PIEZOMETRIC CONE PENETRATION TESTING WITH SOIL ELECTRICAL CONDUCTIVITY MEASUREMENTS AND GROUNDWATER SAMPLING STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT

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1.0 INTRODUCTION

STRATIGRAPHICS, The Geotechnical Data Acquisition Corporation, performed geo-environmental cone penetrometer exploration at the Stratford Army Engine Plant in Stratford, Connecticut. Piezometric Cone Penetration Tests with soil Electrical Conductivity measurement (CPTU-EC) soundings were performed to provide data on subsurface soil conditions to Harding Lawson Associates (HLA). Groundwater samples were collected for analysis by HLA.

The work was performed from May 5 through May 26, 1999 and totaled 15 days of field work. Seventeen CPTU-EC soundings were performed to depths ranging from 38.5 to 162.4 ft, for a total of 1792.4 ft of data. Thirty eight pore water pressure dissipation tests were performed to provide estimates of soil hydraulic conductivity. Eighty seven groundwater samples were collected at depths ranging from 8.8 to 159.1 ft. The total groundwater sampling footage was 5600 ft.

This report includes CPTU-EC sounding logs, and tabulations of recorded data and correlated geotechnical parameters. The pore water pressure dissipation test data are summarized on Table 1. The sampling program is summarized on Table 3. Details of penetrometer exploration techniques are included in the main body of the report, both for this study and for penetrometer uses in general. Discussion of geotechnical data correlation are included in Appendix A.

2.0 PENETROMETER EQUIPMENT AND DATA ACQUISITION

2.1 Procedure The Cone Penetration Test (CPT) consists of smoothly and continuously pushing a small diameter, instrumented probe (penetrometer) deep into the ground while a computer data acquisition system displays and records the soil response to penetration (Figure 1). In geotechnical terms, the CPT penetrometer models a foundation pile under plunging failure load conditions. CPT data are used to develop continuous, high resolution profiles of in situ soil conditions rapidly, accurately and economically.

The soil resistance to penetration, acting on the tip and along the sides of the penetrometer, is measured during CPT (Figure 1a). CPT soil resistance measurements are accurate and highly repeatable. The measurements can be used for the evaluation of stratigraphy and various geotechnical parameters. Performance of CPT is specified by ASTM Standard D3441.

A pressure transducer is added to the CPT penetrometer to acquire hydrogeologic data (Saines and others, 1989) and is called a Piezometric Cone Penetration Test (CPTU). A soil electrical conductivity sensor is added to the penetrometer (CPTU-EC) to acquire qualitative moisture information in vadose zone soils, and general groundwater quality data (Strutynsky and others, 1991, 1998). Penetrometer groundwater, soil, and soil gas samplers are used for direct sampling (Strutynsky and Sainey, 1990, Strutynsky and others, 1998). Recent advances in penetrometer instrumentation include a natural gamma sensor, induced UV fluorescence for detection of hydrocarbons and other compounds, and shear wave velocity and stress controlled testing for low and high strain soil deformation evaluation.

The penetrometer is mounted at the end of a string of sounding rods. A hydraulic ram is used to push the penetrometer and rod string into the ground at a constant rate of 4 ft per minute. Electronic signals from the downhole sensors are transmitted by a cable, strung through the sounding rods, to the computer data acquisition system. Measurements are displayed and recorded for immediate definition of subsurface conditions. Downhole equipment can be automatically steam cleaned during retrieval at the end of a test. Open hole can be grouted using a bentonite clay grout.

Large 3 axle trucks are used to carry the 2 penetrometer systems used by STRATIGRAPHICS. Truck weight and ballast serve to counteract the thrust of the hydraulic ram. The enclosed rig work area allows all-weather operations. Computers, samplers, electrical power, lighting, compressed air, steam cleaner, grout pump, and water tank are all included on each rig, providing for self-contained operations. Other systems for mounting on drill rigs can be used in areas with poor access or for overseas projects.

Lightning detection systems are mounted on the rigs to monitor dangerous weather conditions, that can affect safety and productivity. STRATIGRAPHICS is currently in the process of mounting differential, carrier phase, post processed Global Positioning Systems (GPS) on its rigs, to allow surveying exploration points to an accuracy of about 5 to 15 cm.

No borehole is required during exploration because penetrometers are directly thrust into the soil from the ground surface. Pressures of over 3 million pounds per square foot can be applied to the tip of the penetrometer for penetration of most soils finer than medium gravel. Asphalt pavements up to 6 inches thick can usually be penetrated by penetrometer methods without predrilling. Site disturbance is reduced since no borehole cuttings or drilling fluids are generated during penetrometer operations. Personnel exposure to possibly contaminated soil is significantly less than exposures during drilling and sampling operations. Penetrometer downhole equipment is readily decontaminated during retrieval, when contaminated soils are encountered .

Four hundred to thirteen hundred feet of CPT (with no time dependent piezometric, gamma or shear wave velocity measurements) can be performed in one day, depending on site access. Depths of more than 180 ft can be achieved, depending on site stratigraphy. Where soils are exceptionally dense or gravelly, ar uninstrumented prepunch tool can be used to probe the subsurface. Information obtained using the prepunch tool can be similar to that obtained during mechanical (Dutch) cone testing, especially where friction on the sounding rods is minimal. Dynamic driving can be used in conjunction with the thrust of the hydraulic ram to aid in prepunching of very dense or gravelly soils.

2.1.1 Signal Conditioning and Recording CPT data are acquired using a 16 bit (resolution of 1 part in 32,768) analog to digital data logger and field computer. Test data are graphically displayed for immediate evaluation of subsurface conditions. Field sounding logs are provided at the end of each test. Data are recorded on disk for data processing and long term storage.

2.2 Soil Shear Resistance Measurements The resistance of a soil to penetration is measured on the tip and along the sides of the CPT penetrometer (Figure 1a). The conical tip of the penetrometer has a projected cross-sectional area of 15 square centimeters (2.3 square inches), and a diameter of 1.7 inches. The soil resistance acting on the cone tip reflects the deep bearing capacity of a soil, and is termed cone end bearing or tip resistance. The friction between the soil and the penetrometer is measured along a cylindrical sleeve mounted behind the cone tip. The sleeve has a surface area of 200 square centimeters (31.0 square inches), a length of 5.8 inches, and a diameter slightly larger than the cone tip. The soil friction measurement is termed friction sleeve resistance. Two strain gage loadcells are used to measure the tip and sleeve resistances (Strutynsky and others, 1985). The tip measurement has a resolution of about 2 to 4 inches. The sleeve measurement has a resolution of about 6 inches.

2.3 Piezometric Measurements A fluid pressure transducer is used to measure the soil pore water pressure response to penetration. The CPTU piezometric measurement has a layer detection limit of about 1 inch and an accuracy of about +/- 0.5 ft of water pressure. The advance of the penetrometer causes a volumetric distortion of the soil, which generates a local water pressure field. These local generated pressures dissipate almost instantaneously in soils of high permeability, so equilibrium water pressures are measured during CPTU ir coarse sand and gravel. In medium or low permeability soils, the generated water pressure field is sustained for a lengthy period of time (Saines and others, 1989).

The dissipation of generated water pressure can be recorded during pauses in the penetration process. If the pauses are long enough for all generated water pressures to dissipate, potentiometric surface measurements can be obtained at multiple depths in a single CPTU sounding. The dissipation test is also used to estimate soil hydraulic conductivity and consolidation characteristics.

2.3.1 Piezometer Saturation The CPTU piezometer filter is saturated with an incompressible liquid so that instantaneous responses (zero lag time) can be achieved during testing. High saturation levels are indicated by sharp responses at interfaces and immediate regeneration of excess water pressure after pauses in penetration. Low saturation levels leading to poor measurements can be caused by inadequate equipment preparation, soil suction, or filter damage on coarse soil particles. Clogging of piezometric filters by clay particles also can lead to poor results. Loss of filter saturation or clogged filters are beyond the control of the penetrometer system operator. Thus, the piezometric measurements can be less repeatable than the highly repeatable CPT tip and sleeve measurements.

2.4 Electrical Conductivity and Thermal Measurements A CPTU-EC penetrometer including tip, sleeve, piezometric, temperature, and electrical conductivity (EC) sensors can be used to simultaneously acquire geotechnical, hydrogeological and qualitative geochemical information. Soil EC is measured using a two electrode array, energized with a 3 kHz signal, mounted on the penetrometer tip. The EC measurement has a resolution of about 0.75 inches.

A thermal sensor can be mounted inside the penetrometer. Significant frictional heating occurs when penetrating sandy soils. During pauses, the generated heat will dissipate and the penetrometer will reach thermal equilibrium with the soil. This allows a soil temperature profile to be acquired.

2.5 Natural Gamma Measurements A CPTU-ECG penetrometer incorporating cone, friction, piezometric, soil electrical conductivity and natural gamma (G) sensors can be used to simultaneously acquire geotechnical, hydrogeological, qualitative geochemical and radiological information. Gamma measurements can be used to enhance lithologic interpretation. Radionuclide contamination can also be detected using gamma logging.

2.6 Induced UV Fluorescence A CPTU-EC-UVF penetrometer incorporating cone, friction, piezometric, soil electrical conductivity, and induced UV Fluorescence (UVF) sensors can be used to simultaneously acquire geotechnical, hydrogeological, and qualitative geochemical information. The UVF system consists of a sapphire window in the penetrometer, a UV light source, and photonic sensors. UV light is transmitted through the window into the adjacent soil. If the soil contains compounds such as petroleum hydrocarbons that fluoresce, the resulting light can be detected.

The UV source light is bandpass filtered to provide an excitation wavelength of 254 nm. The photonics sensor is filtered to monitor resulting fluorescence emissions above 290 nm. Future improvements to the UVF module include a photonic sensor array, filtered at several different wavelengths to allow some compound differentiation capabilities.

2.7 CPT Shear Wave Velocity Measurements A geophone module is deployed similarly to other penetrometer sensors. A main advantage of the pushed in sensor is that it has superior coupling to the soil, resulting in much better definition of wave arrival, as compared to borehole deployed geophones. The shear wave system consists of a pair of downhole geophones, an uphole wave source and timing trigger, signal conditioning and A/D, signal enhancement and acquisition software, and a PC computer.

The CPT shear wave velocity data acquisition procedure is as follows: 1) the geophone module is pushed to the required depth; 2) data file/signal conditioning is initialized; 3) a hammer/timing trigger is used as a uphole wave source; 4) geophone signal is monitored for wave arrival. The software allows signal stacking to enhance the picking of wave arrival times. The procedure is repeated at multiple depths, to allow calculation of interval wave velocities between adjacent tests.

