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16. Abstract

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The pavement at the District 1 site consisted of a surface treatment and six inches of flexible base course over a poor clay subgrade. Analysis of the FWD deflection data indicated that the section containing the geotextile was statiscally stronger than the control section. The cone penetrometer readings indicated effective base thickenss of the experimental section was almost 1.5 inches thicker than the control section. This implies that, even under this very light traffic loadings, the geotextile has prevented soil intrusion into the base course.

The pavement at the District 21 site consisted of 1.5 inches of Hot Mix, 12 inches of flexible base over a lime stabilized subgrade. In analyzing the data from the experimental and control sections no significant differences in performance were found.

It is concluded from this study that geotextiles are cost-effective in stabilizing lightly trafficked thin pavements over difficult subgrade. Further studies are required to determine where and when geotextiles can replace traditional soil stabilization procedures.

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# FIELD EVALUATION OF GEOTEXTILES UNDER BASE COURSES

## A SUPPLEMENT

by

Tom Scullion

and

Eddie Chou

Research Report 414-1F
(Supplement)
Research Study Number 2-10-83-414
Fabrics Under Base Courses

Sponsored by

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January 1986

TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas

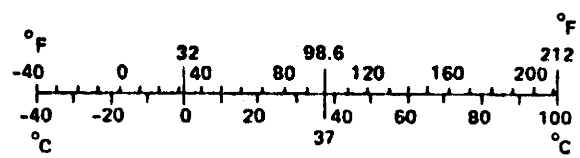
# METRIC CONVERSION FACTORS

## Approximate Conversions to Metric Measures

| Symbol | When You Know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | | **LENGTH** | | |
| in | inches | *2.5 | centimeters | cm |
| ft | feet | 30 | centimeters | cm |
| yd | yards | 0.9 | meters | m |
| mi | miles | 1.6 | kilometers | km |
| | | **AREA** | | |
| $in^2$ | square inches | 6.5 | square centimeters | $cm^2$ |
| $ft^2$ | square feet | 0.09 | square meters | $m^2$ |
| $yd^2$ | square yards | 0.8 | square meters | $m^2$ |
| $mi^2$ | square miles | 2.6 | square kilometers | $km^2$ |
| | acres | 0.4 | hectares | ha |
| | | **MASS (weight)** | | |
| oz | ounces | 28 | grams | g |
| lb | pounds | 0.45 | kilograms | kg |
| | short tons (2000 lb) | 0.9 | tonnes | t |
| | | **VOLUME** | | |
| tsp | teaspoons | 5 | milliliters | ml |
| Tbsp | tablespoons | 15 | milliliters | ml |
| fl oz | fluid ounces | 30 | milliliters | ml |
| c | cups | 0.24 | liters | l |
| pt | pints | 0.47 | liters | l |
| qt | quarts | 0.95 | liters | l |
| gal | gallons | 3.8 | liters | l |
| $ft^3$ | cubic feet | 0.03 | cubic meters | $m^3$ |
| $yd^3$ | cubic yards | 0.76 | cubic meters | $m^3$ |
| | | **TEMPERATURE (exact)** | | |
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |


## Approximate Conversions from Metric Measures

| Symbol | When You Know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | | **LENGTH** | | |
| mm | millimeters | 0.04 | inches | in |
| cm | centimeters | 0.4 | inches | in |
| m | meters | 3.3 | feet | ft |
| m | meters | 1.1 | yards | yd |
| km | kilometers | 0.6 | miles | mi |
| | | **AREA** | | |
| $cm^2$ | square centimeters | 0.16 | square inches | $in^2$ |
| $m^2$ | square meters | 1.2 | square yards | $yd^2$ |
| $km^2$ | square kilometers | 0.4 | square miles | $mi^2$ |
| ha | hectares (10,000 $m^2$) | 2.5 | acres | |
| | | **MASS (weight)** | | |
| g | grams | 0.035 | ounces | oz |
| kg | kilograms | 2.2 | pounds | lb |
| t | tonnes (1000 kg) | 1.1 | short tons | |
| | | **VOLUME** | | |
| ml | milliliters | 0.03 | fluid ounces | fl oz |
| l | liters | 2.1 | pints | pt |
| l | liters | 1.06 | quarts | qt |
| l | liters | 0.26 | gallons | gal |
| $m^3$ | cubic meters | 35 | cubic feet | $ft^3$ |
| $m^3$ | cubic meters | 1.3 | cubic yards | $yd^3$ |
| | | **TEMPERATURE (exact)** | | |
| °C | Celsius temperature | 9/5 (then add 32) | Fahrenheit temperature | °F |




*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

# ABSTRACT

This report describes a structural evaluation of two thin pavements which had a woven geotextile as a separator between base and subgrade. On both pavements Falling Weight Deflectometer and Dynamic Cone Penetration measurements were made. The FWD test was used to generate a load versus deflection plot for each pavement. The penetrometer indicated the layer strengths and effective base thickness.

The pavement at the District 1 site consisted of a surface treatment and six inches of flexible base course over a poor clay subgrade. Analysis of the FWD deflection data indicated that the section containing the geotextile was statistically stronger than the control section. The cone penetrometer readings indicated that the effective base thickness of the experimental section was almost 1.5 inches thicker than the control section. This implies that, even under this very light traffic loadings, the geotextile has prevented soil intrusion into the base course.

The pavement at the District 21 site consisted of 1.5 inches of Hot Mix, 12 inches of flexible base over a lime stabilized subgrade. In analysing the data from the experimental and control sections no significant differences in performance were found.

It is concluded from this study that geotextiles are cost-effective in stabilizing lightly trafficked thin pavements over difficult subgrade. Further studies are required to determine where and when geotextiles can replace traditional soil stabilization procedures.

## IMPLEMENTATION STATEMENT

The results in this report indicate that geotextiles can be cost effective as separators in thin pavements over difficult subgrades. Under the action of construction equipment and normal traffic, soil from the subgrade can intrude into the base course markedly reducing its strength. The placement of a permeable fabric between the base and subgrade can help maintain design thicknesses. In 1984 prices these geotextiles cost between $0.60 and $0.80 per square yard.

## DISCLAIMER

TABLE OF CONTENTS

# 1. INTRODUCTION

As described in Research Report 414-1, "Testing Procedures, Specifications, and Applications for Geofabrics in Highway Pavements" (1), the Texas Department of Highways and Public Transportation, as of August 1984, had nine projects in which geofabrics had been used on an experimental basis. Several of these projects used geomembranes (impermeable geofabrics) as vertical moisture barriers at the pavements edge to minimize moisture movements into expansive clay subgrades. These moisture barriers have reportedly (2) reduced pavement roughness and increased life between overlays.

In other applications, a geotextile (permeable geofabric) had been placed between base and subgrade to act as a separator and possible reinforcing member. The mechanisms of separation and reinforcement are discussed in (1). In this project, investigations were made on two experimental sections which had a geotextile between subgrade and base course. Both projects were built and initially monitored by SDHPT personnel. The goal of this investigation was to use the Department's Falling Weight Deflectometer and Cone Penetrometer to determine what effect, if any, the geotextile is having on the pavement structure. The testing procedures are described in Section 2 of this report.

The two projects are located on SH186 in District 21 near Port Mansfield and on Recreational Road 3 in District 1 near Bonham. Site descriptions and a summary of results are presented in Sections 3 and 4. Detailed test results are given in the Appendices.

Neither project exhibited any significant visual distress at the time of testing.

## 2 EVALUATION PROCEDURE

### 2.1 Introduction

In this chapter, the equipment used to structurally evaluate the experimental sites will be described. These are the Falling Weight Deflectometer (FWD), the Dynaflect, and the Cone Penetrometer. The testing procedure used at the Bonham site was as follows:

1) Twenty test locations were marked in the experimental and control sections. These being at 100 ft intervals in the outer wheel path.

2) Dynaflect readings were taken at all 20 test locations.

3) At each location Falling Weight Deflectometer reading were taken using four different drop weights, corresponding to loadings of 4500, 9000, 12000 and 15000 lbs.

4) From the FWD deflection results a strong, intermediate and weak location was selected in both the experimental and control section.

5. At these six locations the Dynamic Cone Penetrometer was driven through the pavement layers to a total depth of approximately 24 inches. The penetrometer was used to obtain an indication of the effective base thickness and relative layer strengths.

Note, the Dynaflect was not available at the SH186 site and only the Falling Weight Deflectometer and Dynamic Cone Penetrometer were used.

The Falling Weight Deflectometer, Dynaflect and Dynamic Cone Penetrometer are described in the following sections.

### 2.2 Falling Weight Deflectometer

The Deflectometer used in this project was the Department's Dynatest 8002 FWD (3) and its microcomputer which recorded and interpreted the measured loads and deflections. The FWD itself is a light-weight trailer mounted unit, as can be seen in Figure 1.

The FWD can deliver an impulse load of 1500 lbs to 24,000 lbs to a pavement. The impulse is essentially a half sine curve with a duration of 25 to 30 milliseconds. The load is transmitted to the pavement through a 12 in. diameter loading plate which rests on a thick rubber pad which is in contact with the pavement surface. In principle, the force applied to the pavement is dependent on the mass of the drop-weights used, the height of the drop, and the spring constants of the rubber pad as well as that of the overall pavement. In practice, however, only the mass of the drop-weights and/or the height of drop is varied. The actual load relayed to the pavement is measured by the load cell located just above the loading plate.

The deflection basin is obtained by monitoring the deflections at seven locations on the pavement surface using velocity transducers. One of these is located in an opening in the center of the loading plate.

In the tests, the height of drop and weight were adjusted to produce four different load levels - 4500 lbs, 9000 lbs, 12,000 lbs, and 15,000 lbs with the exact magnitude being registered by the load cell.

The deflections sensors were commonly spaced at one foot intervals. A typical set of deflection basins observed at the four different load levels is shown in Figure 2.

## 2.3 Dynaflect

The Dynaflect (4) is currently the most commonly used NDT device in the United States for the purpose of pavement evaluation and design (5). This equipment is a dynamic force generator mounted on a covered trailer, as can be seen in Figure 3. The cyclic force is produced by a pair of counter-rotating unbalanced flywheels and this force oscillates in a sine-wave fashion with an amplitude of 500 lbs at a cycle frequency of 8 cycles per second. This force, together with the dead weight of the trailer which is about 1600 lbs, is transmitted to the ground via two steel wheels placed 20 in. apart. The peak-to-peak deflections are measured by five geophones placed at 1 ft intervals with the first directly between the wheels. A typical deflection basin obtained is shown in Figure 4.

## 2.4 Dynamic Cone Penetrometer

The Dynamic Cone Penetrometer (DCP) (6) consists of a steel rod with a $60^{0}$ cone of tempered steel at one end. A sliding hammer of about 17.6 lbs falling over a height of 22.6 in. provided the consistent impact load required to penetrate the pavement. The penetration given as inches per blow gives an indication of the stiffnesses of the pavement layers. This instrument was found to be useful in comparing the stiffnesses of the base courses and subgrades encountered in this study. Figure 5 shows the DCP.

Figure 6 shows the typical results obtained from a DCP test. When passing through a base course, the penetration per blow is fairly constant. Once the subgrade is entered, the penetration per blow increases considerably. As shown in Figure 6, in this study the DCP was used to determine the effective base thickness on both the geotextile and control section. The aim being to determine if the geotextile was acting as a separator between base and subgrade. On weak subgrades clays often penetrate into the base course, reducing base thickness and overall pavement strength.

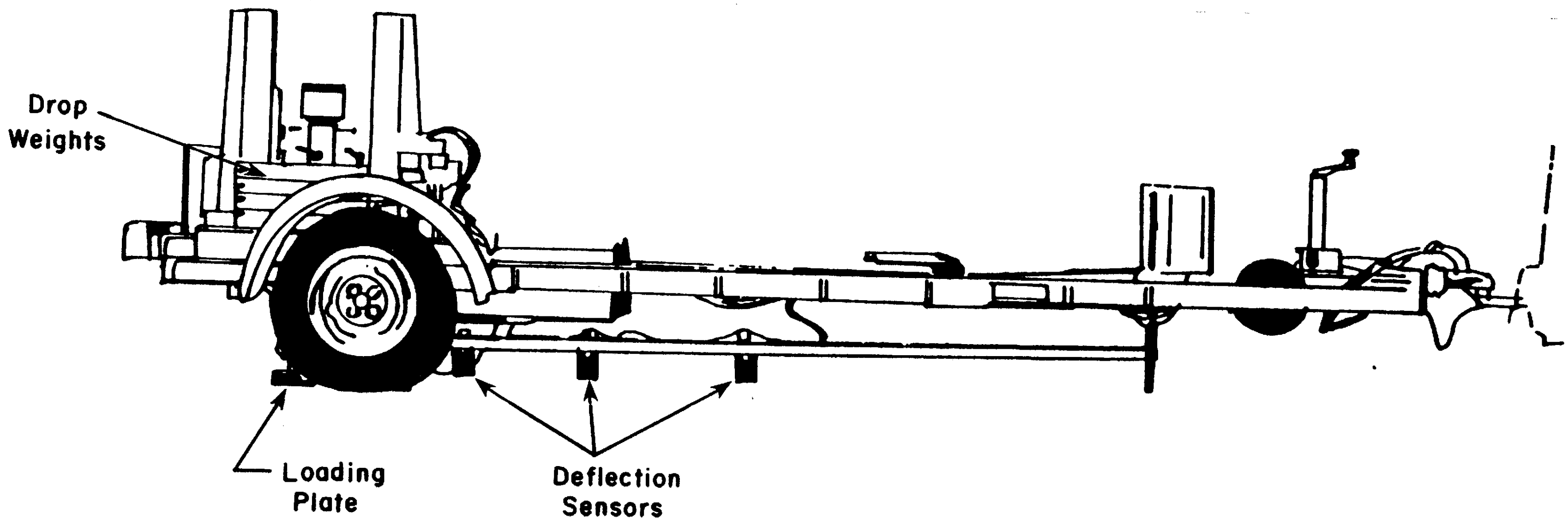



Figure 1. The Falling Weight Deflectometer

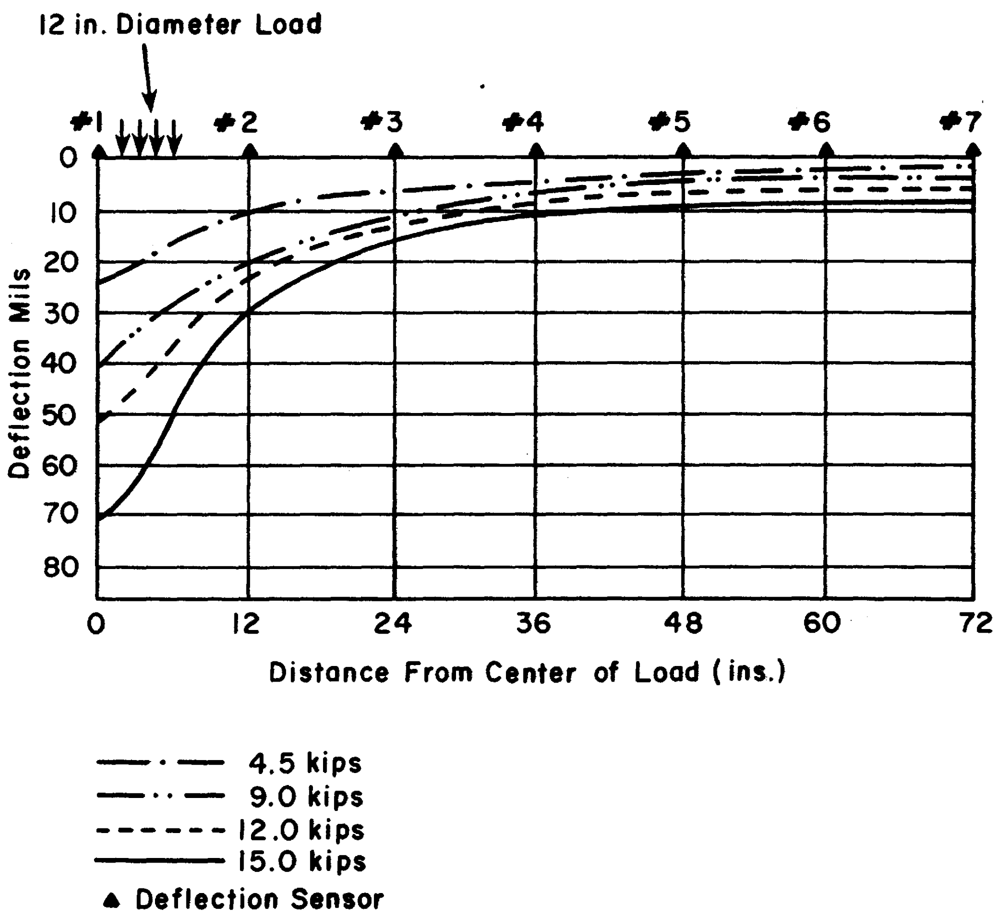



Figure 2. Typical deflection basin from the Falling Weight Deflectometer.

