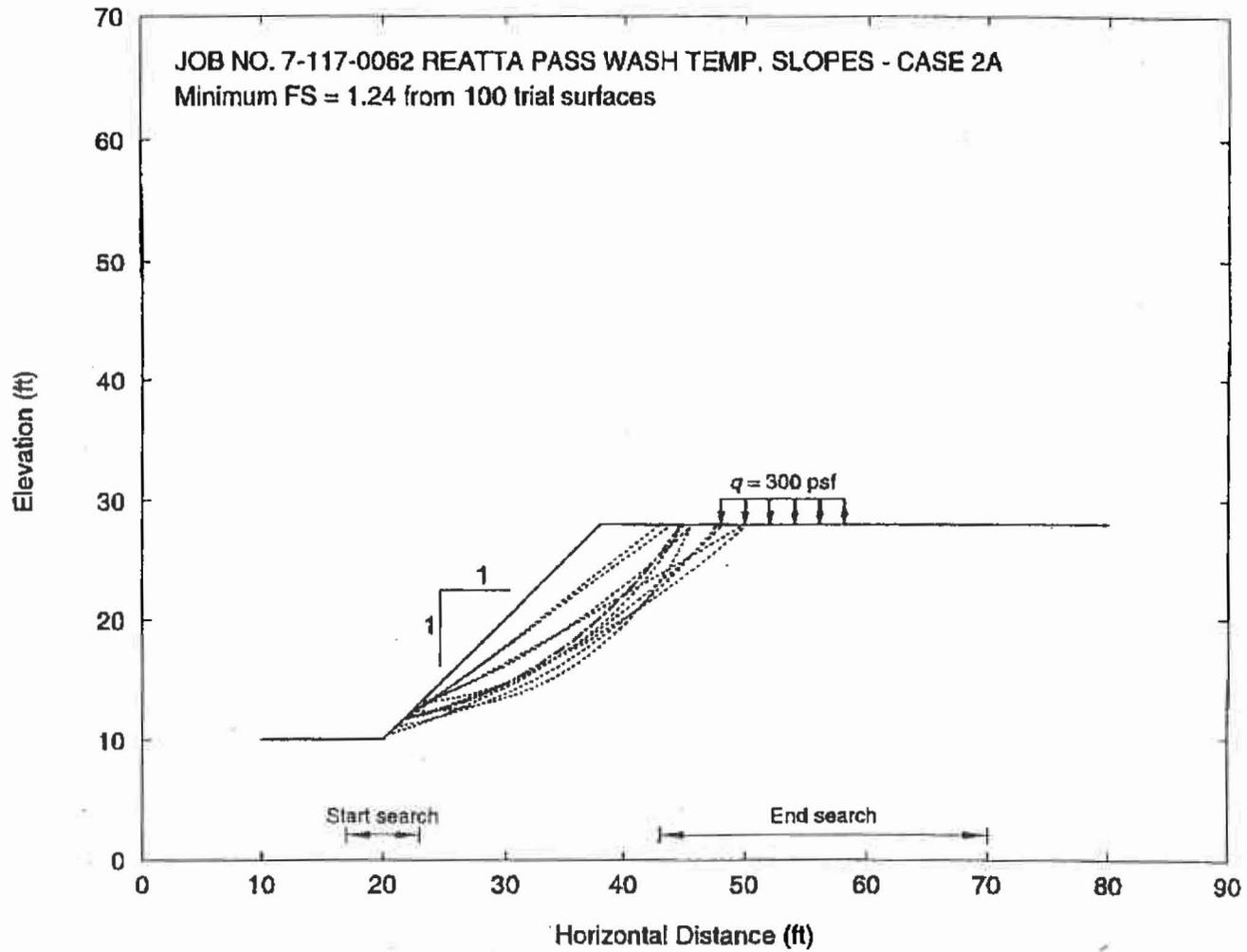


FIGURE 3

**SOIL-CEMENT MIX DESIGNS
ADDITIONAL INVESTIGATION - DESERT GREENBELT
REATA PASS WASH CHANNELIZATION
BETWEEN PINNACLE PEAK ROAD &
EXTENSION OF DEER VALLEY ROAD
SCOTTSDALE, ARIZONA**

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Submitted To:

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3150 Bristol Street
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Submitted By:

**AGRA Earth & Environmental, Inc.
3232 West Virginia Avenue
Phoenix, Arizona 85009-1502**



December 15, 1997

**AEE Job No. 7-117-000062
Report No. 4**

December 15, 1997
AEE Job No. 7-117-00062
Report No. 4

Simons Li & Associates, Inc.
3150 Bristol Street
Suite 500
Costa Mesa, California 92626-3067

Attention: Lan Yin-Li Weber, Ph.D., P.E.
Vice President/Senior Program Manager

Gentlemen:

**RE: SOIL-CEMENT MIX DESIGNS
ADDITIONAL INVESTIGATION - DESERT GREENBELT
REATA PASS WASH CHANNELIZATION
BETWEEN PINNACLE PEAK ROAD &
EXTENSION OF DEER VALLEY ROAD
SCOTTSDALE, ARIZONA**

In accordance with the request of Lan Yin-Li Weber, Ph.D., P.E. of Simons, Li & Associates, Inc. (SLA), the results of all soil-cement mix designs prepared for the Desert Greenbelt Reatta Pass Wash project are presented herein, including 20 soil-cement mix designs prepared using samples obtained recently from the planned channel alignment. Our Report No. 3, dated 8 August 1997 presented the results of four soil-cement mix designs performed on samples retrieved during two previous investigations. The intent of this submittal is to supplement the data presented in Report No. 3 with a significant number of additional soil-cement strength mix designs. The additional data is necessary to provide SLA, the City of Scottsdale and the Maricopa County Flood Control District (FCD) a more accurate estimate of cement requirements for the project, and to provide contractors with suitable information with which to prepare cost effective and relatively accurate bids for production of soil-cement grade control levees and channel embankments.

Included herein is a description of the recent field investigation, results of all field investigations and testing completed to date for the Reatta Pass Wash project, and graphical comparisons of the soil-cement mix design results. Also included are recommended compressive strengths and minimum cement requirements for construction of channel

embankments, grade control structures and channel inverts (where utilized). Results of stability analyses performed for temporary excavations required to construct the soil-cement embankments, are presented.

1.0 INVESTIGATION

1.1 BACKHOE TEST PITS

Twenty-four backhoe test pits were excavated to depths of about 6.5 to 10 feet below existing site grades with a Ford 555 backhoe. Logs of the test pits were prepared and bulk samples of selected soils were collected by Dennis C. Pickens, Engineering Assistant of AEE, at the locations shown on the site plans located in the map pocket.

The sampling program was predetermined based on the existing test data, in order to obtain representative samples of all soil types (both good and marginal for soil-cement) known to be present along the alignment. The intent was to collect sufficient samples from individual test pits such that the soils of similar or slightly different classification from different pits could be combined this representing what actually might occur during construction. Four designated areas (Area 1 through Area 4) of sampling and testing, based on alignment stationing, were set up initially. The areas were established based on the assumption that the contractor will need to set up batch plants at a minimum of three locations to produce the soil-cement in the near vicinity of placement. Combining of samples was done only within each designated area, with no sample cross-over. The designated areas based on alignment stationing and the test pits completed within each area were as follows:

Location	Station Limits	Test Pits Completed Within Area
Area 1	18+00 to 80+00	TP-1 thru TP-6
Area 2	80+00 to 162+00	TP-7 thru TP-12
Area 3	162+00 to 230+00	TP-12 thru TP-18
Area 4	230+00 to 270+00	TP-19 thru TP-24

1.2 PREVIOUS INVESTIGATIONS BY AEE

AEE previously performed test borings and test pits along the proposed Reatta Wash alignment for Greiner, Inc. (AEE Job Nos. E95-86 and 6-117-000029). A total of 30 test pits and nine

test borings were advanced for the two projects. Laboratory testing performed on selected samples included moisture content, grain-size analysis and Atterberg limits. Soil-cement mix designs were performed on two of the samples.

The logs of the test borings and test pits performed for the previous projects are included in Appendix A. The results of the sieve and Atterberg limits tests and the two soil-cement mix designs are presented in Appendix B. Both of the soil-cement mix designs were performed on soils collected to the south of Deer Valley Road along the proposed channel alignment.

AEE also performed two soil-cement mix designs for SLA using samples obtained from hand-dug pits, as discussed in Report No. 3, dated August 8, 1997. The samples were obtained to the north of the eastward extension of Deer Valley Road at locations designated HP-1 and HP-2 (shown on the site plans). The results of laboratory testing, including the soil-cement mix designs, are included in Appendix B.

The approximate geotechnical profile of the entire channel alignment, which includes the data collected from all of the previous as well as the current investigations, is presented on Sheet 3 located in the map pocket. Also indicated on Sheet 3 are the locations where samples were collected for use in the soil-cement mix designs.

1.3 LABORATORY ANALYSIS

Moisture content, sieve analysis, Atterberg limits tests and moisture-density tests, and the soil-cement mix designs were performed on combined bulk samples obtained from Test Pit Nos. TP-1 through TP-24. Similar testing was performed on previous selected samples obtained from the channel alignment. The results of all tests are presented in Appendix B. Sand equivalent tests were also performed on selected samples obtained from Test Pit Nos. TP-1 through TP-24. The results of those tests also are included in Appendix B.

2.0 SOIL-CEMENT PERFORMANCE HISTORY

Soil-cement has been utilized for construction of bank protection and grade control structures for an increasing number of projects in Arizona over the past several years. Soil cement has proven to be a natural looking, cost effective, performance tested method for protecting stream banks in the desert southwest (Hansen, 1995)*. The initial use of soil-cement for bank protection was in 1965 in Tucson. However, large scale use of soil-cement bank protection

*References are listed at the end of this report.

did not occur until the late 1970s when large reaches of several washes, the Santa Cruz River and the Rillito River were protected with soil-cement. At the same time soil-cement was first used for construction of grade control structures. A significant increase in the use of soil-cement in Pima County, as well as projects in Phoenix and surrounding southwestern states, occurred following it's excellent performance during a major flood in Tucson, Arizona in October of 1983.

The most commonly used and understood parameter to determine the quality of soil-cement is compressive strength. The required minimum compressive strength generally has ranged from 600 to 750 psi at seven days for soil-cement bank protection. For drop structures exposed to more abrasive flow at the river bottom, a minimum seven day compressive strength of 1,000 psi has commonly been specified (Hansen, 1985). Quite often for projects completed in the general Phoenix area, a minimum of 2 percent of cement by weight is added above the determined seven-day design strength mix. It is believed that the additional cement accounts for variances in the materials utilized and construction methods. The additional cement generally results in significant long-term strength gains. Even without the added cement, soil-cement typically more than doubles in terms of compressive strength over a period of less than one year (Felt and Abrams, 1957). Therefore, with a design compressive strength of 1,000 psi, the soil-cement material generally approaches the strength of lower strength concrete over time.

Little data exists regarding the performance of soil-cement versus actual flow velocity. (Hansen, 1995) mentions a soil-cement bank constructed adjacent to a housing project west of downtown Tucson, where the bank protection, although overtopped, performed well with flow velocities exceeding 20 feet per second (fps). According to Lan Yim-Li Webber, PhD., P.E. with SLA, design velocities for this project may approach 30 fps within sections of Upper Reatta, to the north of Deer Valley Road, where the channel gradient is high and the width of the channel will be limited due to existing development. A minimum design compressive strength on the order of 1,500 psi, which likely will approach 2,500 to 3,000 psi over a period of about 1 year, is likely warranted for design of soil-cement grade control structures for the higher stream flow velocities.

3.0 RECOMMENDED MIX DESIGN STRENGTHS

Given the above discussion, minimum 7-day soil-cement mix design strengths and minimum cement contents for the channel embankments, inverts and grade control structures, as indicated in Table 1, were determined.

has been revised

TABLE 1
Recommended Design Element Minimum Compressive Strengths
and Minimum Cement Contents

Structure	Recommended Minimum Compressive Strength (psi)	Recommended Minimum Cement Content (Includes the Additional 2% Cement)
Upper Reatta Grade Control	1,500 plus 2% Cement	11
Upper Reatta Channel Embankments & Channel Invert	1,000 plus 2% Cement	9
Reatta Grade Control Structures	1,000 plus 2% Cement	9
Reatta Channel Embankments	750 plus 2% Cement	7

MIN: use for bidding and prep only

A compressive strength of 1,000 to 1,500 psi is not unlike that of much of the bedrock which is present along the proposed channel reach to the north of Deer Valley Road. The quartzite bedrock present near Pinnacle Peak Road likely has materials which possess unconfined compressive strengths that exceed 10,000 psi and seismic velocities which exceed 10,000 feet per second (fps). However, much of the schist and phyllite bedrock exposed on the ridge adjacent to the planned channel from about Stations 215 +00 to 232 +00 (as discussed in Report No. 1, dated April 25, 1997) is relatively weak, with unconfined compressive strengths likely ranging from less than 500 psi to perhaps more 5,000 psi. The rock is held intact and is resistant to severe erosion do mainly to the makeup of the fractures within the rock. Bedrock that either has widely spaced fractures or that has fractures which are bound together by cementing materials such as calcite are typically much more resistant to erosion than more closely fractured rock. In fact, soft rock which is either widely fractured or has fractures which are bonded, typically is much more resistant to stream flow erosion than hard, more closely-fractured rock.

Considering the above relationship of the bedrock exposed on-site to the planned soil-cement, bonding of the individual layers of soil-cement likely is of as much, or more importance than the compressive strength of main structure body, especially for the grade control structures. Flows passing over such structures are known to develop significant uplift forces that tend to separate individual soil-cement lifts. Adequate bonding of successive soil-cement layers within the grade control structures must be achieved. Portland cement/sand bonding mortar possessing a 28-compressive strength of at least 2,500 psi, which is typically used to bond individual lifts of Roller Compacted Concrete (RCC), is recommended to be used between

require set-retarding admixture & max-time before next lift

successive lifts of soil-cement within all of the project grade control structures to prevent separation of the lifts. It is further recommended that due to high anticipated velocities within the Upper Reatta section bonding mortar be utilized, as a minimum, between all horizontal lifts of soil-cement placed for construction of the channel inverts and the channel embankments within Upper Reatta. Provided that the channel inverts planned within Upper Reatta are constructed such that the vertical joints are staggered, the use of the bonding mortar within the vertical joints should not be necessary. Bonding mortar should also be considered for use in any other areas where design velocities along channel embankments are anticipated to exceed 20 fps.

4.0 SOIL-CEMENT MIX DESIGN RESULTS

Figure 1 presents the results of all 24 soil-cement mix designs performed by AEE for the Reatta Pass Project. In general, the results indicate that in order for the soil-cement to meet 7-day compressive strengths on the order of 750 psi to 1,500 psi, a wide range of cement contents would be required, if utilizing all of the available soil types were utilized. Obviously, some materials present along the channel alignment are superior to others for achieving compressive strengths at lower cement contents. Based on a comparison of the laboratory sieve and Atterberg limits (plasticity index) tests to the results of the mix designs, the following conditions appear to be evident:

- Compressive strengths of 750 to 1,500 psi are achieved most readily with the coarser grained sand, gravel and cobbles, which typically contain approximately 5 to 10 percent minus No. 200 sieve fines. The coarser grained soils abundant in Area 2 and at depth within Area 1 (Figures 2 and 3) typically indicate compressive strengths exceeding 750 psi at a cement content of about 6 to 7 percent by weight. The same soils typically exceeded compressive strengths of 1,000 to 1,500 psi at respective cement contents of about 7 to 8 percent and 9 to 11 percent. The finer grained soils which are more abundant in Areas 3 and 4 (Figures 4 and 5), typically did not perform quite as well. Within Area 3, the finer grained silty to clayey sand tested did meet the 1,000 to 1,500 psi specified strengths at cement contents of about 11 to 13 percent, and within Area 4 the results were somewhat variable.
- The sample collected from Test Pits TP-23 and TP-24 (Area 4) performed the worst, with a required cement content exceeding the tested value of 15 percent for a seven-day compressive strength of 750 psi. Given the performance of the other samples tested, the compressive strengths determined are considered to be an anomalous, and likely representative of only a small percentage of the soils present along the channel

COMPARISON OF ALL SOIL-CEMENT COMPRESSIVE STRENGTH TESTS

Reatta Pass Wash

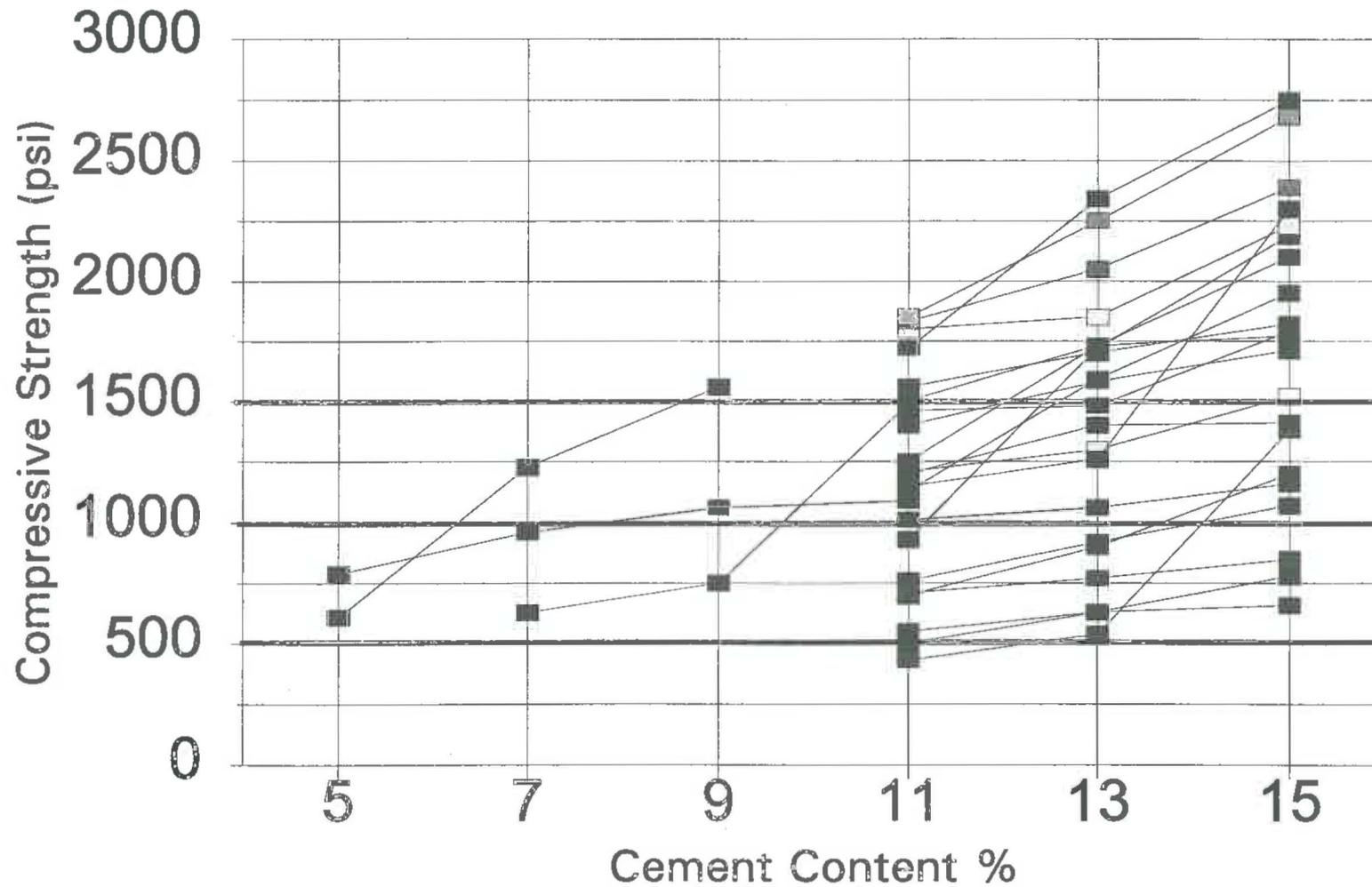


Figure 1

AREA 1 SOIL-CEMENT COMPRESSIVE STRENGTH TESTS

(Sta. 18+00 to 80+00)

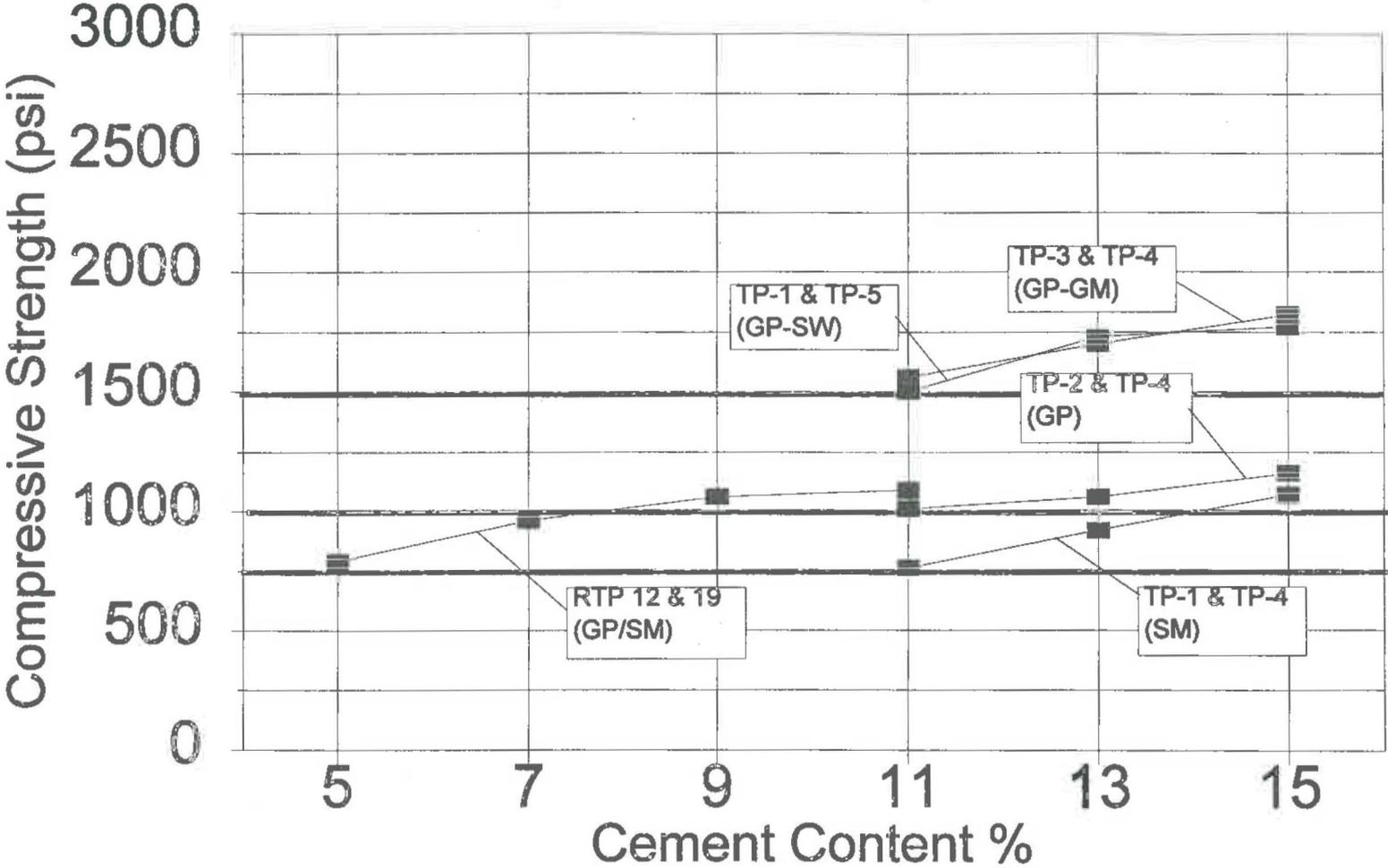


Figure 2

AREA 2 SOIL-CEMENT COMPRESSIVE STRENGTH TESTS

(Sta. 80+00 to 162+00)