2.8 CPT Load/settlement Measurements The standard CPT procedure is typically conducted as a constant rate of strain test, resulting in continuous measurements of soil ultimate bearing and frictional strengths. By conducting CPT under monotonically increasing stress conditions, soil deformation properties can be evaluated. The procedure is very similar to pile load testing except that no pile "set up" is typically allowed - the CPT test is conducted during short pauses in the continuous push process.

2.9 Penetrometer Geometry The CPT penetrometer external geometry is specified by ASTM standards. Differences in penetrometer internal design can lead to some variability in response between penetrometers of different manufacture, especially in very soft clays. The CPTU measurement of generated water pressure depends on external filter geometry. Measurements of equilibrium water pressures after pauses in the penetration process are not sensitive to geometry, and reflect undisturbed conditions. CPTU piezometric filters are typically mounted on either the cone tip or just ahead of the friction sleeve. Each position has advantages and disadvantages. Measurements taken with the cone tip filter are at a maximum and show high resolution of thin soil seams. The cone tip filter is prone to damage on coarse soil particles.

Negative pressures are often measured in dense, silty or clayey sands and hard clays when using the friction sleeve filter. These low pressures are caused by soil elastic rebound (expansion) as the soil moves from the intensely loaded region beneath the cone tip to the less loaded region next to the friction sleeve. Soil expansion can induce large suction forces on the friction sleeve filter, which then often results in decreased filter saturation levels.

Site characteristics and data usage determine which piezometric filter geometry is appropriate. The piezometric filter is placed at the friction sleeve position on the CPTU-EC penetrometer. Generally good results can be obtained using this geometry when proper preparation techniques are followed.

2.10 Downhole Equipment Decontamination and Open Hole Grouting The rod string is retrieved through a rodwasher mounted on the hydraulic ram assembly. High pressure hot water is sprayed from internal nozzles to clean the rod string. Wash water (½ gallon per 10 ft of rod) can be captured for disposal.

The STRATIGRAPHICS grouting system is used to seal open hole. As penetrometers are being advanced, bentonite grout is pumped into the annular space between the smaller diameter sounding rods and the soil formed by the passage of the larger diameter penetrometer. A bypass valve is opened and additional grout is pumped to seal the hole during rod string retrieval. About 3/4 gallons of grout are required to seal 10 ft of open hole.

Pressure grouting during sounding advance controls cross-contamination between different strata. The grout decreases the contact of downhole equipment with contaminated soil. The grout also can decrease friction on the sounding rods, which can allow deeper penetration. Grout levels are checked after completion, and additional grout is added to account for penetration of grout into permeable strata.

3.0 PENETROMETER SAMPLING EQUIPMENT

Groundwater, soil gas, and soil samplers are deployed in the same manner as CPTU-EC penetrometers. Good sample isolation is achieved because no open hole exists during penetrometer operations.

3.1 Groundwater Sampler The STRATIGRAPHICS groundwater sampler is a shielded wellpoint sampler of heavy construction. The shield prevents sampler contamination while penetrating soils above the sampling depth. After shield retraction, groundwater flows under in situ pressure conditions, through a 20 inch long screen, into the 350 ml sample barrel. The sampler is retrieved to pour off the sample and for decontamination. Small diameter pumps can be used with the sampler to acquire large volumes of sample. This sampler can be deployed in any soil capable of being penetrated by the CPTU-EC penetrometer (Strutynsky and others, 1998).

A pressure transducer can be placed inside the sampler barrel. This allows the measurement of sample inflow rate. Analysis of inflow data using rising head slug test methods can provide a means of estimating soil hydraulic conductivities. If equilibrium conditions are reached, a measurement of the static water pressure head is obtained during groundwater sampling.

3.2 Soil Gas Sampler The STRATIGRAPHICS soil gas sampler is a shielded screen sampler, similar to the groundwater sampler. The shield is opened by pulling back the rod string during sampling, and soil gases are then extracted. The shield can be closed, and the rod string advanced to another depth, allowing multiple samples during a single rod trip. Soil gasses are extracted from the rod string. A vacuum box can be used to inflate Tedlar bags for off site analysis. Portable analytical equipment can be used to allow immediate analysis. The sampler, rod string and tubing are purged before sampling.

3.3 Soil Samplers Fixed piston samplers are used to obtain soil samples during penetrometer exploration. The STRATIGRAPHICS and MOSTAP 2-meter samplers are deployed similarly to a penetrometer. A piston, locked into the tip of the barrel to prevent soil from entering the sampler prematurely, is released at the sampling depth. The barrel is then advanced to the bottom of the sampling interval. The soil enters the liners within the barrel and is retained by a core catcher. The sampler is retrieved to remove the sample and for sampler decontamination.

The MOSTAP Sampler is used to obtain 1 inch diameter samples as long as 2 meters (78 inches). This sampler incorporates a PVC liner and a nylon stocking to allow retrieval of such a long sample. As the sample enters the sampler, it is encased in the nylon stocking. The stocking lessens soil friction around on the sample as it enters the PVC liner. At the end of the 2 meter run, the sampler is rotated to twist the stocking, helping retain the sample. This sampler can be used in softer soils.

4.0 PIEZOMETER INSTALLATION TECHNIQUES

Penetrometer methods can be used to install piezometers for water level measurements, slug testing, groundwater sampling, and for remediation activities, such as sparging and soil vapor extraction (SVE). Various installation techniques are available (Saines and others, 1989). Proprietary, low volume change piezometers also can be installed using penetrometer equipment. These piezometers are often used for long term water pressure measurements during geotechnical projects.

PVC piezometers can be installed using either of two techniques. The simplest is to lower 3/4 inch PVC screen and riser into the open hole left after penetrometer retrieval. Installation and material costs are very low for this technique. A drawback is that caving sands or squeezing clays can limit the depth to which the PVC pipe can be lowered.

PVC piezometers also are most often installed using a steel casing pushed to depth. The steel casing is sealed with an expendable tip, which prevents soil from entering the casing during deployment. The PVC screen and risers are lowered into the casing. The steel casing is then withdrawn, leaving the expendable tip and PVC piezometer in place.

5.0 DATA REDUCTION

Test data are monitored as the soundings are performed. Data are recorded on hard disk and may consist of: depth, time, tip and sleeve resistance, generated water pressure, EC, UVF, temperature and natural gamma. Data are processed in-house for final reporting. Before final reporting, data pass a quality control review. Routine checking of proper equipment performance is conducted in the field. Office review helps assure that data quality is maintained throughout the study.

Several parameters can be computed to enhance data correlation:

friction ratio, FR (in %):

$$FR = fs/qc * 100 \qquad \text{(Eq. 1); and}$$

pore pressure ratio, Bq (dimensionless):

$$Bq = (U-Ue)/(qc-Sv) \qquad \text{(Eq. 2);}$$

where: fs is the measured friction sleeve resistance, in TSF;
qc is the measured cone end bearing resistance, in TSF;
U is the measured generated pore water pressure, in TSF;
Ue is the measured or estimated equilibrium pore water pressure, in TSF; and
Sv is the total soil overburden pressure, in TSF.

Measured data and correlated parameters are presented in a graphical sounding log format for each sounding; numerical data are typically tabulated at 0.5 ft intervals. Tabulated digital data in ASCII real format are attached on 3-1/2 inch, 1.44 M floppy disk.

CPTU dissipation test data are recorded as a function of time during pauses in the penetration process. The CPTU dissipation data are normalized using the following equation:

normalized dissipation level, U* (dimensionless):

$$(Ut - Ue) / (U0 - Ue) \qquad \text{(Eq. 3);}$$

where: Ut is the excess pore water pressure at time t, in TSF;
Ue is the measured or estimated equilibrium, undisturbed pore water pressure (in situ pore water pressure before penetrometer insertion), in TSF; and
U0 is the excess pore water pressure at time equal to zero, at the start of the dissipation test, in TSF

The normalized dissipation level is plotted versus log scale time. In uniform soils, the plot takes the shape of a reverse S-curve, beginning at 1.0 at zero time (at the instant the penetration process is stopped) and falling to 0.0 when equilibrium pressures are achieved. Boundary effects in interbedded deposits can cause deviation from this ideal.

An estimate of the horizontal coefficient of soil consolidation can be calculated (Baligh and Levadoux, 1980) using:

$$Ch \text{ (in cm**2/sec)} = (r**2*T)/t \qquad \text{(Eq. 4a).}$$

Estimates of soil hydraulic conductivity in the horizontal direction can be calculated using:

$$kh \text{ (in cm/s)} = ((r**2*T)/t)*RR*(Gw/(2.3*Sv')) \qquad \text{(Eq. 4b);}$$

where: r is the penetrometer radial dimension at the plane of the piezometric filter, equal to 2.2 cm for the friction sleeve filter and 1.9 cm for the cone tip filter;
T is a dimensionless time factor at the 50% normalized dissipation level, equal to 5.5 for the friction sleeve filter and 3.8 for the cone tip filter;
t is the measured time, in seconds, at which the normalized dissipation level is 50%;
RR is a dimensionless soil compressibility parameter;
Gw is the unit weight of water, in kg/cm***3; and
Sv' is the effective soil vertical overburden pressure, in kg/cm**2.

Dissipation test data can be presented in graphical plots and are summarized in tabular form.

6.0 GENERAL DATA EVALUATION

<u>6.1 Sounding Log</u> The CPTU-EC sounding logs provide high resolution information on subsurface conditions. Soil layering is often highly apparent. Soil relative strength and saturation levels can also be evaluated. Zones of anomalous soil electrical conductivity can readily be identified. Lateral continuity of conditions can be developed by overlaying adjacent sounding logs on a light table and comparing layer characteristics for similarities. Digital CPTU-EC data files can be used in two and three dimensional data visualization or CAD software programs.

6.2 Soil Type Classification Correlations between penetrometer data and soil classification have been developed from geotechnical bearing capacity theory and a relational database on adjacent CPT soundings and drilled boreholes (Douglas and Olsen, 1981). A CPT soil classification chart based on cone tip resistance and friction ratio is presented in Appendix A.

The CPT tip resistance increases exponentially with soil grain size. For example, tip resistance in dense sands ranges from about 100 to 400 tons per square foot (TSF), while tip resistance in a stiff clay ranges from about 5 to 15 TSF. The friction ratio (Section 5.0) is also used for indication of soil type. The friction ratio increases with the fines content and compressibility of a soil. The friction ratio is less than about 1% in a sand and greater than about 3% in a clay.