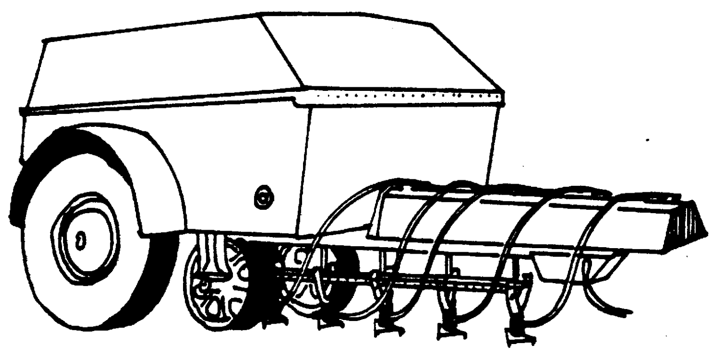


Figure 3. The Dynaflect

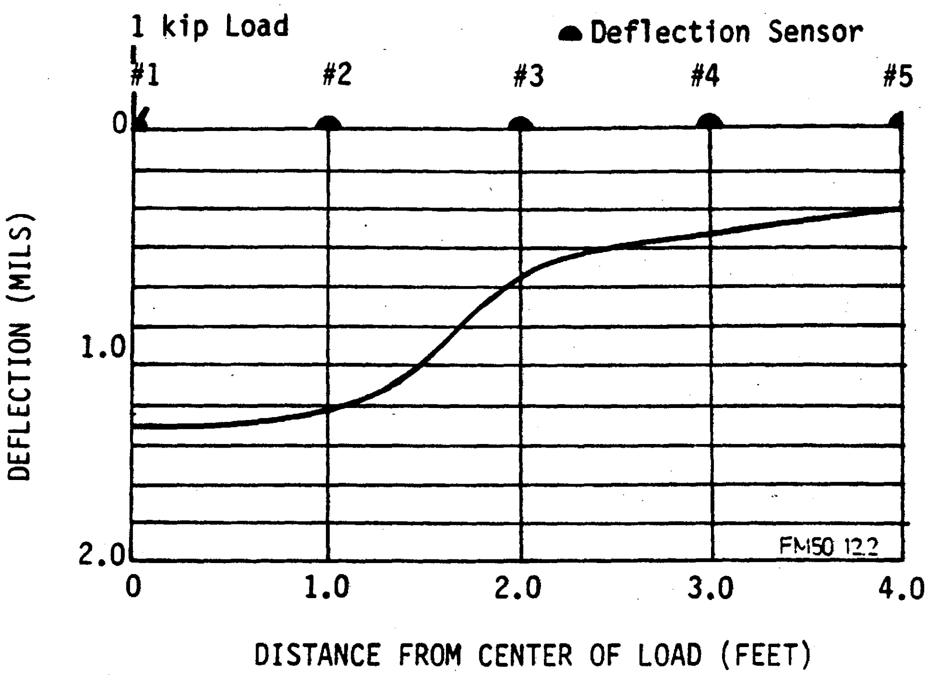



Figure 4. Typical Deflection Basin - Dynaflect

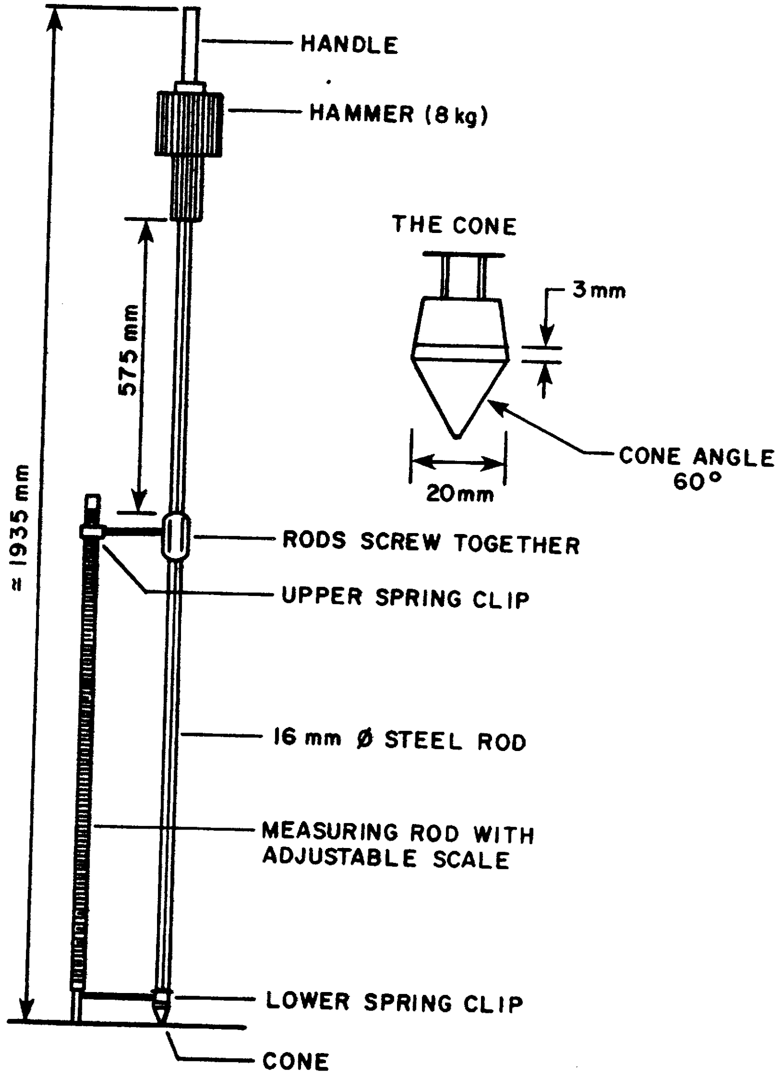



Figure 5. The Dynamic Cone Penetrometer (6)

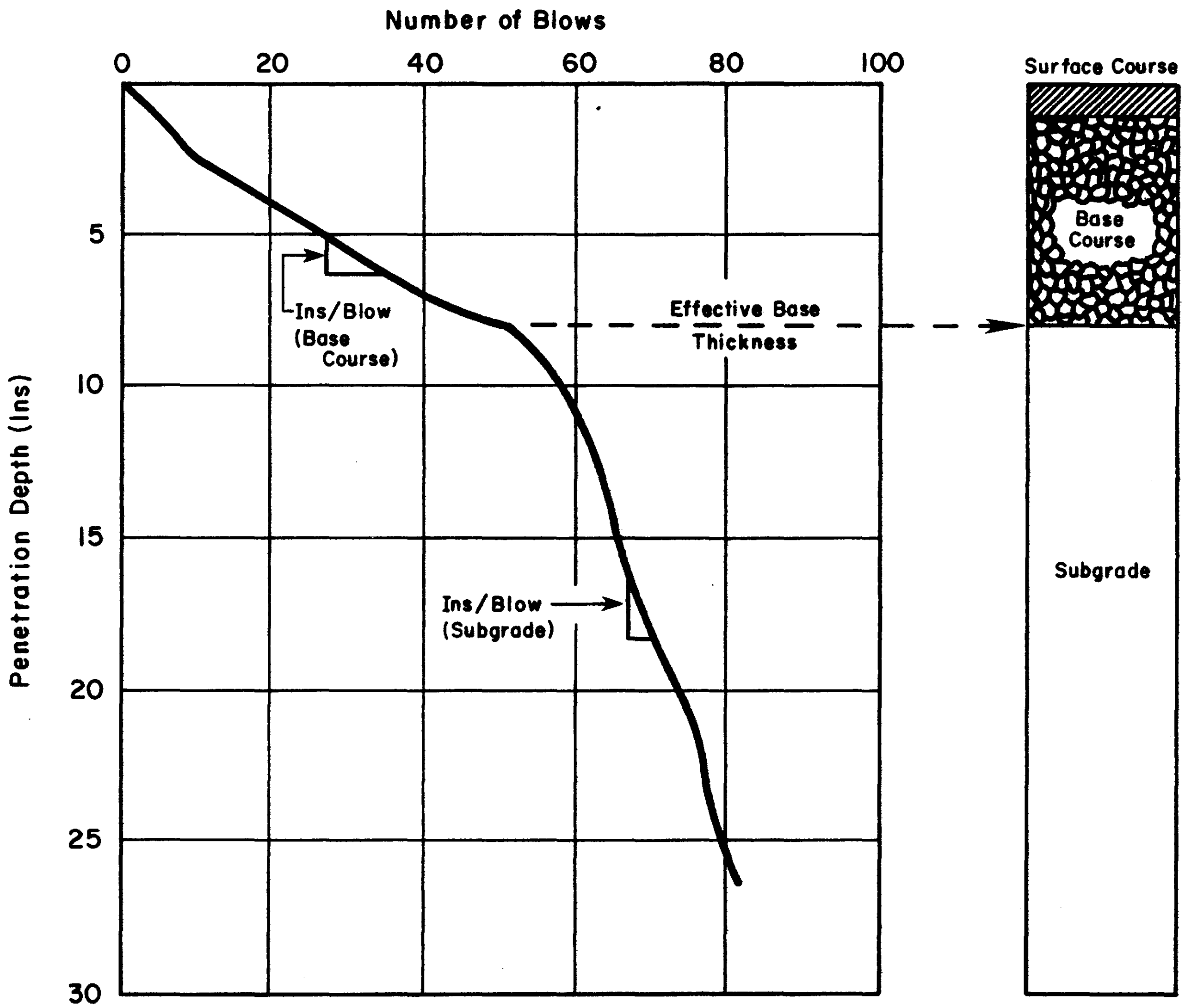



Figure 6. Determining Effective Base Thickness with the Core Penetrometer.

The advantage of the DCP is that it is an inexpensive method of determining effective layer thickness and relative layer stiffness. Its disadvantage is that it is labor-intensive and slow.

## 2.5 Analysis Procedure

One aim of this testing is to determine if the Falling Weight Deflectometer, by applying gradually increasing loads, can determine if the geotextile is having any significant effect on the pavement structure. To accomplish this, the following steps were performed.

Step 1. The FWD data was plotted on a load versus deflection graph as shown in Figure 7.

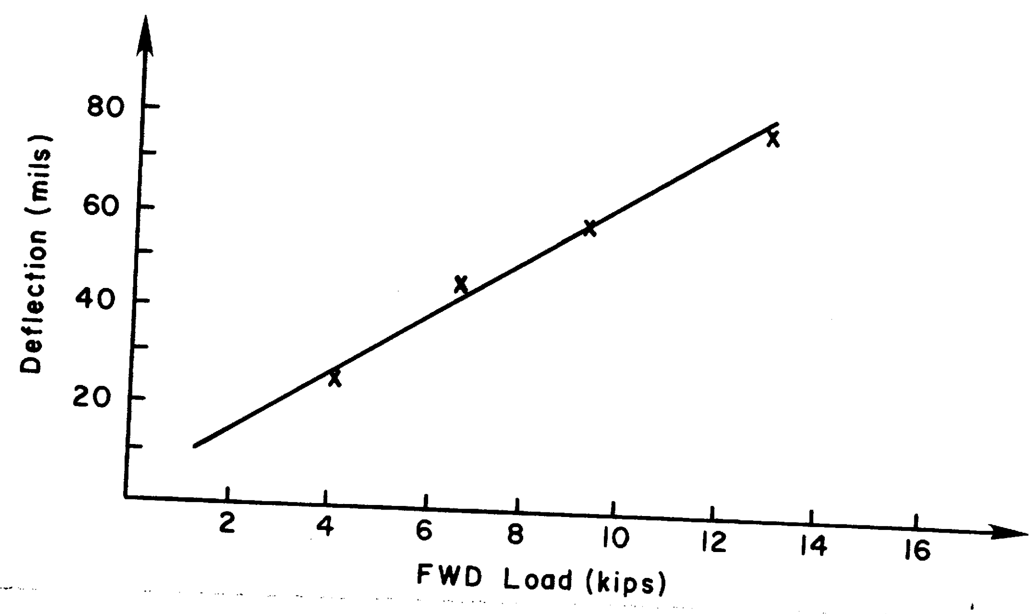



Figure 7. Typical FWD Load Versus Deflection

[For simplicity, a straight line was fitted through the available data points. In some cases the load versus deflection plot appears to be curved. Whether this is a true material response or a measurement problem is unclear. The curved load versus deflection plots are associated with pavements exhibiting high deflections, i.e., where the 15,000 lbs load caused a deflection of over 100 mils. However, the maximum range of the geophones used with the FWD was 80 mils. In general, when pavements had deflections less than 80 mils, a straight-line best represented the load versus deflection data.]

Step 2. Using the least squares line through the available data for each section calculate the following parameters:

1. The deflection at an FWD load of 4500 lbs
2. The deflection at an FWD load of 9000 lbs
3. The deflection at an FWD load of 12,000 lbs
4. The deflection at an FWD load of 14,000 lbs
5. The slope of the load versus deflection line in lbs/mil.

Step 3. Using a students t-test, determine if the mean deflection or slope of the geotextile section is significantly different from the mean of the control section, as shown below in Figure 8.

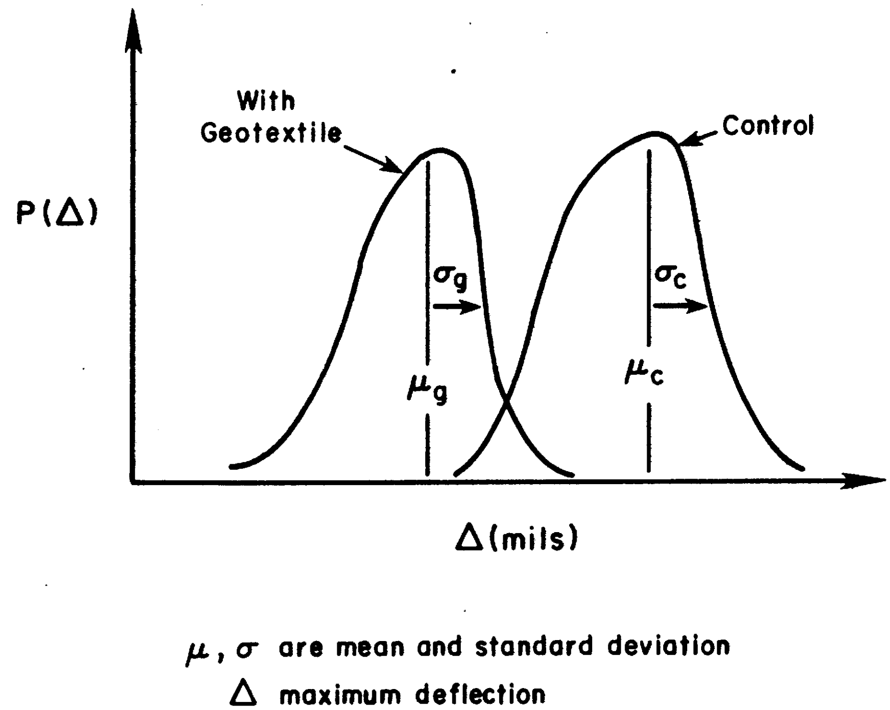



Figure 8. Typical T-Test Results

(A separate test was performed for each of the parameters calculated in Step 2.)

Step 4. Compare effective base thicknesses from Cone Penetrometer Data. This analysis was performed on the data from the Bonham site only.

# 3 RESULTS FROM SH186 IN DISTRICT 21

## 3.1 Site Description

A section of SH186 near Port Mansfield, Texas, was reconstructed shortly after Hurricane Allan hit South Texas in early 1981. The section of highway was built on very poor subgrade soil, had a high water table, and was prone to flooding at high tide.

In rebuilding, the subgrade was stabilized with lime, a Mirafi geotextile (500X) was placed over the subgrade in the west bound lane, and 12 inches of granular base was added. In the eastbound lane no geotextile was used and the base thickness was reduced to 8 inches. Approximately one and a half inches of hot mix asphaltic concrete was placed as a surfacing. The as built section is shown in Figure 9.

At several locations, the geotextile was placed under the shoulder and two feet of the west bound travel lane. At other locations, the geotextile extended over the entire westbound lane. The purpose of the narrow geotextile sections was to determine if the geotextile could be used to prevent edge failures. These sections were not evaluated in this structural survey. Instead, a section was chosen in which the geotextile covered the entire travel lane.

The test procedure was as follows:

a) A Falling Weight Deflectograph survey was made at 24 test points in the outer wheel path of the geotextile section. The test locations were marked with paint, they were 100 feet apart. Four drop heights corresponding to approximately 4500 lbs, 9000 lbs, 13,000 lbs, and 15,000 lbs, were used.

b) The FWD testing was repeated at the 24 test locations in the adjacent east bound direction (no geotextile).

c) Based on the FWD data, weak, strong, and intermediate test points were selected in the experimental and control sections. At these six locations, a Dynamic Cone Penetrometer test was made.

At the time of conducting this survey, no visual distress was apparent in either the experimental or control section. The detailed field results from this survey are shown in Appendix A.

## 3.2 Summary of Results

The analysis of the data collected on this section is complicated by the fact that the geotextile section had twelve inches of base course whereas the control only had eight inches.

The statistical analysis procedure described in a previous

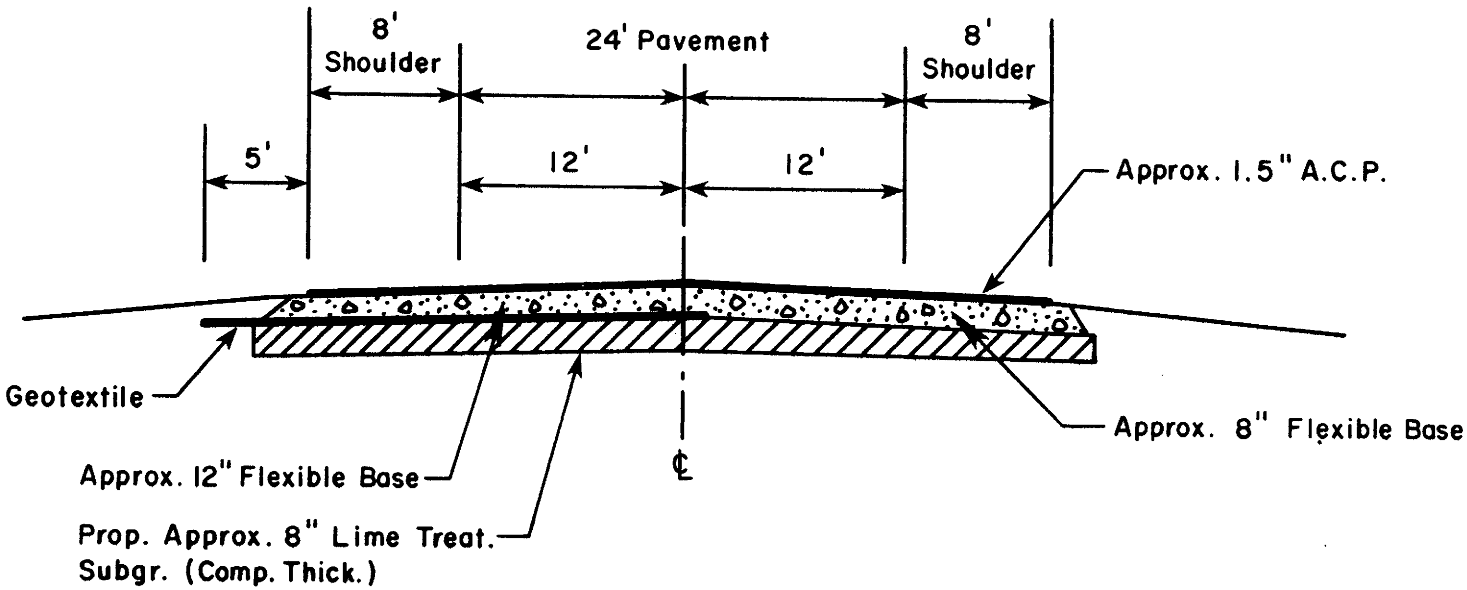



Figure 9. Experimental Geotextile Section on SH186 in District 21

section was performed on the FWD data. For each test point the deflections corresponding to exactly 4000, 9000, 13,000, and 15,000 lbs and the slope of the load versus deflection graph were computed. A "T-test" was performed to determine if the distribution of deflection data was different between the experimental and control sections. The results of this analysis are shown in Table 1.

Table 1. T-Test Results From SH186 Test Site

| FWD Load (lbs) | Mean FWD Sensor 1 Deflection (mils) | | P-value | Statistical Significance |
|---|---|---|---|---|
| | Geotextile | Control | | |
| 4500 | 22.3 | 28.3 | 0.001 | Yes |
| 9000 | 41.5 | 49.3 | 0.006 | Yes |
| 13,000 | 53.7 | 62.5 | 0.002 | Yes |
| 15,000 | 58.1 | 66.6 | 0.006 | Yes |
| Slope (lbs/mil) | 295.0 | 272.0 | 0.20 | No |

[Note: The P-value is a statistical parameter used to evaluate if two mean values $U_1$ and $U_2$ belong to the same distribution, at the 95% significance level, if $p < 0.05$ conclude that the means are different; if $p > 0.05$ conclude no difference in means.]

At each of the 4 load levels, the geotextile section had significantly lower deflections than the control section. This is to be expected as it also had four inches of additional base course, and both had identical subgrade stabilization. The slopes of the load versus deflection curves were similar, the experimental requiring 295 lbs to cause one mil of deflection as opposed to 272 lbs in the control. These results indicate that the geotextile is having little effect on strengthening the pavement structure.