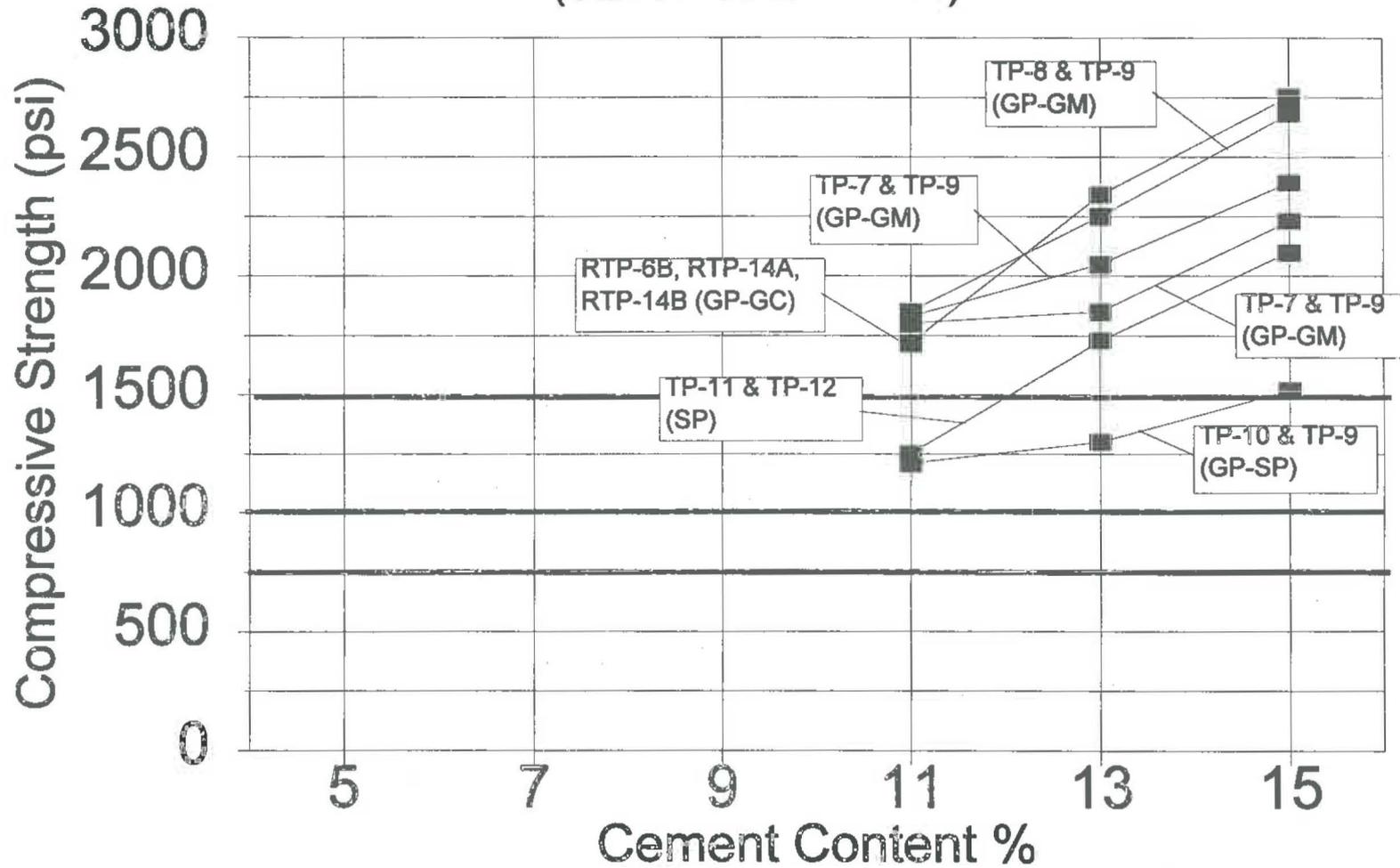


Figure 3

AREA 3 SOIL-CEMENT COMPRESSIVE STRENGTH TESTS

(Sta. 162+00 to 230+00)

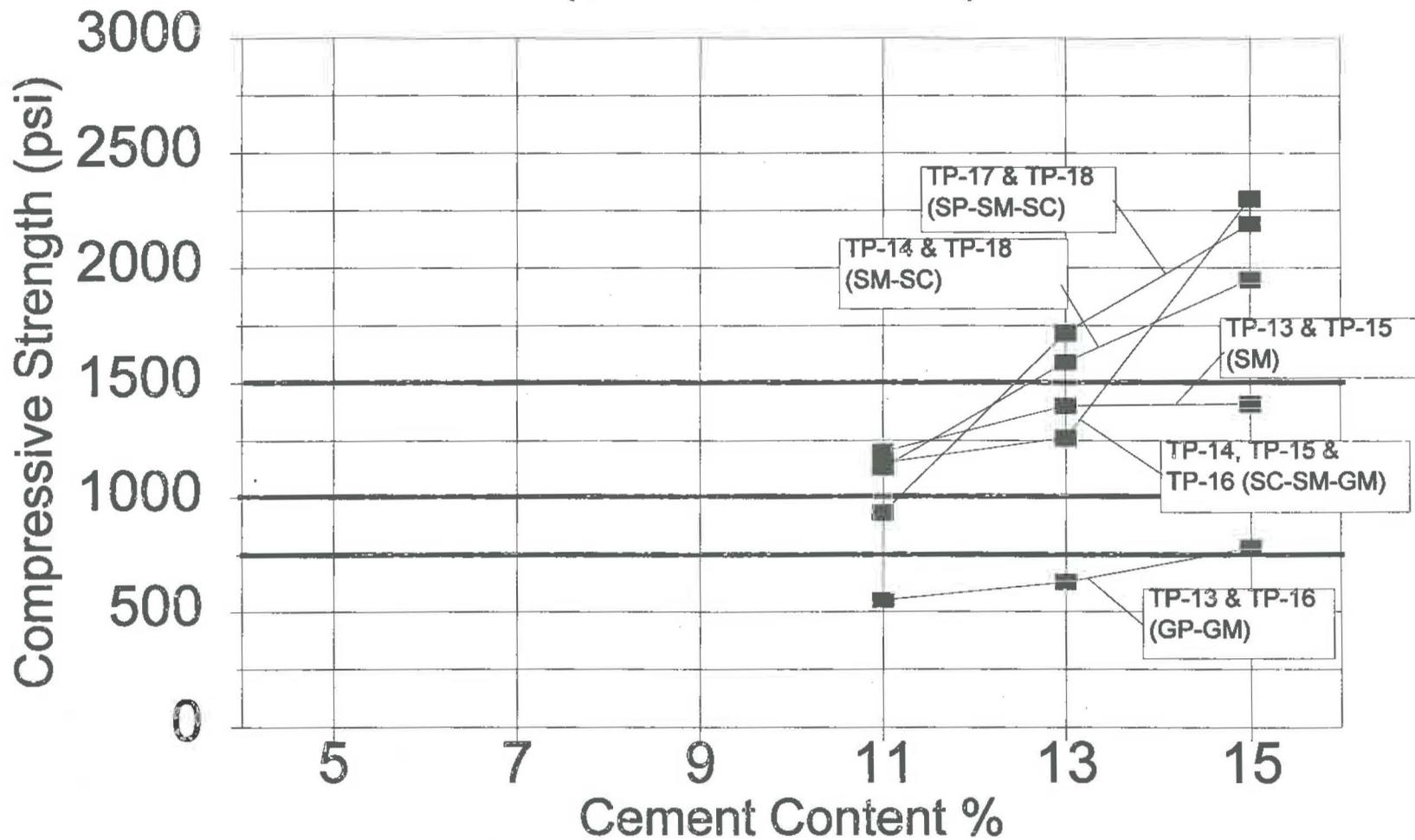


Figure 4

AREA 4 SOIL-CEMENT COMPRESSIVE STRENGTH TESTS

(Sta. 230+00 to 270+00)

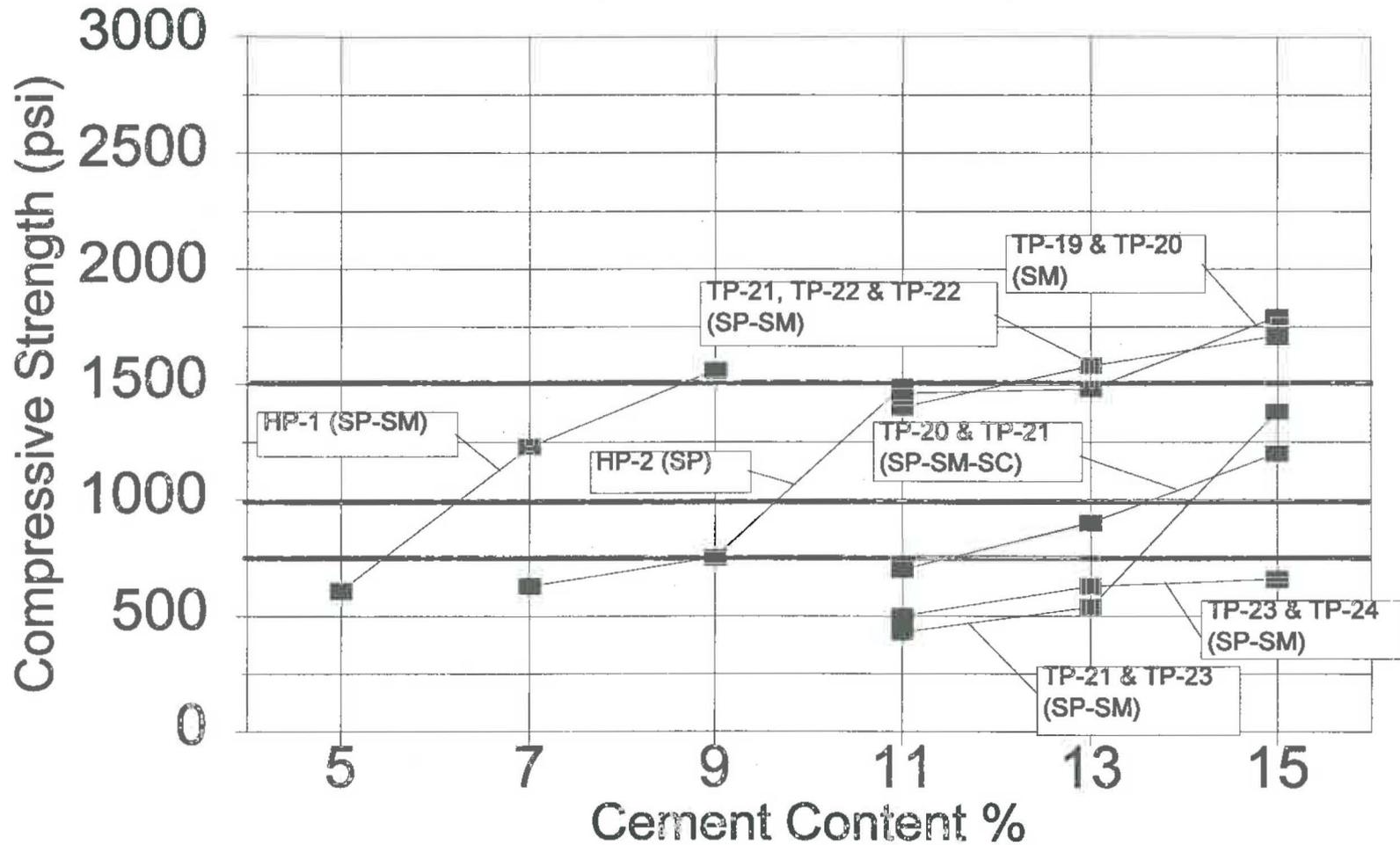


Figure 5

AVERAGE COMPRESSIVE STRENGTHS OF SAMPLES FROM THE FOUR AREAS

(Sta. 18+00 to 270+00)

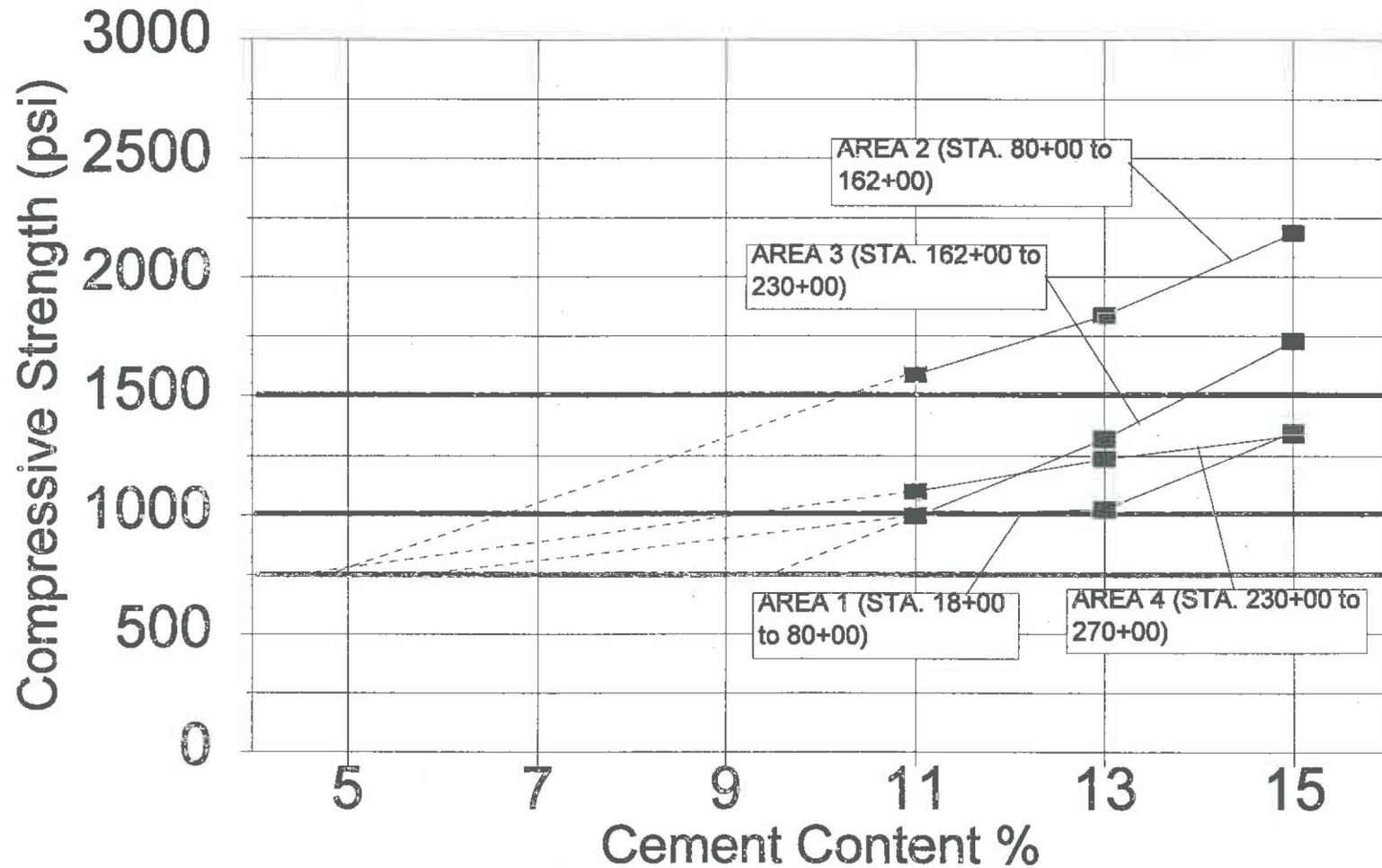


Figure 6

COMPRESSIVE STRENGTHS OF GRAVEL (GP/GM) SAMPLES

(Sta. 18+00 to 270+00)

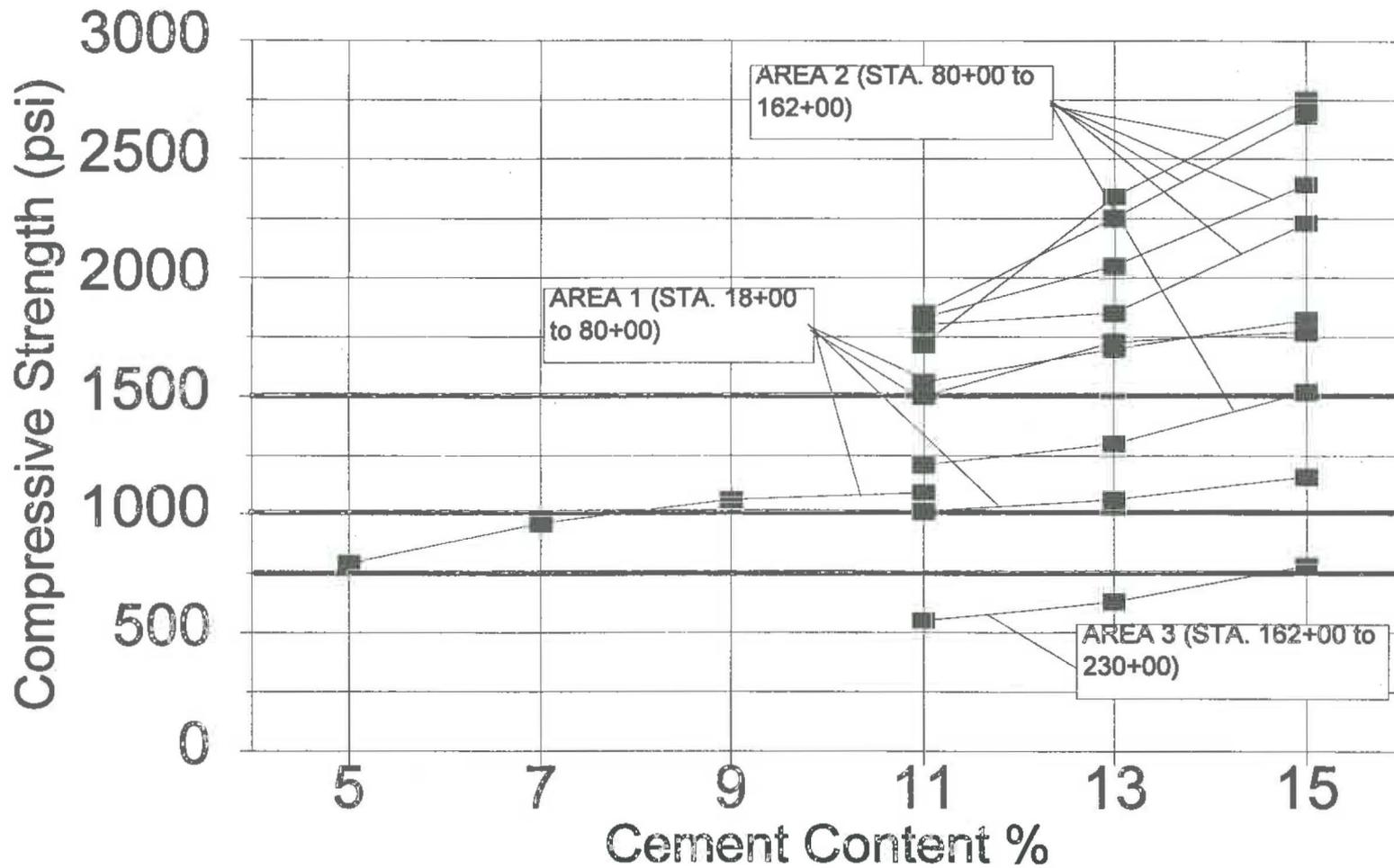


Figure 7

COMPRESSIVE STRENGTHS OF SANDY (SP/SM/SC) SAMPLES

(Sta. 18+00 to 270+00)

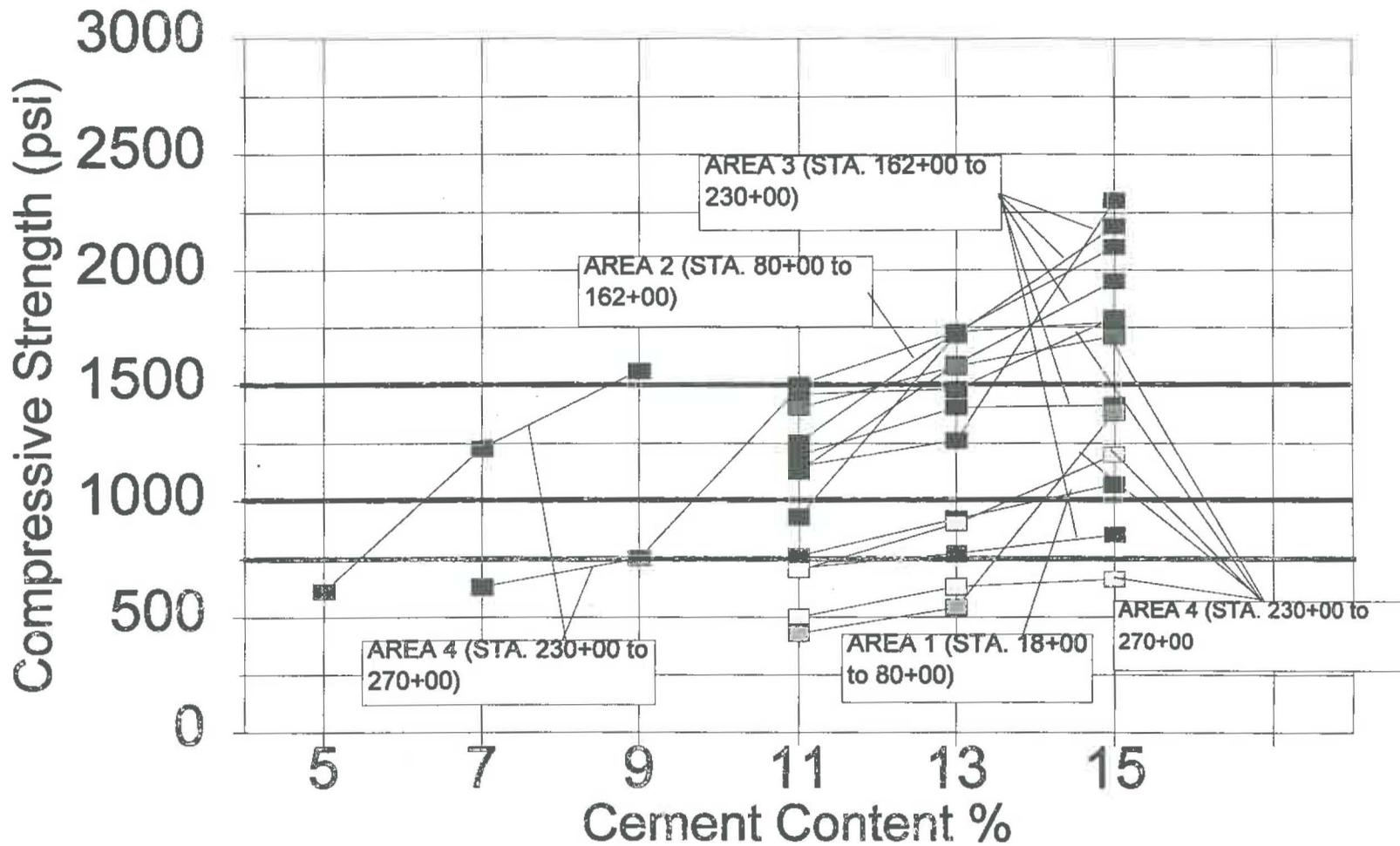


Figure 8

alignment. However, it should be noted that the plasticity index of the combined sample is 13. Most likely these soils will not be suitable for use in the soil-cement (unless blended) as the specification will limit the plasticity index of the soil aggregate to no more than 5.

Typical specifications for soil-cement construction limit the percentage of minus no. 200 fines to less than 15 percent and the plasticity index to a maximum of 5 or 6 when tested in accordance with the requirements of AASHTO T-90 (or equivalent test method). The vast majority of soils present along the wash alignment do meet these criteria. The average minus no. 200 sieve content of 27 soil samples collected by AEE along the Reatta Pass Wash alignment is 11 percent, varying from 2 to 24 percent. The average plasticity index of the materials tested is less than 4, varying from non-plastic (17 samples) to a high of 16. Based on the location of the collected samples, it appears that the poorest soils, in terms of percent fines and plasticity index, likely occur outside of the active wash channel to the north of the eastward extension of Deer Valley Road. Clayey soils which exceed the plasticity index requirements are known to be present (based on visual observations and testing) between about Stations 162+00 to 195+00.

Tested samples from Test Borings RP-1 through RP-6, located in Areas 3 and 4 between Stations 220+00 and 270+00 (AEE Job No. E95-86), had minus no. 200 fines contents varying from 17 to 24 percent. Four of the six samples tested also had plasticity index values at or above 9. Some of the tested near-surface samples located to the south of Deer Valley Road (RTP 14, 16 and 19) also contained high fines contents (19 to 25 percent minus no. 200 fines). It appears that the majority of near surface silty sand present outside of the existing active washes is high in fines content, but the more coarser grained soils, which are abundant, will be suitable. Careful quality control, including blending of marginal soils and wasting of unsuitable soils, will be required in Areas 3 and 4 to assure a high quality product that meets all specified requirements.

The coarser grained soils present to the south of Deer Valley Road as well as some of the recent stream bed material present north of Deer Valley Road (Figure 1), likely are likely the best aggregate sources. The maximum size of aggregate allowed in soil-cement is typically limited to between 1.5 and 3 inches. A 3-inch maximum size has typically been used for projects in the Salt River where the insitu material is very coarse. Even at a 3-inch maximum dimension, about 40 percent of the material is removed by screening (Hansen, 1995). Screening and possibly crushing of the oversize, which is considerable in some areas of the Reatta Pass Wash alignment (mainly in Areas 1 and 2), also would be required. Therefore it is recommended that a 3 inch maximum size be specified.

The average of all samples tested (Figure 6) indicate that cement contents varying from about 5 to 9 percent will be required to produce 750 psi material and that, if averaged cement contents of about 7 to 13 percent and 10 to more than 15 percent would be required to achieve strengths of 1,000 to 1,500 psi. This indicates that consideration will need to be given in the selection of aggregate materials.

Given the large quantity of materials that are to be excavated along the wash alignment (and wasted) relative to the amount that will be reused for soil-cement, the contractor should have considerable leeway in determining which materials should be utilized for soil-cement which results in cost effective construction. It is recommended that trackhoe test pits be excavated for contractors bidding on the soil cement construction, in order that they can observe the existing soil conditions. The contractors should be able to prepare realistic bids based on what materials are exposed within the pits.