Correlated CPT soil classifications reflect the soil shear resistance to penetration. Soil shear resistance is not entirely controlled by grain size distribution. However, correlated CPT classifications generally agree with classifications based on grain size distribution methods, such as the Unified Soil Classification System (USCS).

The generated water pressure measurement may be useful for classification of saturated soils. Penetration of coarse sand and gravel occurs under drained loading conditions, and equilibrium pressures are measured during penetration. The pore pressure ratio (Section 5.0) is zero in high permeability soils.

For saturated soils of permeability less than about 1*10E-2 cm/sec, undrained loading with significant excess water pressure generation occurs during CPTU. Positive excess water pressures are generally measured during penetration of silt or clay soils when using either the cone tip or friction sleeve filter penetrometer (Section 2.7). Pore pressure ratios of fine grained soils typically range from about 0.4 to 1.0.

Positive excess water pressures are also usually measured in dense, silty or clayey sands when using the cone tip filter penetrometer, with pore pressure ratios from about 0 to 0.3. Due to geometric effects (Section 2.7), negative pressures are usually measured in dense, silty or clayey sands, sandy silts, or hard sandy clays with the friction sleeve filter penetrometer. Thus, it is important to note the type of piezometer in use. The CPTU-EC penetrometer uses a friction sleeve piezometric filter.

6.3 Potentiometric Surfaces Equilibrium water pressures are measured during penetrometer advance in saturated, coarse sands and gravels. Measurements of equilibrium water pressures can be obtained during CPTU in lower permeability soils by pausing during penetration and allowing generated water pressures to dissipate to equilibrium conditions.

6.4 Soil Saturation Soil saturation can be evaluated by inspection of the CPTU sounding log. Atmospheric (zero) pressure is measured during CPTU in unsaturated soils. Hydrostatic pressures are measured in saturated, high permeability soils. Significant water pressures are generated in saturated, low permeability soils due to penetrometer advance. Decreased levels of water pressure generation can be indicative of partially saturated soils. Decreased water pressure generation also may occur in organic soils due to the high compressibility of organic soil particles and the presence of biogenic gases, such as methane and hydrogen sulfide.

6.5 Soil Hydraulic Conductivity Excess water pressures are generated by penetrometer advance in saturated soils with permeability of less than about 1*10E-2 cm/sec. These pressures can be allowed to dissipate during pauses in the penetration process. The CPTU dissipation test is similar to a falling head slug test and can be used to estimate soil hydraulic conductivity in the horizontal direction. Very high water pressures are typically generated in low permeability soils by penetrometer advance. The large water pressure changes require soil compressibility (storage) effects to be included in analyses. The CPTU tip resistance provides an index of soil compressibility for these computations (Section 5.0).

6.6 Soil Electrical Conductivity Behavior Soil electrical conductivity (EC) is controlled by the conductance of both the soil particles and soil pore fluids. The ratio between pore fluid and soil-pore fluid electrical conductivity is termed the formation factor (Archie, 1942). Clays can be electrically conductive due to adsorbed water and ionic electrical charges on the clay platelets. Clay EC depends on mineralogy, porosity and pore fluid characteristics. Sand grains are typically non-conductive, so granular soil conductance is primarily dependent on the conductance of pore fluids and the sand's porosity. The following factors affect granular soil EC: **Pore fluids** Pore fluids play a major role in sand EC. A dry sand has low conductance since both the sand grains and the air in the pore space have very low EC. Sands saturated with conductive liquids, such as brine or landfill leachates, have high electrical conductivity. Hydrocarbons typically decrease EC because of their low conductance.

Saturation Soil saturation has a pronounced effect on soil EC, as conductance increases with water saturation. Low saturation is typically associated with low EC.

Porosity The low porosity of a dense sand results in less pore fluid available for electrical conductance and thus lower EC; the high porosity of a loose sand is associated with higher EC. Formation factors vary as an inverse function of porosity, from about 3 at high porosity to about 4.5 at low porosity.

Clay content The addition of as little as 5% clay to a sand can significantly increase soil electrical conductance (Windle, 1977).

Gravel Interference The high resolution of the STRATIGRAPHICS CPTU-EC electrode array makes measurements sensitive to soil grain size. Two behaviors can occur when penetrating gravelly soils. One can occur when a large particle is crushed against an electrode, masking it from the pore fluids, which results in very low EC values. This can result in false positive hydrocarbon interpretations. An opposite behavior is observed in gravel deposits which contain few fine grained, intersticial soils. The resolution of the EC measurement is so high that electrical conductance paths are often entirely within the pore fluid of the coarse grained soil. In this situation, high EC values are measured, more closely reflecting pore fluid EC, rather than soil EC.

6.7 EC Evaluation EC data are evaluated for qualitative geochemical characteristics in conjunction with piezometric data and soil types. Anomalous zones possibly indicative of contaminants can be directly sampled for quantitative chemical analysis.

Vadose Zone Low or zero EC values are measured in dry sandy soils. Increased EC in sands above the water table may indicate moisture infiltration. Low EC data in silty or clayey soils can be anomalous as fine grained soils often retain significant amounts of moisture within their pore spaces, creating good conditions for electrical conductance. Thus, low EC values in silty or clayey soils in the vadose zone may indicate hydrocarbon contamination. Elevated EC values in the vadose zone may be associated with road deicing salts, buried metals and rusted metal objects, flyash and cinders, among others.

Saturated Soils Low EC values in saturated soils can be indicative of anomalous geochemistry. In particular, depressed EC zones immediately at the water table may be associated with floating (LNAPL) compounds. Very low EC zones at interfaces between aquifers and aquitards may be associated with either floating (LNAPL) or sinking (DNAPL) compounds. Gravel interference must be considered when evaluating depressed EC zones in saturated soils.

Elevated EC values in saturated soils can be due to increased soil clay content or to increased dissolved salts in the ground water. Increased clay contents are evaluated based on the CPTU-EC piezometric data and soil type information. Zones of elevated EC immediately above an aquiclude may be associated with brines (Strutynsky and others, 1998).

6.8 UV Fluorescence Behavior Fluorimetry (measurement of fluorescence) has been used for many years for the detection and identification of various compounds and minerals. An excitation light of short wavelength is used to expose the specimen. If fluorescent compounds or minerals are present, light of longer wavelength, as compared to the excitation wavelength, will be emitted from the specimen. This resulting light can be monitored for intensity and spectral distribution.

Compounds that fluoresce include a wide range of hydrocarbon and other organic compounds. Heavy hydrocarbons (e.g. fuel oil and coal tars) fluoresce at relatively long wavelength excitation. As excitation wavelength decreases below about 300 nm, fluorescence from lighter hydrocarbons (e.g. jet fuel and gasoline) is observed. In addition to hydrocarbons, other compounds and minerals, such as fluorites and other carbonates, also exhibit fluorescence. Compounds that fluoresce include dyes and optical brighteners. Dyes and brighteners can be found in paints, detergents, antifreeze compounds, some food additives and cosmetics, among others. UVF response will be affected by the presence of any such compounds.

6.9 CPT-SPT Correlation Since most geoscientists are familiar with drilling and split spoon sampling, CPT data have been correlated with SPT blowcount N-values. The SPT N-value is defined by ASTM to be the number of blows of a 140 lb hammer, dropped 30 inches, required to drive a 2 inch outside diameter sampler 12 inches into the bottom of the borehole, after an initial seating drive of 6 inches. Correlations of CPT to the crude SPT have been based on numerical modeling of the two penetration processes and on side by side comparisons (Douglas and others, 1981). Details on CPT-SPT correlations are included in Appendix A

7.0 OPTIONAL GEOTECHNICAL DATA CORRELATION

CPT data have been correlated with soil type, drained friction angle, undrained shear strength, relative density and SPT blowcounts, among others. A correlation scheme including tip resistance and friction ratio has generally proved most useful for evaluating CPT data. Correlation of CPT data with other parameters has been developed using: 1) comparisons between CPT data and results of other in situ and laboratory tests in adjacent boreholes; 2) CPT testing on large scale soil samples of known composition; and 3) geotechnical bearing capacity and cavity expansion theory. Site specific information can be used to fine tune correlations. Additional information on correlation techniques, including overburden pressure normalization, test drainage conditions and recommended practices, is presented in Appendix A.

8.0 PROGRAM RESULTS

Acquired data are presented following the report text and consist of: 1) sounding logs with lithologic evaluation; 2) data presentation sounding logs; and 3) tabulations of correlated geotechnical parameters, including soil classifications.

It should be noted that the computerized correlations of soil types and other geotechnical properties were generated using a global rather than site specific data base. Use of site specific data was beyond the scope of this study.

9.0 STATEMENT OF LIMITATIONS

Subsurface information was gathered only at the sounding locations. Extrapolation of sounding data to develop stratigraphic continuity is conjectural. Actual site conditions between sounding locations may differ.

Computer correlation of penetrometer data with other parameters was performed using generalized charts rather than on site specific information. Site specific correlation work based on results of detailed laboratory testing was beyond the scope of this project. Evaluation of soil saturation levels and potentiometric surfaces is only representative of conditions encountered during the field program. Seasonal variation must be expected.

Data gathering for this study was attempted to be performed in general accordance with accepted procedures and practices. Correlation of penetrometer data with other parameters is empirical and should not be considered as the exact equivalent of laboratory testing. STRATIGRAPHICS shall not be responsible for another's interpretation of the information obtained for this study.