To assist with the analysis of the deflection data the Corp. of Engineers CHEVDEF (7) moduli back calculation program was used. This program calls a standard linear elastic program as a subroutine, iterations are performed to minimize the percentage error between the measured and computed deflection bowls. The bowls measured under the 9,000 lbs loading and the as built layer thicknesses were input into CHEVDEF. The measured versus computed deflection bowls and the corresponding layer moduli are shown below in Tables 2 and 3 respectively.

Table 2. Measured vs. Predicted Deflections

| Distance from Center of Load (ins) | Geotextile Section | | Control Section | |
|---|---|---|---|---|
| | Deflections (Mils) Measured | Computed | Deflection (Mils) Measured | Computed |
| 0 | 41.5 | 42.4 | 49.3 | 41.9 |
| 12 | 16.4 | 15.9 | 17.0 | 15.4 |
| 24 | 8.1 | 8.5 | 7.0 | 7.7 |
| 48 | 4.0 | 4.2 | 3.5 | 3.7 |
| 72 | 2.4 | 2.7 | 2.1 | 2.4 |

Table 3 Computed Elastic Moduli (psi)

| | Geotextile | Control |
|---|---|---|
| Base | 20,200 | 21,100 |
| Subgrade | 12,100 | 13,300 |

For the purpose of the analysis the modulus of the 1.5 asphalt layer was fixed at 200,000 psi. The decision to fix the asphalt stiffness is because a) both sections have identical surfacings b) both are in good condition and c) the deflections were measured on the same day at the same temperature. As can be seen from the back calculated moduli values there is little difference between the layer moduli in the experimental and control section.

The cone penetrometer data taken on this section is shown graphically in Appendix A. The results of this testing are difficult to interpret. For instance, consider the results obtained at Station 1 in the Geotextile and Control Section, pages A6 and A9. At this location the geotextile is in the westbound lane and the control is in the eastbound. The control section penetrometer results, page A-6, show clear design thicknesses, a stabilized layer starting at approximately 8 inches below the surface and extending to approximately 14 inches, after which the untreated subgrade is entered. The penetrometer results on the section containing the geotextile (page A-9) do not show any distinct layer thicknesses.

It appears on this section that a weak layer is entered at approximately 6 inches below the surface, no lime stabilized layer was found. However, at station 6 (geotextile section on page A-10) very distinct layer thicknesses were observed, the stabilized layer appears to occur between 13 and 19 inches from surface (under a 12 inch base and thin surface). Because of the variability of layer thicknesses and layer strengths, little can be inferred from the cone results about the effect the geotextile is having on the pavement structure.

# 4 RESULTS FROM RR3 IN DISTRICT 1

## 4.1 Site Description

Recreational Road 3 is a lightly trafficked two-lane highway near Bonham in District 1. It had become excessively rough primarily due to movements of the expansive subgrade. Several sections of the road had PSI values of less than 1.0. The original pavement structure consisted of a surface treatment, six inches of flexible base on top of an untreated subgrade.

In September 1983, the base course was bladed off, and the subgrade leveled and recompacted. A geotextile (Mirafi 500X) was placed on the subgrade and the base course was replaced followed by a surface treatment. As shown in Figure 10 the experimental site was 1250 ft long, and a similar length control section was built with a 250 ft transition zone between them. The pavement structure is shown in Figure 11.

In July 1985, this experimental site was evaluated with a Dynaflect, Falling Weight Deflectometer, and Cone Penetrometer survey. The location of the test points are shown in Figure 10, all were in the outer wheel path. The test procedure was as follows.

a. A Dynaflect survey was made at all 40 test points.
b. A FWD survey was made immediately after the Dynaflect testing was complete. Four drop heights corresponding to approximately 4500 lbs, 9000 lbs, 12,000 lbs, and 14,000 lbs were used.
c. Based on FWD data, select a weak, strong, and intermediate test point in both the geotextile and control section. At these six test locations conduct a Cone Penetrometer Test.

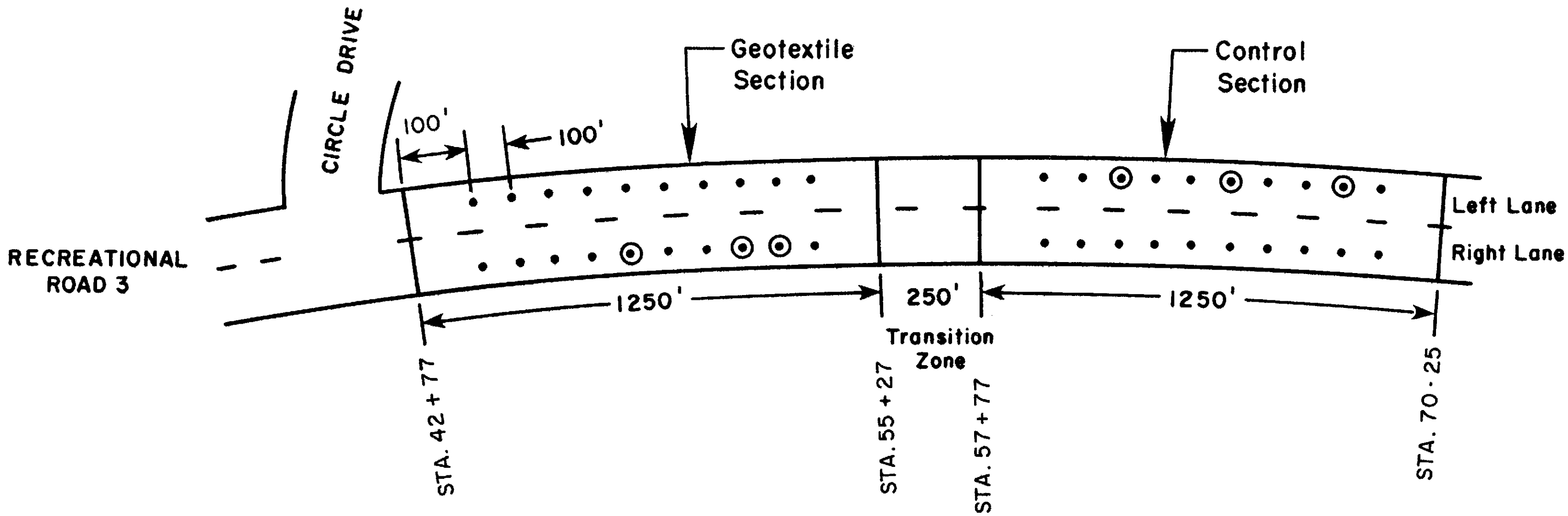
At the time of testing, no significant visual distress was apparent in either the experimental or control section.

The detailed field results from this survey are shown in Appendix B.

## 4.2 Summary of Results

The statistical analysis procedure described in an earlier section, was performed on the FWD data. For each test point the deflections corresponding to exactly 4500, 9000, 12,000, and 14,000 lbs and the slope of the load versus deflection graph were computed. A "T-Test" was performed to determine if the distributions were different between the experimental and control sections. The results of this analysis are shown in Table 4 below.

At each of the four load levels the geotextile section had a statistically lower deflection than the control section. This indicates that the section with the geotextile is stronger than the control section. Furthermore, the slope of the load versus deflection curve was larger in the experimental section (129 lbs load for each




• indicates location of FWD and Dynaflect test point

⊙ indicate cone penetrometer data taken at these test points

**Not to Scale**

Figure 10. Testing locations at Bonham Test Site

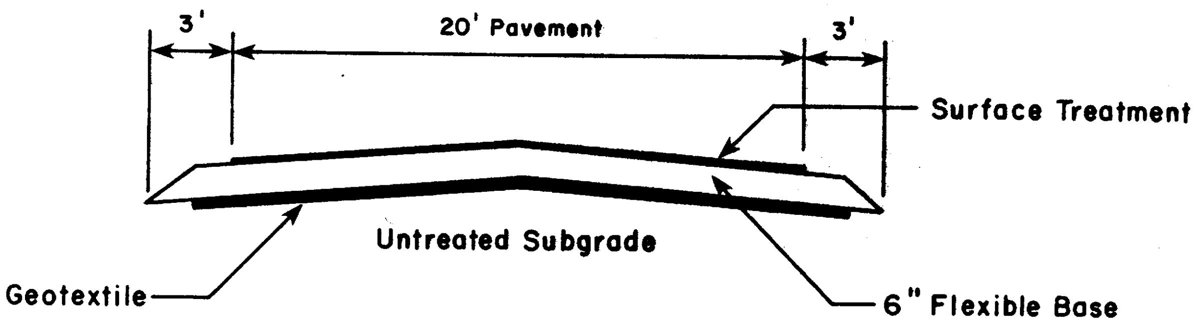



Figure 11. Experimental Geotextile Section on Recreational Road 3 in District 1.

Table 4. T-Test Results From Bonham Test Site

| FWD Load (lbs) | Mean FWD Sensor 1 Deflection (mils) | | P-value | Statistical Significance |
|---|---|---|---|---|
| | Geotextile | Control | | |
| 4500 | 26.6 | 34.3 | 0.0137 | Yes |
| 9000 | 63.2 | 85.3 | 0.0021 | Yes |
| 12,000 | 87.3 | 110.2 | 0.0018 | Yes |
| 14,000 | 97.7 | 113.9 | 0.0086 | Yes |
| Slope (lbs/mm) | 129.7 | 102.0 | 0.0017 | Yes |

mil of deflection) than in the control (102 lbs load for each mil of deflection).

Layer moduli were back calculated for the Bonham pavement using the CHEVDEF program discussed earlier. In this analysis a) the deflections at 9000 lbs were used, b) the pavement was modelled as a two layer system of base and subgrade and c) the effective base thickness as measured by the cone penetrometer was used. The measured versus computed deflection bowls and the corresponding layer moduli are shown below in Tables 5 and 6 respectively.

Table 5 Measured vs. Predicted Deflections for Bonham Test Site

| Distance from center of Load (ins) | Geotextile Section | | Control Section | |
|---|---|---|---|---|
| | Deflection (mils) Measured | Computed | Deflection (mils) Measured | Computed |
| 0 | 63.2 | 64.3 | 85.3 | 89.1 |
| 7.5 | 39.6 | 37.0 | 54.4 | 54.0 |
| 12 | 26.1 | 24.2 | 35.5 | 35.0 |
| 24 | 10.6 | 11.5 | 12.7 | 16.2 |
| 48 | 4.3 | 5.6 | 7.1 | 7.9 |

Table 6 Computed Elastic Moduli (psi)

| | Geotextile | Control |
|---|---|---|
| Base | 22,900 | 25,900 |
| Subgrade | 8,970 | 6,200 |

The base courses have similar moduli values, however the moduli of the subgrade in the section containing the geotextile is noticeably stiffer than the subgrade in the control section.

The Cone Penetrometer data taken on this section is shown graphically in Appendix B. The effective base thickness was defined as the depth at which a significant increase in cone penetration was recorded, the interpolated effective thicknesses are tabulated below.

Table 7. Effective Base Thickness Values From Bonham Test Site

| Geotextile Section | Control Section |
|---|---|
| 6.5 ins. | 4.5 ins. |
| 5.8 ins. | 4.3 ins. |
| 5.2 ins. | 4.3 ins. |

The average effective base thickness in the geotextile section was 5.8 ins., whereas the thickness of the control section was only 4.4 ins. As both sections were rebuilt with a nominal 6 in. base thickness, this would indicate that in the two years of trafficking, soil intrusion into the base course has reduced its effective thickness by 1.4 ins. When the reduction in base thickness occurred is not clear. It may have been a result of the construction process or it may have been a gradual reduction under traffic, or a combination of both. It is significant that this is a very lightly trafficked highway with very little truck traffic.

To determine the rate of base loss with time it will be necessary to repeat the Cone Penetrometer test after another performance period (i.e., 2 years). If after that period the thickness of the control section remains constant at 4.3 ins., then it could be assumed that the construction process was the cause of the loss in base thickness. If further base losses are recorded after the additional performance period it should at that point be possible to estimate the effects of traffic and construction procedures on the design base thickness.

### 4.3 Conclusion

The analysis of the FWD readings indicated that the section with the geotextile separator was stronger than the control section. This strength is primarily attributed to the fact that in the experimental section the base design thickness had been maintained at approximately 6 ins. However, in the control section the effective base thickness was almost 1.5 ins. less than in the experimental section. It has been assumed that both sections started with the same base thickness at reconstruction in September 1983 and that either the construction procedure or traffic loads have caused soil intrusion into the base course of the unprotected section. Further work is recommended to validate these conclusions.

## 5. Conclusions and Recommendations

The following are concluded from this study.

1. The geotextile is having little observable affect on the performance of the section on SH186.

2. The geotextile at the Bonham test site does appear to be significantly improving pavement performance. It was found that the pavement containing the geotextile had maintained its effective base thickness of almost 6 inches, whereas the control section had lost almost 1.5 inches presumably to soil intrusion.

3. At the Bonham site the section with the geotextile also had significantly lower deflection than the control section. However this conclusion is based on the results of one deflection survey taken two years after reconstruction. No other deflection data is available at this site. There is a need to continue to monitor this site.

4. It appears from these observations that the most cost effective use of geotextiles would be in strengthening surface treated pavements with "wet" spots. The geotextile could be used to bridge short sections of difficult subgrade.

5. Further studies should be undertaken to determine if geotextiles are more cost effective than the traditional soil stabilization methods.

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# APPENDIX A

## Detailed Field Results From SH186 Near Port Mansfield in District 21

Pages A1-A5 Falling Weight Deflectometer Results

| Sensor | Distance from Center of load (ins) |
|---|---|
| W1 | 0 |
| W2 | 12 |
| W3 | 24 |
| W4 | 36 |
| W5 | 48 |
| W6 | 60 |
| W7 | 72 |

Westbound lane - With Geotextile
Eastbound lane - No Geotextile

Pages A6-A11 Cone Penetrometer Results

FWD Deflection Data From SH186 in District 21

| Station | Fabric Load (lbs) | Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 | Non-Fabric Load (lbs) | Non-Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 5,056 | 29.8 | 12.6 | 5.0 | 3.4 | 2.4 | 1.6 | 1.4 | 4,560 | 38.1 | 12.3 | 3.8 | 2.3 | 1.7 | 1.3 | 1.0 |
| | 9,912 | 54.6 | 23.9 | 11.0 | 6.8 | 4.9 | 3.6 | 2.9 | 9,312 | 67.8 | 24.0 | 7.8 | 4.9 | 3.7 | 3.0 | 2.4 |
| | 13,704 | 66.1 | 31.1 | 14.8 | 9.2 | 6.6 | 5.0 | 3.8 | 13,064 | 78.5 | 27.7 | 10.6 | 6.5 | 5.1 | 4.1 | 3.4 |
| | 15,768 | 75.9 | 33.1 | 17.1 | 10.7 | 7.7 | 5.7 | 4.5 | 14,968 | 88.7 | 31.3 | 12.4 | 7.6 | 5.9 | 4.7 | 4.0 |
| 1 | 5,032 | 30.3 | 11.0 | 4.3 | 2.6 | 1.9 | 1.4 | 1.2 | 4,552 | 38.3 | 14.0 | 4.4 | 2.4 | 1.7 | 1.2 | 1.0 |
| | 9,880 | 53.8 | 21.7 | 9.4 | 5.8 | 4.2 | 3.2 | 2.5 | 9,376 | 65.6 | 28.1 | 9.0 | 5.0 | 3.7 | 2.8 | 2.4 |
| | 13,600 | 72.2 | 28.4 | 12.6 | 7.8 | 5.7 | 4.3 | 3.4 | 13,160 | 81.6 | 36.0 | 12.0 | 6.7 | 5.1 | 4.1 | 3.3 |
| | 15,784 | 68.4 | 28.9 | 14.7 | 9.1 | 6.6 | 5.0 | 4.0 | 15,136 | 98.3 | 36.1 | 13.9 | 7.8 | 6.0 | 4.7 | 3.9 |
| 2 | 4,752 | 30.6 | 12.2 | 4.3 | 2.6 | 1.7 | 1.2 | 1.0 | 4,600 | 23.6 | 9.7 | 3.0 | 1.9 | 1.5 | 1.2 | 1.0 |
| | 9,544 | 56.7 | 24.3 | 9.7 | 5.6 | 3.8 | 3.0 | 2.4 | 9,224 | 41.8 | 18.4 | 6.7 | 4.4 | 3.4 | 2.6 | 2.2 |
| | 13,464 | 74.0 | 33.3 | 13.4 | 7.8 | 5.3 | 4.1 | 3.4 | 13,128 | 53.8 | 23.7 | 9.3 | 6.1 | 4.7 | 3.8 | 3.1 |
| | 15,472 | 82.5 | 34.1 | 15.7 | 9.1 | 6.3 | 4.9 | 4.0 | 15,376 | 62.3 | 22.6 | 11.0 | 7.1 | 5.5 | 4.3 | 3.5 |
| 3 | 4,896 | 22.8 | 8.2 | 3.6 | 2.4 | 1.8 | 1.4 | 1.1 | 4,568 | 29.4 | 12.8 | 3.8 | 2.1 | 1.7 | 1.4 | 1.0 |
| | 9,488 | 56.2 | 17.4 | 8.2 | 5.2 | 3.7 | 2.8 | 2.3 | 9,352 | 56.5 | 24.3 | 8.3 | 4.8 | 3.8 | 3.0 | 2.4 |
| | 13,552 | 52.1 | 22.6 | 11.3 | 7.2 | 5.2 | 3.9 | 3.2 | 13,176 | 62.5 | 29.5 | 11.4 | 6.7 | 5.2 | 4.0 | 3.2 |
| | 15,712 | 63.4 | 22.6 | 13.1 | 8.4 | 6.1 | 4.6 | 3.7 | | . | . | . | . | . | . | . |
| 4 | 4,976 | 18.9 | 6.9 | 3.5 | 2.4 | 1.9 | 1.4 | 1.1 | 4,520 | 34.1 | 12.9 | 3.5 | 2.0 | 1.6 | 1.0 | 1.0 |
| | 9,464 | 36.3 | 15.5 | 8.0 | 5.3 | 3.9 | 3.0 | 2.4 | 9,312 | 58.5 | 24.7 | 7.7 | 4.6 | 3.7 | 2.8 | 2.4 |
| | 13,544 | 42.2 | 20.9 | 11.2 | 7.4 | 5.5 | 4.1 | 3.4 | 13,160 | 85.1 | 32.6 | 10.8 | 6.5 | 5.1 | 4.0 | 3.4 |
| | 15,984 | 52.7 | 19.0 | 13.2 | 8.7 | 6.4 | 4.8 | 3.8 | 15,120 | 88.5 | 31.2 | 12.8 | 7.7 | 6.0 | 4.7 | 4.0 |