4.0 STABILITY ANALYSIS

Stability analyses were performed on several possible temporary slope configurations which will be required during construction of the soil-cement channel embankments. In general, the soils are assumed to be non-cohesive. The clayey soils known to be present within portions of Areas 3 and 4, are for this analysis considered to be non-contiguous and therefore have not been analyzed. Should significant zones of clayey or otherwise cemented materials be encountered, additional stability analyses would be warranted.

4.1 SOIL PARAMETERS

Based on the soil conditions known to be present along the wash alignment, the soil is assumed to have a representative cohesion of 50 pounds per square-foot, a friction angle of 35 degrees and a unit weight of 115 pounds per cubic foot.

4.2 RESULTS OF STABILITY ANALYSIS

It is understood that excavation depths for the soil-cement embankments will be a maximum of about 20 feet. Combination slopes which consist of a relatively flat bottom portion with a steeper top portion are being considered in order to minimize the overall quantity of excavation. In general, it is recommended that the bottom portion of all channel excavations, which exceed 10 feet in total depth, be sloped no steeper than 1.5H:1V (horizontal to vertical), within the bottom 10 feet of the excavation. This recommendation is based on the granular, non-cemented to weakly cemented soil conditions known to be present over most of the site. Given the above stated recommendation, stability analyses for eight different possible slope

configurations were analyzed using the computer program PC STABL5M (Achilleos, 1988), developed by Purdue University. This program considers a generalized shear surface and utilizes a limiting equilibrium (simplified Janbu or simplified Bishop) method of slices procedures. Random trial shear surfaces are generated and analyzed to determine the critical circular shear surface. In the simplified Bishop procedure, which was utilized for the stability analyses, it is assumed that the forces on the sides of each slice are in a horizontal direction. This assumption implies that there is no friction between slices.

Figures 9 through 16 present the results of the analyses performed. Figures 9 through 12 present cases which assume a slope of 1.5H:1V within the bottom 10 feet and varying minimum slopes within the upper portion of the excavation based on depth of excavation and a minimum safety factor of 1.2 for temporary construction. Each of the above cases assume a total excavation depth of at least 12 feet. Figures 13 through 16 present cases where the total depth of excavation is less than 12 feet. In such cases it is recommended that the bottom 6 feet as a minimum be excavated to slope of 1.5H:1V and that the upper portion of the slope be excavated no steeper than that shown for the cases presented herein. Table 2 presents the results of the slope configurations analyzed. For analysis purposes it is assumed that construction equipment will be located no nearer than 10 feet from the crest of the excavation. An equivalent surcharge of 500 pounds per square foot (psf) was assumed to represent equipment loading.

TABLE 2
Results of Stability Analyses

Case No.	Total Depth (feet)	Slope Configuration	Minimum Computed Safety Factor
1	20	1.5H:1V (Bottom 10')/1H:1V (Upper 10')	1.44
2	18	1.5H:1V (Bottom 10')/1H:1V (Upper 8')	1.54
3	16	1.5H:1V (Bottom 10')/1H:0.75V (Upper 6')	1.50
4	14	1.5H:1V (Bottom 8')/0.75H:1V (Upper 6')	1.36
5	12	1.5H:1V (Bottom 6')/0.5H:1V (Upper 6')	1.29
6	10	1H:1V	1.45
7	8	0.75H:1V	1.51
8	6	0.5H:1V	1.51