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TABLE 1
SUMMARY OF CPTU-EC DISSIPATION TEST DATA
Stratford Army Engine Plant
Stratford, Connecticut

SOUNDING NUMBER	DEPTH (ft)	SOIL TYPE AT DISSIPATION DEPTH	t50 (sec)	ESTIMATED SOIL HORIZONTAL HYDRAULIC CONDUCTIVITY kh (cm/sec)
CP-9901	79.4	Silty sand or fine sand	5.0	2E-04
	92.4	Silty sand or fine sand	6.5	1E-04
	104.3	Silty sand or fine sand	6.5	1E-04
CP-9902	27.1	Silty sand or fine sand	4.5	6E-04
	34.2	Silty sand or fine sand	1.5	1E-03
	47.8	Silty sand or fine sand	3.5	4E-04
	50.1	Silty sand or fine sand	9.5	2E-04
	57.3	Silty sand or fine sand	3.5	4E-04
	66.8	Silty sand or fine sand	5.5	2E-04
	69.6	Silty sand or fine sand	5.5	2E-04
	97.0	Silty sand or fine sand	0.5	2E-03
	99.1	Silty sand or fine sand	0.5	2E-03
CP-9903	21.5	Gravelly, silty sand	1.5	2E-03
	27.0	Silty sand or fine sand	5.0	5E-04
	30.3	Silty sand or fine sand	1.5	1E-03
	63.9	Clayey sand or micaceous sand	4.5	3E-04
	66.3	Clayey sand or micaceous sand	12.5	9E-05
	72.8	Clayey sand or micaceous sand	6.0	2E-04
	92.4	Clayey sand or micaceous sand	3.0	3E-04
	102.2	Clayey sand or micaceous sand	3.5	2E-04
CP-9904	20.8	Silty sand or fine sand	8.5	4E-04
	125.8	Silty sand or fine sand	2.5	2E-04
CP-9905	71.2	Silty sand or fine sand	4.0	3E-04
CP-9906	30.5	Silty sand or fine sand	6.5	4E-04
	42.6	Clayey sand or micaceous sand	4.5	2E-04
	60.1	Clayey sand or micaceous sand	1.5	8E-04
	115.9	Clayey sand or micaceous sand	7.5	9E-05
	125.8	Silty sand or fine sand	1.5	4E-04
CP-9908	40.2	Silty sand or fine sand	13.0	1E-04
CP-9909	44.6	Clayey sand or micaceous sand	59.0	3E-05
	92.5	Silty sand or fine sand	9.0	1E-04
CP-9910	30.2	Silty/fine sand, possibly cemented	0.5	4E-03
	38.0	Silty/fine sand, possibly cemented	2.5	7E-04
CP-9913	49.7	Silty sand or fine sand	2.5	5E-04
	53.0	Silty sand or fine sand	5.5	2E-04
	56.2	Silty sand or fine sand	17.5	7E-05
	86.0	Silty sand or fine sand	3.5	2E-04
	89.9	Silty sand or fine sand	3.0	3E-04

TABLE 2
SUMMARY OF CPTU-EC SOUNDINGS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SOUNDING NUMBER	DATE PERFORMED	SOUNDING TYPE	SOUNDING DEPTH (feet)	COMMENTS
CP-9901	05/05/99	CPTU-EC	131.6	
CP-9902	05/06/99	CPTU-EC	136.3	
CP-9903	05/10/99	CPTU-EC	116.4	
CP-9904	05/06/99	CPTU-EC	162.4	
CP-9905	05/07/99	CPTU-EC	132.8	
CP-9906	05/08/99	CPTU-EC	139.5	
CP-9907	05/11/99	CPTU-EC	115.7	
CP-9908	05/20/99	CPTU-EC	158.8	
CP-9909	05/09/99	CPTU-EC	92.6	
CP-9910	05/18/99	CPTU-EC	75.9	
CP-9911	05/12/99	CPTU-EC	78.6	
CP-9912	05/10/99	CPTU-EC	121.6	
CP-9913	05/12/99	CPTU-EC	144.7	
CP-9914A	05/18/99	CPTU-EC	38.5	
CP-9915	05/20/99	CPTU-EC	59.2	
CP-9916	05/20/99	CPTU-EC	87.8	

TABLE 3
SUMMARY OF SAMPLING
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SAMPLE NUMBER	DATE SAMPLED	SAMPLER TYPE	DEPTH INTERVAL (in feet)	COMMENTS
GWS-9901-130	05/05/99	STRATIGRAPHICS groundwater sampler	128.5 - 130.3	
GWS-9901-98	05/05/98	STRATIGRAPHICS groundwater sampler	96.0 - 97.8	
GWS-9901-80	05/05/98	STRATIGRAPHICS groundwater sampler	78.0 - 79.8	
GWS-9901-56	05/05/98	STRATIGRAPHICS groundwater sampler	54.0 - 55.8	
GWS-9901-42	05/05/98	STRATIGRAPHICS groundwater sampler	40.0 - 41.5	
GWS-9902-133	05/06/99	STRATIGRAPHICS groundwater sampler	131.5 - 133.3	
GWS-9902-96	05/06/99	STRATIGRAPHICS groundwater sampler	94.0 - 95.8	
GWS-9902-44	05/06/99	STRATIGRAPHICS groundwater sampler	42.4 - 44.2	
GWS-9902-32	05/06/99	STRATIGRAPHICS groundwater sampler	30.0 - 31.8	
GWS-9902-20	05/06/99	STRATIGRAPHICS groundwater sampler	18.0 - 19.8	
PZ-9902-9	05/06/99	3/4 INCH PVC piezometer	7.0 8.8	
GWS-9903-114	05/10/99	STRATIGRAPHICS groundwater sampler	112.3 - 114.0	
GWS-9903-97	05/10/99	STRATIGRAPHICS groundwater sampler	94.7 - 96.5	
GWS-9903-76	05/10/99	STRATIGRAPHICS groundwater sampler	74.4 - 76.2	
GWS-9903-56	05/10/99	STRATIGRAPHICS groundwater sampler	54.5 - 56.0	
GWS-9903-39	05/10/99	STRATIGRAPHICS groundwater sampler	37.2 - 39.0	
GWS-9904-159	05/07/99	STRATIGRAPHICS groundwater sampler	157.4 - 159.1	
GWS-9904-112	05/07/99	STRATIGRAPHICS groundwater sampler	110.0 - 111.8	
GWS-9904-85	05/07/99	STRATIGRAPHICS groundwater sampler	86.0 - 87.8	
GWS-9904-45	05/07/99	STRATIGRAPHICS groundwater sampler	43.2 - 45.0	
GWS-9904-34	05/07/99	STRATIGRAPHICS groundwater sampler	32.0 - 33.8	
GWS-9905-131	05/07/99	STRATIGRAPHICS groundwater sampler	129.7 - 131.4	
GWS-9905-99	05/07/99	STRATIGRAPHICS groundwater sampler	97.0 - 98.8	
GWS-9905-74	05/07/99	STRATIGRAPHICS groundwater sampler	72.5 - 74.3	

TABLE 3
SUMMARY OF SAMPLING
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

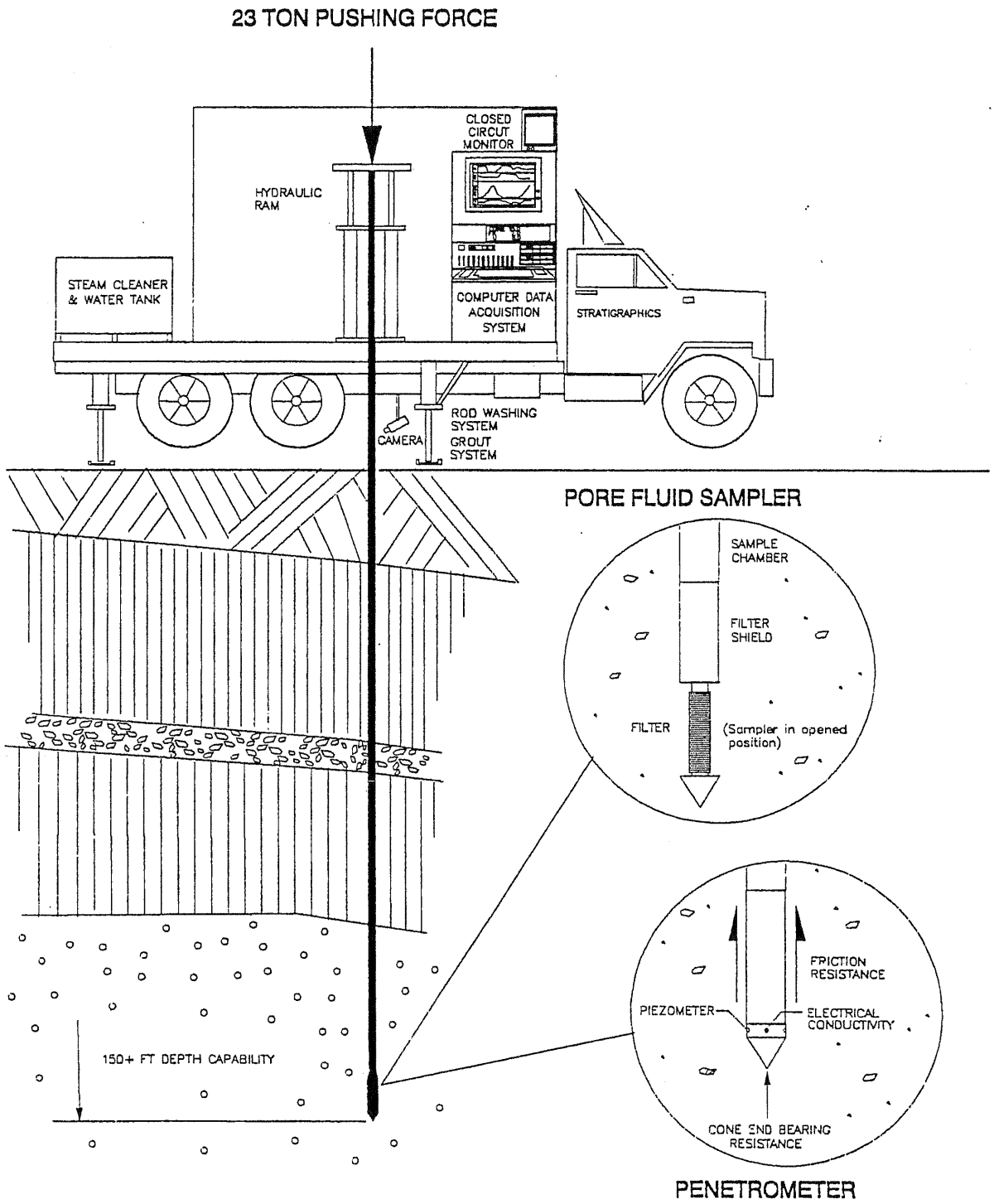
SAMPLE NUMBER	DATE SAMPLED	SAMPLER TYPE	DEPTH INTERVAL (in feet)	COMMENTS
GWS-9905-56	05/07/99	STRATIGRAPHICS groundwater sampler	54.6 - 56.4	
GWS-9905-33	05/07/99	STRATIGRAPHICS groundwater sampler	30.8 - 32.8	
GWS-9906-128	05/09/99	STRATIGRAPHICS groundwater sampler	126.2 - 128.0	
GWS-9906-114	05/09/99	STRATIGRAPHICS groundwater sampler	112.0 - 113.8	
GWS-9906-80	05/09/99	STRATIGRAPHICS groundwater sampler	78.0 - 79.8	
GWS-9906-52	05/09/99	STRATIGRAPHICS groundwater sampler	50.0 - 51.8	
GWS-9906-30	05/09/99	STRATIGRAPHICS groundwater sampler	28.0 - 29.8	
GWS-9907-115	05/11/99	STRATIGRAPHICS groundwater sampler	113.2 - 115.0	
GWS-9907-86	05/11/99	STRATIGRAPHICS groundwater sampler	84.0 - 85.8	
GWS-9907-70	05/11/99	STRATIGRAPHICS groundwater sampler	68.0 - 69.8	
GWS-9907-39	05/11/99	STRATIGRAPHICS groundwater sampler	37.4 - 39.2	
GWS-9907-20	05/11/99	STRATIGRAPHICS groundwater sampler	18.4 - 20.3	
GWS-9908-158	05/08/99	STRATIGRAPHICS groundwater sampler	156.3 - 158.5	
GWS-9908-135	05/08/99	STRATIGRAPHICS groundwater sampler	133.2 - 135.0	
GWS-9908-101	05/19/99	STRATIGRAPHICS groundwater sampler	99.2 - 101.0	
GWS-9908-73	05/19/99	STRATIGRAPHICS groundwater sampler	71.2 - 73.0	
GWS-9908-62	05/19/99	STRATIGRAPHICS groundwater sampler	60.2 - 62.0	
GWS-9908-46	05/19/99	STRATIGRAPHICS groundwater sampler	44.0 - 45.8	
GWS-9908-34	05/19/99	STRATIGRAPHICS groundwater sampler	32.0 - 33.8	
GWS-9908-14	05/19/99	STRATIGRAPHICS groundwater sampler	12.0 - 13.8	
GWS-9909-90	05/09/99	STRATIGRAPHICS groundwater sampler	88.0 - 89.8	
GWS-9909-34	05/09/99	STRATIGRAPHICS groundwater sampler	33.0 - 34.5	
GWS-9910-75	05/18/99	STRATIGRAPHICS groundwater sampler	73.3 - 75.1	
GWS-9910-59	05/18/99	STRATIGRAPHICS groundwater sampler	57.8 - 59.6	