FWD Deflection Data From SH186 in District 21 (Cont'd)

| | Fabric Deflection (mils) | | | | | | | | Non-Fabric Deflection (mils) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station | Load (lbs) | W1 | W2 | W3 | W4 | W5 | W6 | W7 | Load (lbs) | W1 | W2 | W3 | W4 | W5 | W6 | W7 |
| 5 | 4,984 | 24.2 | 8.6 | 4.3 | 3.1 | 2.2 | 1.5 | 1.1 | 4,544 | 26.6 | 11.6 | 4.4 | 2.6 | 1.9 | 1.4 | 1.1 |
| | 9,472 | 43.3 | 17.3 | 9.9 | 7.0 | 4.9 | 3.4 | 2.4 | 9,240 | 49.9 | 24.0 | 9.9 | 5.9 | 4.2 | 3.3 | 2.6 |
| | 13,400 | 55.4 | 23.2 | 13.8 | 9.5 | 6.8 | 4.7 | 3.4 | 13,040 | 58.7 | 32.2 | 13.8 | 8.2 | 5.9 | 4.7 | 3.6 |
| | 15,960 | 57.7 | 26.7 | 16.1 | 11.2 | 7.9 | 5.4 | 4.0 | 15,312 | 67.8 | 34.9 | 16.4 | 9.6 | 6.9 | 5.4 | 4.1 |
| 6 | 4,904 | 32.4 | 12.7 | 4.7 | 3.0 | 2.0 | 1.6 | 1.2 | 4,576 | 30.8 | 11.4 | 4.0 | 2.4 | 1.6 | 1.2 | 1.0 |
| | 9,640 | 59.0 | 24.2 | 10.1 | 6.3 | 4.5 | 3.4 | 2.7 | 9,304 | 57.9 | 23.2 | 9.0 | 5.2 | 3.7 | 2.8 | 2.2 |
| | 13,472 | 66.2 | 28.8 | 13.7 | 8.6 | 6.3 | 4.7 | 3.8 | 13,104 | 76.4 | 27.9 | 12.2 | 7.1 | 5.1 | 3.9 | 3.1 |
| | 15,480 | 77.7 | 29.4 | 15.9 | 10.0 | 7.1 | 5.5 | 4.4 | 15,048 | 79.7 | 29.4 | 14.5 | 8.4 | 5.9 | 4.5 | 3.6 |
| 7 | 4,984 | 21.9 | 8.9 | 4.2 | 2.7 | 1.9 | 1.6 | 1.2 | 4,760 | 27.4 | 11.9 | 3.7 | 2.2 | 1.7 | 1.2 | 1.0 |
| | 9,640 | 40.7 | 17.6 | 9.0 | 5.7 | 4.2 | 3.2 | 2.6 | 9,392 | 49.5 | 18.3 | 7.5 | 4.6 | 3.7 | 2.8 | 2.2 |
| | 13,536 | 51.0 | 22.8 | 12.1 | 7.8 | 5.7 | 4.4 | 3.5 | 13,096 | 65.2 | 21.1 | 10.1 | 6.4 | 5.1 | 4.0 | 3.2 |
| | 15,616 | 58.9 | 23.2 | 14.0 | 9.0 | 6.6 | 5.1 | 4.1 | 15,520 | 68.4 | 23.5 | 11.7 | 7.3 | 6.0 | 4.7 | 3.7 |
| 8 | 5,072 | 29.4 | 10.8 | 4.6 | 3.0 | 2.1 | 1.6 | 1.3 | 4,728 | 28.3 | 12.1 | 3.7 | 2.2 | 1.7 | 1.3 | 1.0 |
| | 9,848 | 52.1 | 20.5 | 9.8 | 6.3 | 4.6 | 3.5 | 2.8 | 9,288 | 50.4 | 22.2 | 8.0 | 4.4 | 3.5 | 2.7 | 2.2 |
| | 13,440 | 88.2 | 20.2 | 12.8 | 8.7 | 6.2 | 4.8 | 3.8 | 13,152 | 58.1 | 22.4 | 10.6 | 6.1 | 4.8 | 3.8 | 3.0 |
| | 15,728 | 65.3 | 23.0 | 14.8 | 10.0 | 7.2 | 5.5 | 4.3 | 15,288 | 64.7 | 24.5 | 12.4 | 7.2 | 5.6 | 4.4 | 3.5 |
| 9 | 4,832 | 27.2 | 10.9 | 4.8 | 3.0 | 2.1 | 1.5 | 1.3 | 4,608 | 35.4 | 14.0 | 4.4 | 2.3 | 1.8 | 1.3 | 1.1 |
| | 9,592 | 48.2 | 19.4 | 10.3 | 6.6 | 4.4 | 3.4 | 2.8 | 9,376 | 59.2 | 26.3 | 8.9 | 4.9 | 3.7 | 2.9 | 2.3 |
| | 13,520 | 64.0 | 23.1 | 13.9 | 8.9 | 6.2 | 4.6 | 3.8 | 13,192 | 70.2 | 32.7 | 12.4 | 6.9 | 5.1 | 4.0 | 3.2 |
| | 15,512 | 73.7 | 24.9 | 16.0 | 10.2 | 7.1 | 5.3 | 4.3 | 15,168 | 79.9 | 34.1 | 14.6 | 9.1 | 6.0 | 4.8 | 3.8 |

FWD Deflection Data From SH186 in District 21 (Cont'd)

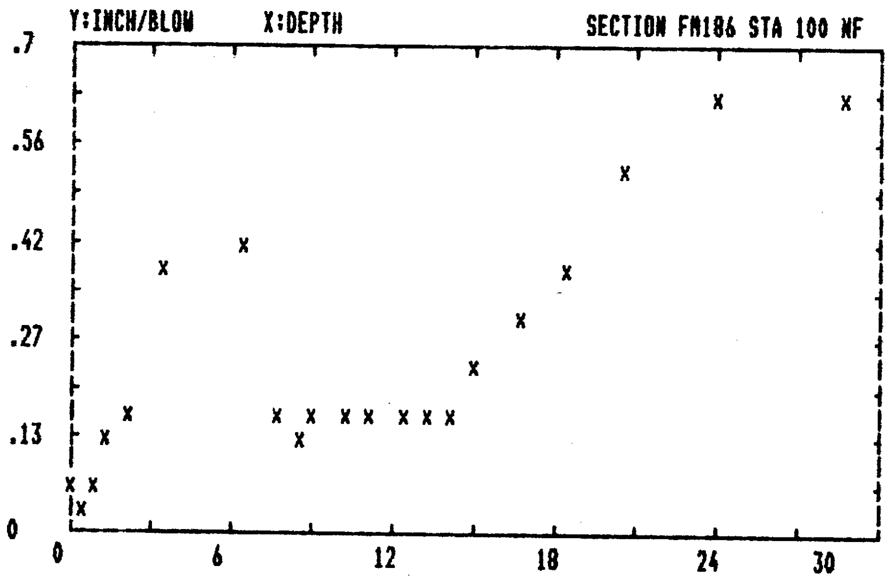
| Station | Fabric Load (lbs) | Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 | Non-Fabric Load (lbs) | Non-Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 4,896 | 20.4 | 9.3 | 4.5 | 2.9 | 2.1 | 1.6 | 1.3 | 4,736 | 33.1 | 12.4 | 4.4 | 3.0 | 2.2 | 1.6 | 1.2 |
| | 9,432 | 35.8 | 18.8 | 9.7 | 6.4 | 4.6 | 3.4 | 2.7 | 9,408 | 56.3 | 21.1 | 9.9 | 6.4 | 4.7 | 3.6 | 2.8 |
| | 13,464 | 44.1 | 21.2 | 13.4 | 8.9 | 6.3 | 4.7 | 3.7 | 13,072 | 69.4 | 26.0 | 13.8 | 8.9 | 6.4 | 4.9 | 3.9 |
| | 15,912 | 48.7 | 23.1 | 15.5 | 10.2 | 7.3 | 5.5 | 4.3 | 15,104 | 78.6 | 27.6 | 16.1 | 10.4 | 7.5 | 5.7 | 4.5 |
| 11 | 4,872 | 28.1 | 11.6 | 4.6 | 2.8 | 2.2 | 1.5 | 1.3 | 4,792 | 26.1 | 10.8 | 4.1 | 3.0 | 2.2 | 1.6 | 1.2 |
| | 9,440 | 48.4 | 23.2 | 10.1 | 6.4 | 4.6 | 3.5 | 2.7 | 9,552 | 46.0 | 21.4 | 8.9 | 6.3 | 4.8 | 3.6 | 2.8 |
| | 13,304 | 60.2 | 28.6 | 13.9 | 9.0 | 6.4 | 4.9 | 3.8 | 13,176 | 56.5 | 23.5 | 12.6 | 8.9 | 6.6 | 5.0 | 3.9 |
| | 15,664 | 71.8 | 28.3 | 16.2 | 10.4 | 7.5 | 5.6 | 4.4 | 15,440 | 62.8 | 23.6 | 14.8 | 10.4 | 7.7 | 5.8 | 4.5 |
| 12 | 4,960 | 27.4 | 10.2 | 4.4 | 2.9 | 2.2 | 1.6 | 1.2 | 4,832 | 25.7 | 11.2 | 3.8 | 2.5 | 1.9 | 1.4 | 1.1 |
| | 9,752 | 47.0 | 17.1 | 9.6 | 6.5 | 4.7 | 3.5 | 2.6 | 9,528 | 45.2 | 17.1 | 8.3 | 5.4 | 4.1 | 3.1 | 2.5 |
| | 13,368 | 61.7 | 20.6 | 13.0 | 8.8 | 6.5 | 4.7 | 3.6 | 13,240 | 54.5 | 20.0 | 11.5 | 7.6 | 5.7 | 4.3 | 3.5 |
| | 15,872 | 68.5 | 22.1 | 15.2 | 10.3 | 7.5 | 5.4 | 4.3 | 15,432 | 60.3 | 23.0 | 13.3 | 8.9 | 6.6 | 5.1 | 4.1 |
| 13 | 5,136 | 23.4 | 8.9 | 3.9 | 2.7 | 2.0 | 1.5 | 1.2 | 4,912 | 25.2 | 6.8 | 2.9 | 2.1 | 1.6 | 1.2 | 1.0 |
| | 10,208 | 39.9 | 13.7 | 8.5 | 5.6 | 4.2 | 3.1 | 2.5 | 9,584 | 39.7 | 13.7 | 6.2 | 4.6 | 3.5 | 2.7 | 2.2 |
| | 13,368 | 45.8 | 16.4 | 11.2 | 7.7 | 5.7 | 4.3 | 3.4 | 13,040 | 47.7 | 15.6 | 8.5 | 6.3 | 4.9 | 3.8 | 3.1 |
| | 16,088 | 54.3 | 17.8 | 13.0 | 8.9 | 6.6 | 5.0 | 4.0 | 15,976 | 55.6 | 15.0 | 10.0 | 7.3 | 5.6 | 4.4 | 3.6 |
| 14 | 5,024 | 22.1 | 8.2 | 3.7 | 2.7 | 2.0 | 1.5 | 1.2 | 4,912 | 23.8 | 8.9 | 3.1 | 2.1 | 1.6 | 1.2 | 1.0 |
| | 9,624 | 37.1 | 12.7 | 7.8 | 5.8 | 4.4 | 3.2 | 2.5 | 9,664 | 40.6 | 17.2 | 6.7 | 4.4 | 3.3 | 2.6 | 2.1 |
| | 13,328 | 48.3 | 15.0 | 10.7 | 7.9 | 6.0 | 4.5 | 3.4 | 13,104 | 56.1 | 16.3 | 9.1 | 6.0 | 4.6 | 3.6 | 2.9 |
| | 16,176 | 58.3 | 16.8 | 12.5 | 9.2 | 7.0 | 5.1 | 4.0 | 15,920 | 60.5 | 17.8 | 10.8 | 7.0 | 5.4 | 4.1 | 3.6 |

FWD Deflection Data From SH186 in District 21 (Cont'd)

| Station | Fabric Load (lbs) | Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 | Non-Fabric Load (lbs) | Non-Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 5,064 | 22.9 | 8.3 | 3.7 | 2.5 | 1.9 | 1.4 | 1.2 | 5,080 | 31.2 | 9.8 | 2.1 | 1.5 | 1.5 | 1.2 | 0.8 |
| | 9,728 | 40.1 | 16.4 | 8.0 | 5.4 | 4.0 | 3.0 | 2.5 | 10,096 | 53.4 | 12.8 | 5.0 | 3.8 | 3.3 | 2.5 | 2.0 |
| | 13,312 | 48.6 | 17.6 | 10.8 | 7.3 | 5.4 | 4.2 | 3.4 | 13,296 | 56.1 | 15.6 | 7.0 | 5.4 | 4.5 | 3.5 | 2.8 |
| | 16,168 | 51.7 | 18.9 | 12.5 | 8.6 | 6.3 | 4.9 | 3.9 | 16,144 | 59.9 | 18.7 | 8.4 | 6.4 | 5.3 | 4.1 | 3.2 |
| 16 | 4,872 | 21.7 | 8.1 | 3.5 | 2.4 | 1.8 | 1.4 | 1.1 | 5,048 | 32.0 | 9.7 | 2.5 | 1.9 | 1.5 | 1.2 | 0.9 |
| | 9,432 | 36.7 | 16.2 | 7.6 | 5.1 | 3.9 | 2.9 | 2.4 | 10,048 | 49.3 | 13.5 | 5.8 | 4.1 | 3.4 | 2.6 | 2.1 |
| | 13,224 | 49.3 | 17.3 | 10.3 | 6.9 | 5.3 | 4.0 | 3.2 | 13,240 | 59.4 | 15.2 | 8.0 | 5.6 | 4.6 | 3.6 | 2.9 |
| | 15,808 | 51.5 | 18.1 | 11.9 | 8.1 | 6.1 | 4.7 | 3.8 | 16,024 | 66.3 | 17.9 | 9.4 | 6.7 | 5.3 | 4.2 | 3.4 |
| 17 | 4,920 | 19.0 | 7.7 | 3.5 | 2.4 | 1.8 | 1.4 | 1.1 | 5,136 | 29.5 | 8.4 | 2.1 | 1.5 | 1.3 | 1.0 | 0.8 |
| | 9,360 | 34.5 | 15.2 | 7.6 | 5.2 | 3.9 | 3.0 | 2.4 | 10,120 | 43.5 | 11.9 | 4.7 | 3.4 | 2.8 | 2.3 | 1.9 |
| | 13,256 | 44.8 | 16.5 | 10.5 | 7.0 | 5.3 | 4.1 | 3.3 | 13,120 | 54.1 | 12.6 | 6.7 | 4.8 | 4.0 | 3.2 | 2.6 |
| | 15,848 | 49.2 | 17.4 | 12.1 | 8.2 | 6.0 | 4.7 | 3.8 | 16,432 | 59.9 | 15.2 | 7.8 | 5.7 | 4.7 | 3.8 | 3.0 |
| 18 | 5,224 | 17.0 | 6.4 | 3.2 | 2.4 | 1.8 | 1.4 | 1.1 | 5,080 | 27.8 | 8.1 | 2.4 | 1.9 | 1.5 | 1.2 | 0.9 |
| | 9,992 | 28.4 | 12.6 | 6.9 | 5.1 | 3.9 | 2.9 | 2.4 | 9,904 | 42.6 | 11.4 | 5.6 | 4.0 | 3.3 | 2.5 | 1.9 |
| | 13,344 | 35.1 | 16.3 | 9.4 | 7.0 | 5.3 | 4.0 | 3.2 | 13,040 | 50.2 | 14.1 | 7.7 | 5.7 | 4.6 | 3.5 | 2.7 |
| | 16,696 | 39.7 | 18.8 | 11.1 | 8.2 | 6.1 | 4.7 | 3.7 | 16,152 | 56.2 | 16.6 | 9.0 | 6.7 | 5.3 | 4.1 | 3.2 |
| 19 | 4,936 | 23.1 | 6.7 | 3.4 | 2.5 | 1.8 | 1.3 | 1.1 | 5,120 | 34.0 | 10.5 | 2.3 | 1.8 | 1.5 | 1.0 | 0.9 |
| | 9,464 | 42.7 | 13.6 | 7.4 | 5.2 | 3.9 | 2.9 | 2.4 | 10,248 | 54.5 | 15.5 | 5.2 | 3.8 | 3.2 | 2.4 | 1.9 |
| | 13,144 | 48.3 | 16.0 | 10.1 | 7.2 | 5.3 | 4.1 | 3.3 | 13,488 | 64.0 | 17.0 | 7.1 | 5.3 | 4.3 | 3.4 | 2.7 |
| | 16,008 | 52.5 | 15.8 | 11.8 | 8.4 | 6.1 | 4.8 | 3.8 | 15,920 | 67.6 | 17.9 | 8.5 | 6.2 | 5.1 | 3.9 | 3.2 |

DISTRICT : 21 COUNTY : CAMERON SECTION : FM186 STA 100 NF

| DEPTH | | BLOWS | SLOPE N | |
|---|---|---|---|---|
| CM | INS | NOS | CM/BLOW | IN/BLOW |
| 0.00 | 0.00 | 0.00 | 0.25 | 0.10 |
| 1.27 | 0.50 | 5.00 | 0.15 | 0.06 |
| 1.52 | 0.60 | 10.00 | 0.15 | 0.06 |
| 2.79 | 1.10 | 15.00 | 0.24 | 0.10 |
| 3.94 | 1.55 | 20.00 | 0.36 | 0.14 |
| 6.35 | 2.50 | 25.00 | 0.52 | 0.20 |
| 9.14 | 3.60 | 30.00 | 1.02 | 0.40 |
| 16.51 | 6.50 | 35.00 | 1.07 | 0.42 |
| 19.81 | 7.80 | 40.00 | 0.53 | 0.21 |
| 21.84 | 8.60 | 45.00 | 0.41 | 0.16 |
| 23.88 | 9.40 | 50.00 | 0.48 | 0.19 |
| 26.67 | 10.50 | 55.00 | 0.53 | 0.21 |
| 29.21 | 11.50 | 60.00 | 0.51 | 0.20 |
| 31.75 | 12.50 | 65.00 | 0.48 | 0.19 |
| 34.04 | 13.40 | 70.00 | 0.45 | 0.18 |
| 36.20 | 14.25 | 75.00 | 0.47 | 0.19 |
| 38.74 | 15.25 | 80.00 | 0.65 | 0.25 |
| 42.67 | 16.80 | 85.00 | 0.88 | 0.34 |
| 47.50 | 18.70 | 90.00 | 1.00 | 0.40 |
| 52.71 | 20.75 | 95.00 | 1.35 | 0.53 |
| 60.96 | 24.00 | 100.00 | 1.65 | 0.65 |
| 73.03 | 28.75 | 105.00 | 1.65 | 0.65 |