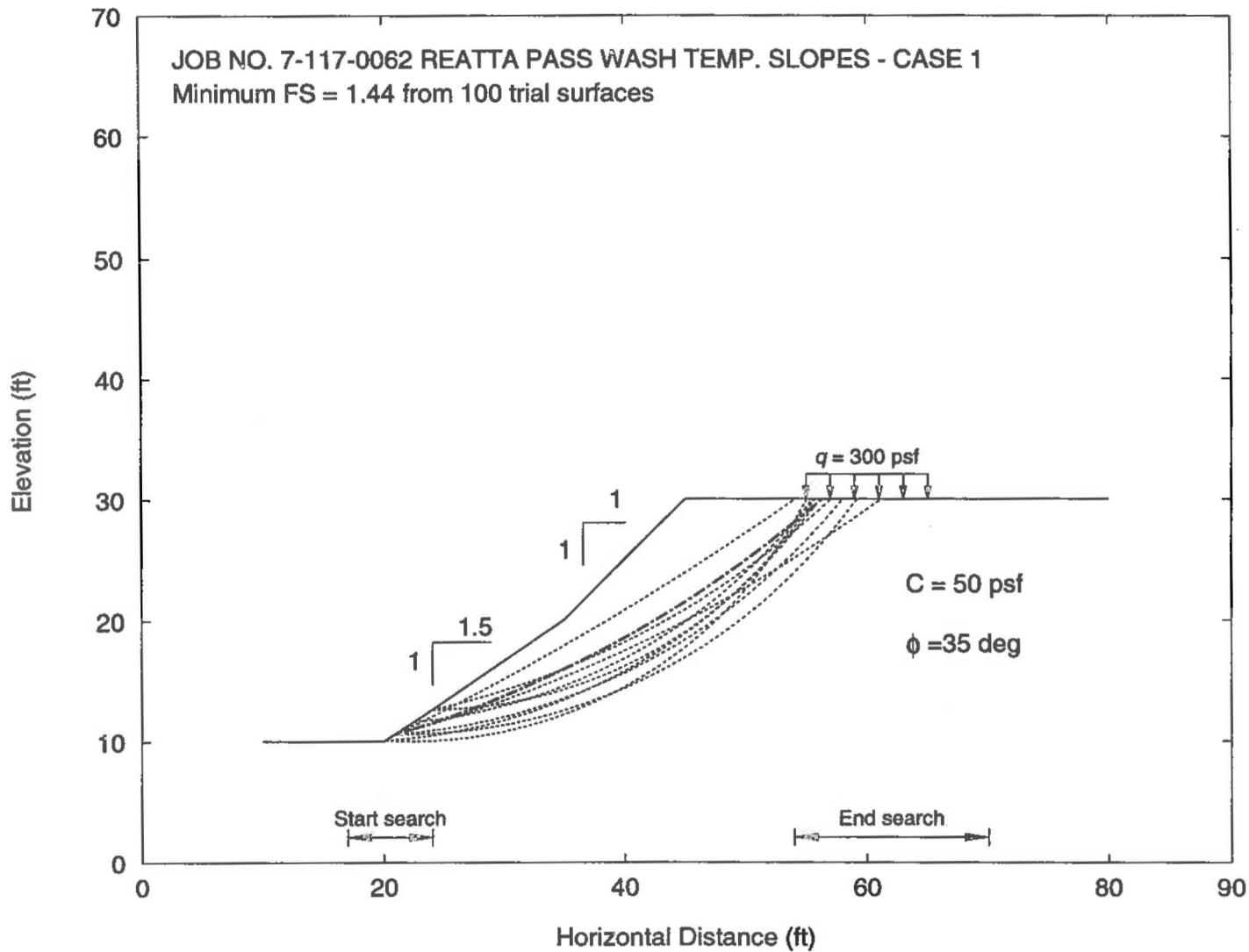


Figure 9

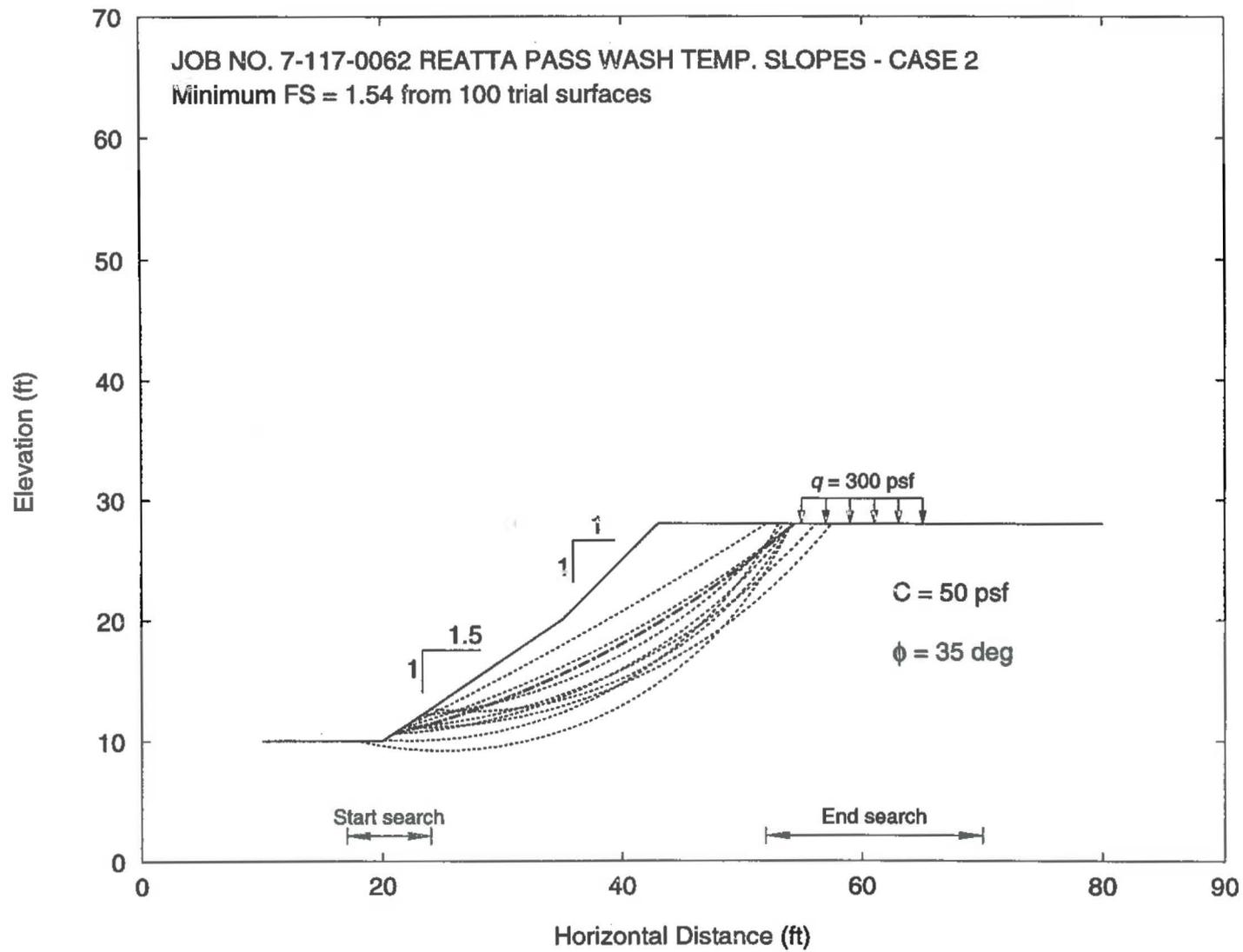


Figure 10

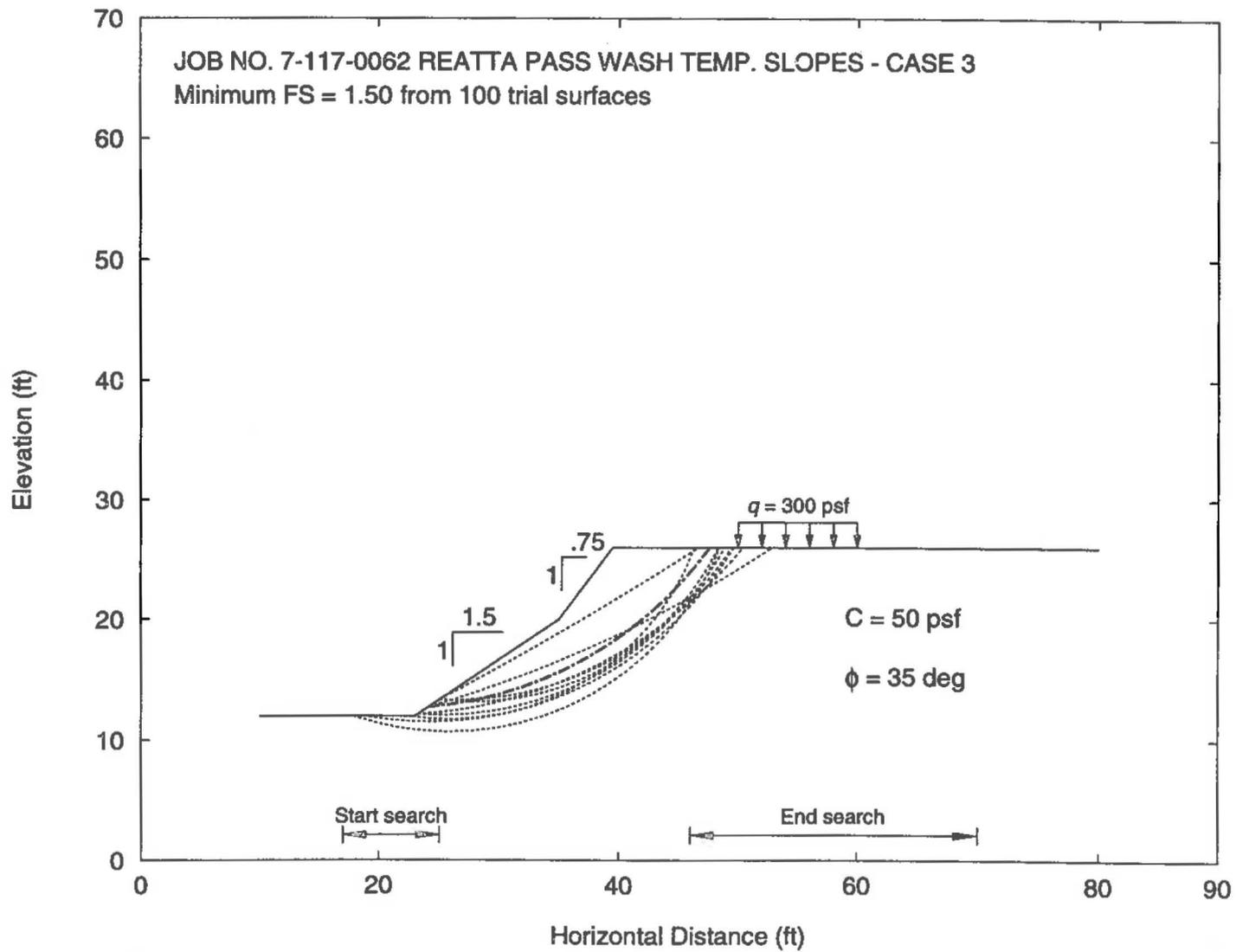


Figure 11

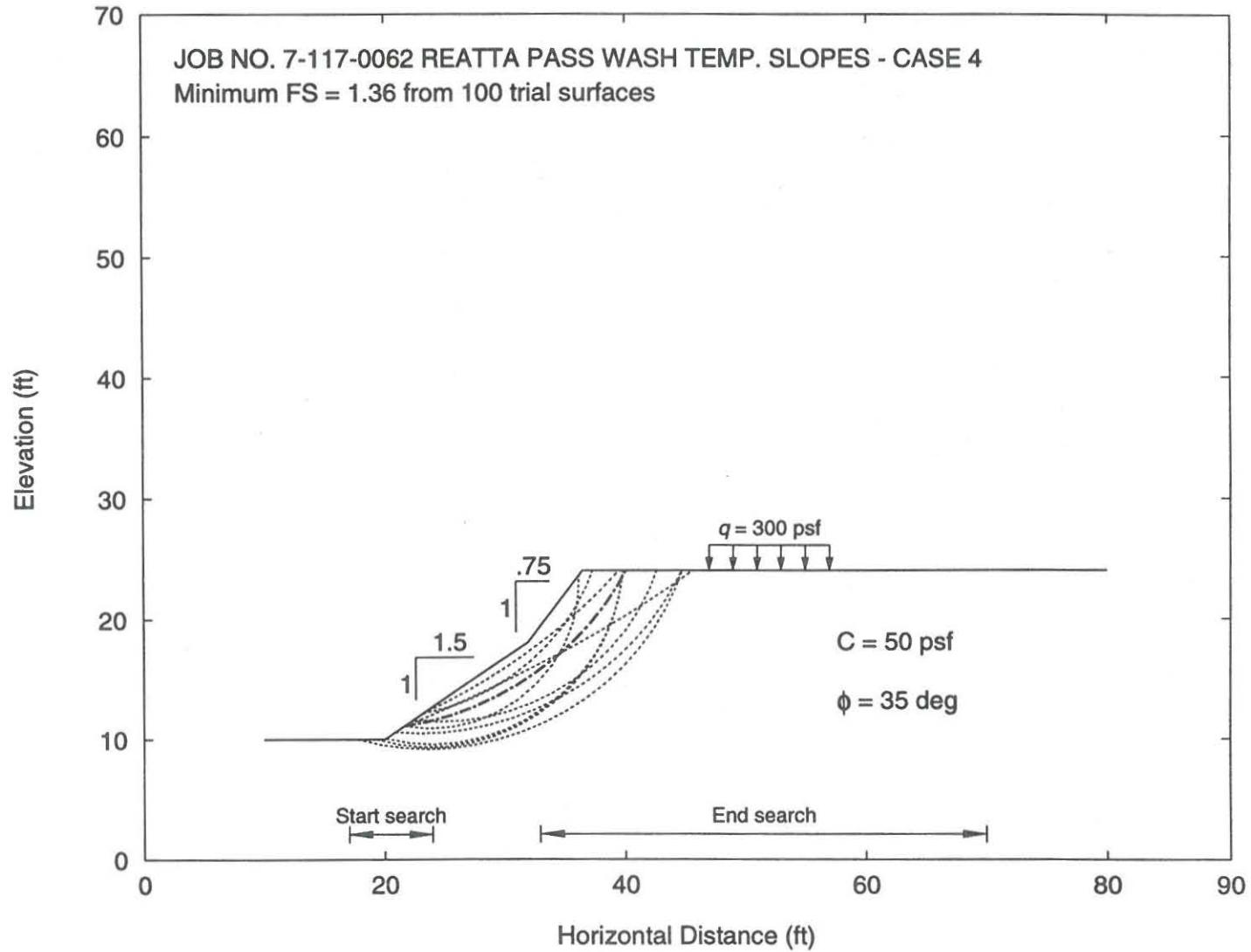


Figure 12

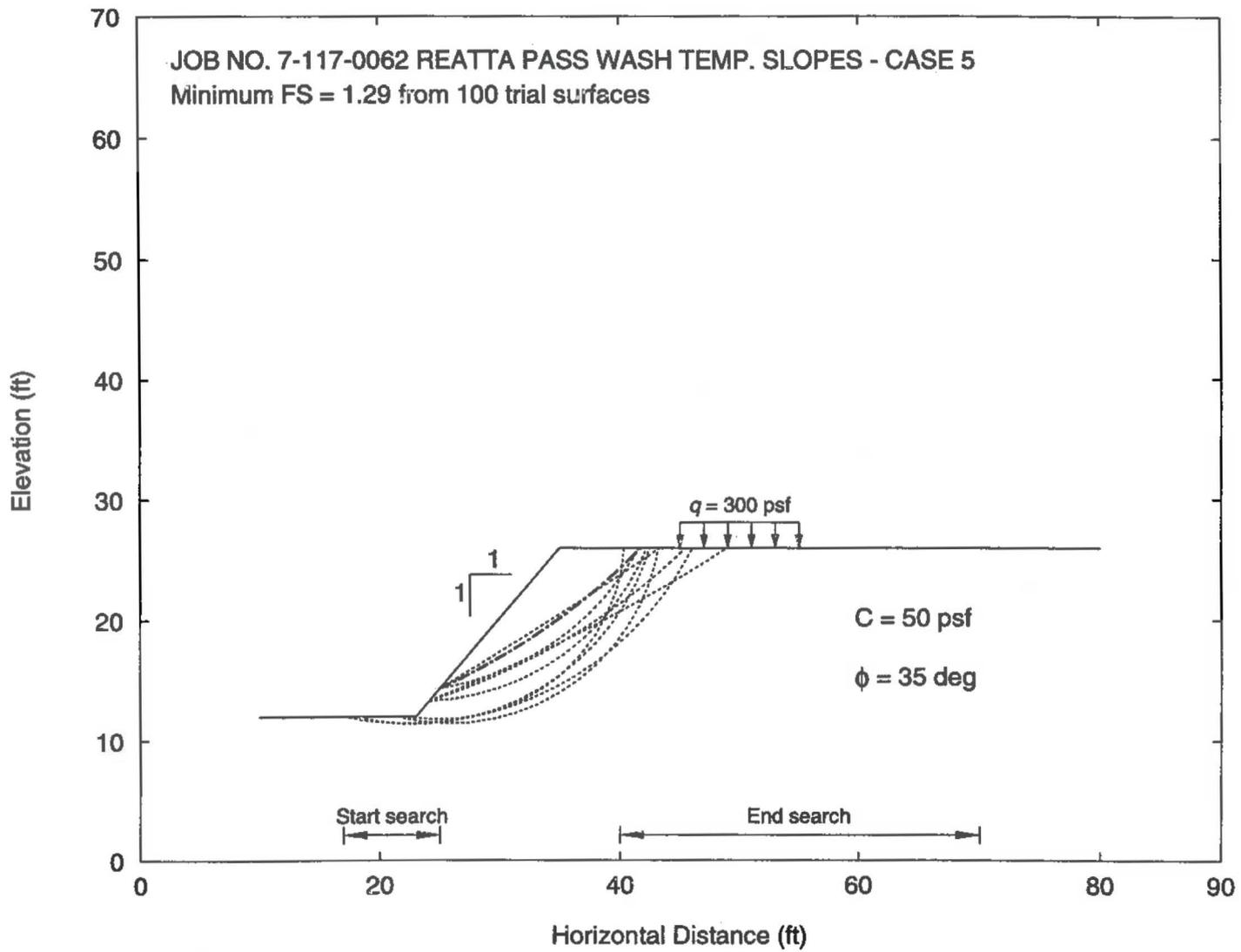


Figure 13

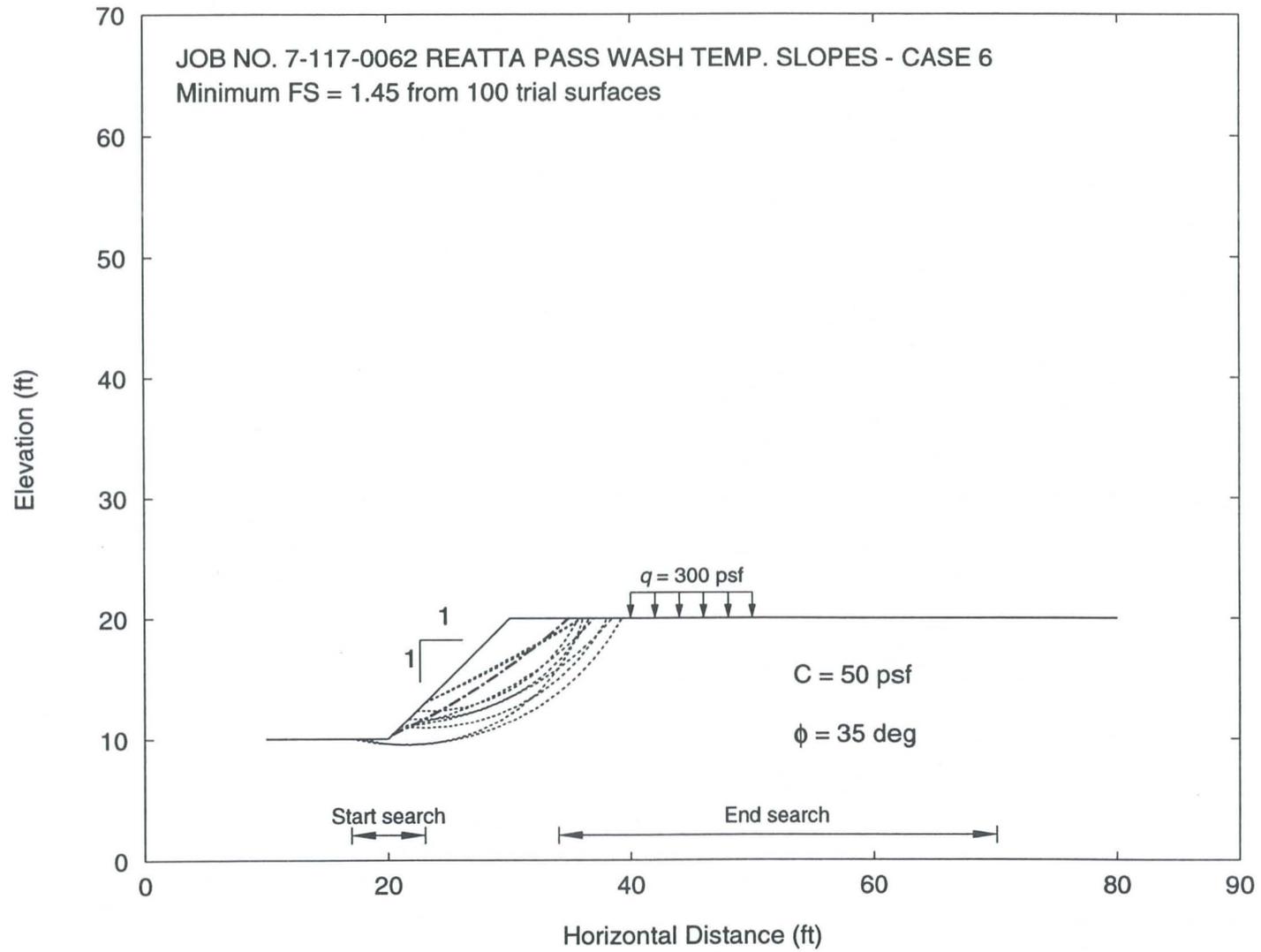


Figure 14

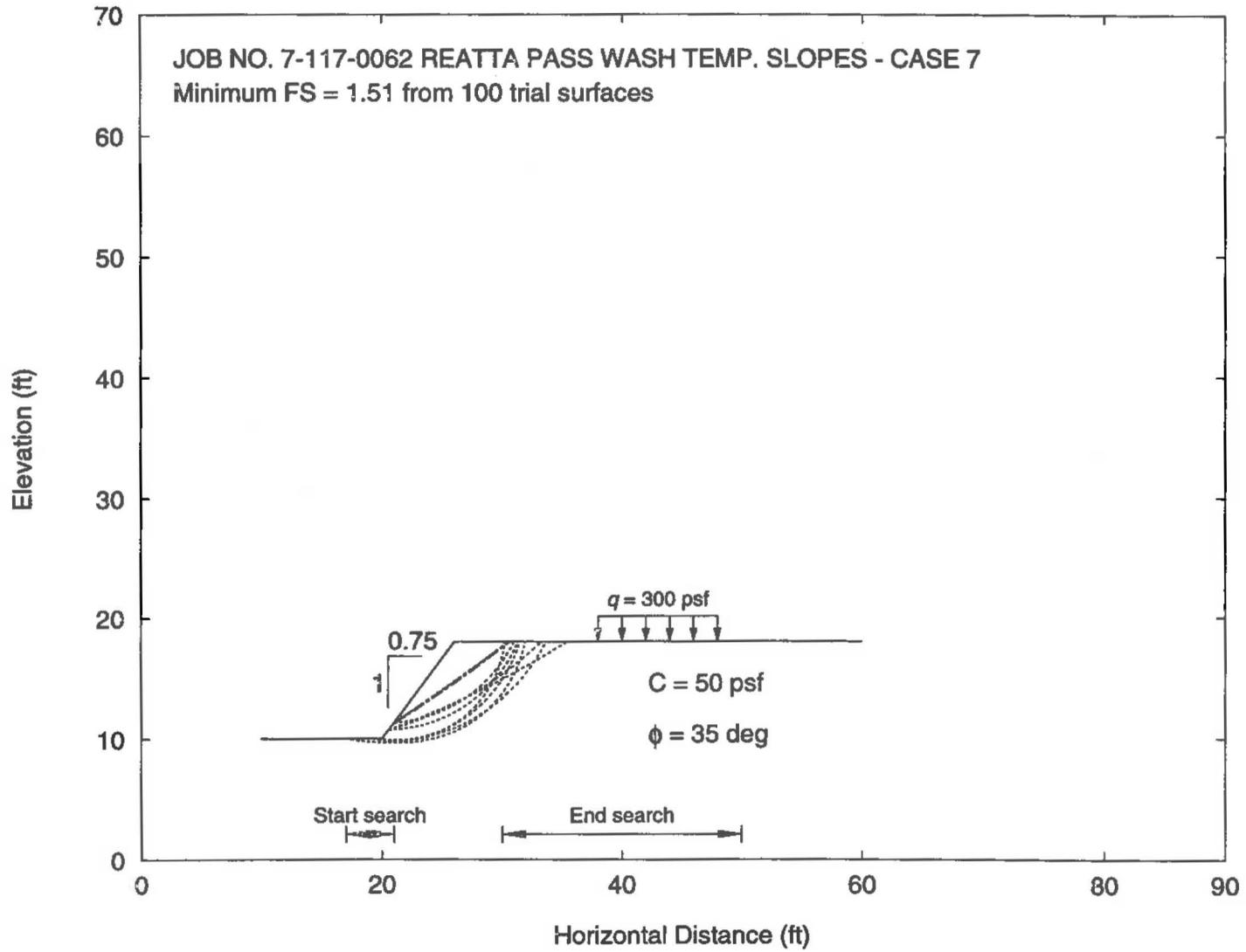


Figure 15

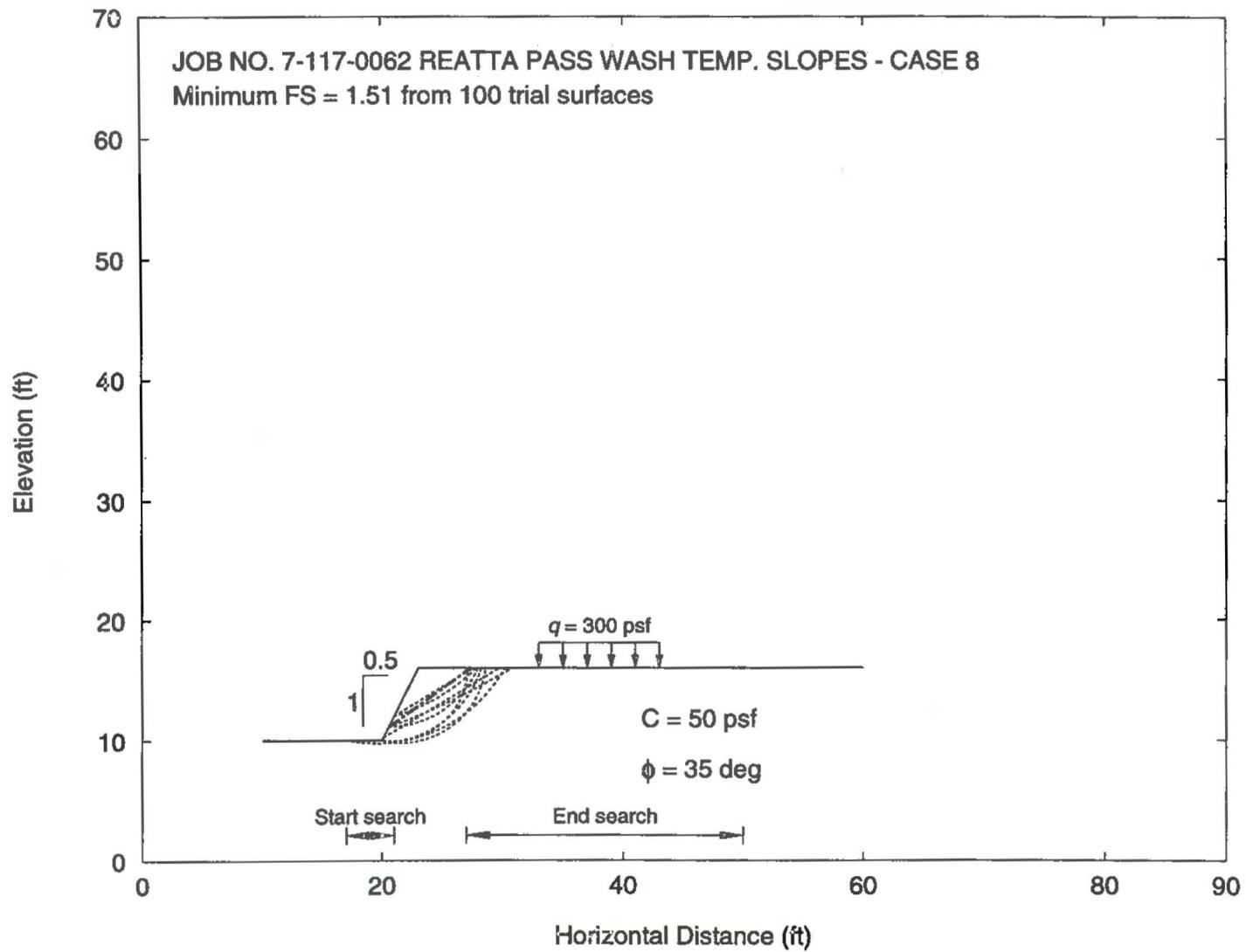


Figure 16

Soil-Cement Mix Designs
Additional Investigation - Desert Greembelt
Reatta Pass Wash Channelization
Between Pinnacle Peak Road &
Extension of Deer Valley Road
Scottsdale, Arizona

AEE Job No. 7-117-000062
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The analyses are based on soil conditions observed in the open trench. Should the soil conditions change the stability of the trench should be re-evaluated. Minor sloughing of the trench should be anticipated, especially where less cemented to non-cemented zones are encountered. Also, temporary excavations required along the bedrock ridges likely can be completed to 0.5H:1V. However, such excavation slopes should be observed inspected by a representative of the geotechnical engineer.

Should you have any questions concerning this report, please do not hesitate in contacting the undersigned.

Respectfully submitted,

AGRA Earth & Environmental, Inc.


Keith H. Dahlen, P.E.
Senior Engineer



c: Addressee (5)

mcb/J97-13/12-15-97

Reviewed by:



Lawrence A. Hansen, Ph.D., P.E.
Senior Vice President



Soil-Cement Mix Designs
Additional Investigation - Desert Greembelt
Reatta Pass Wash Channelization
Between Pinnacle Peak Road &
Extension of Deer Valley Road
Scottsdale, Arizona

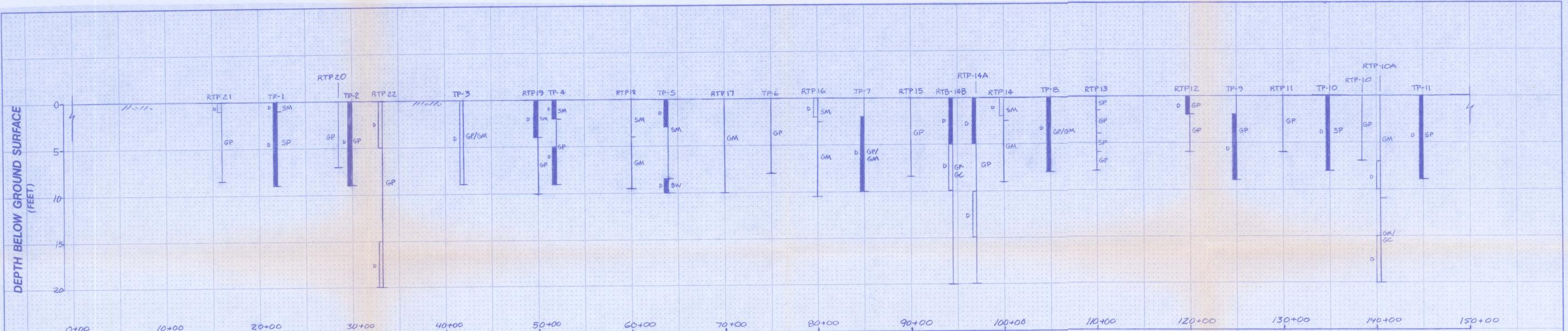
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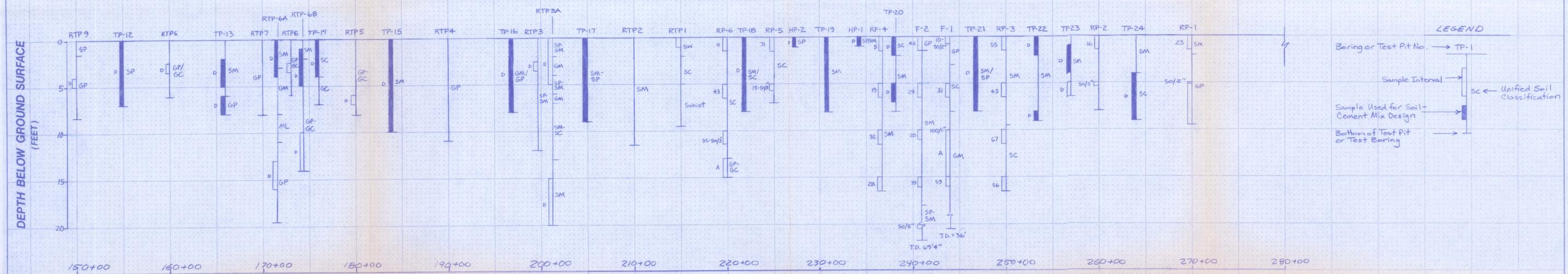
Achilleos, E., 1988, User Guide for PC STABL 5M, Purdue University and Indiana Department of Highways, Joint Highway Research Project, Report JHRP-88/19, December.

Felt, E.J., and Abrams, M. S., 1957, Strength and Elastic Properties of Compacted Soil Cement Mixtures, Authorized Reprint from ASTM Special Technical Publication No. 206, Development Department Bulletin D16.

Hansen, K.D., and Lynch, J.B., 1995, Controlling Floods in the Desert with Soil-Cement, Authorized Reprint From: Second CANMETACI International Symposium on Advances in Concrete Technology, Las Vegas, NV, June 11-14.



STATIONING ALONG CONSTRUCTION CENTERLINE (FEET)



STATIONING ALONG CONSTRUCTION CENTERLINE (FEET)

LEGEND

- Boring or Test Pit No. → TP-1
- Sample Interval →
- Sample Used for Soil-Cement Mix Design →
- Bottom of Test Pit or Test Boring →
- SC ← Unified Soil Classification

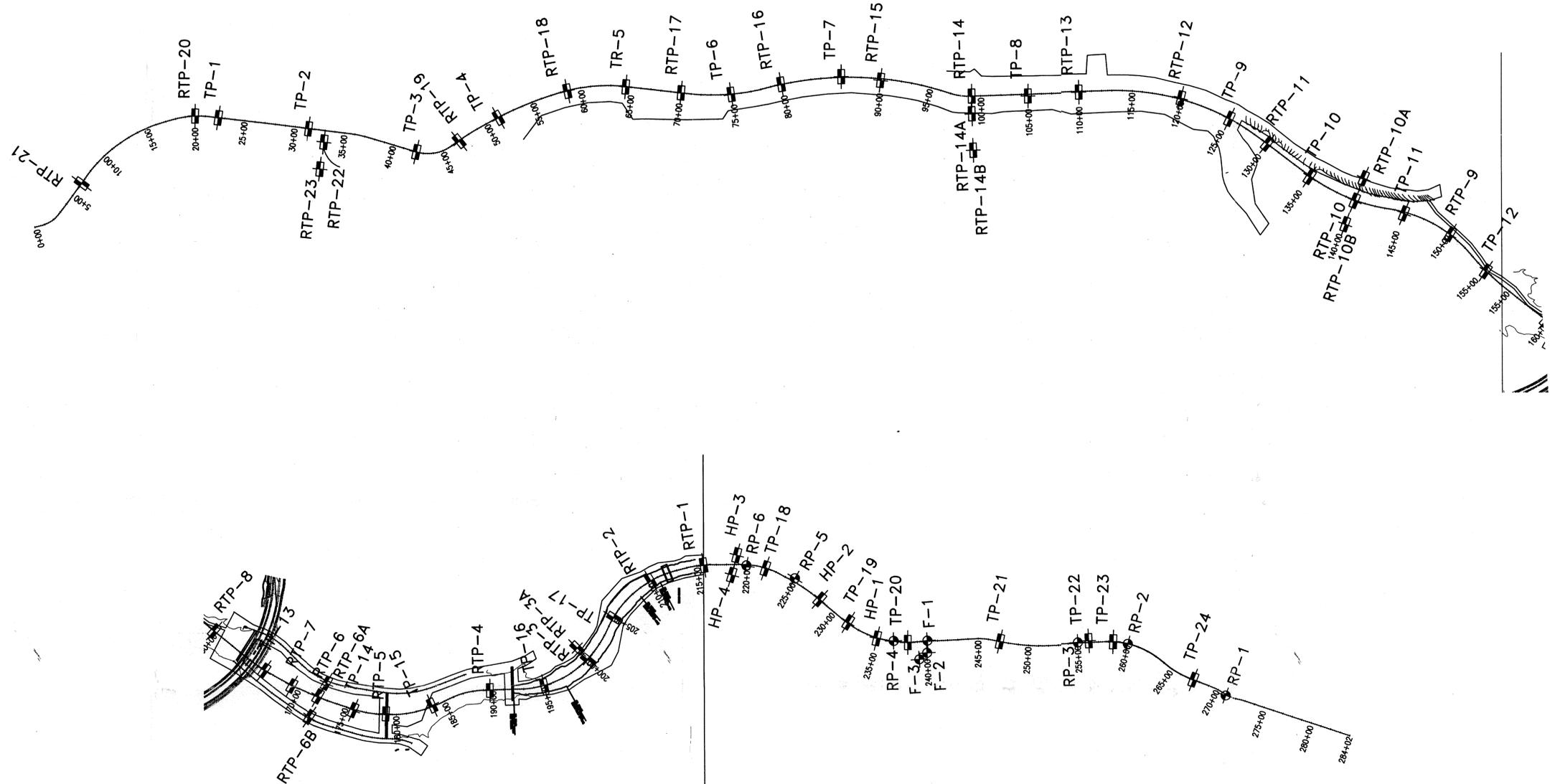
GENERAL NOTE:
 NOT ALL BORINGS AND TEST PITS SHOWN AT EXACT LOCATIONS DUE TO SPACE CONSTRAINTS.



GEOTECHNICAL PROFILE
 ALONG REATTA PASS WASH
 DESERT GREENBELT, SCOTTSDALE, AZ
 KHD | 12/16/97 | SHEET 2



SCALE: 1"=600'
0 300 600 1200



 AGRA Earth & Environmental ENGINEERING GLOBAL SOLUTIONS 322 West Virginia Avenue Phoenix, Arizona 85009-1502 Tel: (602)772-6648 Fax: (602)772-7229	JOB NO. 7-117-062	SITE PLAN SHOWING TEST BORING & TEST PIT LOCATIONS REATA PASS WASH - DESERT GREENBELT SCOTTSDALE, ARIZONA
	DESIGN BY: KHD	
	DRAWN BY: SLB	
	DATE: 12/97	
	SCALE: 1"=600'	

Sheets 1 through 3 are currently being prepared. Will be delivered for insertion into report on 12/16/97.

APPENDIX A
FIELD INVESTIGATION

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-1

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 22 + 00, 75' R

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SM	slightly moist	SILTY SAND , predominantly fine to medium grained sand, nonplastic, light brown
1			D			slightly moist	GRAVELLY SAND , with cobbles, maximum 2' boulders, well graded sand & gravel, rounded to subrounded, nonplastic, brown
2							
3							
4					SP		
5							
6							
7							
8							
9							Backhoe refused at 9'
10							

7-117-000062 GWH 10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-3

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER

BACKHOE TYPE Ford 555D

DEPTH	HOUR	DATE
	none	

LOCATION Sta. 42+00, 100' R

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist to dry	SILTY SAND, GRAVEL & COBBLES , cobbles up to 6" in diameter, subrounded to rounded poorly graded gravel, subrounded to rounded well graded sand, no lime, nonplastic, brown
1							
2							
3							
4					GP/ GM		
5							
6							
7							
8							
9							Stopped Backhoe at 9'
10							

7-117-000062.GWH 10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-4

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 52+00, 50' L
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
1					SM		
2							
3						slightly moist to dry	SANDY GRAVEL & COBBLES , rounded to subrounded cobbles (up to 6" in diameter), poorly graded gravel rounded to subrounded well graded sand, nonplastic, brown
4							
5			D		GP		
6							
7							
8							
9							Stopped Backhoe at 9'
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-5

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 64 + 00, on centerline
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist	SILTY SAND , trace of fine grained gravel, predominantly fine to medium grained, some lime, nonplastic, brown
1							
2							
3					SM		
4							
5							
6							
7							
8							
9			D		SW	slightly moist	GRAVELLY SAND , predominantly fine grained gravel, predominantly coarse grained subrounded to rounded sand, nonplastic, brown Stopped Backhoe at 10'
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-6

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 75+00, 20' R

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification
0			D		
1					
2					
3					GP
4					
5					
6					
7					
8					
9					
10					

REMARKS

VISUAL CLASSIFICATION

slightly moist

SAND, GRAVEL & COBBLES, cobbles up to 2' in diameter, rounded to subrounded well graded sand & gravel, no lime, nonplastic, brown

Stopped Backhoe at 8'

7-117-000062 GWH 10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-7

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 85 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification
0					
1					
2			D		
3					
4					
5					GP/ GM
6					
7					
8					
9					
10					

REMARKS

slightly moist to dry

VISUAL CLASSIFICATION

GRAVELLY SAND, trace of cobbles (up to 6" in diameter), rounded poorly graded gravel, rounded well graded sand, no lime, nonplastic, brown

note: one 2'6" boulder at 2'

Stopped Backhoe at 10'

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

7-117-000062_GWH 10/29/97

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-9

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER			BACKHOE TYPE <u>Ford 555D</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 125 + 00, on centerline</u>
	<u>none</u>		ELEVATION _____
			DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	SAND, GRAVEL & COBBLES , some cobbles, subrounded to rounded well graded sand & gravel, nonplastic, brown
1			D				
2							
3					GP		
4							
5							
6							
7							
8							
9							Stopped Backhoe at 9'
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-10

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 135 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION	
0			D			slightly moist	GRAVELLY SAND , trace of boulders (up to 24" in diameter), fine grained gravel, subangular to subrounded, predominantly medium to coarse grained sand, nonplastic, brown	
1								
2								
3						SP		
4								
5								
6								
7								
8							Stopped Backhoe at 8'	
9								
10								

7-117-000062_GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-11

JOB NO. 7-117-000062 DATE 10-15-97



GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 145 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist	GRAVELLY SAND , fine grained gravel, subangular to subrounded, well graded sand, nonplastic, brown
1							
2							
3						SP	
4							
5							
6							
7							
8							
9							Stopped Backhoe at 9'
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-12

JOB NO. 7-117-000062 DATE 10-15-97

GROUNDWATER			BACKHOE TYPE <u>Ford 555D</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 155 + 00, on centerline</u>
	none		ELEVATION _____
			DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION	
0			D			slightly moist	GRAVELLY SAND , trace of clay, predominantly fine grained gravel, subangular to subrounded, well graded sand, nonplastic, brown	
1								
2						SP		
3								
4								
5								
6								
7						Stopped Backhoe at 7'		
8								
9								
10								

7-117-000062.gwh_10/29/97

SAMPLE TYPE

T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-13

JOB NO. 7-117-000062 DATE 10-16-97

BACKHOE TYPE Ford 555D

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

LOCATION Sta. 166 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist to moist	SILTY SAND , fine grained gravel, well graded sand, no lime, nonplastic, brown note: occasional 24" boulder
1							
2			D		SM		
3							
4							
5							
6			D		GP	slightly moist to moist	SAND, GRAVEL & COBBLES , cobbles up to 12" in diameter, subrounded to rounded sand & gravel, nonplastic, brown
7							
8							Stopped Backhoe at 8'
9							
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-14

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER			BACKHOE TYPE <u>Ford 555D</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 176+00, on centerline</u>
	none		ELEVATION _____
			DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS		VISUAL CLASSIFICATION	
						REMARKS	VISUAL CLASSIFICATION		
0			D			slightly moist to moist	CLAYEY SAND & GRAVEL , predominantly fine grained gravel, subangular to subrounded, predominantly well graded sand, low to medium plasticity, dark brown note: occasional cobbles		
1					SC				
2									
3									
4									
5					GC	slightly moist to moist	SAND, GRAVEL & COBBLES , some clay, boulders up to 24" in diameter, poorly graded sand & gravel, rounded to subrounded, low to medium plasticity, brown		
6									
7								Stopped Backhoe at 7'	
8									
9									
10									

7-117-000062_GWH_10/28/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-15

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 184 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist	SILTY SAND, predominantly fine to medium grained, no lime, nonplastic, light brown
1							
2							
3							
4					SM		
5							
6							
7							
8							
9							
10							Stopped Backhoe at 10'

7-117-000062_GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-16

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 197+00, on centerline
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist	SAND, GRAVEL & COBBLES , trace of clay, cobbles up to 12" in diameter, subangular to subrounded well graded sand & gravel, nonplastic, light brown
1							
2							
3					GM/		
4					GP		
5							
6							
7							
8							Backhoe refused at 8'
9							
10							

7-117-000062.GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-17

JOB NO. 7-117-000062 DATE 10-16-97

BACKHOE TYPE Ford 555D

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

LOCATION Sta. 205 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS		VISUAL CLASSIFICATION	
0			D			slightly moist to dry	SILTY SAND TO SAND, some fine grained gravel, predominantly medium to coarse grained sand, nonplastic, brown		
1									
2									
3					SM/				
4					SP				
5									
6									
7									
8									
9							Stopped Backhoe at 9'		
10									

7-117-000062.GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-18

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 222+00, 10' L
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			moist	SILTY SAND TO CLAYEY SAND , trace of clay, well graded sand, no lime, nonplastic to low plasticity, reddish brown
1							note: 6" cobbles at 8'
2							
3					SM/ SC		
4							
5							
6							
7							
8							Stopped Backhoe at 8'
9							
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-19

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 231+00, 10' L
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			moist	SILTY SAND , trace of boulders, trace of clay, well graded sand, no lime, nonplastic, reddish brown note: refused on boulders at 8'
1							
2							
3					SM		
4							
5							
6							
7							
8							Backhoe refused at 8'
9							
10							