TABLE 3
SUMMARY OF SAMPLING
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SAMPLE NUMBER	DATE SAMPLED	SAMPLER TYPE	DEPTH INTERVAL (in feet)	COMMENTS
GWS-9910-50	05/18/99	STRATIGRAPHICS groundwater sampler	48.0 - 49.8	
GWS-9910-42	05/18/99	STRATIGRAPHICS groundwater sampler	40.8 - 42.6	
GWS-9910-36	05/18/99	STRATIGRAPHICS groundwater sampler	34.5 - 36.3	
GWS-9910-29	05/18/99	STRATIGRAPHICS groundwater sampler	27.0 - 28.8	
GWS-9911-78	05/12/99	STRATIGRAPHICS groundwater sampler	75.7 - 77.5	
GWS-9911-60	05/12/99	STRATIGRAPHICS groundwater sampler	58.0 - 59.8	
GWS-9911-46	05/12/99	STRATIGRAPHICS groundwater sampler	44.6 - 46.4	
GWS-9911-16	05/12/99	STRATIGRAPHICS groundwater sampler	14.5 - 16.3	
GWS-9912-121	05/10/99	STRATIGRAPHICS groundwater sampler	119.8 - 121.6	
GWS-9912-82	05/10/99	STRATIGRAPHICS groundwater sampler	90.0 - 91.8	
GWS-9912-56	05/10/99	STRATIGRAPHICS groundwater sampler	54.6 - 56.4	
GWS-9912-21	05/10/99	STRATIGRAPHICS groundwater sampler	19.6 - 21.4	
GWS-9912-11	05/10/99	STRATIGRAPHICS groundwater sampler	9.0 - 10.8	
GWS-9914-42	05/19/99	STRATIGRAPHICS groundwater sampler	40.6 - 42.4	
GWS-9914-31	05/19/99	STRATIGRAPHICS groundwater sampler	29.0 - 30.8	
GWS-9914-18	05/19/99	STRATIGRAPHICS groundwater sampler	15.3 - 18.1	
GWS-9915-59	05/20/99	STRATIGRAPHICS groundwater sampler	57.4 - 59.2	
GWS-9915-47	05/20/99	STRATIGRAPHICS groundwater sampler	45.5 - 47.0	
GWS-9915-41	05/20/99	STRATIGRAPHICS groundwater sampler	39.0 - 40.8	
GWS-9915-32	05/20/99	STRATIGRAPHICS groundwater sampler	29.7 - 31.5	
GWS-9916-94	05/21/99	STRATIGRAPHICS groundwater sampler	92.3 - 94.0	
GWS-9916-78	05/21/99	STRATIGRAPHICS groundwater sampler	75.7 - 77.5	
GWS-9916-63	05/21/99	STRATIGRAPHICS groundwater sampler	62.7 - 63.5	
GWS-9916-53	05/21/99	STRATIGRAPHICS groundwater sampler	51.0 - 52.8	

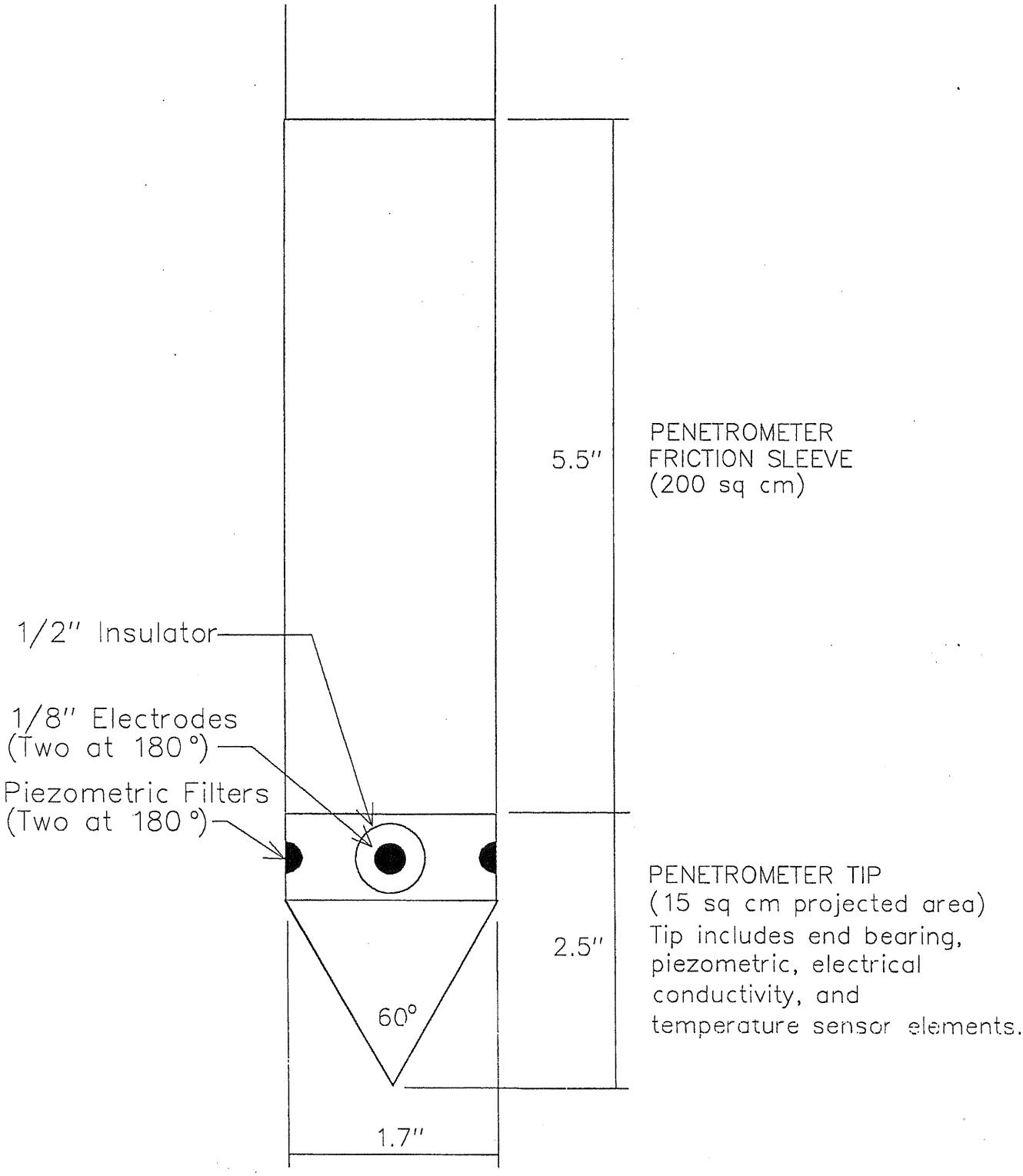
TABLE 3
SUMMARY OF SAMPLING
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SAMPLE NUMBER	DATE SAMPLED	SAMPLER TYPE	DEPTH INTERVAL (in feet)	COMMENTS
GWS-9916-36	05/21/99	STRATIGRAPHICS groundwater sampler	34.6 - 36.4	
GWS-9916-28	05/21/99	STRATIGRAPHICS groundwater sampler	26.7 - 28.5	
GWS-9917-63	05/26/99	STRATIGRAPHICS groundwater sampler	60.9 - 62.7	
GWS-9917-46	05/26/99	STRATIGRAPHICS groundwater sampler	44.0 - 45.8	
GWS-9917-32	05/26/99	STRATIGRAPHICS groundwater sampler	29.0 - 31.8	
GWS-9918-148	05/25/99	STRATIGRAPHICS groundwater sampler	146.2 - 148.0	
GWS-9918-134	05/25/99	STRATIGRAPHICS groundwater sampler	132.6 - 134.4	
GWS-9918-100	05/25/99	STRATIGRAPHICS groundwater sampler	98.6 - 100.4	
GWS-9918-13	05/25/99	STRATIGRAPHICS groundwater sampler	11.5 - 13.3	
GWS-9918-73	05/25/99	STRATIGRAPHICS groundwater sampler	71.4 - 73.2	
GWS-9918-61	05/25/99	STRATIGRAPHICS groundwater sampler	59.2 - 61.0	
GWS-9918-46	05/25/99	STRATIGRAPHICS groundwater sampler	44.0 - 45.8	
GWS-9918-34	05/25/99	STRATIGRAPHICS groundwater sampler	33.0 - 34.8	



PENETROMETER SUBSURFACE EXPLORATION SYSTEM

STRATIGRAPHICS



NOTE:

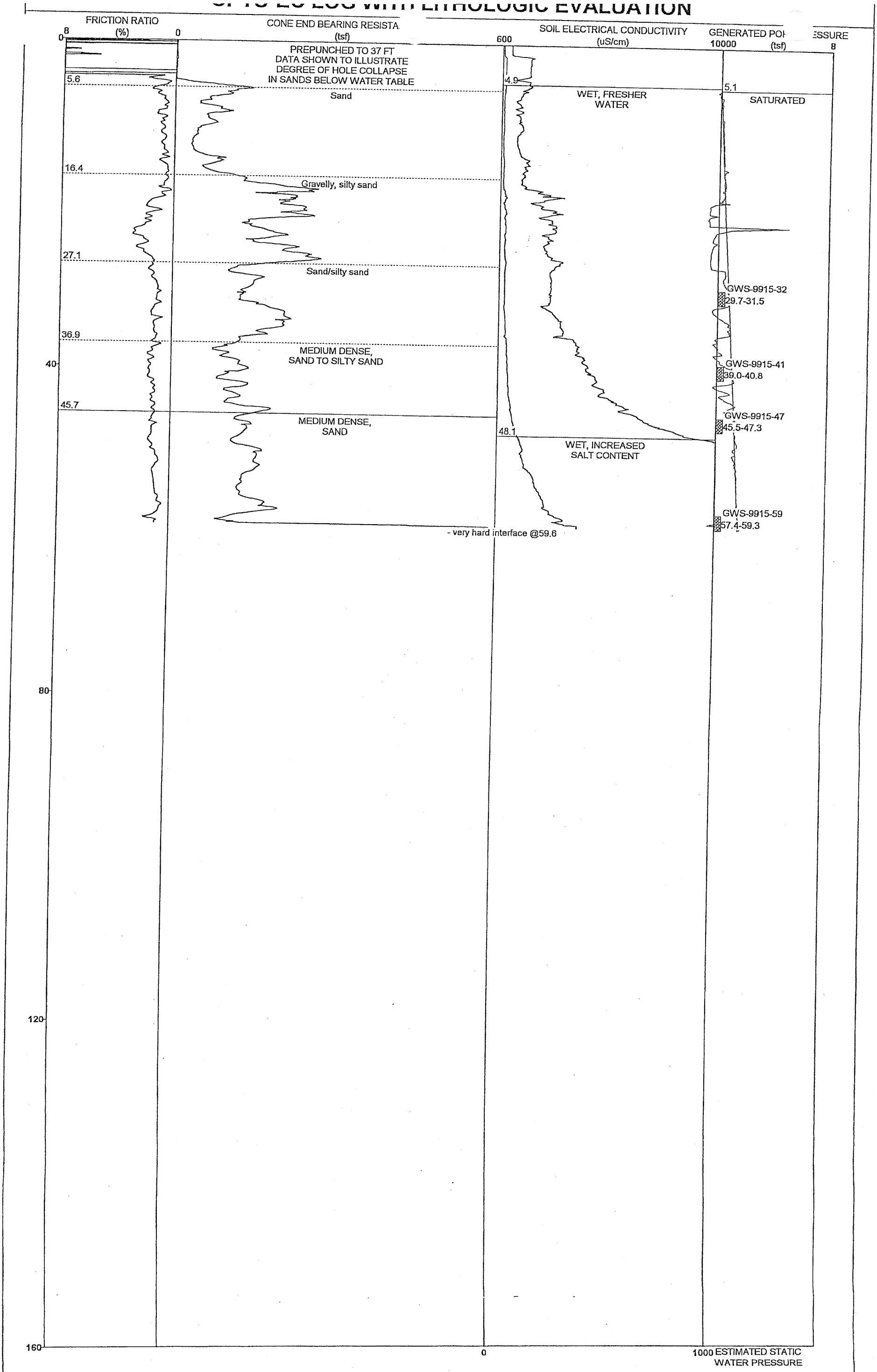
1. All dimensions approximate.

STRATIGRAPHICS

PENETROMETER
FOR CPTU-EC TESTING

Figure 1a

CPT0 20 LOG WITH LITHOLOGIC EVALUATION

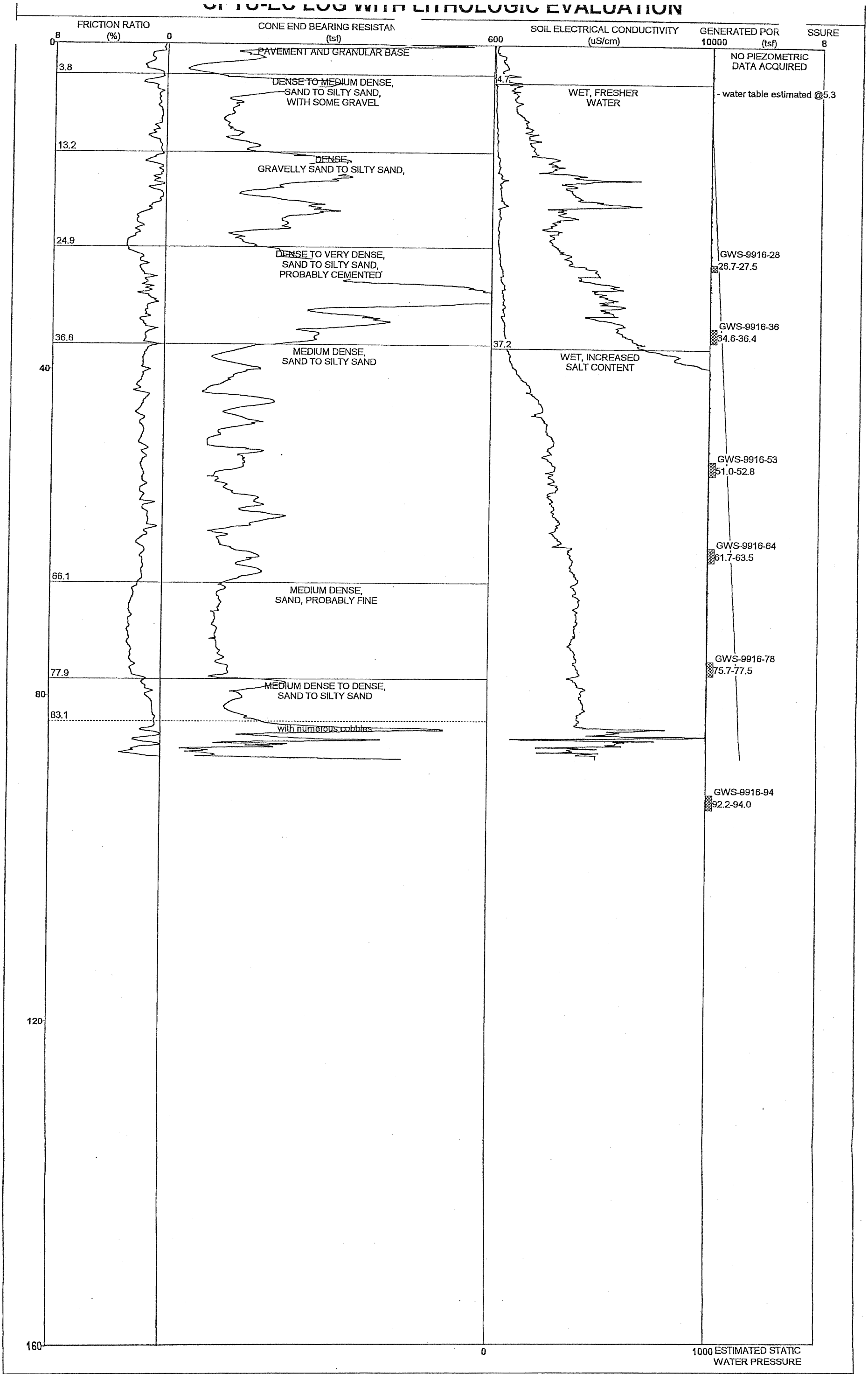


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-20-1999 TIME:10:55:48.01
SOUNDING NUMBER:cp-9915

CPT0-LC LOG WITH LITHOLOGIC EVALUATION

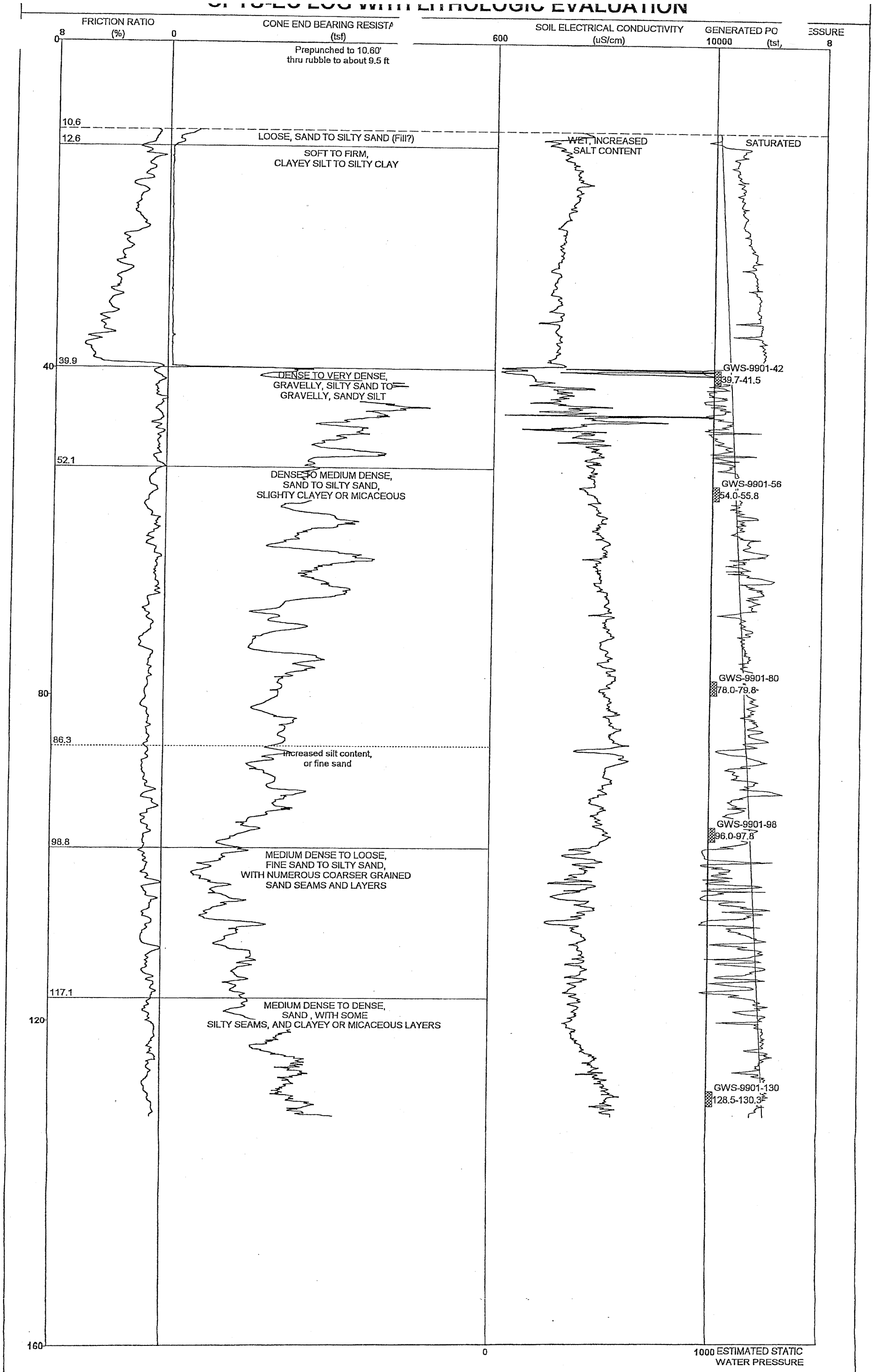


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-20-1999 TIME:15:45:04.69
SOUNDING NUMBER:CP-9916