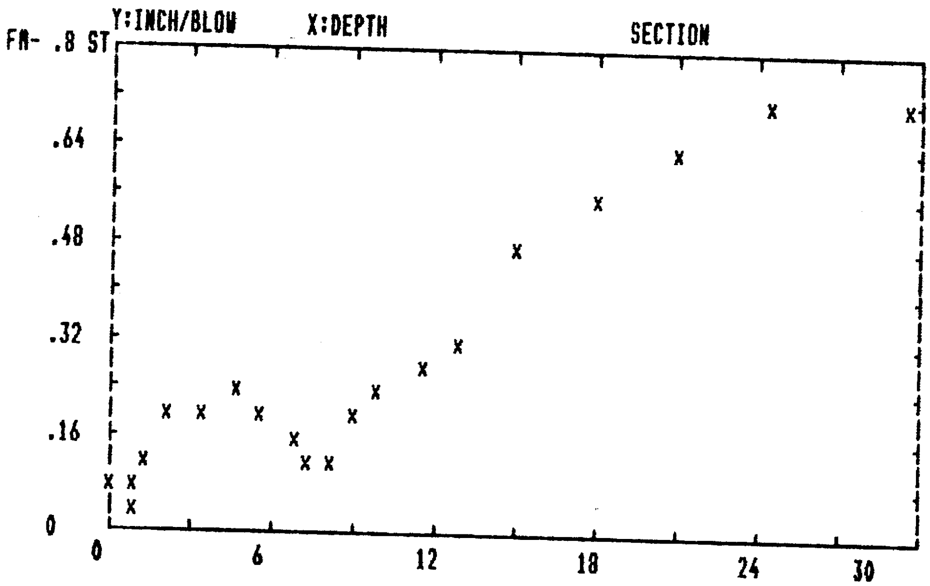

Cone Penetrometer Results
SH186, Station 1, Control Section

FWD Deflection Data From SH186 in District 21 (Cont'd)

| Station | Fabric Load (lbs) | Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 | Non-Fabric Load (lbs) | Non-Fabric Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 4,760 | 24.5 | 9.9 | 4.2 | 2.7 | 2.0 | 1.4 | 1.2 | 5,056 | 32.5 | 9.3 | 2.5 | 1.9 | 1.6 | 1.2 | 1.0 |
| | 9,344 | 43.6 | 19.3 | 9.1 | 5.7 | 4.2 | 3.1 | 2.5 | 10,024 | 56.0 | 13.2 | 5.6 | 4.0 | 3.4 | 2.7 | 2.2 |
| | 13,232 | 58.8 | 25.2 | 12.3 | 7.8 | 5.7 | 4.3 | 3.5 | 13,168 | 63.1 | 15.0 | 7.7 | 5.5 | 4.6 | 3.7 | 3.0 |
| | 15,536 | 61.7 | 22.0 | 14.2 | 8.9 | 6.5 | 5.0 | 4.0 | 15,944 | 68.4 | 17.4 | 9.2 | 6.5 | 5.4 | 4.3 | 3.5 |
| 21 | 4,736 | 25.7 | 9.3 | 4.3 | 2.8 | 2.1 | 1.5 | 1.2 | 4,976 | 34.3 | 11.6 | 3.2 | 2.3 | 1.8 | 1.4 | 1.1 |
| | 9,368 | 45.3 | 18.8 | 9.2 | 5.9 | 4.4 | 3.3 | 2.7 | 9,776 | 57.8 | 20.7 | 7.0 | 4.7 | 3.8 | 3.0 | 2.4 |
| | 13,216 | 56.1 | 24.6 | 12.4 | 8.1 | 5.9 | 4.5 | 3.7 | 13,216 | 68.4 | 22.7 | 9.6 | 6.7 | 5.2 | 4.1 | 3.3 |
| | 15,336 | 70.5 | 22.7 | 14.3 | 9.3 | 6.8 | 5.2 | 4.3 | 15,600 | 78.6 | 24.9 | 11.3 | 7.9 | 6.2 | 4.8 | 3.9 |
| 22 | 4,672 | 19.2 | 7.2 | 3.9 | 2.7 | 2.0 | 1.6 | 1.2 | 5,016 | 32.8 | 11.2 | 3.3 | 2.4 | 1.8 | 1.4 | 1.1 |
| | 9,408 | 36.9 | 15.0 | 8.5 | 5.9 | 4.3 | 3.2 | 2.6 | 9,752 | 56.5 | 17.6 | 7.1 | 4.9 | 3.7 | 2.8 | 2.4 |
| | 13,160 | 46.0 | 20.1 | 11.5 | 8.0 | 5.8 | 4.4 | 3.5 | 13,176 | 64.8 | 19.6 | 9.6 | 6.8 | 5.1 | 3.9 | 3.2 |
| | 15,616 | 53.3 | 22.3 | 13.2 | 9.2 | 6.7 | 5.1 | 4.1 | 15,672 | 69.3 | 21.9 | 11.2 | 7.9 | 5.9 | 4.5 | 3.7 |
| 23 | 4,872 | 19.0 | 8.5 | 4.1 | 2.8 | 2.1 | 1.5 | 1.1 | 4,864 | 28.1 | 11.2 | 3.8 | 2.5 | 1.9 | 1.4 | 1.1 |
| | 9,408 | 34.3 | 16.7 | 8.7 | 5.9 | 4.2 | 3.1 | 2.4 | 9,440 | 47.4 | 21.1 | 8.3 | 5.0 | 3.8 | 2.9 | 2.3 |
| | 13,248 | 49.3 | 22.1 | 11.8 | 8.0 | 5.7 | 4.2 | 3.1 | 13,232 | 58.3 | 21.2 | 11.1 | 6.9 | 5.2 | 4.0 | 3.2 |
| | 15,992 | 53.9 | 22.0 | 13.6 | 9.2 | 6.6 | 4.9 | 3.6 | 15,400 | 68.2 | 22.5 | 12.6 | 7.9 | 6.0 | 4.6 | 3.7 |
| 24 | 4,808 | 29.6 | 12.3 | 4.8 | 2.9 | 2.1 | 1.6 | 1.2 | 4,952 | 28.2 | 11.2 | 4.0 | 2.6 | 1.9 | 1.4 | 1.2 |
| | 9,560 | 51.5 | 23.8 | 10.1 | 6.1 | 4.2 | 3.1 | 2.5 | 9,488 | 48.5 | 21.1 | 8.5 | 5.2 | 3.8 | 2.9 | 2.3 |
| | 13,192 | 64.5 | 27.0 | 13.4 | 8.1 | 5.8 | 4.3 | 3.5 | 13,248 | 61.7 | 21.0 | 11.4 | 7.1 | 5.2 | 3.9 | 3.2 |
| | 15,296 | 73.3 | 29.5 | 15.5 | 9.4 | 6.8 | 5.1 | 4.1 | 15,456 | 69.3 | 22.4 | 13.0 | 8.0 | 5.9 | 4.5 | 3.7 |

DISTRICT : 21 COUNTY : CAMERON SECTION : FM-186 STA 600ft NF

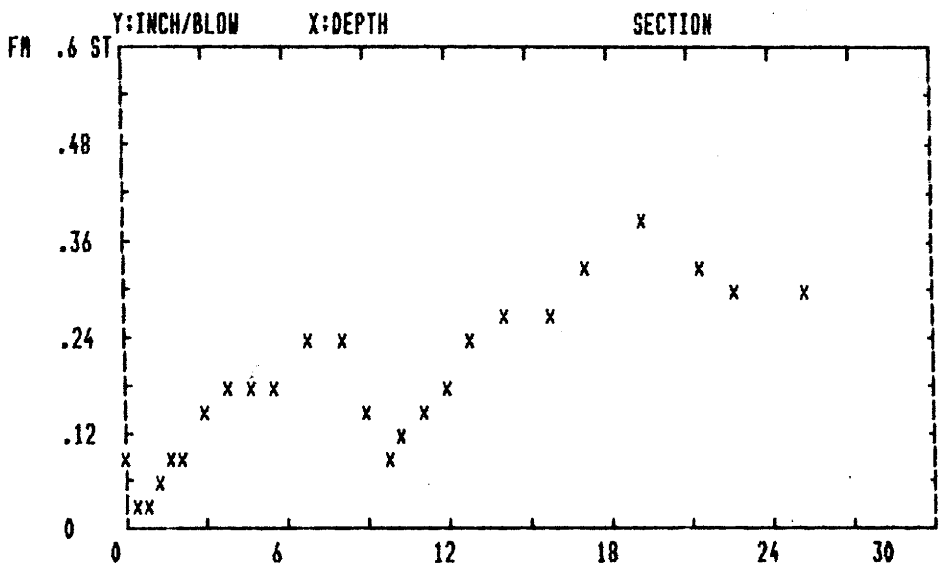
| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE N CM/BLOW | SLOPE N IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.20 | 0.08 |
| 1.02 | 0.40 | 5.00 | 0.23 | 0.09 |
| 2.29 | 0.90 | 10.00 | 0.22 | 0.09 |
| 3.18 | 1.25 | 15.00 | 0.15 | 0.06 |
| 3.81 | 1.50 | 20.00 | 0.32 | 0.12 |
| 6.35 | 2.50 | 25.00 | 0.51 | 0.20 |
| 8.89 | 3.50 | 30.00 | 0.57 | 0.23 |
| 12.07 | 4.75 | 35.00 | 0.61 | 0.24 |
| 14.99 | 5.90 | 40.00 | 0.55 | 0.21 |
| 17.53 | 6.90 | 45.00 | 0.46 | 0.18 |
| 19.56 | 7.70 | 50.00 | 0.34 | 0.14 |
| 20.96 | 8.25 | 55.00 | 0.38 | 0.15 |
| 23.37 | 9.20 | 60.00 | 0.51 | 0.20 |
| 26.04 | 10.25 | 65.00 | 0.65 | 0.26 |
| 29.85 | 11.75 | 70.00 | 0.76 | 0.30 |
| 33.66 | 13.25 | 75.00 | 0.89 | 0.35 |
| 38.74 | 15.25 | 80.00 | 1.26 | 0.49 |
| 46.23 | 18.20 | 85.00 | 1.46 | 0.57 |
| 53.34 | 21.00 | 90.00 | 1.68 | 0.66 |
| 62.99 | 24.80 | 95.00 | 1.93 | 0.76 |
| 75.69 | 29.80 | 100.00 | 1.93 | 0.76 |




Cone Penetrometer Results
SH186, Station 6, Control Section

DISTRICT : 21 COUNTY : CAMERON SECTION : FM 186 STA 2400ft NF

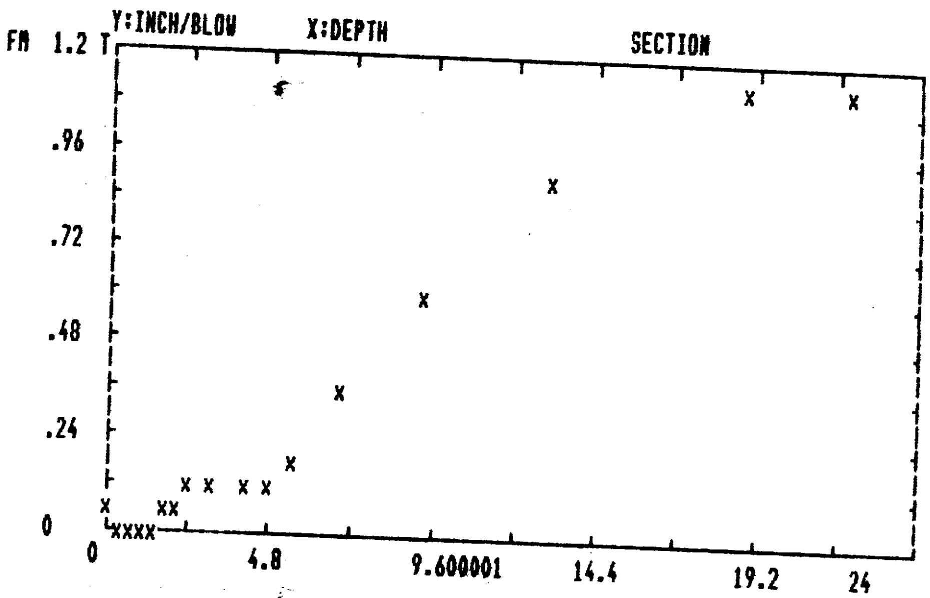
| DEPTH | | BLOWS | SLOPE N | |
|---|---|---|---|---|
| CM | INS | NOS | CM/BLOW | IN/BLOW |
| 0.00 | 0.00 | 0.00 | 0.25 | 0.10 |
| 1.27 | 0.50 | 5.00 | 0.15 | 0.06 |
| 1.52 | 0.60 | 10.00 | 0.10 | 0.04 |
| 2.29 | 0.90 | 15.00 | 0.13 | 0.05 |
| 2.79 | 1.10 | 20.00 | 0.10 | 0.04 |
| 3.30 | 1.30 | 25.00 | 0.20 | 0.08 |
| 4.83 | 1.90 | 30.00 | 0.28 | 0.11 |
| 6.10 | 2.40 | 35.00 | 0.30 | 0.12 |
| 7.87 | 3.10 | 40.00 | 0.38 | 0.15 |
| 9.91 | 3.90 | 45.00 | 0.46 | 0.18 |
| 12.45 | 4.90 | 50.00 | 0.51 | 0.20 |
| 14.99 | 5.90 | 55.00 | 0.53 | 0.21 |
| 17.78 | 7.00 | 60.00 | 0.66 | 0.26 |
| 21.59 | 8.50 | 65.00 | 0.61 | 0.24 |
| 23.88 | 9.40 | 70.00 | 0.38 | 0.15 |
| 25.40 | 10.00 | 75.00 | 0.30 | 0.12 |
| 26.92 | 10.60 | 80.00 | 0.31 | 0.12 |
| 28.45 | 11.20 | 85.00 | 0.38 | 0.15 |
| 30.73 | 12.10 | 90.00 | 0.51 | 0.20 |
| 33.53 | 13.20 | 95.00 | 0.61 | 0.24 |
| 36.83 | 14.50 | 100.00 | 0.69 | 0.27 |
| 40.39 | 15.90 | 105.00 | 0.76 | 0.30 |
| 44.45 | 17.50 | 110.00 | 0.89 | 0.35 |
| 49.28 | 19.40 | 115.00 | 1.02 | 0.40 |
| 54.61 | 21.50 | 120.00 | 0.91 | 0.36 |
| 58.42 | 23.00 | 125.00 | 0.76 | 0.30 |
| 64.77 | 25.50 | 130.00 | 0.76 | 0.30 |




Cone Penetrometer Results
SH186, Station 24, Control Section

DISTRICT : 21 COUNTY : CAMERON SECTION : FM 186 STA 100ft FABRIC

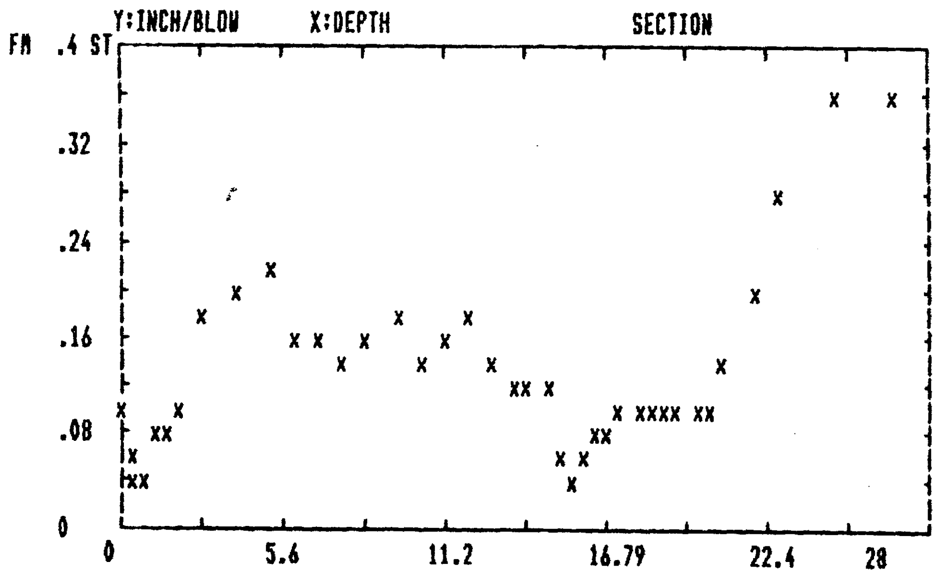
| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE N CM/BLOW | SLOPE N IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.20 | 0.08 |
| 1.02 | 0.40 | 5.00 | 0.13 | 0.05 |
| 1.27 | 0.50 | 10.00 | 0.06 | 0.02 |
| 1.65 | 0.65 | 15.00 | 0.06 | 0.03 |
| 1.91 | 0.75 | 20.00 | 0.09 | 0.04 |
| 2.54 | 1.00 | 25.00 | 0.13 | 0.05 |
| 3.18 | 1.25 | 30.00 | 0.10 | 0.04 |
| 3.56 | 1.40 | 35.00 | 0.13 | 0.05 |
| 4.45 | 1.75 | 40.00 | 0.20 | 0.08 |
| 5.59 | 2.20 | 45.00 | 0.22 | 0.09 |
| 6.65 | 2.62 | 50.00 | 0.31 | 0.12 |
| 8.64 | 3.40 | 55.00 | 0.40 | 0.16 |
| 10.67 | 4.20 | 60.00 | 0.41 | 0.16 |
| 12.70 | 5.00 | 65.00 | 0.41 | 0.16 |
| 14.73 | 5.80 | 70.00 | 0.51 | 0.20 |
| 17.78 | 7.00 | 75.00 | 0.94 | 0.37 |
| 24.13 | 9.50 | 80.00 | 1.59 | 0.63 |
| 33.66 | 13.25 | 85.00 | 2.41 | 0.95 |
| 48.26 | 19.00 | 90.00 | 2.92 | 1.15 |
| 55.88 | 22.00 | 95.00 | 2.92 | 1.15 |




Cone Penetrometer Results
SH186, Station 1, Geotextile Section

DISTRICT : 21 COUNTY : CAMERON SECTION : FM 186 STA 600ft FABRIC

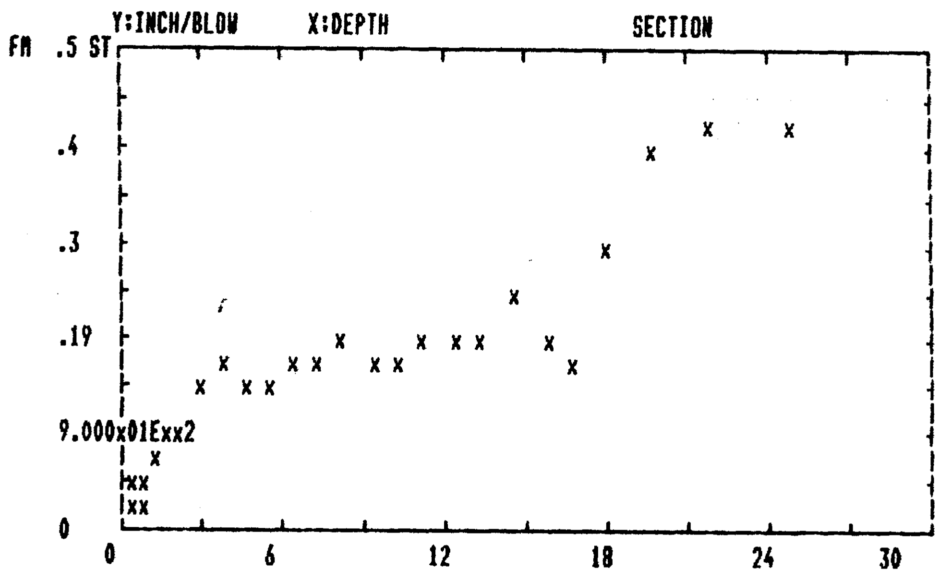
| DEPTH | | BLOWS | SLOPE N | |
|---|---|---|---|---|
| CM | INS | NOS | CM/BLOW | IN/BLOW |
| 0.00 | 0.00 | 0.00 | 0.25 | 0.10 |
| 1.27 | 0.50 | 5.00 | 0.19 | 0.08 |
| 1.91 | 0.75 | 10.00 | 0.13 | 0.05 |
| 2.54 | 1.00 | 15.00 | 0.13 | 0.05 |
| 3.18 | 1.25 | 20.00 | 0.23 | 0.09 |
| 4.83 | 1.90 | 25.00 | 0.25 | 0.10 |
| 5.72 | 2.25 | 30.00 | 0.30 | 0.12 |
| 7.87 | 3.10 | 35.00 | 0.47 | 0.18 |
| 10.41 | 4.10 | 40.00 | 0.55 | 0.22 |
| 13.34 | 5.25 | 45.00 | 0.56 | 0.22 |
| 16.00 | 6.30 | 50.00 | 0.44 | 0.17 |
| 17.78 | 7.00 | 55.00 | 0.41 | 0.16 |
| 20.07 | 7.90 | 60.00 | 0.41 | 0.16 |
| 21.84 | 8.60 | 65.00 | 0.45 | 0.18 |
| 24.56 | 9.67 | 70.00 | 0.48 | 0.19 |
| 26.67 | 10.50 | 75.00 | 0.40 | 0.16 |
| 28.58 | 11.25 | 80.00 | 0.45 | 0.18 |
| 31.12 | 12.25 | 85.00 | 0.47 | 0.18 |
| 33.27 | 13.10 | 90.00 | 0.38 | 0.15 |
| 34.93 | 13.75 | 95.00 | 0.30 | 0.12 |
| 36.32 | 14.30 | 100.00 | 0.32 | 0.12 |
| 38.10 | 15.00 | 105.00 | 0.31 | 0.12 |
| 39.37 | 15.50 | 110.00 | 0.19 | 0.08 |
| 40.01 | 15.75 | 115.00 | 0.15 | 0.06 |
| 40.89 | 16.10 | 120.00 | 0.19 | 0.07 |
| 41.91 | 16.50 | 125.00 | 0.23 | 0.09 |
| 43.18 | 17.00 | 130.00 | 0.22 | 0.09 |
| 44.07 | 17.35 | 135.00 | 0.25 | 0.10 |
| 45.72 | 18.00 | 140.00 | 0.29 | 0.11 |
| 46.99 | 18.50 | 145.00 | 0.25 | 0.10 |
| 48.26 | 19.00 | 150.00 | 0.25 | 0.10 |
| 49.53 | 19.50 | 155.00 | 0.25 | 0.10 |
| 50.80 | 20.00 | 160.00 | 0.25 | 0.10 |
| 52.07 | 20.50 | 165.00 | 0.28 | 0.11 |
| 53.59 | 21.10 | 170.00 | 0.38 | 0.15 |
| 55.88 | 22.00 | 175.00 | 0.51 | 0.20 |
| 58.67 | 23.10 | 180.00 | 0.74 | 0.29 |
| 63.25 | 24.90 | 185.00 | 0.92 | 0.36 |
| 68.58 | 27.00 | 190.00 | 0.92 | 0.36 |