7-117-000062 GWH 10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-20

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER

DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 238 + 00, on centerline

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0	[Diagonal Hatching]	[Cross-hatching]	D			slightly moist to moist	SANDY CLAY TO CLAYEY SAND, well graded sand, no lime, medium plasticity, brown
1					SC		
2	[Vertical Lines]	[Vertical Lines]				slightly moist to moist	SILTY SAND, some cobbles (up to 6" in diameter), well graded sand, nonplastic, brown
3							
4					SM		
5	[Vertical Lines]	[Cross-hatching]	D				
6							
7	[Vertical Lines]	[Vertical Lines]					
8							
8						Stopped Backhoe at 8'	
9							
10							

7-117-000062 GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-21

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D

LOCATION Sta. 247+00, 25' L

ELEVATION _____

DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			slightly moist to moist	SILTY SAND TO SAND , trace of cobbles (up to 6" in diameter), poorly graded sand, predominantly coarse grained, no lime, nonplastic, brown
1							
2							
3					SM/		
4					SP		
5							
6							
7							
8							Stopped Backhoe at 8'
9							
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-22

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER

BACKHOE TYPE Ford 555D



DEPTH	HOUR	DATE
	none	

LOCATION _____
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0			D			moist	SILTY SAND , trace of cobbles, well graded, nonplastic, brown note: trace of fine grained gravel note: low plasticity from 8' to 9'
1							
2							
3					SM		
4							
5							
6							
7							
8			D				
9							Stopped Backhoe at 9'
10							

7-117-000062.gwh 12/15/97

SAMPLE TYPE

- T - Tube Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-23

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 257+00, 10' L
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	SILTY SAND , some gravel & occasional cobbles up to 3" in diameter, well graded sand, nonplastic, brown note: material became weakly lime cemented with cobbles at 4', strongly lime cemented at 6'
1			D				
2							
3					SM		
4							
5			D				
6							
7							Backhoe refused at 6'6"
8							
9							
10							

7-117-000062_GWH_10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation - Desert Greenbelt

LOG OF TEST PIT NO. TP-24

JOB NO. 7-117-000062 DATE 10-16-97

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE Ford 555D
 LOCATION Sta. 264+00, 30' L
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/USCS Classification	REMARKS	VISUAL CLASSIFICATION
0						moist	SILTY SAND , trace of fine grained gravel, well graded sand, nonplastic, brown
1					SM		
2							
3							
4			D			moist	CLAYEY SAND , some fine grained gravel, well graded sand, medium plasticity, reddish brown
5							
6					SC		
7							
8							
9							Stopped Backhoe at 9'
10							

7-117-000062_GWH 10/29/97

SAMPLE TYPE
 T - Tube Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT **Desert Greenbelt Phase I**

LOG OF TEST BORING NO. **F-1**

JOB NO. **E95-86** DATE **6-8-95**

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blow Count	Dry Density lbs. per Cubic ft.	Moisture Content Percent of Dry Weight	Unified Soil Classification	Remarks	Visual Classification
									Remarks	Visual Classification
0				S	10-50/2"			GP	slightly moist	SAND, GRAVEL & COBBLES, some silt, poorly graded, subrounded to subangular, nonplastic, brown
5				S	13-16-15			SC	very dense slightly moist	CLAYEY SAND, some fine grained gravel, subrounded to subangular, low plasticity, brown
10				U	100/1"				very firm	SILTY SAND, GRAVEL & COBBLES, subrounded to subangular, poorly graded, nonplastic, brown
15				A					slightly moist	
15				U	59	113	2	GM	very firm to hard	
20				S	10-20-25					
25				S	24-50/5"					
30				S	15-20-20			SM	slightly moist	SILTY SAND & GRAVEL, poorly graded, subrounded to subangular, nonplastic, brown
35				S	15-50/4"				very firm to hard	
36										Auger refused at 36'

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A - Drill Cuttings
 S - 2" O.D., 1.38" I.D. Tube Sample.
 U - 3" O.D., 2.42" I.D. Tube Sample.
 NR - No Recovery

PROJECT Desert Greenbelt Phase I

LOG OF TEST BORING NO. F-2

JOB NO. E95-86 DATE 6-8-95

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blow Count	Dry Density lbs. per Cubic ft.	Moisture Content Percent of Dry Weight	Unified Soil Classification	RIG TYPE CME-55	
									BORING TYPE 6 5/8" Hollow Stem Auger	
									SURFACE ELEV. _____	
									DATUM _____	
									REMARKS	VISUAL CLASSIFICATION
0				S	1-12-30			GP	slightly moist	SAND, GRAVEL & COBBLES, some silt, poorly graded, subrounded to subangular, nonplastic, brown
									dense	
5				S	8-15-14				slightly moist	SILTY SAND, considerable poorly graded gravel, subrounded to subangular, nonplastic, brown
10				U	20		2	SM	firm to very firm	
15				U	39	112	2			
20				S	50/5"				slightly moist	SILTY SAND, some fine grained gravel, poorly graded, subrounded to subangular, nonplastic to low plasticity, light brown
									hard	
25				S	50/4"					
								SP-SM		
30				S	30-50/4"		2			
35				S	28-50/5"					
40				S	13-50/5"					
45										Auger refused at 42'
50										

GROUNDWATER

SAMPLE TYPE

A-7

DEPTH	HOUR	DATE
	none	

A - Drill Cuttings
 S - 2" O.D., 1.38" I.D. Tube Sample.
 U - 3" O.D., 2.42" I.D. Tube Sample.
 NR - No Recovery

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST BORING NO. F-3

JOB NO. 6-117-000029 DATE 2-24-96

LOCATION Foothills Drive Bridge
 RIG TYPE AP-1000
 BORING TYPE 9" Dual Percussion Hammer
 SURFACE ELEV. _____
 DATUM _____

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blow Count	Dry Density lbs. per Cubic ft.	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50	17			S	8-24-		2		moist to very moist (from 57' to 58')	SILTY SAND & GRAVEL, continued
	38				36					
	49									
	23									
55	19									
	20									
	23									
	32			A			3	GP/ GM		
	33									
60	27			S	14-30-					
	50				50/4"					
	30									
	35									
	60									
65	50			A			2			
	39									
	60									
	63									
	70			S	50/4"					
70									Stopped Hammer at 69' Stopped Sampler at 69'4"	

GROUNDWATER

SAMPLE TYPE

A-9

DEPTH	HOUR	DATE
	none	

A - Drill Cuttings
 S - 2" O.D., 1.38" I.D. Tube Sample.
 U - 3" O.D., 2.42" I.D. Tube Sample.
 NR - No Recovery
 T - Thin Walled Shelby Tube

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-3A

JOB NO. 6-117-000029

DATE 2-23-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 200+75, 190' L
 ELEVATION 1948' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SP-SM	slightly moist	SILTY SAND , some fine grained gravel, poorly graded, subrounded to subangular, nonplastic, brown
					GM	slightly moist	SILTY SAND, GRAVEL & COBBLES , poorly graded, angular to subangular, nonplastic, brown
5					SP-SM	slightly moist	SILTY SAND , some fine grained gravel, occasional large gravels, poorly graded, subrounded to subangular, nonplastic, brown
					GM	slightly moist	SILTY SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, nonplastic, brown
					SM/SC	slightly moist	SILTY TO CLAYEY SAND , some fine grained gravel, poorly graded, subrounded to subangular, weakly lime cemented, low plasticity, brown
15			D		SM	slightly moist	SILTY SAND , some fine grained gravel, predominantly fine to medium grained gravel, subrounded to subangular, nonplastic, brown
20							Stopped Trackhoe at 20'
25							

SAMPLE TYPE

- B - Undisturbed Block Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-6B

JOB NO. 6-117-000029

DATE 2-22-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 174 + 40, 270' R
 ELEVATION 1862' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	slightly moist	SILTY SAND , some fine grained gravel, predominantly fine to medium grained, subrounded to subangular, nonplastic to low plasticity, brown
5		D	1		GP-GC	slightly moist	CLAYEY SAND, GRAVEL & COBBLES , occasional boulders, poorly graded, subrounded to subangular, low plasticity, light brown note: estimated maximum particle size of 24"
10		D					
15							Trackhoe refused at 14'
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-6A

JOB NO. 6-117-000029

DATE 2-22-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 171 + 60, 200' L
 ELEVATION 1860' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D	2	SM	slightly moist	SILTY SAND , some fine grained gravel, subrounded to subangular, nonplastic, brown
5					GM	slightly moist	SILTY SAND & GRAVEL , poorly graded, subrounded to subangular, nonplastic, brown
10					ML	slightly moist	CLAYEY TO SANDY SILT , low plasticity, brown
15			D		GP	slightly moist	SILTY SAND, GRAVEL & COBBLES , occasional boulders, poorly graded, angular to subangular, nonplastic, brown note: maximum estimated particle size of 18"
20							Stopped Trackhoe at 19'6"
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample



PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-10A

JOB NO. 6-117-000029

DATE 2-23-96

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 140+40, 275' L
 ELEVATION 1770' +/-
 DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS		VISUAL CLASSIFICATION		
0						slightly moist	SILTY SAND & GRAVEL , predominantly fine grained gravel, subrounded to subangular, nonplastic, brown note: increase in gravel with some cobbles from 6' to 8'			
5					GM					
6										
7										
8										
9										
10										
11										
12										
13										
14										
15							slightly moist	SILTY SAND & GRAVEL , some cobbles & boulders, poorly graded, subrounded to subangular, nonplastic to low plasticity, light brown note: estimated maximum particle size of 24"		
16										
17										
18										
19										
20							Stopped Trackhoe at 20'			
21										
22										
23										
24										
25										

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample



PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-10B

JOB NO. 6-117-000029

DATE 2-23-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 140+40, 255' R
 ELEVATION 1780' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION	
0						slightly moist (very dense)	SILTY SAND, GRAVEL & COBBLES , some cobbles & boulders, trace of clay, poorly graded, subrounded to subangular, nonplastic to low plasticity, brown to light brown note: maximum particle size of 18"	
5		D			GM-GP			
10								
15								
20								
25								
						Trackhoe refused at 10'		

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample



PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-14A

JOB NO. 6-117-000029

DATE 2-23-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 100+00, 190' R
 ELEVATION 1681' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D	2		slightly moist	SAND, GRAVEL & COBBLES , some boulders, trace to some clay, poorly graded, subrounded to subangular, weakly lime cemented, nonplastic, brown to light brown note: maximum estimated particle size of 24"
5					GP		
10			D				
15							
20							Stopped Trackhoe at 20'
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-14B

JOB NO. 6-117-000029

DATE 2-23-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 100+15, 510' R
 ELEVATION 1682' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D	3		slightly moist	CLAYEY SAND, GRAVEL & COBBLES , some boulders, poorly graded, subrounded to subangular, low plasticity, brown note: maximum estimated particle size of 24"
5			D		GP-GC		
10							
15							Stopped Trackhoe at 20'
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-22

JOB NO. 6-117-000029

DATE 2-24-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 33+30, 135' R
 ELEVATION 1550' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D	3		slightly moist	SAND, GRAVEL & COBBLES , occasional boulders, trace of clay, poorly graded, subrounded to subangular, low plasticity, brown note: maximum estimated particle size of 18"
5					GP		
10						slightly moist	SAND, GRAVEL & COBBLES , some boulders, some silt & clay, poorly graded, subrounded to subangular, weakly lime cemented, low plasticity, brown to light brown note: maximum estimated particle size of 18"
15			D		GP		
20							Stopped Trackhoe at 20'
25							

SAMPLE TYPE

- B - Undisturbed Block Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Additional Investigation
Desert Greenbelt Phase I Project

LOG OF TEST PIT NO. RTP-23

JOB NO. 6-117-000029

DATE 2-24-96

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE MS-380 Trackhoe
 LOCATION Sta. 33 + 30, 440' R
 ELEVATION 1948' +/-
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SM	slightly moist loose	SILTY SAND, some fine grained gravel, poorly graded, subrounded to subangular, nonplastic, brown
5			D		GM	slightly moist loose	SILTY SAND & GRAVEL, some cobbles, poorly graded, subrounded to subangular, nonplastic, brown
10					GP-GC	slightly moist very dense	CLAYEY SILT, SAND & GRAVEL, some cobbles, occasional boulders, poorly graded, subrounded to subangular, low plasticity, light brown note: maximum estimated particle size of 18"
20							Stopped Trackhoe at 20'
25							

SAMPLE TYPE

- B - Undisturbed Block Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP1

JOB NO. E95-86

DATE 7-21-95

	GROUNDWATER			BACKHOE TYPE <u>CAT 416B</u>
	DEPTH	HOUR	DATE	LOCATION <u>Sta. 215 + 00, on centerline</u>
		<u>none</u>		ELEVATION _____
				DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SW	slightly moist	SAND & GRAVEL , occasional to considerable cobbles, well graded, subrounded to subangular, nonplastic, yellowish brown
					SC	slightly moist to moist	CLAYEY SAND , trace of gravel, poorly graded, subrounded to subangular, nonplastic, dark brown
5						slightly moist	GRANITE , fine to medium grained, decomposed to highly weathered, soft to very soft, gray
10							Stopped Backhoe at 9'6"
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-29

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP4

JOB NO. E95-86

DATE 7-21-95

BACKHOE TYPE CAT 416B

LOCATION Sta. 190+00, on centerline

ELEVATION _____

DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	SAND & GRAVEL, occasional cobbles, poorly graded, subrounded to subangular, nonplastic, brown
5					GP		
10							
11						Stopped Backhoe at 11'	
15							
20							
25							

SAMPLE TYPE

- B - Undisturbed Block Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

A-32

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP5

JOB NO. E95-86 DATE 7-21-95

BACKHOE TYPE CAT 416B
 LOCATION Sta. 180 + 00, on centerline
 ELEVATION _____
 DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	CLAYEY SAND & GRAVEL , some cobbles, trace of small boulders, angular to subrounded, low plasticity, reddish brown note: increase in cobbles with depth below 4'
5		D			GP-GC		
10							Stopped Backhoe at 8'2"
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP6

JOB NO. E95-86 DATE 7-21-95

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification
0					
			D		GP-GC
5					
10					
15					
20					
25					

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE CAT 416B
 LOCATION Sta. 173+00, on centerline
 ELEVATION _____
 DATUM _____

REMARKS	VISUAL CLASSIFICATION
slightly moist	SAND & GRAVEL , some cobbles, trace of clay, poorly graded, angular to subrounded, nonplastic, reddish brown note: boulders up to 36" diameter on surface
	Stopped Backhoe at 6'

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample



PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP7

JOB NO. E95-86 DATE 7-21-95

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE CAT 416B
 LOCATION Sta. 170 + 00, on centerline
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					GP	slightly moist	SAND & GRAVEL , some cobbles, poorly graded, angular to subrounded, nonplastic, reddish brown note: maximum estimated particle size of 6" diameter
5							
10							
15							
20							
25							
							Stopped Backhoe at 8'

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP8

JOB NO. E95-86 DATE 7-21-95

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE CAT 416B
 LOCATION Sta. 160 + 00, on centerline
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					SP	slightly moist	SAND , occasional gravel & trace of cobbles, poorly graded, subangular to subrounded, low plasticity, light reddish brown note: maximum particle size of 10" diameter
5					GP	slightly moist	SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, low plasticity, light reddish brown
							Stopped Backhoe at 6'
10							
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-36

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP10

JOB NO. E95-86 DATE 7-21-95

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE CAT 416B
 LOCATION Sta. 140+00, on centerline
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					GP	slightly moist	SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, nonplastic, reddish brown note: dense cobble layer from 2' to 3' & 5' to 7'
5							
10							
15							
20							
25							

Stopped Backhoe at 6'10"

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP11

JOB NO. E95-86 DATE 7-24-95

BACKHOE TYPE CAT 416B
 LOCATION Sta. 130+00, on centerline
 ELEVATION _____
 DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					GP	slightly moist	SAND, GRAVEL & COBBLES , some silt, poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 24" diameter
5							
6							Stopped Backhoe at 6'
10							
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42' I.D. Tube Sample



PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP12

JOB NO. E95-86 DATE 7-24-95

GROUNDWATER			BACKHOE TYPE <u>CAT 416B</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 120 + 00, on centerline</u>
	<u>none</u>		ELEVATION _____
			DATUM _____

Depth In Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0			D		GP	slightly moist	SAND & GRAVEL, some silt, poorly graded, subrounded to subangular, nonplastic, brown
5					GP	slightly moist	SAND, GRAVEL & COBBLES, poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 18" diameter
							Stopped Backhoe at 6'
10							
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample



PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP13

JOB NO. E95-86 DATE 7-24-95

GROUNDWATER			BACKHOE TYPE	<u>CAT 416B</u>
DEPTH	HOUR	DATE	LOCATION	<u>Sta. 110 + 00, on centerline</u>
	<u>none</u>		ELEVATION	
			DATUM	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS		VISUAL CLASSIFICATION	
0					SP	slightly moist		SAND & GRAVEL , some silt, poorly graded, subrounded to subangular, nonplastic, brown	
					GP	slightly moist		SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 24" diameter	
5					SP	slightly moist to moist		SAND , considerable gravel, poorly graded, subrounded to subangular, nonplastic, reddish brown	
					GP	slightly moist to moist		SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, nonplastic, reddish brown note: maximum particle size of 18" diameter	
10								Stopped Backhoe at 8'	
15									
20									
25									

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-41

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP14

JOB NO. E95-86 DATE 7-24-95

BACKHOE TYPE CAT 416B
 LOCATION Sta. 100+00, on centerline
 ELEVATION _____
 DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS		VISUAL CLASSIFICATION	
0			D		SM	slightly moist		SILTY SAND, some fine grained gravel, poorly graded, subrounded to subangular, weakly cemented, nonplastic, brown	
5					GM	slightly moist		SILTY SAND & GRAVEL, some cobbles, poorly graded, subrounded to subangular, nonplastic, brown	
10								Stopped Backhoe at 9'	
15									
20									
25									

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-42

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP15

JOB NO. E95-86

DATE 7-24-95

BACKHOE TYPE CAT 416B

LOCATION Sta. 90+00, on centerline

ELEVATION _____

DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	SAND, GRAVEL & COBBLES, some silt, poorly graded, subrounded to subangular, nonplastic, brown
5					GP		
10							Stopped Backhoe at 8'
15							
20							
25							

SAMPLE TYPE

- B - Undisturbed Block Sample
- D - Disturbed Bulk Sample
- U - 3" O.D., 2.42" I.D. Tube Sample

A-43

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP17

JOB NO. E95-86 DATE 7-24-95

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

BACKHOE TYPE CAT 416B
 LOCATION Sta. 70+00, 10' R
 ELEVATION _____
 DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0						slightly moist	SILTY SAND, GRAVEL & COBBLES, poorly graded, subrounded to subangular, nonplastic, brown to reddish brown
5					GM		
10							Stopped Backhoe at 10'
15							
20							
25							

SAMPLE TYPE

- B - Undisturbed Block Sample
- D - Disturbed Bulk Sample
- U - 3" O.D. 2.42" I.D. Tube Sample

A-45

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP18

JOB NO. E95-86 DATE 7-24-95

GROUNDWATER			BACKHOE TYPE <u>CAT 416B</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 60+00, on centerline</u>
	<u>none</u>		ELEVATION _____
			DATUM _____

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	slightly moist	SILTY SAND , some gravel, poorly graded, subrounded to subangular, weakly lime cemented, nonplastic, brown
5					GM	slightly moist	SILTY SAND, GRAVEL & COBBLES , poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 24" diameter
10						Stopped Backhoe at 9'6"	
15							
20							
25							

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-46

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP19

JOB NO. E95-86

DATE 7-24-95

BACKHOE TYPE CAT 416B

LOCATION Sta. 50+00, on centerline

ELEVATION _____

DATUM _____

GROUNDWATER

DEPTH	HOUR	DATE
	none	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS		VISUAL CLASSIFICATION	
0			D			slightly moist		SILTY SAND , some gravel, poorly graded, subrounded to subangular, nonplastic, brown	
					SM				
5						slightly moist		SILTY SAND & GRAVEL , occasional cobbles, poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 18" diameter	
					GP				
10							Stopped Backhoe at 10'		
15									
20									
25									

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-47

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP20

JOB NO. E95-86 DATE 7-24-95

GROUNDWATER			BACKHOE TYPE <u>CAT 416B</u>
DEPTH	HOUR	DATE	LOCATION <u>Sta. 29+00, on centerline</u>
	<u>none</u>		ELEVATION _____
			DATUM _____

Depth In Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification	REMARKS	VISUAL CLASSIFICATION
0					GP	slightly moist	SAND, GRAVEL & COBBLES , some silt, poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 18" diameter
5							
10							
15							
20							
25							

Stopped Backhoe at 7'

SAMPLE TYPE

- B - Undisturbed Block Sample.
- D - Disturbed Bulk Sample.
- U - 3" O.D. 2.42" I.D. Tube Sample

A-48

PROJECT Desert Greenbelt Phase I

LOG OF TEST PIT NO. RTP21

JOB NO. E95-86 DATE 7-24-95

BACKHOE TYPE CAT 416B
 LOCATION Sta. 16+00, on centerline
 ELEVATION _____
 DATUM _____

GROUNDWATER		
DEPTH	HOUR	DATE
	none	

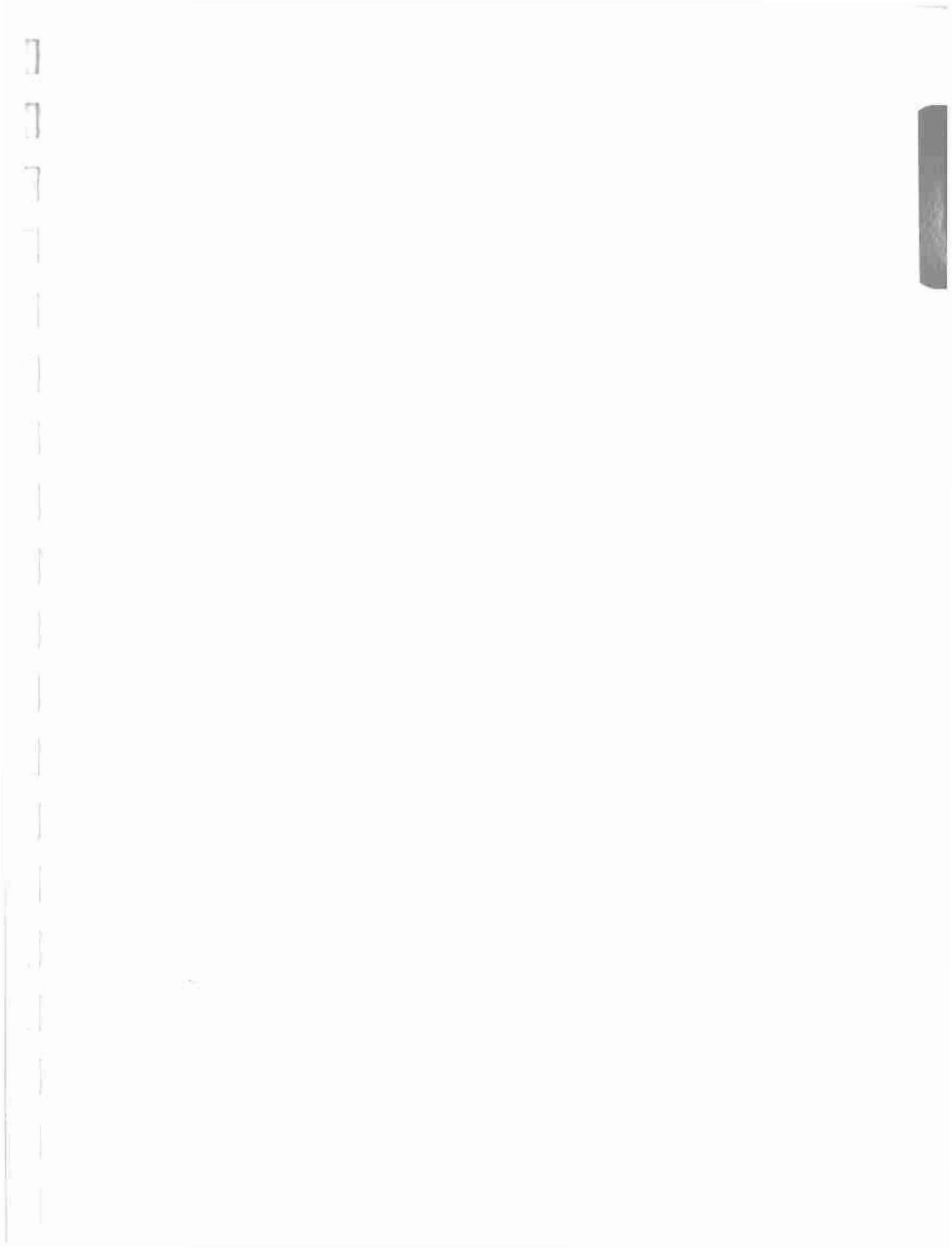
Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Soil/Rock Classification
0			D		
5					GP
10					
15					
20					
25					

REMARKS	VISUAL CLASSIFICATION
slightly moist	SAND, GRAVEL & COBBLES , some silt, poorly graded, subrounded to subangular, nonplastic, brown note: maximum particle size of 24" diameter
	Stopped Backhoe at 8'6"

SAMPLE TYPE
 B - Undisturbed Block Sample.
 D - Disturbed Bulk Sample.
 U - 3" O.D. 2.42" I.D. Tube Sample

A-49





APPENDIX B
LABORATORY TESTING

AGRA Earth & Environmental, Inc.