CPT0-LOG WITH LITHOLOGIC EVALUATION

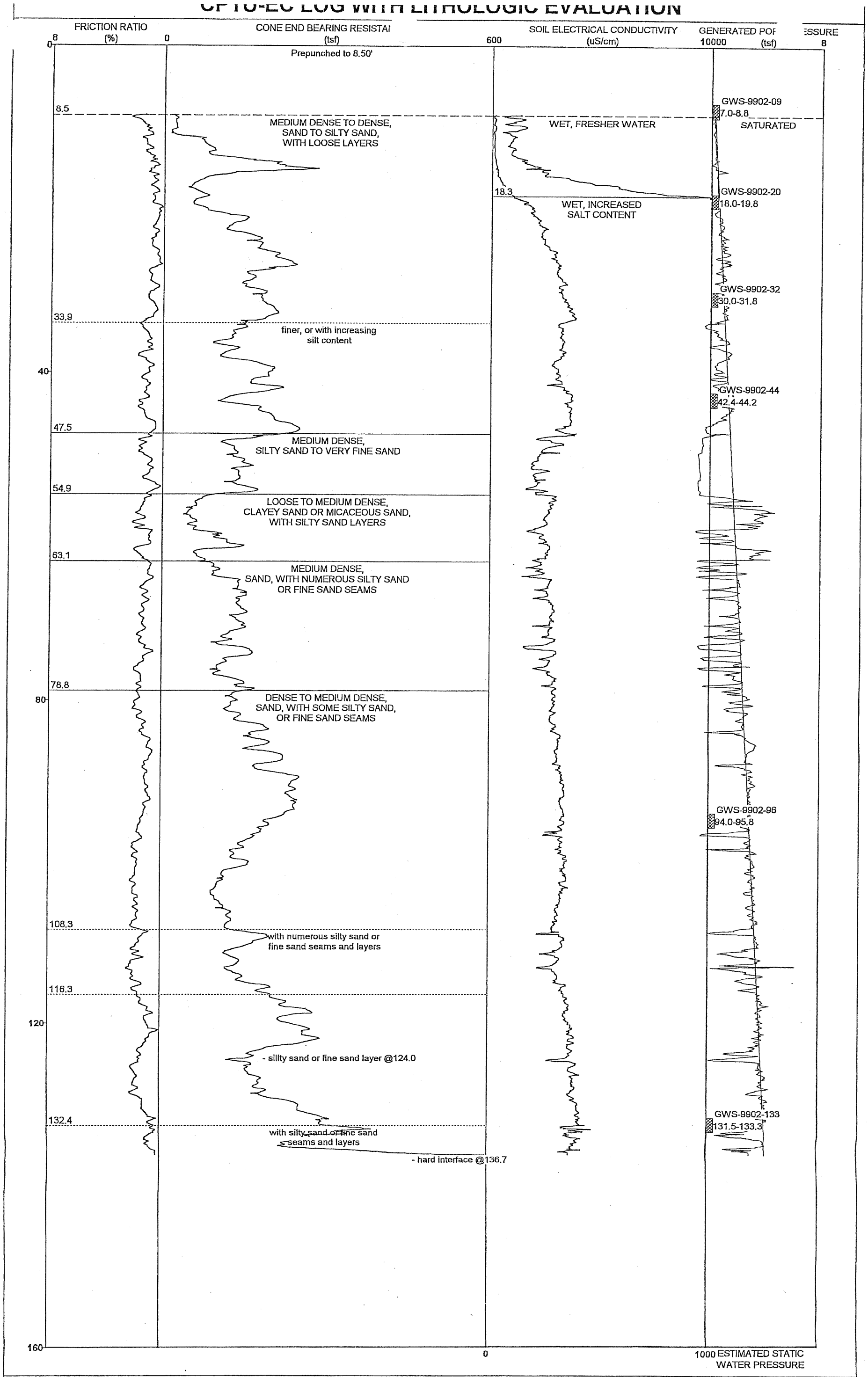


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

CPTU-EC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

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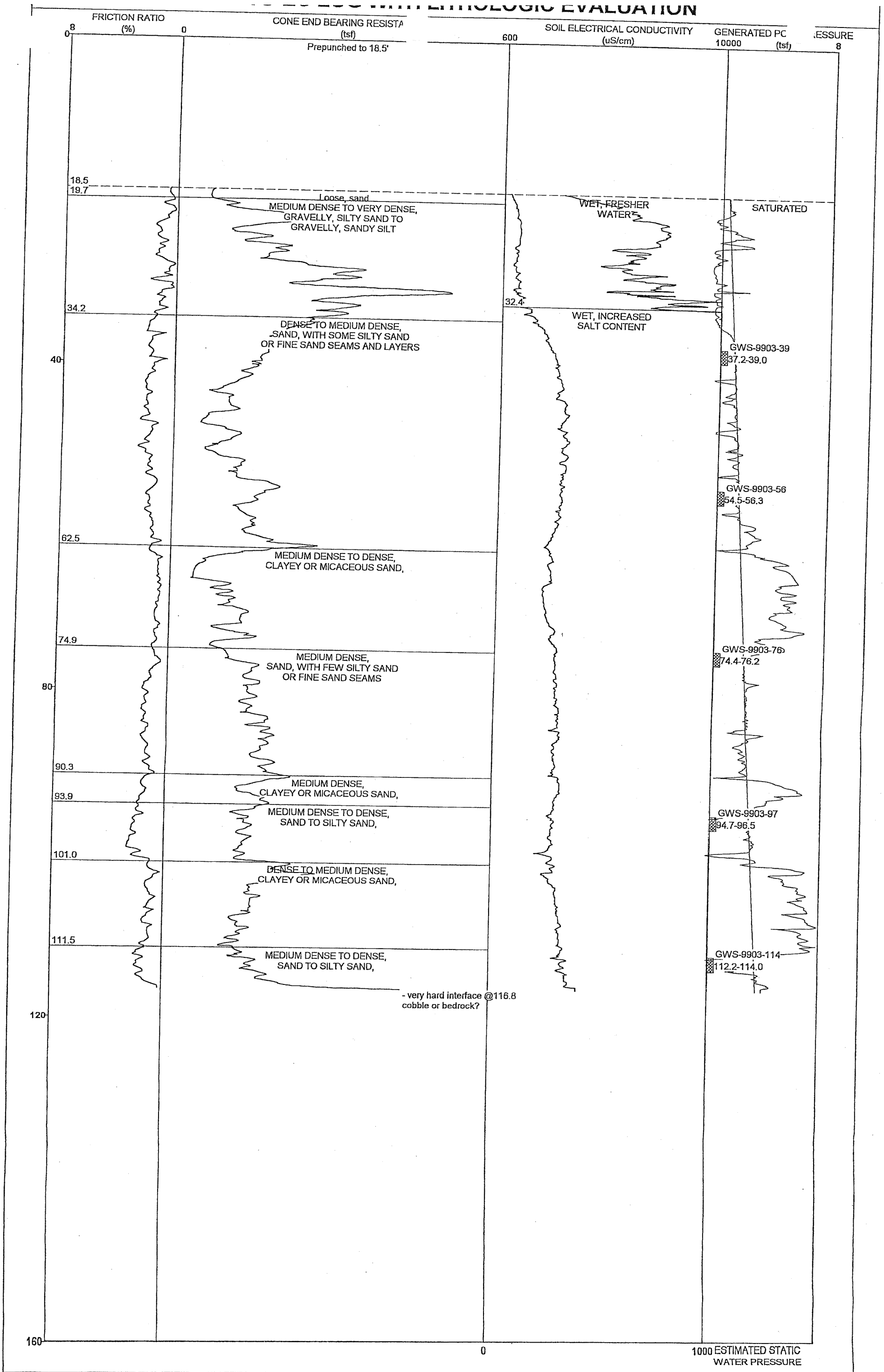
SOUNDING NUMBER:cp-9902