Cone Penetrometer Results
SH186, Station 6, Geotextile Section

DISTRICT : 21 COUNTY : CAMERON SECTION : FM 186 STA 2400ft FABRIC

| DEPTH CM | INS | BLOWS NOS | SLOPE N CM/BLOW | IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.25 | 0.10 |
| 1.27 | 0.50 | 5.00 | 0.15 | 0.06 |
| 1.52 | 0.60 | 10.00 | 0.13 | 0.05 |
| 2.54 | 1.00 | 15.00 | 0.13 | 0.05 |
| 2.79 | 1.10 | 20.00 | 0.13 | 0.05 |
| 3.81 | 1.50 | 25.00 | 0.23 | 0.09 |
| 5.08 | 2.00 | 30.00 | 0.25 | 0.10 |
| 6.35 | 2.50 | 35.00 | 0.28 | 0.11 |
| 7.87 | 3.10 | 40.00 | 0.38 | 0.15 |
| 10.16 | 4.00 | 45.00 | 0.48 | 0.19 |
| 12.70 | 5.00 | 50.00 | 0.43 | 0.17 |
| 14.48 | 5.70 | 55.00 | 0.41 | 0.16 |
| 16.76 | 6.60 | 60.00 | 0.46 | 0.18 |
| 19.05 | 7.50 | 65.00 | 0.48 | 0.19 |
| 21.59 | 8.50 | 70.00 | 0.53 | 0.21 |
| 24.38 | 9.60 | 75.00 | 0.48 | 0.19 |
| 26.42 | 10.40 | 80.00 | 0.46 | 0.18 |
| 28.96 | 11.40 | 85.00 | 0.53 | 0.21 |
| 31.75 | 12.50 | 90.00 | 0.53 | 0.21 |
| 34.29 | 13.50 | 95.00 | 0.56 | 0.22 |
| 37.34 | 14.70 | 100.00 | 0.64 | 0.25 |
| 40.64 | 16.00 | 105.00 | 0.53 | 0.21 |
| 42.67 | 16.80 | 110.00 | 0.51 | 0.20 |
| 45.72 | 18.00 | 115.00 | 0.76 | 0.30 |
| 50.29 | 19.80 | 120.00 | 1.02 | 0.40 |
| 55.88 | 22.00 | 125.00 | 1.12 | 0.44 |
| 63.75 | 25.10 | 130.00 | 1.12 | 0.44 |




Cone Penetrometer Results
SH186, Station 24, Geotextile Section

# APPENDIX B

## Detailed Field Results From Recreational Road 3 near Bonham in District 1

Pages B1-B7 Falling Weight Deflectometer Results

| Sensor | Distance from Center of load (ins) |
|---|---|
| W1 | 0 |
| W2 | 7.5 |
| W3 | 12 |
| W4 | 18 |
| W5 | 24 |
| W6 | 30 |
| W7 | 48 |

Pages B8-B11 Dynaflect Data

Pages B12-B17 Cone Penetrometer Data

FWD Deflection Data from Rec. Road 3 near Bonham

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | W1 | W2 | W3 | W4 | W5 | W6 | W7 |
| 1 | R | Yes | 4,560 | 20.5 | 12.1 | 8.5 | 5.3 | 3.7 | 2.9 | 1.7 |
| | | | 8,952 | 42.5 | 26.3 | 19.0 | 12.5 | 8.3 | 6.5 | 4.1 |
| | | | 12,440 | 58.3 | 36.8 | 26.9 | 18.0 | 12.1 | 9.4 | 5.6 |
| | | | 14,656 | 74.2 | 44.0 | 32.1 | 21.5 | 14.4 | 11.3 | 6.7 |
| 2 | R | Yes | 4,552 | 23.9 | 15.4 | 11.6 | 8.3 | 5.4 | 4.5 | 2.2 |
| | | | 9,120 | 50.3 | 34.4 | 26.4 | 18.6 | 12.6 | 9.8 | 4.8 |
| | | | 12,488 | 66.6 | 49.8 | 38.9 | 27.4 | 18.8 | 14.4 | 7.1 |
| | | | 14,920 | 75.4 | 60.1 | 46.3 | 32.6 | 22.3 | 17.1 | 8.2 |
| 3 | R | Yes | 4,672 | 26.5 | 15.5 | 11.2 | 7.5 | 4.9 | 4.3 | 2.4 |
| | | | 9,192 | 58.8 | 37.4 | 27.3 | 18.2 | 12.2 | 9.4 | 5.1 |
| | | | 12,640 | 83.3 | 55.3 | 41.1 | 27.4 | 18.3 | 14.1 | 7.5 |
| | | | 14,776 | 98.3 | 66.0 | 49.4 | 32.9 | 22.1 | 16.9 | 8.8 |
| 4 | R | Yes | 4,624 | 23.4 | 14.1 | 10.1 | 6.3 | 3.6 | 2.9 | 1.6 |
| | | | 9,256 | 57.6 | 35.7 | 25.2 | 15.0 | 8.9 | 6.1 | 2.8 |
| | | | 12,664 | 82.1 | 54.1 | 38.6 | 22.8 | 13.1 | 8.9 | 4.2 |
| | | | 14,816 | 97.6 | 65.9 | 47.6 | 27.9 | 16.1 | 10.6 | 4.7 |
| 5 | R | Yes | 4,792 | 16.4 | 9.6 | 6.7 | 4.3 | 2.6 | 2.1 | 1.2 |
| | | | 9,152 | 35.7 | 21.2 | 14.8 | 9.5 | 5.8 | 4.3 | 2.2 |
| | | | 12,648 | 51.7 | 30.7 | 21.5 | 13.8 | 8.4 | 6.2 | 3.0 |
| | | | 14,968 | 73.1 | 38.8 | 26.0 | 16.5 | 9.9 | 7.3 | 3.6 |
| 6 | R | Yes | 4,528 | 25.5 | 17.7 | 12.5 | 8.0 | 4.6 | 3.5 | 1.9 |
| | | | 9,064 | 59.7 | 42.5 | 30.2 | 18.9 | 11.1 | 7.8 | 4.0 |
| | | | 12,344 | 85.7 | 62.7 | 45.0 | 28.2 | 16.6 | 11.5 | 5.7 |
| | | | 14,720 | 100.8 | 74.9 | 54.4 | 34.1 | 20.1 | 14.0 | 6.9 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | W1 | W2 | Deflection (mils) W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 7 | R | Yes | 4,536 | 25.6 | 16.0 | 11.1 | 7.2 | 4.7 | 3.7 | 2.5 |
| | | | 9,048 | 62.3 | 39.5 | 27.2 | 16.9 | 10.8 | 8.3 | 4.6 |
| | | | 12,488 | 91.4 | 59.6 | 41.4 | 25.5 | 16.2 | 12.1 | 6.6 |
| | | | 14,568 | 108.7 | 71.8 | 50.3 | 31.0 | 19.6 | 14.7 | 8.0 |
| 8 | R | Yes | 4,536 | 35.9 | 21.1 | 14.5 | 9.1 | 5.7 | 4.3 | 2.1 |
| | | | 8,880 | 81.2 | 51.2 | 35.8 | 21.9 | 13.6 | 9.6 | 4.1 |
| | | | 12,224 | 114.1 | 76.1 | 54.2 | 33.2 | 20.6 | 14.3 | 6.1 |
| | | | 14,224 | 116.7 | 91.5 | 66.0 | 40.5 | 25.1 | 17.2 | 7.2 |
| 9 | R | Yes | 4,480 | 33.3 | 19.2 | 13.1 | 8.0 | 5.1 | 4.0 | 2.0 |
| | | | 8,832 | 80.2 | 49.1 | 33.6 | 19.9 | 12.3 | 8.7 | 3.9 |
| | | | 12,144 | 114.8 | 73.7 | 51.5 | 30.5 | 18.5 | 12.9 | 5.7 |
| | | | 14,160 | 130.5 | 88.6 | 62.7 | 37.3 | 22.6 | 15.5 | 6.7 |
| 10 | R | Yes | 4,576 | 22.4 | 14.5 | 10.4 | 6.7 | 4.3 | 3.3 | 1.8 |
| | | | 8,864 | 51.2 | 32.9 | 24.0 | 15.3 | 9.8 | 7.3 | 3.6 |
| | | | 12,304 | 78.4 | 49.1 | 35.7 | 22.7 | 14.5 | 10.7 | 5.2 |
| | | | 14,568 | 96.3 | 60.7 | 43.6 | 27.9 | 17.6 | 13.0 | 6.2 |
| 1 | R | No | 4,832 | 20.9 | 12.7 | 8.3 | 5.4 | 3.9 | 3.1 | 1.8 |
| | | | 8,864 | 51.2 | 30.7 | 20.0 | 12.7 | 8.7 | 7.2 | 3.9 |
| | | | 12,408 | 76.3 | 46.4 | 30.6 | 19.1 | 13.0 | 10.4 | 5.6 |
| | | | 14,392 | 93.6 | 56.6 | 37.8 | 23.2 | 15.7 | 12.7 | 6.8 |
| 2 | R | No | 4,440 | 24.2 | 12.3 | 8.3 | 5.3 | 3.3 | 2.7 | 1.5 |
| | | | 8,896 | 61.2 | 32.4 | 20.8 | 12.0 | 7.4 | 5.9 | 3.2 |
| | | | 12,312 | 94.8 | 51.1 | 33.1 | 17.6 | 10.6 | 8.0 | 4.5 |
| | | | 14,464 | 112.8 | 64.0 | 41.8 | 21.6 | 12.7 | 9.5 | 5.4 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | R | No | 4,464 | 28.1 | 15.1 | 9.4 | 5.5 | 3.2 | 2.4 | 1.4 |
| | | | 8,984 | 71.3 | 38.4 | 23.1 | 12.4 | 6.8 | 4.9 | 3.0 |
| | | | 12,440 | 128.4 | 59.6 | 35.8 | 18.7 | 9.8 | 6.9 | 4.1 |
| | | | 14,544 | 140.8 | 76.3 | 44.3 | 22.8 | 11.7 | 8.2 | 4.9 |
| 4 | R | No | 4,560 | 20.2 | 12.2 | 8.6 | 5.7 | 3.8 | 3.0 | 1.8 |
| | | | 9,136 | 48.6 | 30.7 | 21.5 | 13.5 | 8.8 | 6.7 | 3.7 |
| | | | 12,512 | 71.9 | 46.8 | 33.2 | 20.4 | 12.9 | 9.6 | 5.3 |
| | | | 14,808 | 85.3 | 57.0 | 41.5 | 24.9 | 15.6 | 11.5 | 6.1 |
| 5 | R | No | 4,536 | 32.0 | 18.3 | 12.4 | 7.8 | 5.1 | 4.1 | 2.4 |
| | | | 8,832 | 89.2 | 51.7 | 33.5 | 18.9 | 11.5 | 8.7 | 4.8 |
| | | | 12,120 | 126.1 | 81.1 | 53.7 | 29.2 | 17.1 | 12.6 | 7.0 |
| | | | 14,144 | 136.5 | 99.4 | 66.6 | 36.1 | 20.7 | 15.0 | 8.3 |
| 6 | R | No | 4,424 | 52.4 | 30.2 | 18.7 | 9.9 | 5.4 | 4.1 | 2.4 |
| | | | 8,648 | 117.3 | 75.6 | 49.3 | 25.1 | 12.9 | 8.5 | 4.7 |
| | | | 11,936 | 100.4 | 107.8 | 73.5 | 38.3 | 19.5 | 12.4 | 6.7 |
| | | | 13,792 | 104.3 | 122.3 | 87.0 | 46.6 | 23.6 | 15.1 | 7.9 |
| 7 | R | No | 4,520 | 27.3 | 13.8 | 8.4 | 5.2 | 3.5 | 2.7 | 1.5 |
| | | | 8,712 | 68.2 | 35.6 | 20.9 | 12.0 | 7.8 | 5.7 | 3.1 |
| | | | 12,224 | 102.3 | 57.6 | 33.0 | 18.2 | 11.5 | 8.3 | 4.5 |
| | | | 14,232 | 131.4 | 72.0 | 40.9 | 22.2 | 13.7 | 9.8 | 5.3 |
| 8 | R | No | 4,504 | 46.2 | 26.3 | 16.6 | 9.5 | 5.4 | 4.0 | 2.1 |
| | | | 8,736 | 103.9 | 67.4 | 44.1 | 24.2 | 13.1 | 8.6 | 4.2 |
| | | | 12,048 | 144.4 | 99.5 | 66.8 | 37.0 | 19.9 | 12.8 | 6.3 |
| | | | 13,984 | 100.8 | 117.1 | 80.3 | 44.9 | 24.1 | 15.5 | 7.5 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | R | No | 4,448 | 48.0 | 26.0 | 16.6 | 9.6 | 5.8 | 4.5 | 2.3 |
| | | | 8,712 | 113.7 | 67.0 | 43.2 | 23.3 | 13.7 | 9.6 | 4.8 |
| | | | 11,952 | 130.6 | 98.8 | 65.5 | 35.2 | 20.3 | 14.0 | 6.9 |
| | | | 13,840 | 117.1 | 116.3 | 78.9 | 42.8 | 24.6 | 16.8 | 8.4 |
| 10 | R | No | 4,488 | 22.7 | 12.8 | 8.1 | 4.9 | 3.1 | 2.2 | 1.0 |
| | | | 8,864 | 56.5 | 32.8 | 21.0 | 11.8 | 7.0 | 4.9 | 2.2 |
| | | | 12,288 | 87.6 | 52.3 | 33.8 | 18.3 | 10.4 | 6.9 | 3.1 |
| | | | 14,512 | 107.7 | 65.5 | 42.5 | 22.7 | 12.6 | 8.3 | 3.6 |
| 1 | L | No | 4,472 | 40.8 | 21.7 | 12.9 | 7.0 | 4.2 | 3.3 | 2.1 |
| | | | 8,808 | 93.9 | 56.1 | 33.4 | 16.9 | 9.6 | 6.9 | 3.6 |
| | | | 12,152 | 123.5 | 85.6 | 52.4 | 26.2 | 14.2 | 10.0 | 5.3 |
| | | | 14,016 | 138.5 | 106.6 | 64.9 | 32.5 | 17.4 | 11.8 | 6.0 |
| 2 | L | No | 4,384 | 39.5 | 24.1 | 15.7 | 9.1 | 5.9 | 4.7 | 2.8 |
| | | | 8,688 | 90.7 | 60.1 | 40.2 | 22.5 | 14.1 | 10.4 | 5.6 |
| | | | 12,000 | 120.3 | 87.8 | 60.7 | 34.1 | 21.0 | 15.3 | 8.1 |
| | | | 13,912 | 100.6 | 104.6 | 73.0 | 41.5 | 25.5 | 18.3 | 9.4 |
| 3 | L | No | 4,480 | 44.6 | 27.3 | 17.3 | 10.0 | 6.2 | 4.5 | 2.4 |
| | | | 8,704 | 101.4 | 68.6 | 44.9 | 25.1 | 14.6 | 10.0 | 4.9 |
| | | | 11,968 | 143.4 | 100.9 | 68.5 | 38.6 | 22.2 | 14.8 | 7.1 |
| | | | 13,832 | 132.4 | 120.1 | 83.3 | 47.4 | 27.1 | 18.1 | 8.6 |
| 4 | L | No | 4,624 | 30.2 | 17.6 | 11.0 | 6.9 | 4.6 | 3.5 | 1.7 |
| | | | 8,944 | 76.4 | 47.7 | 29.4 | 16.4 | 10.3 | 7.7 | 4.0 |
| | | | 12,280 | 110.0 | 73.3 | 47.0 | 25.3 | 15.2 | 11.0 | 5.6 |
| | | | 14,224 | 147.9 | 90.0 | 59.1 | 31.7 | 18.6 | 13.3 | 6.9 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L | Yes | 4,520 | 21.3 | 13.8 | 10.5 | 7.8 | 5.4 | 4.5 | 2.4 |
| | | | 8,928 | 54.9 | 35.4 | 26.4 | 18.5 | 12.9 | 10.3 | 5.3 |
| | | | 12,328 | 84.3 | 55.8 | 40.9 | 28.1 | 19.3 | 15.2 | 7.6 |
| | | | 14,360 | 104.2 | 68.8 | 50.5 | 34.3 | 23.4 | 18.3 | 9.2 |
| 2 | L | Yes | 4,536 | 25.1 | 14.3 | 10.6 | 7.3 | 5.0 | 3.7 | 1.8 |
| | | | 9,000 | 65.1 | 39.2 | 28.6 | 18.7 | 12.0 | 8.6 | 3.6 |
| | | | 12,384 | 97.6 | 61.5 | 45.1 | 28.9 | 18.3 | 13.0 | 5.4 |
| | | | 14,368 | 116.3 | 75.1 | 55.4 | 35.6 | 22.4 | 15.8 | 6.5 |
| 3 | L | Yes | 4,584 | 23.0 | 15.3 | 12.0 | 8.6 | 6.0 | 4.7 | 2.3 |
| | | | 9,064 | 60.5 | 40.3 | 31.4 | 21.5 | 14.6 | 10.8 | 4.9 |
| | | | 12,400 | 93.5 | 62.8 | 49.0 | 33.3 | 22.3 | 16.1 | 7.0 |
| | | | 14,352 | 113.6 | 76.9 | 60.0 | 40.0 | 27.2 | 19.6 | 8.8 |
| 4 | L | Yes | 4,496 | 29.8 | 18.0 | 13.2 | 8.9 | 6.3 | 4.8 | 2.6 |
| | | | 8,832 | 72.6 | 44.9 | 32.5 | 21.7 | 14.7 | 11.3 | 5.8 |
| | | | 12,216 | 105.7 | 68.2 | 49.5 | 32.8 | 22.0 | 16.8 | 8.4 |
| | | | 14,216 | 122.2 | 83.5 | 60.7 | 40.0 | 26.7 | 20.4 | 10.2 |
| 5 | L | Yes | 4,528 | 17.3 | 12.0 | 9.2 | 6.5 | 4.5 | 3.5 | 1.7 |
| | | | 9,064 | 43.9 | 30.2 | 22.7 | 15.7 | 10.6 | 8.0 | 3.5 |
| | | | 12,360 | 67.9 | 46.6 | 35.1 | 23.7 | 15.8 | 11.7 | 5.2 |
| | | | 14,736 | 83.5 | 57.8 | 43.3 | 29.0 | 19.2 | 14.0 | 6.2 |
| 6 | L | Yes | 4,696 | 34.4 | 20.2 | 11.6 | 5.8 | 3.7 | 3.0 | 1.7 |
| | | | 9,016 | 64.0 | 37.1 | 22.0 | 11.6 | 7.2 | 5.8 | 3.3 |
| | | | 12,304 | 89.2 | 50.3 | 29.4 | 15.4 | 9.6 | 7.8 | 4.5 |
| | | | 14,344 | 104.5 | 58.1 | 33.9 | 17.3 | 10.5 | 8.7 | 5.1 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | L | No | 4,448 | 51.0 | 31.6 | 20.6 | 10.8 | 6.4 | 4.4 | 2.5 |
| | | | 8,592 | 115.8 | 76.8 | 52.1 | 27.5 | 14.4 | 10.0 | 5.4 |
| | | | 11,880 | 123.9 | 111.1 | 77.9 | 42.0 | 22.0 | 14.8 | 7.9 |
| | | | 13,688 | 104.9 | 136.4 | 93.7 | 50.8 | 26.9 | 17.8 | 9.5 |
| 6 | L | No | 4,328 | 34.1 | 20.4 | 13.7 | 8.6 | 5.5 | 4.4 | 2.6 |
| | | | 8,704 | 82.7 | 54.4 | 36.3 | 21.3 | 13.3 | 10.0 | 5.3 |
| | | | 11,880 | 139.6 | 82.7 | 56.0 | 32.4 | 19.8 | 14.7 | 7.5 |
| | | | 13,752 | 136.2 | 100.7 | 69.3 | 39.7 | 24.0 | 17.5 | 8.8 |
| 7 | L | No | 4,544 | 30.4 | 19.3 | 12.9 | 7.8 | 4.9 | 3.7 | 1.8 |
| | | | 8,896 | 80.9 | 52.6 | 34.4 | 19.3 | 11.1 | 7.8 | 3.8 |
| | | | 12,160 | 119.4 | 81.9 | 54.5 | 29.8 | 16.7 | 11.5 | 5.3 |
| | | | 14,096 | 120.3 | 101.5 | 68.2 | 37.1 | 20.5 | 14.0 | 6.3 |
| 8 | L | No | 4,512 | 23.6 | 13.5 | 8.6 | 5.2 | 3.2 | 2.6 | 1.6 |
| | | | 9,008 | 64.6 | 36.0 | 22.1 | 11.7 | 7.2 | 5.6 | 3.2 |
| | | | 12,440 | 97.9 | 56.6 | 35.0 | 17.6 | 10.6 | 8.1 | 4.8 |
| | | | 14,504 | 115.1 | 69.9 | 44.0 | 21.8 | 12.8 | 9.8 | 5.7 |
| 9 | L | No | 4,408 | 45.2 | 27.5 | 16.9 | 9.0 | 5.1 | 4.0 | 2.2 |
| | | | 8,608 | 115.6 | 74.3 | 46.1 | 22.2 | 10.9 | 8.0 | 4.3 |
| | | | 11,840 | 112.4 | 113.0 | 72.6 | 35.4 | 16.1 | 10.7 | 6.3 |
| | | | 13,680 | 114.8 | 133.9 | 90.7 | 44.9 | 19.9 | 12.4 | 7.5 |
| 10 | L | No | 4,504 | 21.3 | 13.8 | 10.5 | 7.8 | 5.4 | 4.5 | 2.4 |
| | | | 9,024 | 54.9 | 35.4 | 26.4 | 18.5 | 12.9 | 10.3 | 5.3 |
| | | | 12,288 | 84.3 | 55.8 | 40.9 | 28.1 | 19.3 | 15.2 | 7.6 |
| | | | 14,432 | 104.2 | 68.8 | 50.5 | 34.3 | 23.4 | 18.3 | 9.2 |