PROJECT: ADDITIONAL INVEST.- DESERT GREENBELT
 LOCATION: REATTA PASS WASH CHANNELIZATION

JOB NO: 7-117-000062
 WORK ORDER NO: 1
 DATE SAMPLED: 07-07-97

MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay		SAND						GRAVEL						COBBLES		Lab #
				#200	#100	Fine			Medium			Coarse		Fine			Coarse			
						#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	

PERCENT PASSING BY WEIGHT

HP-1 @ L-6 ALLUV	SP-SM	NP	0	9	13	19	24	30	45	58	64	80	87	93	95	97	97	98	99	99	100	100	1
HP-2 @ L-1 STRMBED	SP	NP	0	3	5	12	16	22	38	57	65	91	96	98	98	99	99	99	99	100	100	100	2

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT PHASE I
LOCATION: PIMA RD & DEER VALLEY RD, SCOTTSDALE

JOB NO: 6-117-000029
WORK ORDER NO: 2
DATE SAMPLED: 02-27-96

**MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)**

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay	SAND								GRAVEL						COBBLES		Lab #
					Fine			Medium			Coarse		Fine			Coarse					
					#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	

PERCENT PASSING BY WEIGHT

Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	Lab #
RTP-3A @ 0.0 - 5.0'	SP-SM	NV	NP	11	14	21	24	29	41	54	58	74	79	84	85	86	87	89	91	95	95	100	11
RTP-6A @ 0.0 - 4.0'	SM	NV	NP	17	22	29	33	37	47	58	62	81	88	94	96	98	98	99	100	100	100	100	1
RTP-10A @ 7.0 - 10.0'	SP-SM	NV	NP	8.1	10	15	19	23	36	55	61	82	86	91	93	94	96	97	100	100	100	100	13
RTP-14A @ 0.0 - 5.0'	GP	NV	NP	4.1	5	8	9	12	18	26	30	46	53	62	67	75	79	87	94	100	100	100	16
RTP-6B @ 2.0 - 5.0'	GP-GC	25	7	7.3	9	13	15	17	22	28	30	37	40	46	48	53	58	65	72	87	87	100	9
RTP-14B @ 0.0 - 5.0'	GP-GC	25	9	5.1	7	10	13	15	22	30	33	48	54	63	68	76	81	87	92	100	100	100	18
RTP-22 @ 0.0 - 5.0'	GP	23	6	4.4	6	10	12	15	23	30	33	44	50	58	63	71	76	84	90	92	98	100	20
RTP-22 @ 15.0 - 20.0'	GP	28	8	3.9	6	9	13	17	28	37	39	48	53	60	65	75	82	92	99	100	100	100	21

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT - PHASE I
LOCATION: PIMA ROAD BETWEEN BELL & PINNACLE PEAK

JOB NO: F95-86
WORK ORDER NO: 6
DATE SAMPLED: 07-21-95

**MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)**

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay #200	SAND								GRAVEL							Lab #
					Fine			Medium			Coarse		Fine				Coarse			
					#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	

PERCENT PASSING BY WEIGHT

DB-1 @ 5 - 6'	CL	30	9	78	87	91	93	94	96	97	97	99	99	99	100	100	100	100	100	100	215
DB-1 @ 20 - 24.5'	SM	40	14	24	29	34	37	41	54	67	71	92	97	100	100	100	100	100	100	100	218
RP-1 @ 0 - 1.5'	SM	NV	NP	24	28	35	39	44	55	66	71	87	93	97	100	100	100	100	100	100	195
RP-3 @ 10 - 11.5'	SC	30	10	17	22	30	35	40	54	66	71	86	92	98	99	100	100	100	100	100	202
RP-4 @ 5 - 6.5'	SM	NV	NP	19	25	34	41	47	62	74	78	92	95	97	100	100	100	100	100	100	205
RP-5 @ 0 - 1.5'	SC	28	9	26	32	42	48	55	71	82	85	94	97	99	100	100	100	100	100	100	208
RP-6 @ 5 - 6.5'	SC	30	10	21	24	30	33	38	50	64	70	89	95	100	100	100	100	100	100	100	211
RP-6 @ 13 - 15'	GP-GC	33	16	8.2	9	11	13	15	21	29	33	47	54	64	71	85	98	100	100	100	213

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT - PHASE I
 LOCATION: PIMA RD BETWEEN BELL & PINNACLE PEAK RDS

JOB NO: E95-86
 WORK ORDER NO: 8
 DATE SAMPLED: 07-31-95

**MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)**

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay	SAND								GRAVEL						COBBLES		Lab #
					Fine			Medium			Coarse	Fine			Coarse						
					#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	

PERCENT PASSING BY WEIGHT

Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	Lab #
RTP 12 @ 0 - 2'	GP	NV	NP	2.5	4	6	8	10	17	23	25	34	37	44	48	55	59	69	73	87	100	100	254
RTP 14 @ 0 - 2'	SM	NV	NP	19	25	33	37	42	53	62	66	79	82	87	89	92	92	93	95	100	100	100	253
RTP 16 @ 0 - 2'	SM	NV	NP	23	31	40	45	51	62	72	76	87	90	95	97	99	99	100	100	100	100	100	255
RTP 19 @ 0 - 4'	SM	NV	NP	25	31	38	41	45	55	65	68	82	86	92	94	96	97	98	100	100	100	100	252

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT - PHASE I
 LOCATION: PIMA RD BETWEEN BELL & PINNACLE PEAK RDS

JOB NO: B95-86
 WORK ORDER NO: 9
 DATE SAMPLED: 07-31-95

MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay	SAND								GRAVEL						COBBLES		Lab #		
					Fine				Medium		Coarse		Fine			Coarse			4"	6"			
				#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	

PERCENT PASSING BY WEIGHT

CN5A-1 @ 5 - 6'	SC-SM	26	6	41	48	55	58	61	69	75	78	90	95	99	100	100	100	100	100	100	100	100	100	257
CN5A-2 @ 10 - 11.5'	SM	27	5	34	40	46	50	54	67	78	83	96	98	99	100	100	100	100	100	100	100	100	100	262
CN5B-1 @ 5 - 6'	SM	36	9	42	49	54	57	61	71	80	83	94	98	99	100	100	100	100	100	100	100	100	100	270
CN5B-2 @ 5 - 6'	SM	32	6	39	44	48	52	55	67	76	80	95	98	99	100	100	100	100	100	100	100	100	100	273
CN5B-3 @ 10 - 11.5'	SC	32	9	37	43	49	52	55	64	74	77	92	95	99	100	100	100	100	100	100	100	100	100	278
RTP-1	SW	NV	NP	2.1	4	11	16	22	39	59	66	88	93	98	98	100	100	100	100	100	100	100	100	280
RTP-3	SP-SM	NV	NP	5.0	8	13	16	20	33	46	52	73	83	95	97	99	99	100	100	100	100	100	100	281
RTP-5	SC	29	12	15	19	24	27	31	40	48	52	61	66	73	77	84	89	96	100	100	100	100	100	282
RTP-6	GP-GC	30	12	7.1	9	12	14	17	23	29	32	41	45	53	58	67	72	78	89	96	100	100	100	283
RTP-9	GP	NV	NP	3.7	6	10	13	17	27	36	39	52	57	66	72	80	86	93	96	100	100	100	100	284

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT PHASE I
LOCATION: PIMA RD & DEER VALLEY RD; SCOTTSDALE

JOB NO: 6-117-00029
WORK ORDER NO: 2
DATE SAMPLED: 02-27-96

**MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)**

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay	SAND								GRAVEL						COBBLES		Lab #
					Fine			Medium			Coarse		Fine			Coarse			4"	6"	
					#200	#100	#50	#40	#30	#16	#10	#6	#4	1/4"	3/8"	1/2"	3/4"	1"			

PERCENT PASSING BY WEIGHT

RTP-3A @ 0.0 - 5.0'	SP-SM	NV	NP	11	14	21	24	29	41	54	58	74	79	84	85	86	87	89	91	95	95	100	11
RTP-6A @ 0.0 - 4.0'	SM	NV	NP	17	22	29	33	37	47	58	62	81	88	94	96	98	98	99	100	100	100	100	7
RTP-10A @ 7.0 - 10.0'	SP-SM	NV	NP	8.1	10	15	19	23	36	55	61	82	86	91	93	94	96	97	100	100	100	100	13
RTP-14A @ 0.0 - 5.0'	GP	NV	NP	4.1	5	8	9	12	18	26	30	46	53	62	67	75	79	87	94	100	100	100	16
RTP-6B @ 2.0 - 5.0'	GP-GC	25	7	7.3	9	13	15	17	22	28	30	37	40	46	48	53	58	65	72	87	87	100	9
RTP-14B @ 0.0 - 5.0'	GP-GC	25	9	5.1	7	10	13	15	22	30	33	48	54	63	68	76	81	87	92	100	100	100	18
RTP-22 @ 0.0 - 5.0'	GP	23	6	4.4	6	10	12	15	23	30	33	44	50	58	63	71	76	84	90	92	98	100	20
RTP-22 @ 15.0 - 20.0'	GP	28	8	3.9	6	9	13	17	28	37	39	48	53	60	65	75	82	92	99	100	100	100	21

AGRA Earth & Environmental, Inc.

PROJECT: DESERT GREENBELT - PHASE I
LOCATION: PIMA ROAD BETWEEN BELL & PINNACLE PEAK

JOB NO: E95-86
WORK ORDER NO: 6
DATE SAMPLED: 07-21-95

**MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)**

SIEVE SIZES

Location & Depth	USCS	LL	PI	Silt or Clay	SAND								GRAVEL						Lab #
					Fine			Medium			Coarse	Fine			Coarse				
					#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	

PERCENT PASSING BY WEIGHT

DB-1 @ 5 - 6'	CL	30	9	78	87	91	93	94	96	97	97	99	99	99	100	100	100	100	100	100	215
DB-1 @ 20 - 21.5'	SM	40	14	24	29	34	37	41	54	67	71	92	97	100	100	100	100	100	100	100	218
RP-1 @ 0 - 1.5'	SM	NV	NP	24	28	35	39	44	55	66	71	87	93	97	100	100	100	100	100	100	195
RP-3 @ 10 - 11.5'	SC	30	10	17	22	30	35	40	54	66	71	86	92	98	99	100	100	100	100	100	202
RP-4 @ 5 - 6.5'	SM	NV	NP	19	25	34	41	47	62	74	78	92	95	97	100	100	100	100	100	100	205
RP-5 @ 0 - 1.5'	SC	28	9	26	32	42	48	55	71	82	85	94	97	99	100	100	100	100	100	100	208
RP-6 @ 5 - 6.5'	SC	30	10	21	24	30	33	38	50	64	70	89	95	100	100	100	100	100	100	100	211
RP-6 @ 13 - 15'	GP-GC	33	16	8.2	9	11	13	15	21	29	33	47	54	64	71	85	98	100	100	100	213

AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATTA PASS WASH CHANELAZATION:SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	NATIVE	LAB NO:	SEE BELOW
SAMPLE SOURCE:	SEE BELOW	DATE SAMPLED:	10-20-97

**SAND EQUIVALENT VALUE OF SOILS AND FINE AGGREGATE
ASTM D-2419**

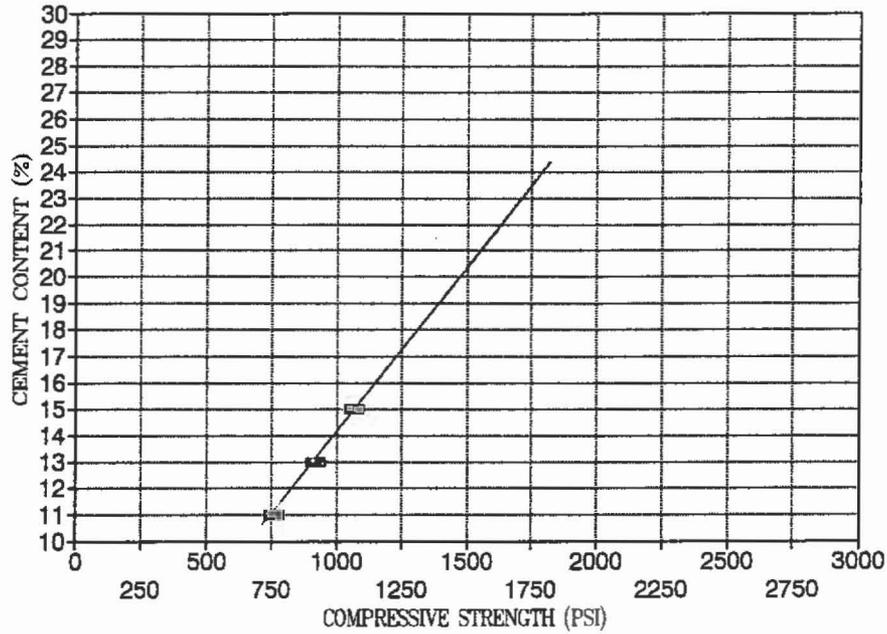
SAMPLE ID	LOCATIONS AND DEPTH	AVG CLAY READING	AVG SAND READING	SAND EQUIVALENT
5/9	TP1 @0-1'&TP4 @ 0-2'	5.9	1.8	31
6/12	TP1 @1-9'&TP5 @ 8.5-10'	5.5	3.3	60
7/10	TP2 @0-9'&TP4 @ 5-9'	8.4	3.1	37
8/13	TP3 @0-9'&TP6 @ 0-8'	6.1	3.2	52
9/11	TP4 @0-2'&TP5 @ 0-3'	6.1	1.3	21
14/15	TP7 @2-9'&TP8 @ 0-8'	5.9	3.2	54
14/16	TP7 @2-9'&TP9 @ 1-9'	6.2	3.7	60
16	TP9 @1-9'	4.6	3.3	72
17/18	TP10 @0-8'&TP11 @ 0-9'	5.4	3.3	61
18/19	TP11 @0-9'&TP12 @ 0-7'	7.7	3.4	44
20/23	TP13 @2-5'&TP15 @ 0-8'	6.7	3.0	45
21/24	TP13 @6-8'&TP16 @ 0-8'	9.8	3.1	32
22/26	TP14 @0-4'&TP18 @ 0-8'	11.4	3.1	27
22/23&24	TP14@0-8',TP15@0-8'&TP16@0-8'	9.2	3.1	34
25	TP17 @0-8'	4.5	3.3	73
27/29	TP19 @0-7'&TP20 @ 5-7'	7.5	3.2	43
28/30	TP20 @0-2'&TP21 @ 0-8'	6.6	2.9	44
30/33	TP21 @0-8'&TP23 @ 1-4'	7.6	3.3	43
33/35	TP23 @1-4'&TP24 @ 4-9'	11.5	2.9	25
30/31&32	TP21@0-8'&TP22@0-2'&TP22@8-9'	8.5	3.2	38

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 5/9
SAMPLE SOURCE TP1 @ 0-1' & TP4 @ 0-2' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 20.5 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 22.5 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	5/9
SAMPLE SOURCE:	TP1 @ 0-1' & TP4 @ 0-2'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

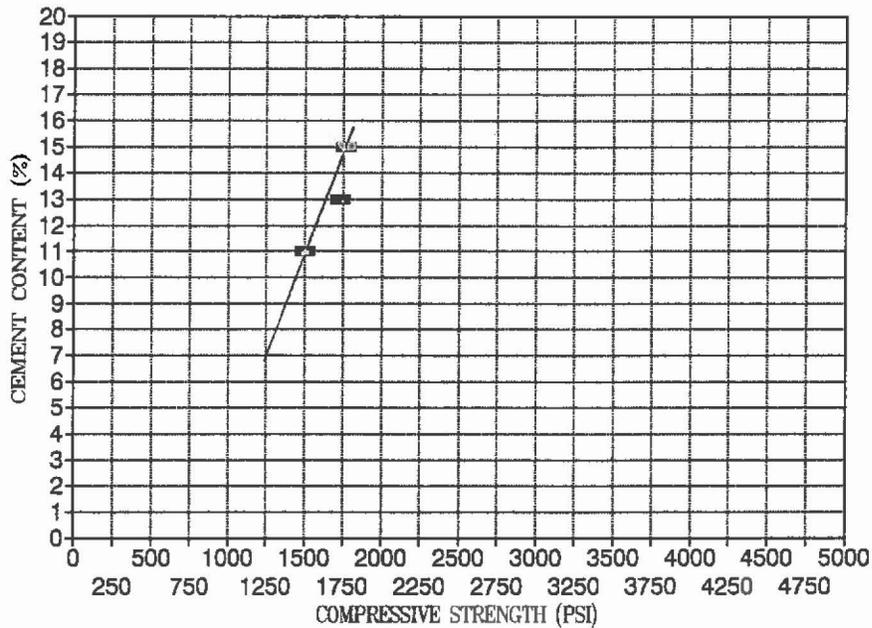
SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	CORRECTED	
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)				AVERAGE STRESS (PSI)	AVERAGE STRESS (PSI)
115	2063	8.0	126.3	4.00	11.0	10560	840		
116	2017	7.5	124.1	3.99	11.0	8460	677	758	760
117	2040	8.2	124.7	3.99	13.0	11331	906		
118	2055	8.3	125.5	3.99	13.0	11707	936	921	920
119	2054	7.9	125.9	3.99	15.0	13209	1056		
120	2017	8.4	123.1	3.97	15.0	13308	1075	1066	1070

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 6/12
SAMPLE SOURCE TP1 @ 1-9' & TP5 @ 8.5-10' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 10.9 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 12.9 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	6 &12
SAMPLE SOURCE:	TP1 @ 1-9' & TP5 @ 8.5-10'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

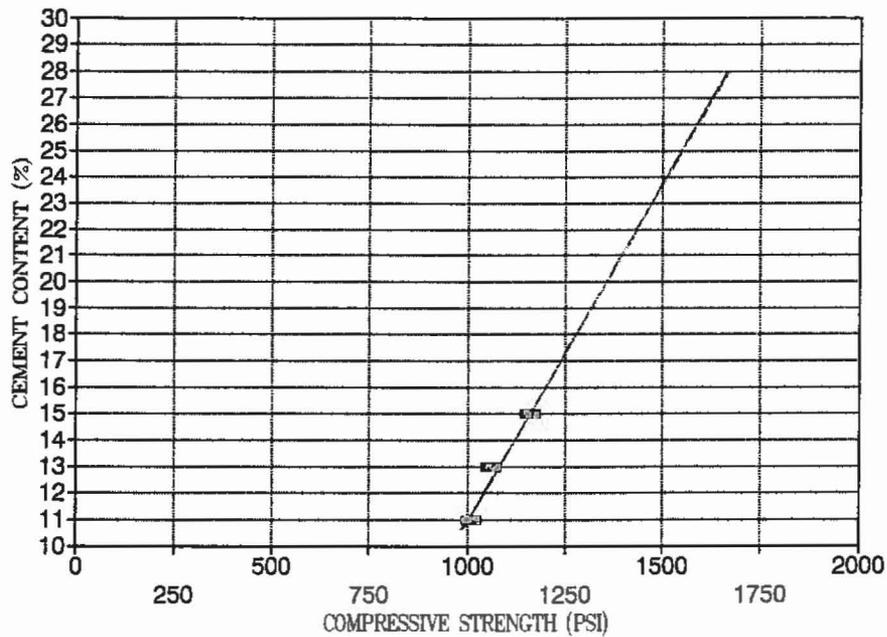
SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)					
55	2139	8.1	130.9	3.97	11.0	17975	1452		
56	2154	7.8	132.2	3.98	11.0	19162	1540	1496	1500
57	2124	7.4	130.8	3.89	13.0	20329	1711		
58	2139	7.8	131.2	3.99	13.0	21832	1746	1728	1730
59	2123	7.9	130.1	3.99	15.0	22128	1770		
60	2130	7.7	130.8	3.99	15.0	22010	1760	1765	1770

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 7/10
SAMPLE SOURCE TP2 @ 0-9' & TP4 @ 5-9' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 23.9 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 25.9 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION:SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	7/10
SAMPLE SOURCE:	TP2 @ 0-9', TP4 @ 5-9'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

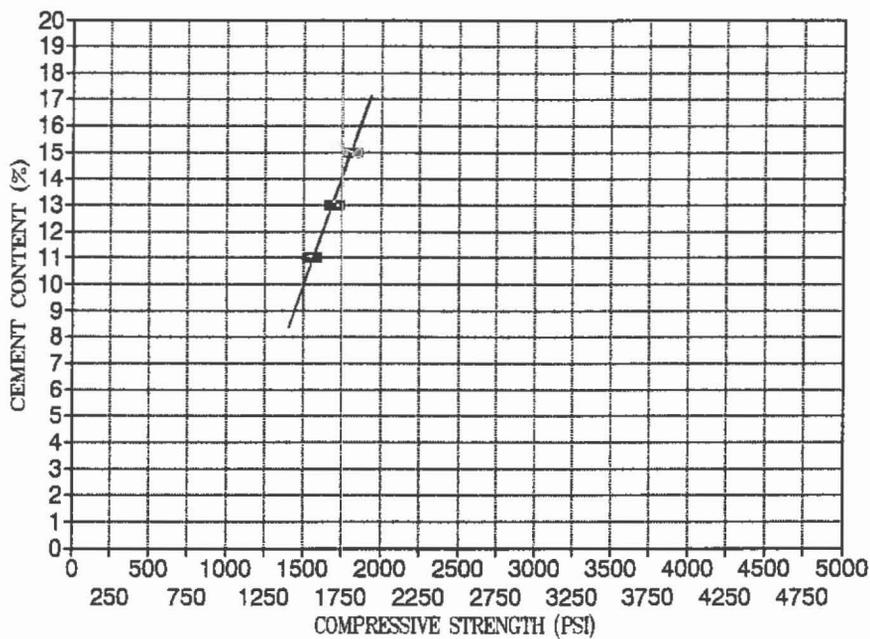
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
73	2121	6.3	132.0	3.99	11.0	12320	985		
74	2125	6.1	132.5	3.99	11.0	12952	1036	1011	1010
75	2110	6.4	131.2	3.98	13.0	13387	1076		
76	2083	6.4	129.5	3.99	13.0	13071	1045	1061	1060
77	2060	7.5	126.7	3.99	15.0	14139	1131		
787	2078	5.8	129.9	3.99	15.0	14930	1194	1162	1160

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 8/13
SAMPLE SOURCE TP3 @ 0-9' & TP4 @ 5-9' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 10.0 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 12.0 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	8/13
SAMPLE SOURCE:	TP3 @ 0-9' & TP4 @ 5-9'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

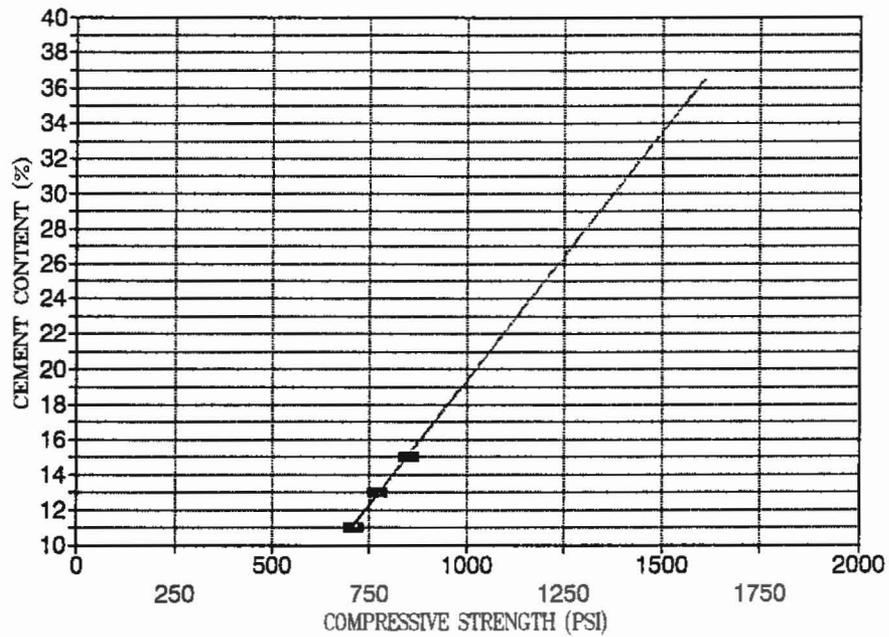
SAMPLE ID	WET		DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED
	SAMPLE WEIGHT (GR)	MOISTURE (%)							AVERAGE STRESS (PSI)
67	2190	7.6	134.6	3.98	11.0	18905	1520		
68	2181	7.4	134.3	3.98	11.0	19854	1596	1558	1560
69	2171	7.4	133.7	3.98	13.0	21139	1699		
70	2161	7.8	132.6	3.98	13.0	21109	1697	1698	1700
71	2150	7.4	132.4	3.98	15.0	23137	1860		
72	2150	7.4	132.4	3.98	15.0	22029	1771	1815	1820

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 9/11
SAMPLE SOURCE TP4 @ 0-2' & TP5 @ 0-3' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 33.5 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 35.5 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION:SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	9/11
SAMPLE SOURCE:	TP4 @ 0-2' & TP5 @ 0-3'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

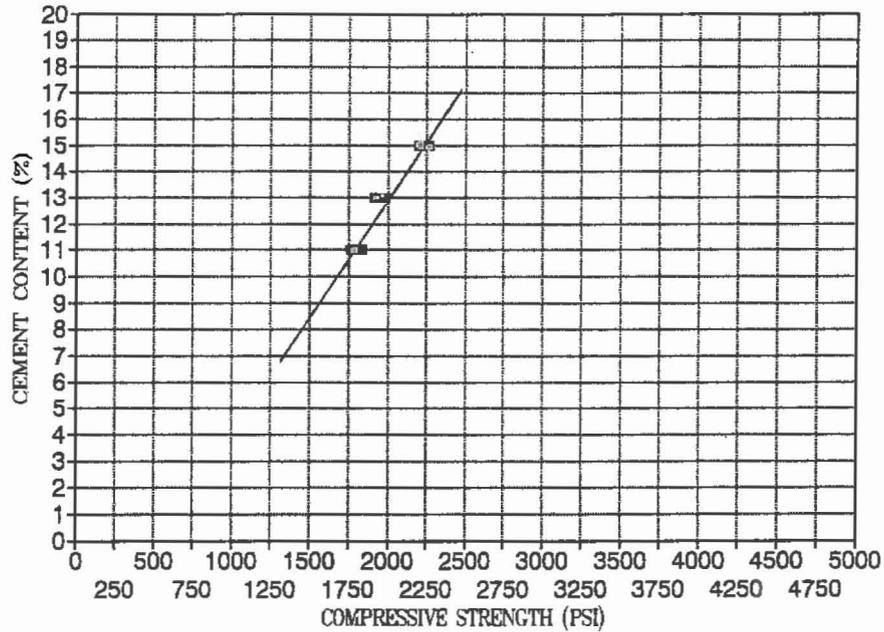
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
25	2038	9.4	123.2	3.98	11.0	9810	789		
26	2020	9.1	122.5	3.99	11.0	7930	634	711	710
27	1988	9.2	120.4	3.99	13.0	9690	775		
28	2009	9.2	121.7	3.99	13.0	9610	769	772	770
29	2005	9.1	121.5	3.99	15.0	10876	870		
30	2007	9.4	121.3	3.99	15.0	10480	838	854	850

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 14/15
SAMPLE SOURCE TP7 @ 2-9' & TP8 @ 0-8' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 8.5 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 10.5 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	14/15
SAMPLE SOURCE:	TP7 @ 2-9', TP8 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

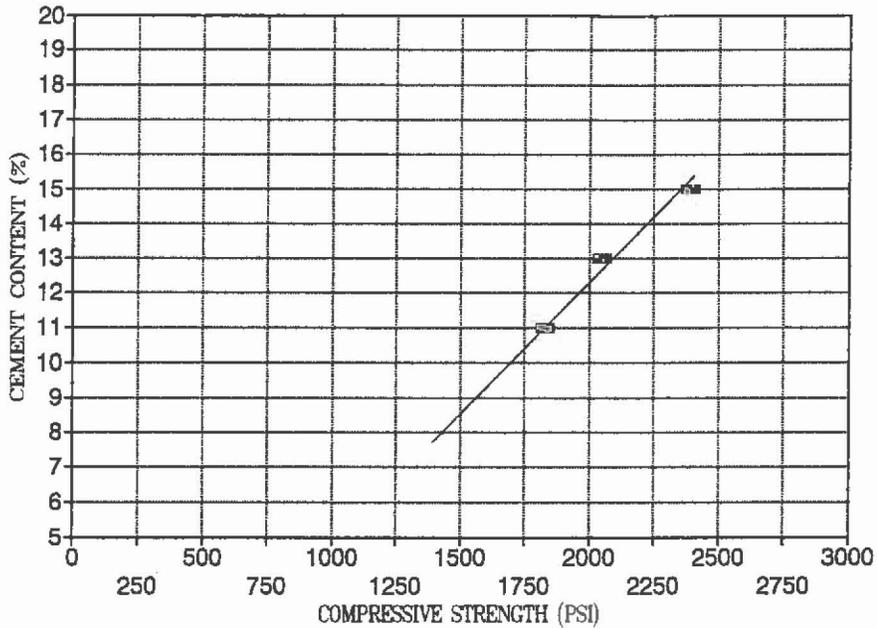
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
61	2194	7.5	135.0	3.90	11.0	19538	1636		
62	2205	7.5	135.7	3.90	11.0	23543	1971	1803	1800
63	2201	7.7	135.2	3.90	13.0	22207	1859		
64	2206	7.2	136.1	3.90	13.0	24363	2039	1949	1950
65	2174	7.0	134.4	4.00	15.0	26400	2101		
66	2205	7.2	136.0	3.90	15.0	28120	2354	2227	2230

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 14/16
SAMPLE SOURCE TP7 @ 2-9' & TP9 @ 1-9' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 8.8 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 10.8 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	14/16
SAMPLE SOURCE:	TP7 @ 2-9' & TP9 @ 1-9'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

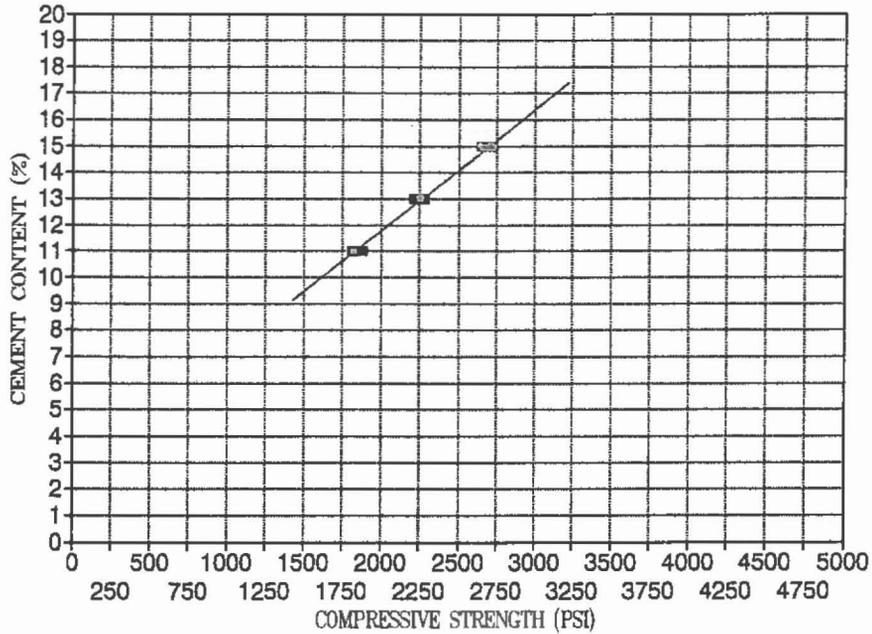
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
19	2190	7.6	134.6	3.99	11.0	23493	1879		
20	2172	7.9	133.1	3.98	11.0	22267	1790	1834	1830
21	2200	7.4	135.5	4.00	13.0	25589	2036		
22	2213	7.4	136.3	3.99	13.0	25826	2065	2051	2050
23	2190	7.8	134.4	4.00	15.0	29465	2345		
24	2166	7.3	133.5	4.00	15.0	30493	2427	2386	2390

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 15/16
SAMPLE SOURCE TP8 @ 0-8' & TP9 @ 1-9' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 9.3 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 11.3 %



AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 7-117-000062
LOCATION: REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 15/16
SAMPLE SOURCE: TP8 @ 0-8' & TP9 @ 1-9' DATE SAMPLED: 10-20-97

SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A

7 DAY BREAKS

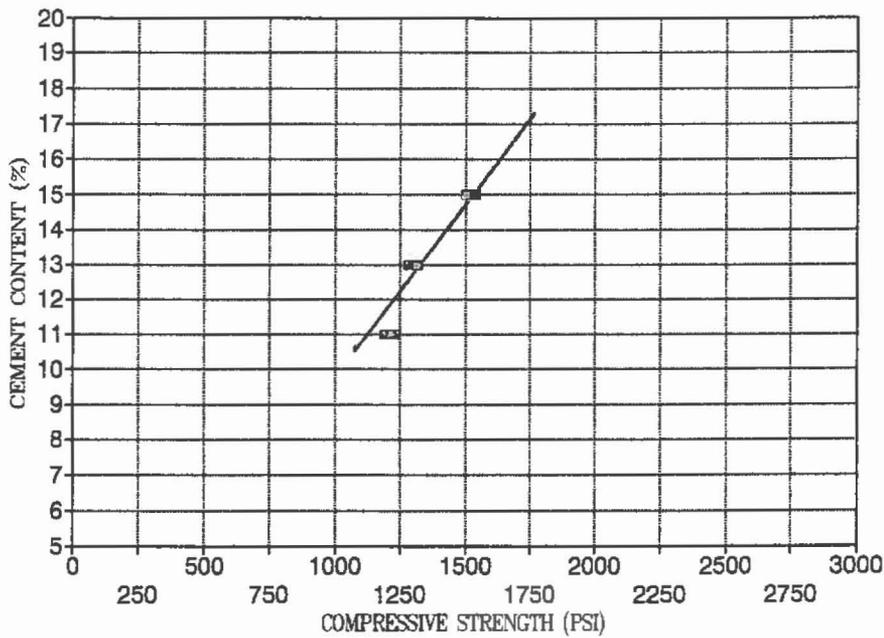
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
31	2206	7.8	135.3	3.90	11.0	21120	1768		
32	2201	8.4	134.3	3.90	11.0	23137	1937	1852	1850
33	2195	8.0	134.4	3.90	13.0	26894	2251		
34	2205	8.8	134.0	3.90	13.0	26815	2245	2248	2250
35	2207	8.0	135.2	4.00	15.0	32823	2612		
36	2206	7.4	135.9	3.90	15.0	32708	2738	2675	2680

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 17/18
SAMPLE SOURCE TP10 @ 0-8' & TP11 @ 0-9' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 14.9 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 16.9 %



AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 7-117-000062
LOCATION: REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 17/18
SAMPLE SOURCE: TP10 @ 0-8' & TP11 @ 0-9' DATE SAMPLED: 10-20-97

SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A

7 DAY BREAKS

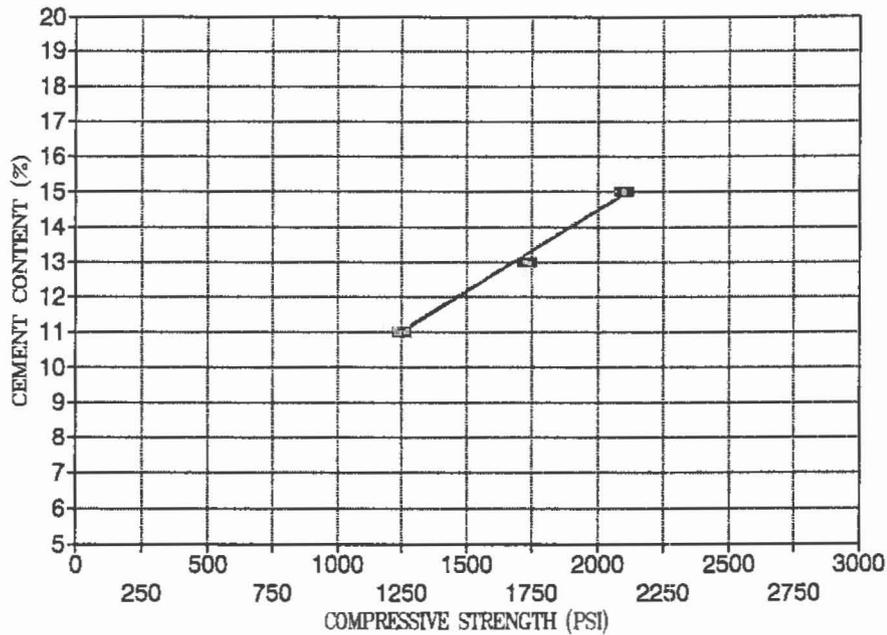
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
13	2114	7.3	130.3	3.99	11.0	15642	1251		
14	2148	7.1	132.7	3.98	11.0	14475	1163	1207	1210
15	2087	7.4	128.5	3.99	13.0	16797	1343		
16	2083	7.0	128.8	3.99	13.0	15800	1264	1304	1300
17	2086	7.3	128.6	3.99	15.0	18916	1513		
18	2085	7.4	128.4	3.98	15.0	19004	1528	1520	1520

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 18/19
SAMPLE SOURCE TP11 @ 0-9' & TP12 @ 0-7' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.1 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.1 %



AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 7-117-000062
LOCATION: REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 18/19
SAMPLE SOURCE: TP11 @ 0-9' & TP12 @ 0-7' DATE SAMPLED: 10-20-97

SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A

7 DAY BREAKS

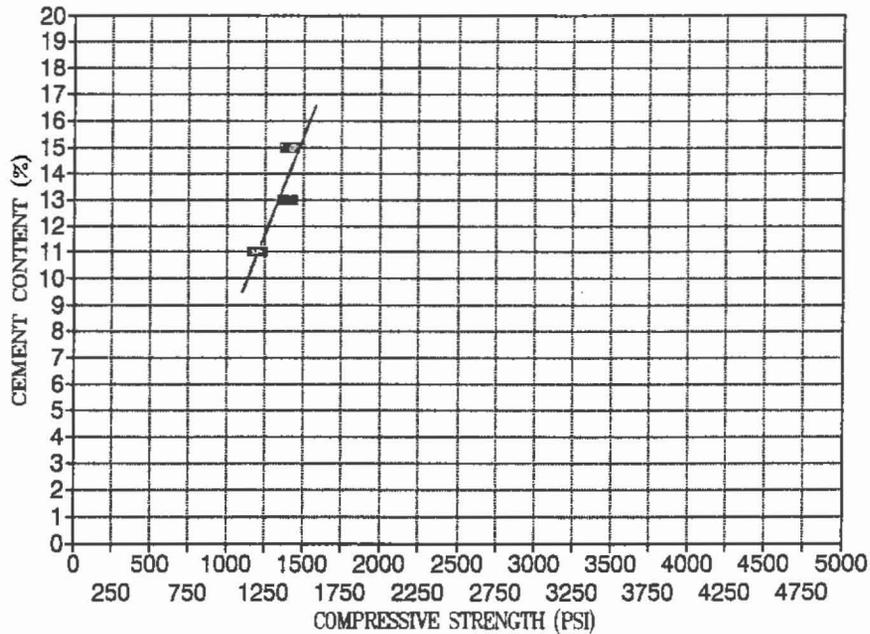
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
7	2205	9.0	133.8	3.99	11.0	16393	1311		
8	2164	8.7	131.7	4.00	11.0	14969	1191	1251	1250
9	2191	8.5	133.6	4.00	13.0	21416	1704		
10	2211	9.1	134.0	4.02	13.0	22267	1754	1729	1730
11	2220	8.9	134.8	3.99	15.0	27250	2179		
12	2231	9.0	135.4	4.02	15.0	25708	2025	2102	2100

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 20/23
SAMPLE SOURCE TP13 @ 2-5' & TP15 @ 0-8' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 15.4 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 17.4 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	20/23
SAMPLE SOURCE:	TP13 @ 2-5' & TP15 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

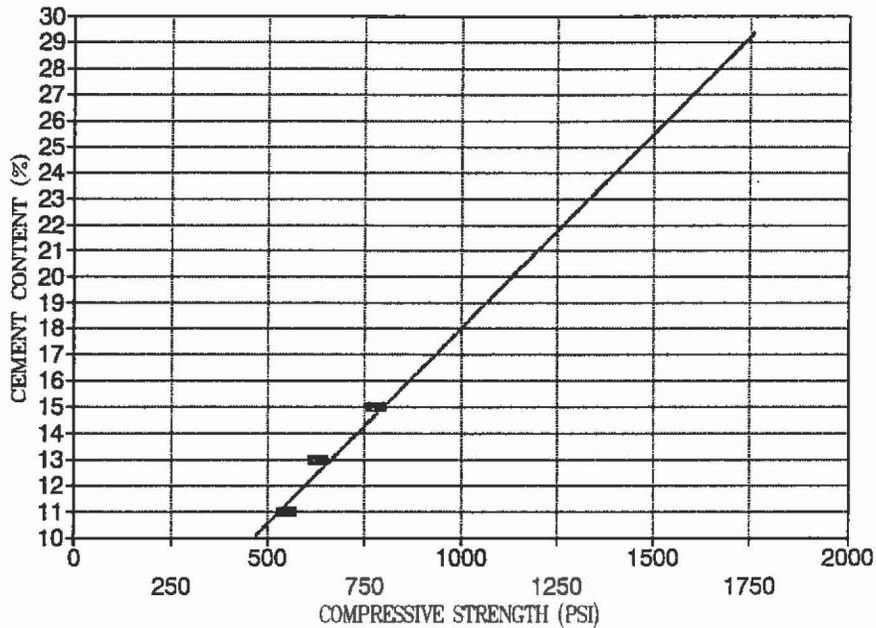
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
79	2131	7.7	130.9	3.99	11.0	15879	1270		
80	2112	7.8	129.6	3.99	11.0	14238	1139	1204	1200
81	2137	7.5	131.5	3.97	13.0	17323	1399		
82	2120	8.0	129.8	3.99	13.0	17580	1406	1403	1400
83	2097	7.4	129.1	3.99	15.0	17916	1433		
84	2100	7.5	129.2	3.99	15.0	17362	1389	1411	1410

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 15/16
SAMPLE SOURCE TP13 @ 6-8' & TP16 @ 0-8' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 27.3 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 29.3 %

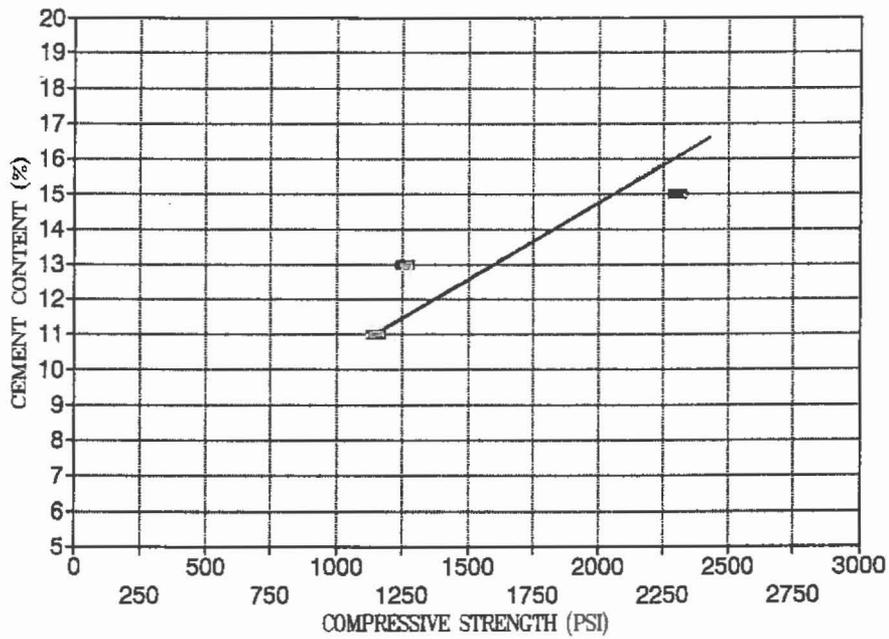


AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 22/23/24
SAMPLE SOURCE TP14 @ 0-4',TP15 @ 0-8'&TP16 @ 0-8' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.8 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.8 %



AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT
LOCATION: REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ
MATERIAL: SOIL CEMENT
SAMPLE SOURCE: TP13 @ 6-8' & TP16 @ 0-8'

JOB NO: 7-117-000062
WORK ORDER NO: 2
LAB NO: 21/24
DATE SAMPLED: 10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

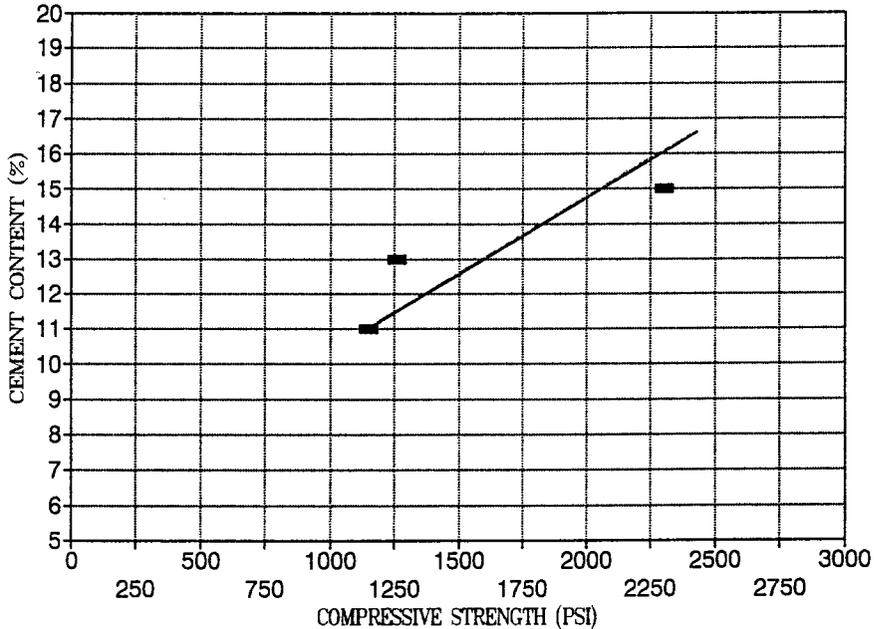
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	CORRECTED	
								AVERAGE STRESS (PSI)	AVERAGE STRESS (PSI)
103	2029	4.9	127.9	3.97	11.0	6860	554		
104	2026	5.1	127.5	3.98	11.0	6740	542	548	550
105	2046	5.5	128.3	3.98	13.0	7970	641		
106	2065	6.5	128.2	3.98	13.0	7615	612	626	630
107	2055	5.5	128.8	3.98	15.0	10401	836		
108	2053	5.5	128.7	3.97	15.0	8880	717	777	780

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 22/23/24
SAMPLE SOURCE TP14 @ 0-4',TP15 @ 0-8'&TP16 @ 0-8' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.8 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.8 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	22/23/24
SAMPLE SOURCE:	TP14 @ 0-4', TP15 @ 0-8' & TP16 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

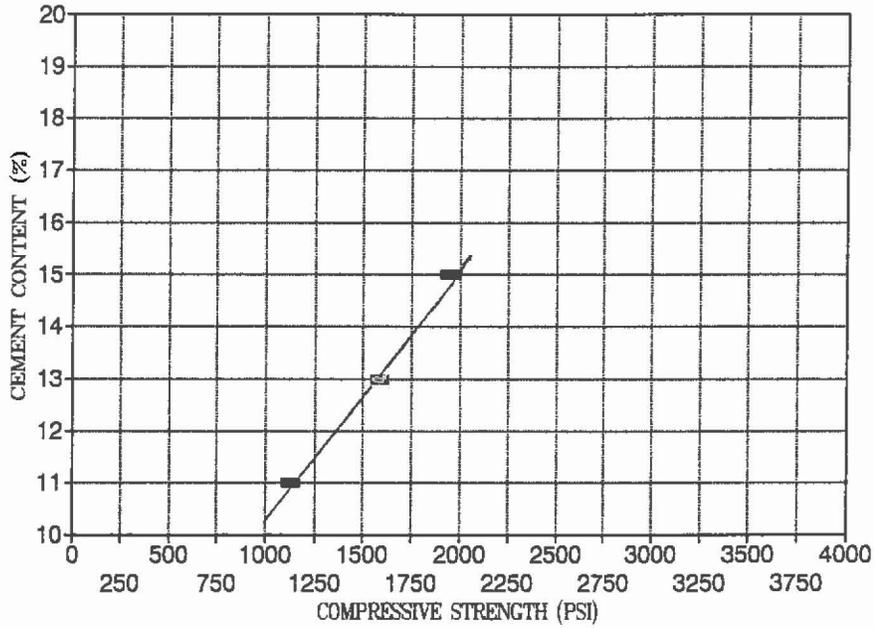
SAMPLE ID	WET		DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	CORRECTED	
	SAMPLE WEIGHT (GR)	MOISTURE (%)						AVERAGE STRESS (PSI)	AVERAGE STRESS (PSI)
1	2136	7.1	131.9	3.99	11.0	14337	1147		
2	2146	7.3	132.3	3.98	11.0	14337	1152	1150	1150
3	2144	7.3	132.2	3.99	13.0	15325	1226		
4	2147	7.4	132.2	3.98	13.0	16116	1295	1261	1260
5	2113	6.9	130.7	3.99	15.0	18687	1495		
6	2127	7.3	131.1	4.10	15.0	18470	1399	1447	2300

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 22/26
SAMPLE SOURCE TP14 @ 0-4' & TP18 @ 0-8' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.7 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.7 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	22/26
SAMPLE SOURCE:	TP14 @ 0-4' & TP18 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