FWD Deflection Data from Rec. Road 3 near Bonham (Cont'd)

| Section | Lane | Fabric | Load (lbs) | Deflection (mils) W1 | W2 | W3 | W4 | W5 | W6 | W7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 7 | L | Yes | 4,520 | 34.4 | 21.5 | 14.5 | 9.0 | 5.8 | 4.3 | 2.3 |
| | | | 8,776 | 85.8 | 56.6 | 38.4 | 22.2 | 13.3 | 9.3 | 4.7 |
| | | | 12,088 | 120.9 | 86.5 | 59.9 | 34.5 | 20.0 | 13.8 | 6.8 |
| | | | 13,952 | 126.2 | 105.9 | 73.8 | 42.6 | 24.5 | 16.6 | 8.2 |
| 8 | L | Yes | 4,504 | 40.2 | 23.1 | 15.5 | 9.4 | 5.9 | 4.5 | 2.5 |
| | | | 8,816 | 91.2 | 55.9 | 37.7 | 22.5 | 13.8 | 10.2 | 5.4 |
| | | | 12,160 | 114.7 | 84.5 | 57.2 | 33.9 | 20.8 | 15.1 | 7.9 |
| | | | 14,032 | 132.3 | 103.0 | 70.0 | 41.5 | 25.3 | 18.3 | 9.5 |
| 9 | L | Yes | 4,368 | 33.6 | 18.6 | 12.5 | 8.2 | 5.7 | 4.4 | 2.5 |
| | | | 8,744 | 75.4 | 45.5 | 30.8 | 19.3 | 12.8 | 9.7 | 5.1 |
| | | | 12,112 | 107.9 | 68.4 | 47.0 | 29.2 | 19.1 | 14.4 | 7.4 |
| | | | 14,216 | 132.5 | 82.7 | 57.7 | 35.6 | 23.1 | 17.3 | 8.9 |
| 10 | L | Yes | 4,496 | 23.5 | 13.1 | 9.4 | 6.3 | 4.6 | 3.7 | 2.2 |
| | | | 8,928 | 55.1 | 31.5 | 22.2 | 14.5 | 10.4 | 8.2 | 4.6 |
| | | | 12,336 | 81.4 | 48.4 | 34.2 | 22.1 | 15.6 | 12.2 | 6.9 |
| | | | 14,448 | 99.6 | 59.6 | 42.4 | 27.2 | 19.0 | 14.8 | 8.3 |

DYNAFLECT DEFLECTION DATA
************************

District________ County Bonham Highway Rec. Rd. 3 Milepost________

Date 6/27/85 Temperature 80

Fabric/Left Lane/Coming Back

| Location | Dynaflect Readings | | | | |
|---|---|---|---|---|---|
| | Sc 1 | Sc 2 | Sc 3 | Sc 4 | Sc 5 |
| 1 | 2.26 | 1.41 | 0.79 | 0.48 | 0.31 |
| 2 | 2.07 | 1.33 | 0.78 | 0.47 | 0.28 |
| 3 | 2.34 | 1.58 | 0.96 | 0.56 | 0.35 |
| 4 | 2.86 | 1.83 | 1.18 | 0.80 | 0.58 |
| 5 | 1.99 | 1.29 | 0.79 | 0.47 | 0.29 |
| 6 | 2.14 | 1.10 | 0.53 | 0.35 | 0.25 |
| 7 | 2.75 | 1.75 | 0.98 | 0.59 | 0.36 |
| 8 | 2.50 | 1.66 | 1.06 | 0.71 | 0.50 |
| 9 | 2.44 | 1.49 | 1.07 | 0.70 | 0.49 |
| 10 | 2.14 | 1.34 | 0.96 | 0.63 | 0.45 |

DYNAFLECT DEFLECTION DATA
************************

District______ County Bonham Highway Rec. Rd 3 Milepost__________

Date 6/27/85 Temperature 78

Non-Fabric/Left Lane/Coming Back

| Location | Dynaflect Readings | | | | |
|---|---|---|---|---|---|
| | Sc 1 | Sc 2 | Sc 3 | Sc 4 | Sc 5 |
| 1 | 3.00 | 1.62 | 0.84 | 0.48 | 0.30 |
| 2 | 3.02 | 1.88 | 1.16 | 0.77 | 0.53 |
| 3 | 3.07 | 1.83 | 1.02 | 0.61 | 0.39 |
| 4 | 2.41 | 1.40 | 0.83 | 0.52 | 0.33 |
| 5 | 3.31 | 1.86 | 1.04 | 0.65 | 0.43 |
| 6 | 2.40 | 1.50 | 1.02 | 0.70 | 0.50 |
| 7 | 2.11 | 1.22 | 0.72 | 0.45 | 0.29 |
| 8 | 1.49 | 0.90 | 0.55 | 0.37 | 0.26 |
| 9 | 2.86 | 1.69 | 0.87 | 0.50 | 0.29 |
| 10 | 2.11 | 1.38 | 0.94 | 0.64 | 0.44 |

DYNAFLECT DEFLECTION DATA
************************

District______ County Bonham Highway Recreation Rd. 3 Milepost_____

Date 6/27/85 Temperature 78

Non-Fabric/Right Lane/Going

| Location | Dyneflect Readings | | | | |
|---|---|---|---|---|---|
| | Sc 1 | Sc 2 | Sc 3 | Sc 4 | Sc 5 |
| 1 | 1.99 | 1.27 | 0.83 | 0.57 | 0.41 |
| 2 | 2.27 | 1.38 | 0.80 | 0.49 | 0.31 |
| 3 | 1.98 | 1.07 | 0.58 | 0.36 | 0.25 |
| 4 | 1.94 | 1.21 | 0.73 | 0.47 | 0.31 |
| 5 | 3.02 | 1.78 | 1.06 | 0.67 | 0.45 |
| 6 | 3.16 | 1.88 | 1.04 | 0.64 | 0.42 |
| 7 | 2.05 | 1.20 | 0.70 | 0.44 | 0.30 |
| 8 | 2.65 | 1.60 | 0.92 | 0.54 | 0.33 |
| 9 | 3.13 | 1.94 | 1.12 | 0.71 | 0.47 |
| 10 | 1.73 | 1.01 | 0.58 | 0.34 | 0.22 |

DYNAFLECT DEFLECTION DATA
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DISTRICT________ COUNTY Bonham HIGHWAY Rec.Rd 3 MILEPOST________

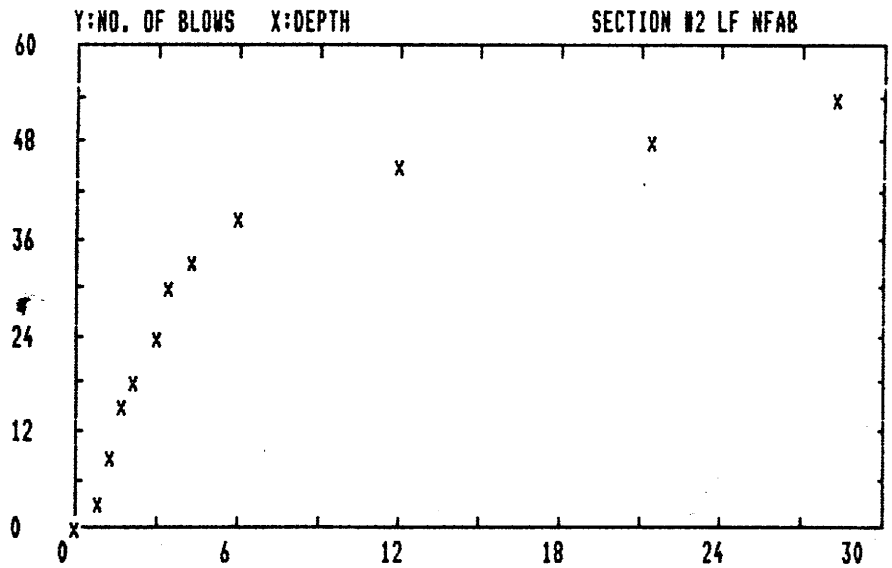
DATE 6/27/85 TEMPERATURE 76

Fabric/Right Lane/Going

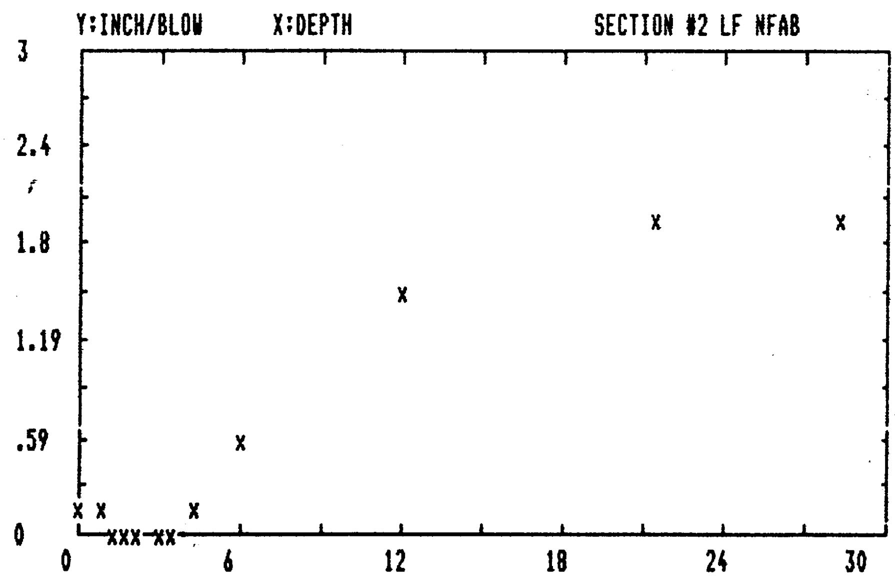
| Location | Dyneflect Readings | | | | |
|---|---|---|---|---|---|
| | Sc 1 | Sc 2 | Sc 3 | Sc 4 | Sc 5 |
| 1 | 1.95 | 1.35 | 0.87 | 0.62 | 0.46 |
| 2 | 2.35 | 1.75 | 1.18 | 0.75 | 0.51 |
| 3 | 2.26 | 1.59 | 1.04 | 0.68 | 0.48 |
| 4 | 1.81 | 1.18 | 0.70 | 0.40 | 0.25 |
| 5 | 1.79 | 1.04 | 0.57 | 0.34 | 0.24 |
| 6 | 2.13 | 1.53 | 0.85 | 0.48 | 0.31 |
| 7 | 2.35 | 1.57 | 1.01 | 0.86 | 0.46 |
| 8 | 2.42 | 1.46 | 0.81 | 0.47 | 0.28 |
| 9 | 2.46 | 1.48 | 0.82 | 0.47 | 0.28 |
| 10 | 2.34 | 1.46 | 0.86 | 0.51 | 0.32 |

DISTRICT : 00 COUNTY : BONHAM SECTION : #2 LF NFAB

| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE M CM/BLOW | SLOPE M IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.46 | 0.18 |
| 2.30 | 0.91 | 5.00 | 0.39 | 0.15 |
| 3.90 | 1.54 | 10.00 | 0.31 | 0.12 |
| 5.40 | 2.13 | 15.00 | 0.26 | 0.10 |
| 6.50 | 2.56 | 20.00 | 0.24 | 0.09 |
| 7.80 | 3.07 | 25.00 | 0.28 | 0.11 |
| 9.30 | 3.66 | 30.00 | 0.38 | C.15 |
| 11.60 | 4.57 | 35.00 | 0.60 | 0.24 |
| 15.30 | 6.02 | 40.00 | 1.89 | 0.74 |
| 30.50 | 12.01 | 45.00 | 4.00 | 1.57 |
| 55.30 | 21.77 | 50.00 | 4.96 | 1.95 |
| 72.30 | 28.46 | 55.00 | 4.96 | 1.95 |




PrtSc?

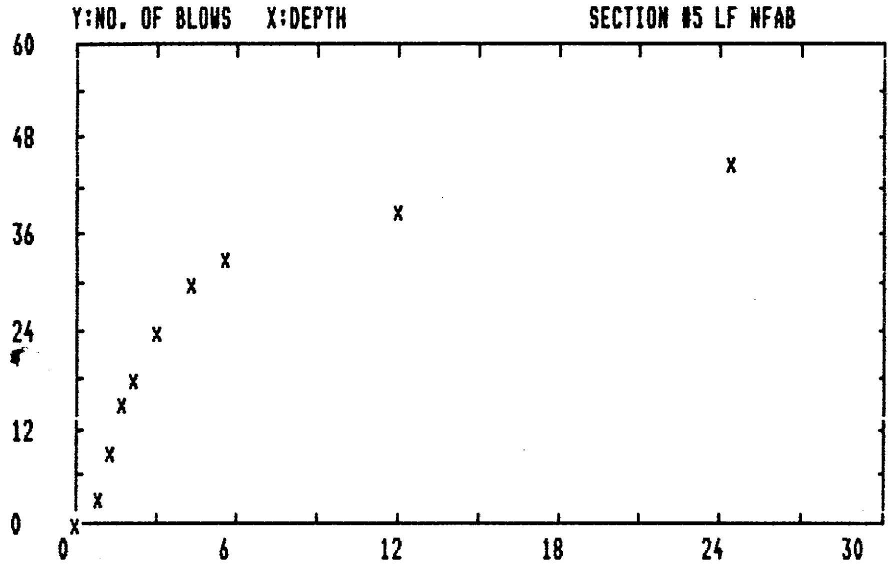



PrtSc?

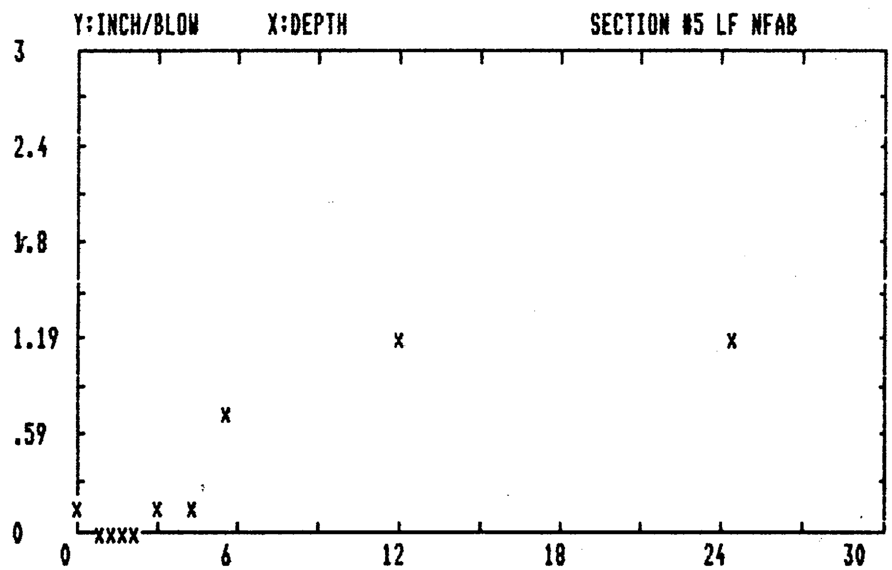
Cone Penetrometer Results
RR3, Station 2, Control Section

DISTRICT : 00 COUNTY : BONHAM SECTION : #5 LF NFAB

| DEPTH | | BLOWS | SLOPE N | |
|---|---|---|---|---|
| CM | INS | NOS | CM/BLOW | IN/BLOW |
| 0.00 | 0.00 | 0.00 | 0.44 | 0.17 |
| 2.20 | 0.87 | 5.00 | 0.36 | 0.14 |
| 3.60 | 1.42 | 10.00 | 0.27 | 0.11 |
| 4.90 | 1.93 | 15.00 | 0.27 | 0.11 |
| 6.30 | 2.48 | 20.00 | 0.35 | 0.14 |
| 8.40 | 3.31 | 25.00 | 0.47 | 0.19 |
| 11.00 | 4.33 | 30.00 | 0.66 | 0.26 |
| 15.00 | 5.91 | 35.00 | 2.05 | 0.81 |
| 31.50 | 12.40 | 40.00 | 3.30 | 1.30 |
| 62.50 | 24.61 | 45.00 | 3.30 | 1.30 |




PrtSc?

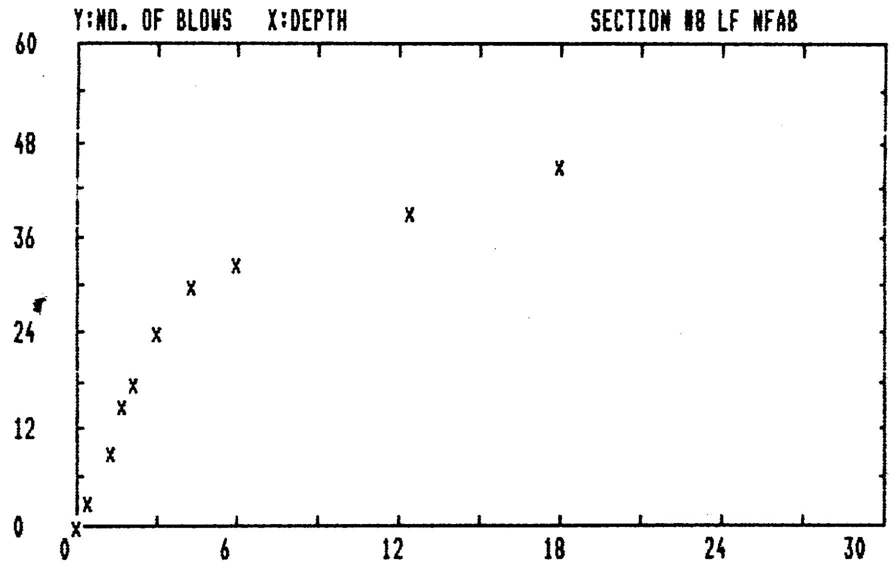



PrtSc?

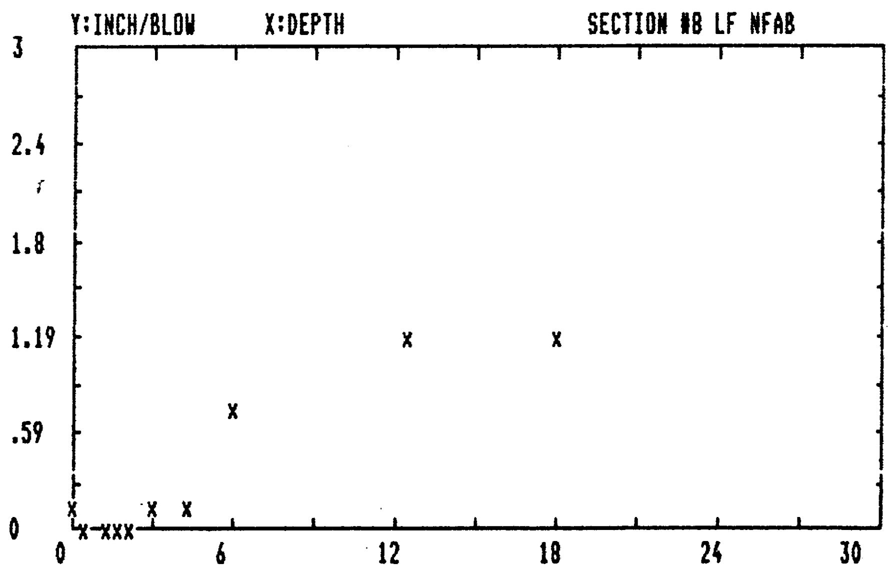
Cone Penetrometer Results
RR3, Station 5, Control Section

DISTRICT : 00 COUNTY : BONHAM SECTION : #8 LF NFAB

| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE N CM/BLOW | SLOPE N IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.40 | 0.16 |
| 2.00 | 0.79 | 5.00 | 0.36 | 0.14 |
| 3.60 | 1.42 | 10.00 | 0.32 | 0.13 |
| 5.20 | 2.05 | 15.00 | 0.28 | 0.11 |
| 6.40 | 2.52 | 20.00 | 0.34 | 0.13 |
| 8.60 | 3.39 | 25.00 | 0.46 | 0.18 |
| 11.00 | 4.33 | 30.00 | 0.69 | 0.27 |
| 15.50 | 6.10 | 35.00 | 2.13 | 0.84 |
| 32.30 | 12.72 | 40.00 | 3.36 | 1.32 |
| 46.50 | 18.31 | 45.00 | 3.36 | 1.32 |




PrtSc?

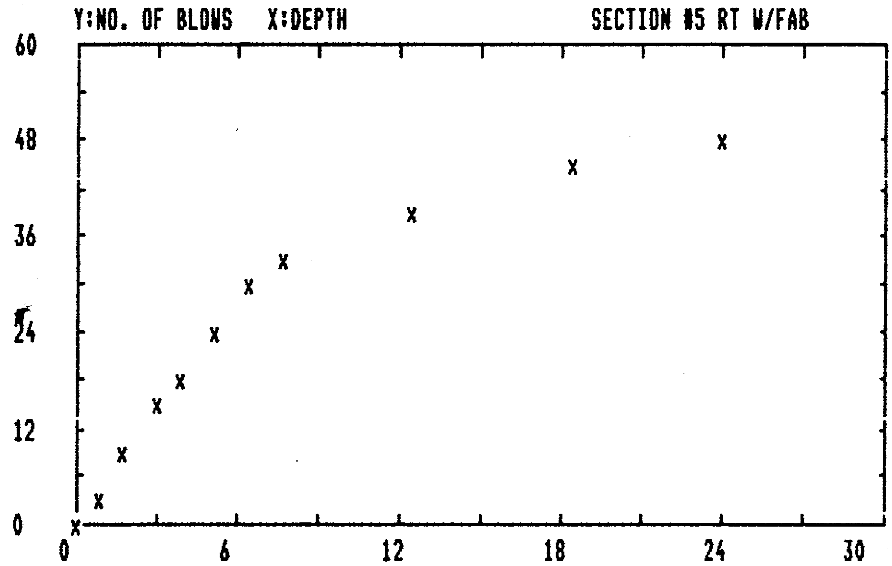



PrtSc?

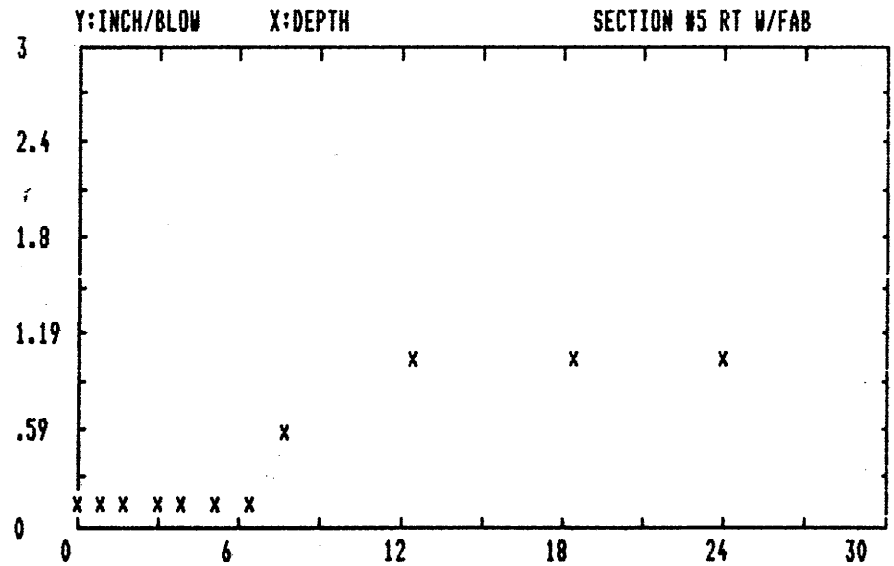
Cone Penetrometer Results
RR3, Station 8, Control Section

DISTRICT : 00 COUNTY : BONHAM SECTION : #5 RT W/FAB

| DEPTH | | BLOWS | SLOPE N | |
|---|---|---|---|---|
| CM | INS | NOS | CM/BLOW | IN/BLOW |
| 0.00 | 0.00 | 0.00 | 0.52 | 0.20 |
| 2.60 | 1.02 | 5.00 | 0.53 | 0.21 |
| 5.30 | 2.09 | 10.00 | 0.52 | 0.20 |
| 7.80 | 3.07 | 15.00 | 0.53 | 0.21 |
| 10.60 | 4.17 | 20.00 | 0.56 | 0.22 |
| 13.40 | 5.28 | 25.00 | 0.60 | 0.24 |
| 16.60 | 6.54 | 30.00 | 0.72 | 0.28 |
| 20.60 | 8.11 | 35.00 | 1.60 | 0.63 |
| 32.60 | 12.83 | 40.00 | 2.70 | 1.06 |
| 47.60 | 18.74 | 45.00 | 3.00 | 1.18 |
| 61.60 | 24.25 | 50.00 | 3.00 | 1.18 |




PrtSc?

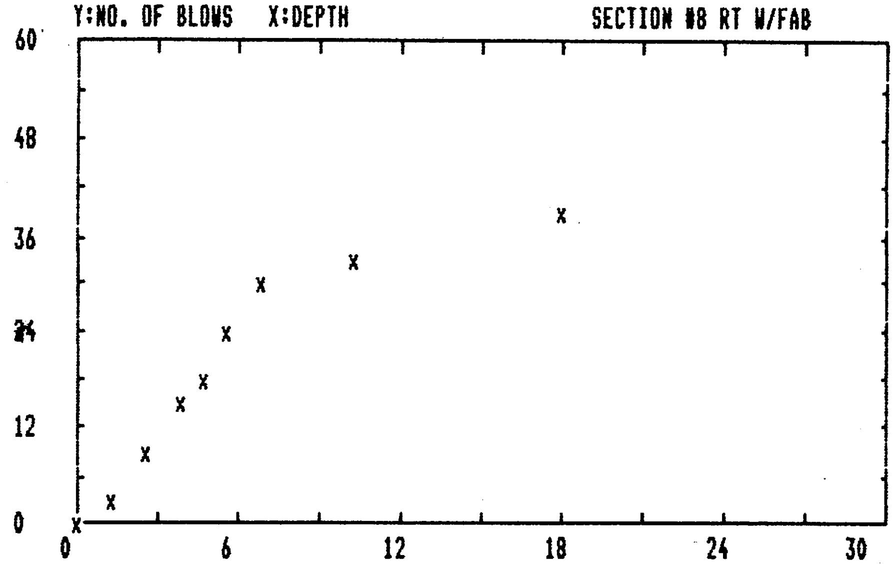



PrtSc?

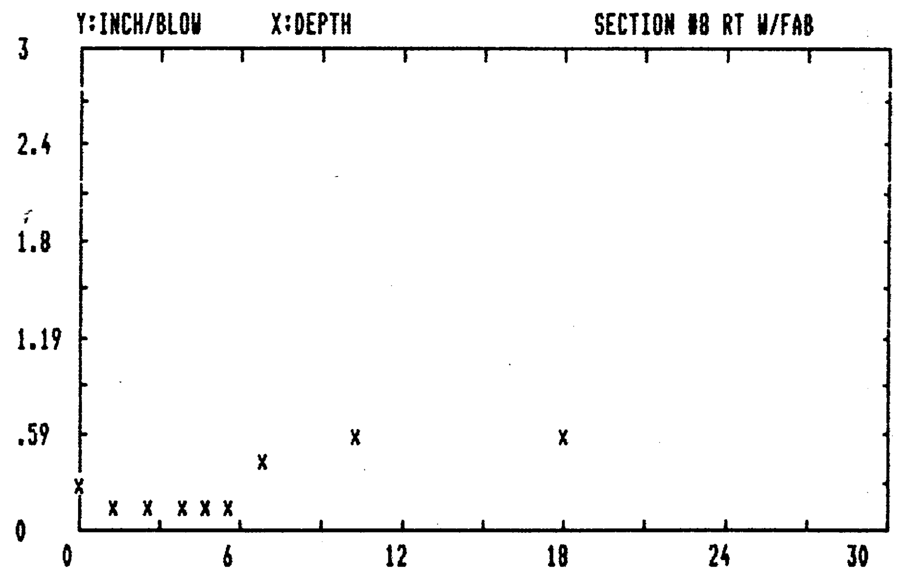
Cone Penetrometer Results
RR3, Station 5, Geotextile Section

DISTRICT : 00 COUNTY : BONHAM SECTION : #8 RT W/FAB

| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE N CM/BLOW | SLOPE N IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.80 | 0.31 |
| 4.00 | 1.57 | 5.00 | 0.70 | 0.28 |
| 7.00 | 2.76 | 10.00 | 0.58 | 0.23 |
| 9.80 | 3.86 | 15.00 | 0.50 | 0.20 |
| 12.00 | 4.72 | 20.00 | 0.49 | 0.19 |
| 14.70 | 5.79 | 25.00 | 0.60 | 0.24 |
| 18.00 | 7.09 | 30.00 | 1.21 | 0.48 |
| 26.80 | 10.55 | 35.00 | 1.76 | 0.69 |
| 46.50 | 18.31 | 40.00 | 1.76 | 0.69 |




PrtSc?

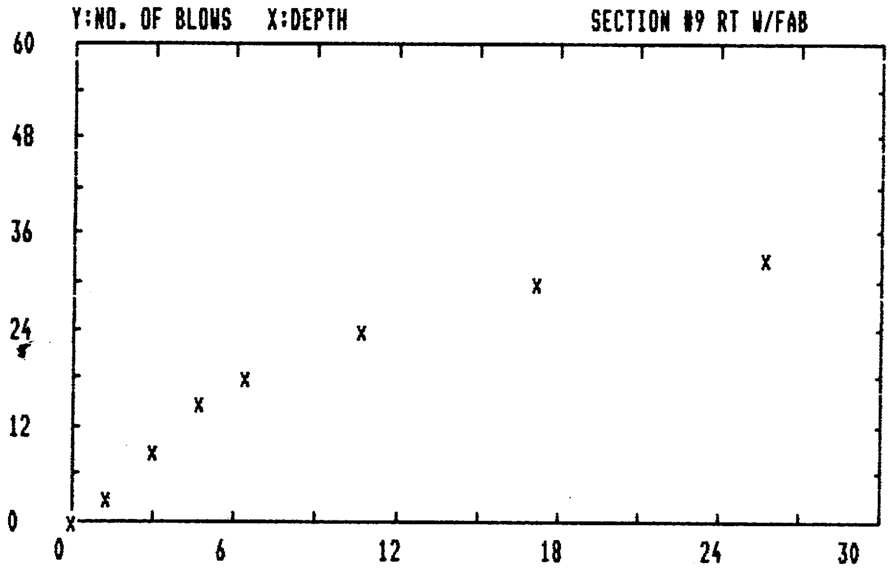



PrtSc?

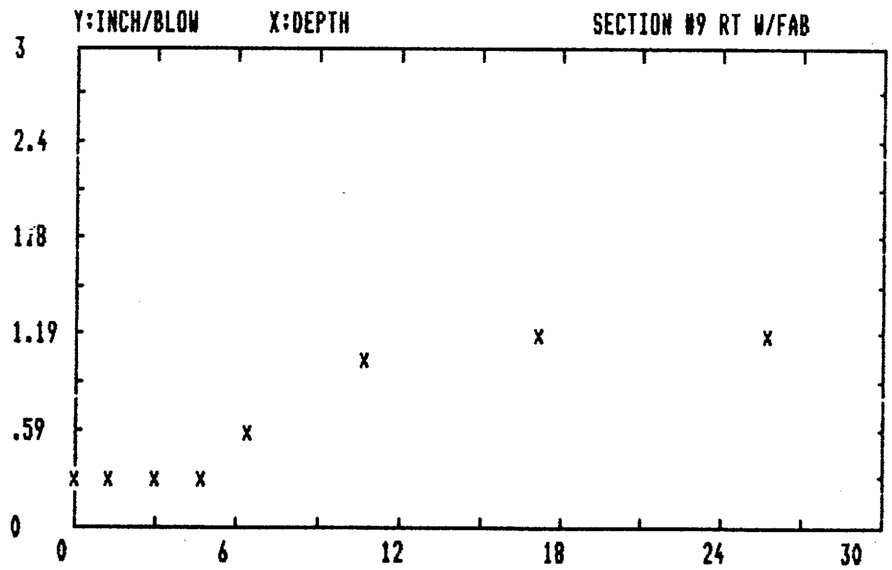
Cone Penetrometer Results
RR3, Station 8, Geotextile Section

DISTRICT : 00 COUNTY : BONHAM SECTION : #9 RT W/FAB

| DEPTH CM | DEPTH INS | BLOWS NOS | SLOPE N CM/BLOW | SLOPE N IN/BLOW |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.84 | 0.33 |
| 4.20 | 1.65 | 5.00 | 0.80 | 0.31 |
| 8.00 | 3.15 | 10.00 | 0.78 | 0.31 |
| 12.00 | 4.72 | 15.00 | 0.87 | 0.34 |
| 16.70 | 6.57 | 20.00 | 1.60 | 0.63 |
| 28.00 | 11.02 | 25.00 | 2.73 | 1.07 |
| 44.00 | 17.32 | 30.00 | 3.20 | 1.26 |
| 66.00 | 25.98 | 35.00 | 3.20 | 1.26 |




PrtSc?




PrtSc?

Cone Penetrometer Results
RR3, Station 9, Geotextile Section