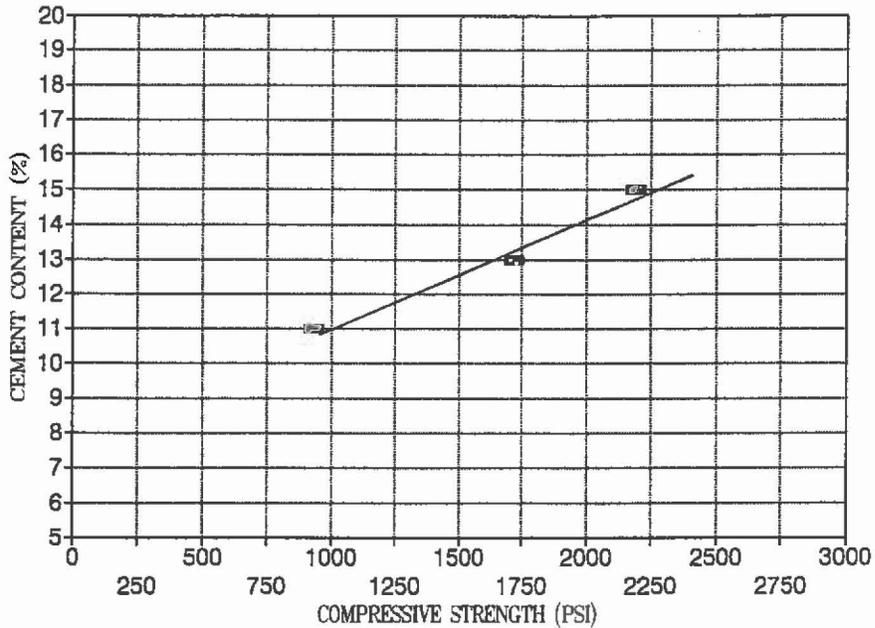
SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)					
49	2100	8.4	128.1	3.98	11.0	14139	1136		
50	2109	8.6	128.4	3.98	11.0	14000	1125	1131	1130
51	2156	8.1	131.9	3.98	13.0	19854	1596		
52	2138	8.4	130.4	3.99	13.0	19772	1581	1589	1590
53	2184	8.4	133.3	3.99	15.0	22425	1793		
54	2197	8.4	134.0	3.99	15.0	26204	2096	1945	1950

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 25
SAMPLE SOURCE TP17 @ 0-8' & TP18 @ 0-8' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.6 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.6 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	25
SAMPLE SOURCE:	TP17 @ 0-8' & TP18 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

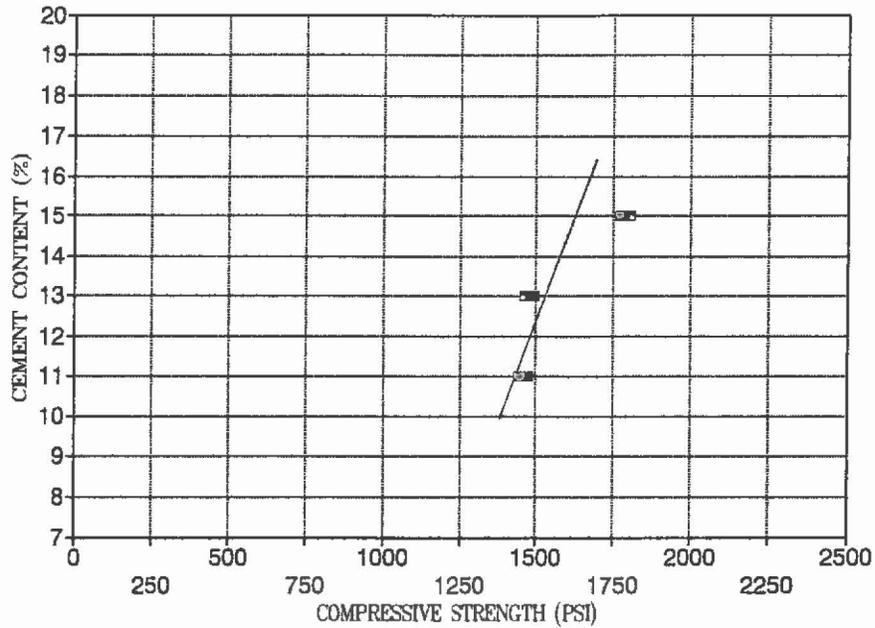
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
109	2138	8.4	130.4	3.98	11.0	12003	965		
110	2119	9.0	128.6	3.99	11.0	11173	894	929	930
111	2193	9.0	133.1	3.98	13.0	21583	1735		
112	2200	8.5	134.1	3.98	13.0	21137	1699	1717	1720
113	2217	9.0	134.5	3.99	15.0	26775	2141		
114	2205	8.2	134.8	4.00	15.0	28001	2228	2185	2190

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 27/29
SAMPLE SOURCE TP19 @ 0-7' & TP20 @ 5-7' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.3 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.3 %



AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 7-117-000062
LOCATION: REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 27-29
SAMPLE SOURCE: TP19 @ 0-7' & TP20 @ 5-7' DATE SAMPLED: 10-20-97

SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A

7 DAY BREAKS

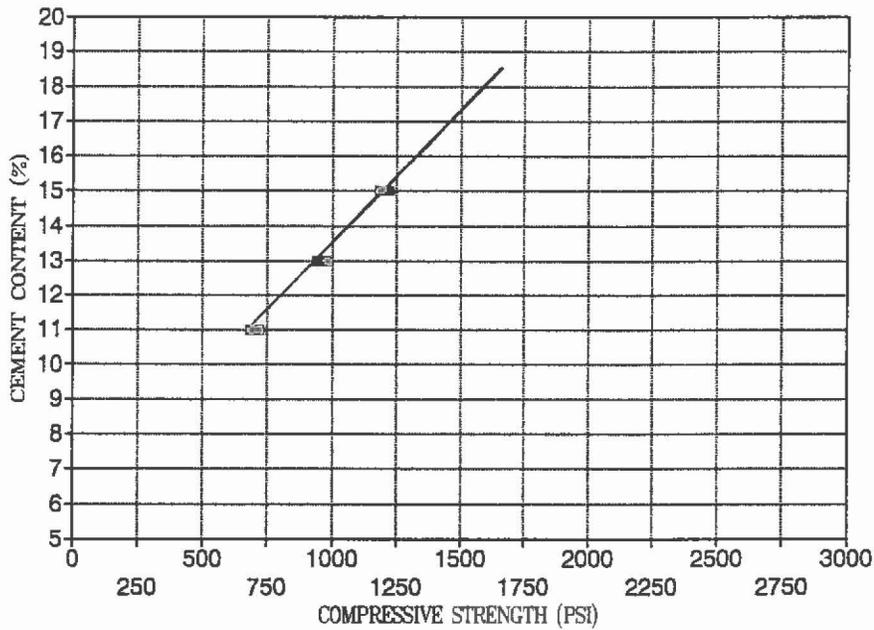
SAMPLE ID	WET SAMPLE		DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED
	WEIGHT (GR)	MOISTURE (%)							AVERAGE STRESS (PSI)
37	2173	9.1	131.7	3.90	11.0	17758	1487		
38	2173	8.9	132.0	4.00	11.0	17936	1427	1457 1460	
39	2152	9.8	129.6	4.00	13.0	19142	1523		
40	2174	9.6	131.2	4.00	13.0	18040	1436	1479 1480	
41	2153	9.3	130.3	3.90	15.0	21317	1784		
42	2151	8.8	130.8	3.90	15.0	21535	1803	1794 1790	

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENB **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSD **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 28/30
SAMPLE SOURCE TP20 @ 0-2' & TP21 @ 0-8' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 17.4 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 19.4 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	28/30
SAMPLE SOURCE:	TP20 @ 0-2' & TP21 @ 0-8'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

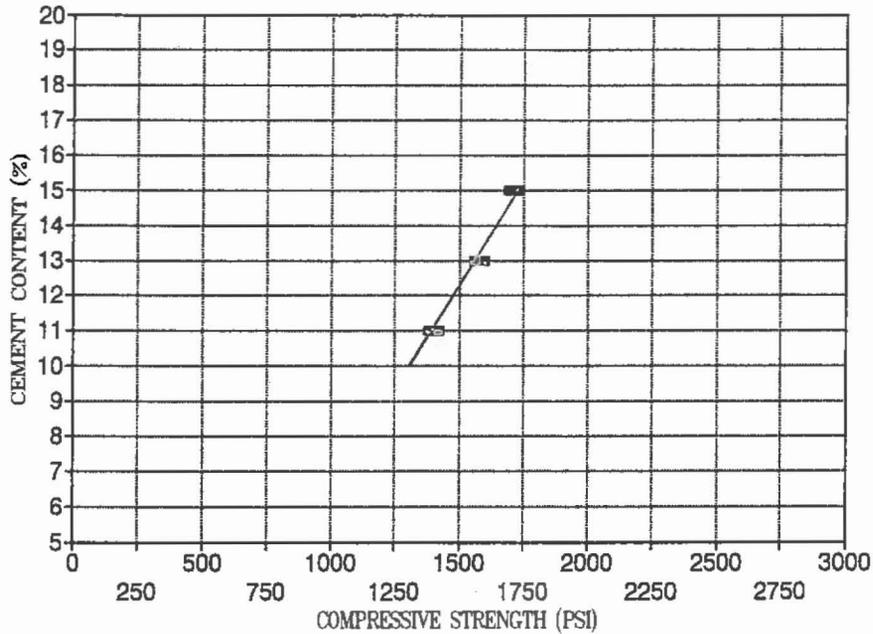
SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)					
43	2034	8.0	124.6	3.90	11.0	8130	681		
44	2008	7.8	123.2	3.90	11.0	8580	718	699	700
45	2099	8.9	127.5	3.90	13.0	11252	942		
46	2116	9.2	128.2	3.90	13.0	11608	972	957	960
47	2116	9.1	128.3	3.90	15.0	14653	1227		
48	2114	8.8	128.5	3.90	15.0	14080	1179	1203	1200

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 30/31/32
SAMPLE SOURCE TP21 @ 0-8', TP22 @ 0-2' & TP22 @ 8-9' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 12.2 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 14.2 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	30/31/32
SAMPLE SOURCE:	TP21 @ 0-8', TP22 @ 0-2' & TP22 @ 8-9'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

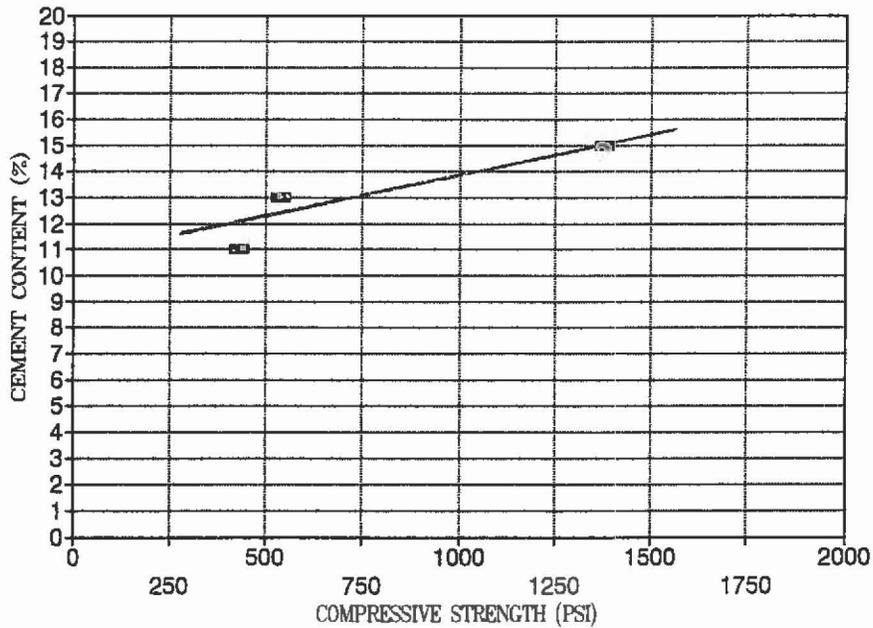
SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	CORRECTED	
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)				AVERAGE STRESS (PSI)	AVERAGE STRESS (PSI)
91	2180	8.5	132.9	3.98	11.0	17636	1418		
92	2159	8.8	131.2	3.99	11.0	17184	1374	1396	1400
93	2167	8.8	131.7	3.99	13.0	18944	1515		
94	2167	8.8	131.7	3.98	13.0	20348	1636	1575	1580
95	2159	8.5	131.6	3.98	15.0	21337	1715		
96	2162	9.2	130.9	3.97	15.0	21021	1698	1707	1710

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT **JOB NO:** 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ **WORK ORDER NO:** 2
MATERIAL: SOIL CEMENT **LAB NO:** 30/33
SAMPLE SOURCE TP21 @ 0-8' & TP23 @ 1-4' **DATE SAMPLED:** 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 15.5 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 17.5 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	30/33
SAMPLE SOURCE:	TP21 @ 0-8' & TP23 @ 1-4'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

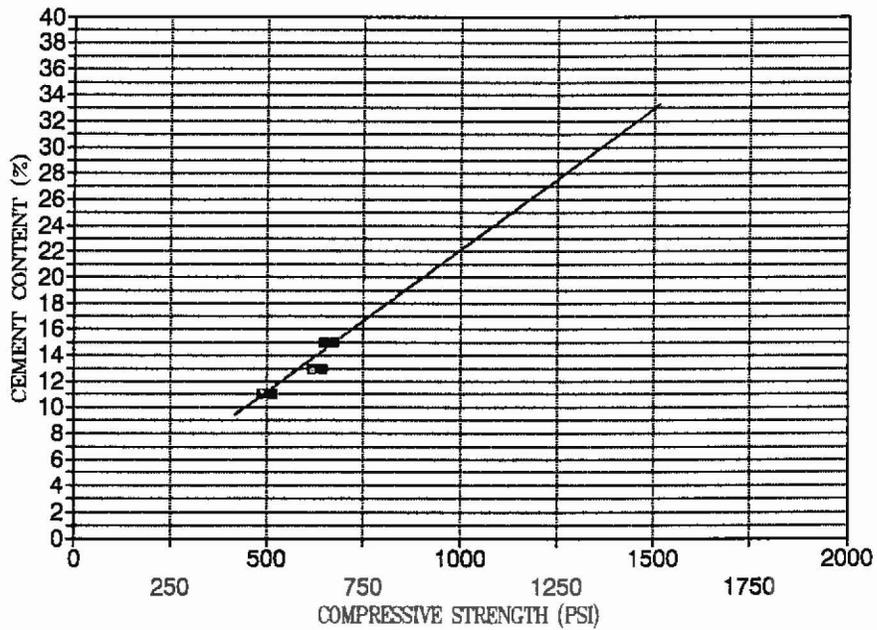
SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
97	2155	8.2	131.7	3.98	11.0	5120	412		
98	2156	7.3	132.9	3.99	11.0	5660	453	432	430
99	2150	8.2	131.4	3.99	13.0	7495	599		
100	2160	8.2	132.0	3.98	13.0	6071	488	544	540
101	1981	7.5	121.9	3.98	15.0	16749	1346		
102	1956	7.4	120.5	3.99	15.0	17560	1404	1375	1380

AGRA Earth & Environmental

PROJECT: ADDITIONAL INVESTIGATION-DESERT GREENBELT JOB NO: 6-117-000062
LOCATION: REATTA PASS WASH CHANELIZATION;SCOTTSDALE AZ WORK ORDER NO: 2
MATERIAL: SOIL CEMENT LAB NO: 15/16
SAMPLE SOURCE TP23 @ 1-4' & TP24 @ 4-9' DATE SAMPLED: 10-20-97

SOIL CEMENT COMPRESSIVE STRENGTH VERSUS CEMENT CONTENT

MIX DESIGN SOIL CEMENT COMPRESSIVE STRENGTH: 1500 PSI
CORRESPONDING CEMENT CONTENT: 33.0 %
PLUS 2 PERCENT FOR DURABILITY AND MATERIAL VARIATION
TOTAL CEMENT CONTENT 35.0 %



AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION-DESERT GREENBELT	JOB NO:	7-117-000062
LOCATION:	REATTA PASS WASH CHANELAZATION;SCOTTSDALE AZ	WORK ORDER NO:	2
MATERIAL:	SOIL CEMENT	LAB NO:	33/35
SAMPLE SOURCE:	TP23 @ 1-4' & TP24 @ 4-9'	DATE SAMPLED:	10-20-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

7 DAY BREAKS

SAMPLE ID	WET SAMPLE WEIGHT (GR)	MOISTURE (%)	DRY DENSITY (PCF)	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED AVERAGE STRESS (PSI)
85	2022	6.5	125.6	3.90	11.0	6700	561		
86	2021	7.3	124.6	3.90	11.0	5300	444	502	500
87	2009	6.3	125.0	3.90	13.0	7420	621		
88	2008	6.8	124.4	3.90	13.0	7690	644	632	630
89	2017	6.8	124.9	4.00	15.0	7930	631		
90	2006	6.4	124.7	3.90	15.0	8150	682	657	660

AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION DESERT GREENBELT REATA PASS WASH	JOB NO:	7-117-000062
LOCATION:		WORK ORDER NO:	1
MATERIAL:	SOIL CEMENT	LAB NO:	1
SAMPLE SOURCE:	HP-2 @ L-1-STRMBED	REPORT DATE:	7-17-97

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

SAMPLE ID	HEIGHT	DIAMETER	AREA	7 DAY BREAK		PSI	AVERAGE PSI	CORRECTED PSI
				7% CEMENT	MAX LOAD			
1	4.90	4.00	12.57	6763	538			
2	4.80	4.00	12.57	8958	713			
3	4.80	4.00	12.57	8029	639	630	630	

SAMPLE ID	HEIGHT	DIAMETER	AREA	9% CEMENT		PSI	AVERAGE PSI	CORRECTED PSI
				MAX LOAD				
4	4.70	4.00	12.57	10619	845			
5	4.80	4.00	12.57	8523	678			
6	4.90	4.00	12.57	8978	714	746	750	

SAMPLE ID	HEIGHT	DIAMETER	AREA	11% CEMENT		PSI	AVERAGE PSI	CORRECTED PSI
				MAX LOAD				
1	4.70	4.00	12.57	18054	1437			
2	4.70	4.00	12.57	17521	1394			
3	4.80	4.00	12.57	20487	1630	1487	1490	

AGRA Earth & Environmental

PROJECT:	ADDITIONAL INVESTIGATION DESERT GREENBELT	JOB NO:	7-117-000062
	REATA PASS WASH	WORK ORDER NO:	1
LOCATION:		LAB NO:	2
MATERIAL:	SOIL CEMENT	REPORT DATE:	7-17-97
SAMPLE SOURCE:	HP-1 @ L-6-ALLUM		

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ARIZONA 241A**

SAMPLE ID	HEIGHT	DIAMETER	AREA	7 DAY BREAK		PSI	AVERAGE PSI	CORRECTED PSI
				5% CEMENT	MAX LOAD			
1	4.80	4.00	12.57	8405	669			
2	4.80	4.00	12.57	7930	631			
3	4.90	4.00	12.57	6823	543	614	610	

SAMPLE ID	HEIGHT	DIAMETER	AREA	7% CEMENT		PSI	AVERAGE PSI	CORRECTED PSI
				MAX LOAD				
4	4.80	4.00	12.57	12933	1029			
5	4.80	4.00	12.57	13427	1068			
6	4.80	4.00	12.57	19973	1589	1229	1230	

SAMPLE ID	HEIGHT	DIAMETER	AREA	9% CEMENT		PSI	AVERAGE PSI	CORRECTED PSI
				MAX LOAD				
1	4.90	4.00	12.57	19973	1589			
2	4.80	4.00	12.57	18925	1506			
3	4.80	4.00	12.57	19874	1582	1559	1560	

AGRA Earth & Environmental

PROJECT: DESERT GREENBELT-PHASE I
LOCATION: PIMA RD BTWN BELL & PINNACLE RDS.
MATERIAL: SOIL CEMENT
SAMPLE SOURCE: RTP-6B, 2-5'; RTP-14A, 0-5'; RTP-14B, 0-5'

JOB NO: 6-117-000029
WORK ORDER NO: 2
LAB NO: 9, 16 & 18
DATE SAMPLED: 02-27-96

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
 ARIZONA 241A**

7 DAY BREAKS

SAMPLE ID	WET	MOISTURE (%)	DRY	DIAMETER (IN)	CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	AVERAGE STRESS (PSI)	CORRECTED
	SAMPLE WEIGHT (GR)		DENSITY (PCF)						AVERAGE STRESS (PSI)
9	2243	8.7	136.5	4.10	11	22445	1698		
9	2250	8.7	136.9	4.09	11	20823	1585		
9	2261	8.7	137.6	4.05	11	24125	1873	1719	1720
16	2264	8.7	137.8	4.05	13	28595	2217		
16	2247	8.7	136.7	4.09	13	31502	2404		
16	2248	8.7	136.8	4.05	13	31601	2453	2335	2340
18	2286	8.7	139.1	4.06	15	32668	2530		
18	2274	8.7	138.4	4.04	15	37157	2899		
18	2285	8.7	139.0	4.06	15	36660	2832	2753	2750

AGRA Earth & Environmental

PROJECT: DESERT GREENBELT-PHASE I
LOCATION: PIMA RD BTWN BELL & PINNACLE RDS.
MATERIAL: SOIL CEMENT
SAMPLE SOURCE: RTP 12-19

JOB NO: E95-86
WORK ORDER NO: 11
LAB NO: 252-255
DATE SAMPLED: 08-11-95

**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
 ARIZONA 241A**

7 DAY BREAKS

SAMPLE ID	WET		DRY		CEMENT CONTENT (%)	MAX LOAD (LBS)	STRESS (PSI)	CORRECTED	
	SAMPLE WEIGHT (GR)	MOISTURE (%)	DENSITY (PCF)	DIAMETER (IN)				AVERAGE STRESS (PSI)	AVERAGE STRESS (PSI)
1	2156	7.9	132.2	4.02	5	9333	735		
2	2141	7.5	131.7	4.03	5	10520	825		
3	2168	8.3	132.4	4.01	5	10362	820	794	790
4	2175	7.7	133.6	4.01	7	12062	955		
5									
6	2167	8.4	132.2	4.00	7	12003	955	955	960
7	2186	7.1	135.0	4.01	9	14040	1112		
8	2191	8.3	133.8	4.00	9	13249	1054		
9	2167	7.6	133.2	4.01	9	12774	1011	1059	1060
10	2151	8.2	131.5	4.00	11	12557	999		
11	2174	7.8	133.4	4.03	11	14066	1103		
12	2171	8.4	132.5	4.00	11	14574	1160	1087	1090

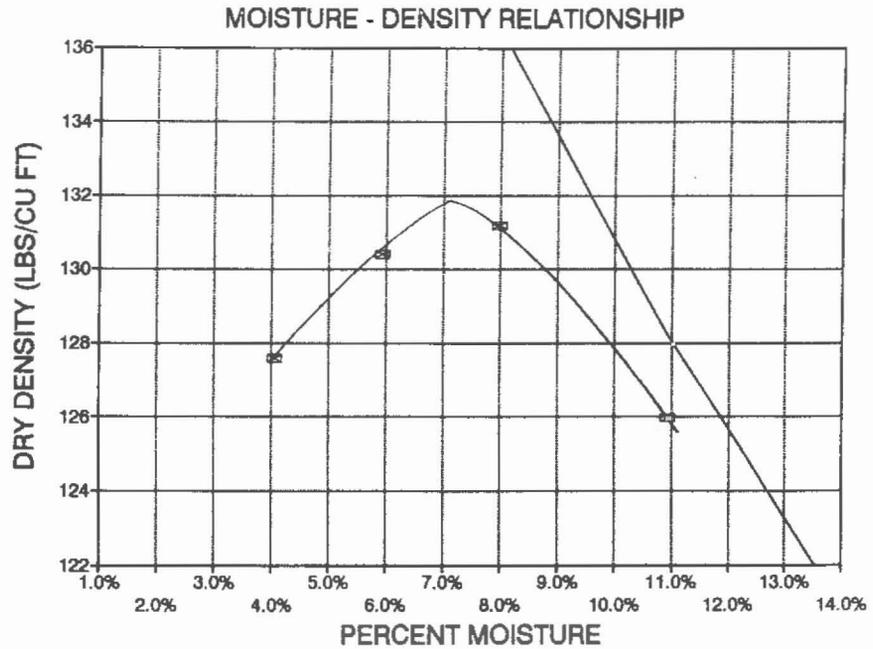
* NOTE: SAMPLE ID #5 WAS DAMAGED

AGRA Earth & Environmental

PROJECT:	DESERT GREENBELT PHASE I	JOB NO:	6-117-000029
LOCATION:	PIMA RD & DEER VALLEY RD; SCOTTSDALE	WORK ORDER NO:	2
MATERIAL:	SM	LAB NO:	7
SAMPLE SOURCE:	RTP-6A @ 0.0 - 4.0'	DATE SAMPLED:	02-27-96

ASTM D698

MAXIMUM DRY DENSITY	131.9 PCF	METHOD	A
OPTIMUM MOISTURE CONTENT	7.3%		



AGRA Earth & Environmental

PROJECT:	DESERT GREENBELT PHASE I	JOB NO:	6-117-000029
LOCATION:	PIMA RD & DEER VALLEY RD; SCOTTSDALE	WORK ORDER NO:	2
MATERIAL:	GP	LAB NO:	16
SAMPLE SOURCE:	RTP-14A @ 0.0 - 5.0'	DATE SAMPLED:	02-27-96

ASTM D698

MAXIMUM DRY DENSITY	129.8 PCF	METHOD	A
OPTIMUM MOISTURE CONTENT	9.0%		