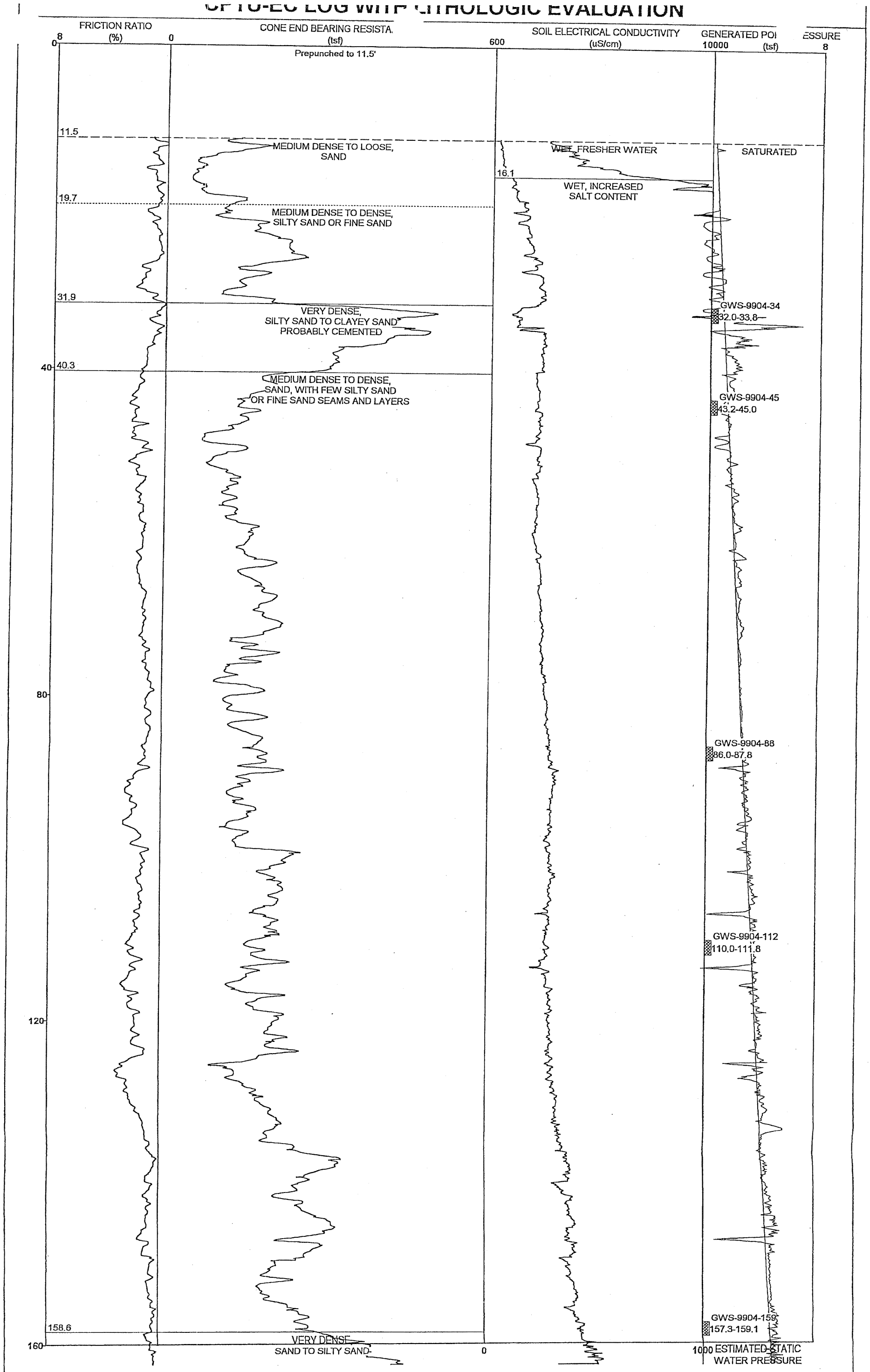


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-10-1999 TIME:08:21:07.97
SOUNDING NUMBER:cp-9903

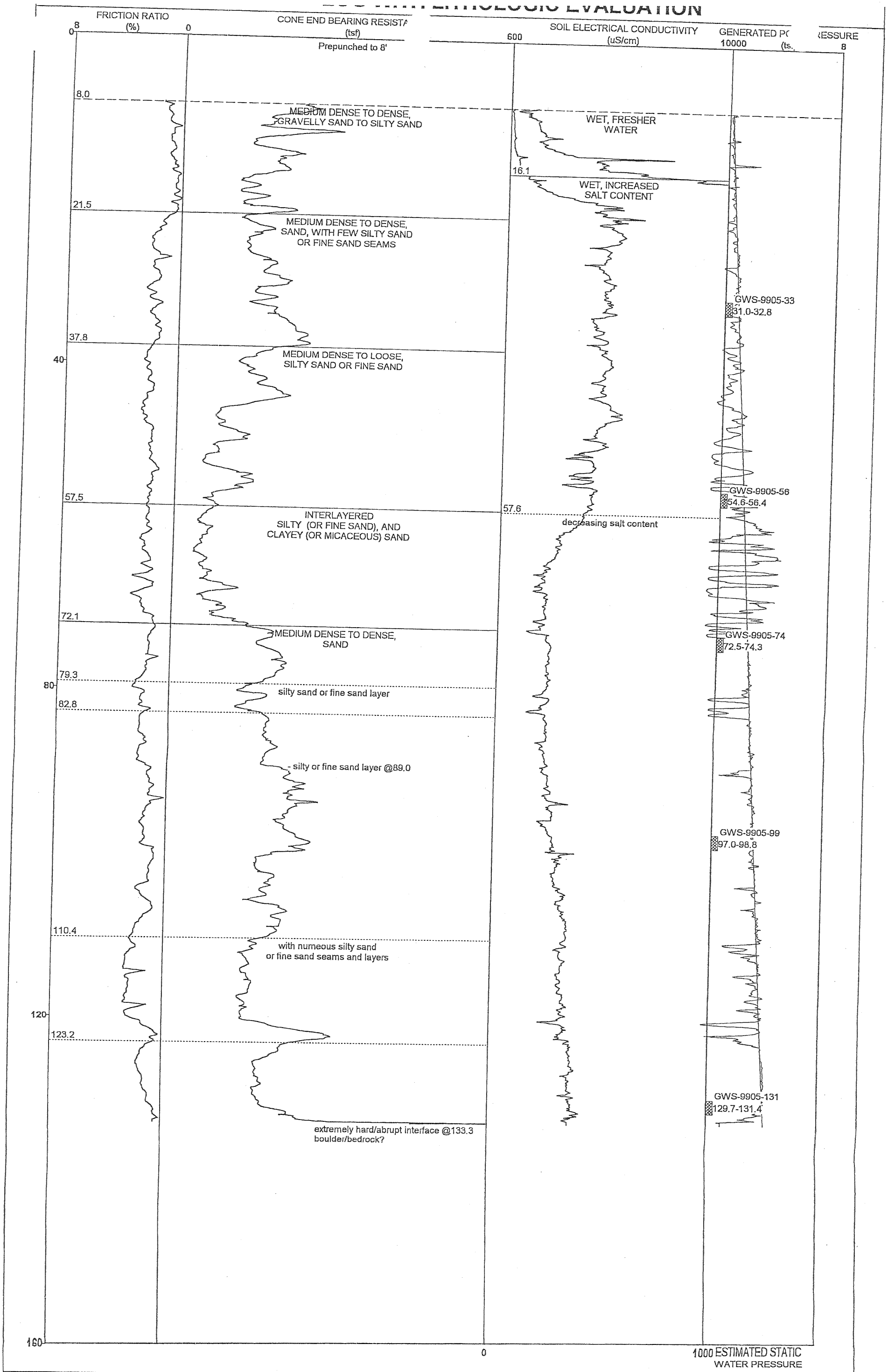
CPT U-EC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

05/06/99
SOUNDING NUMBER:cp9904

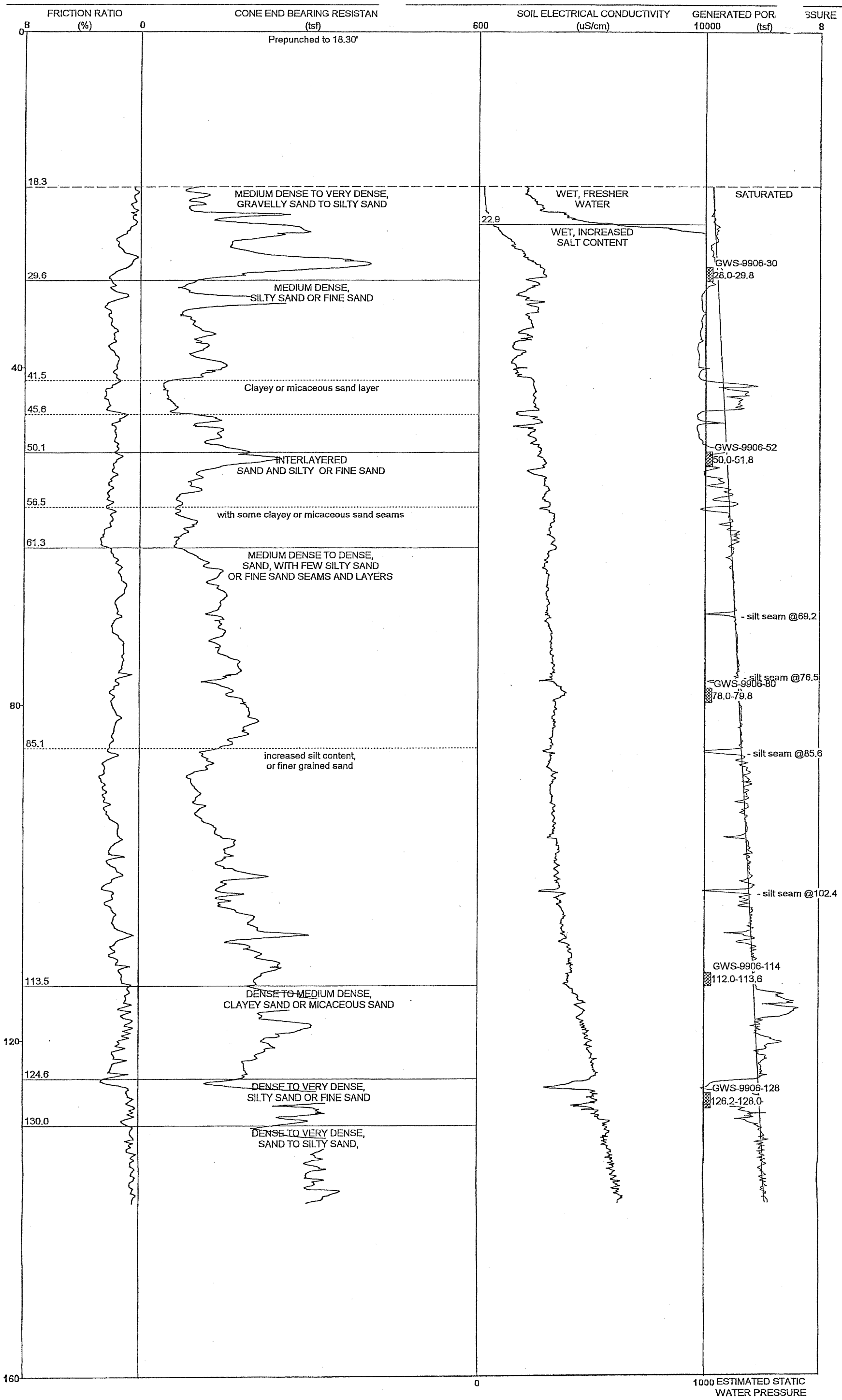


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

CPTU-LC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

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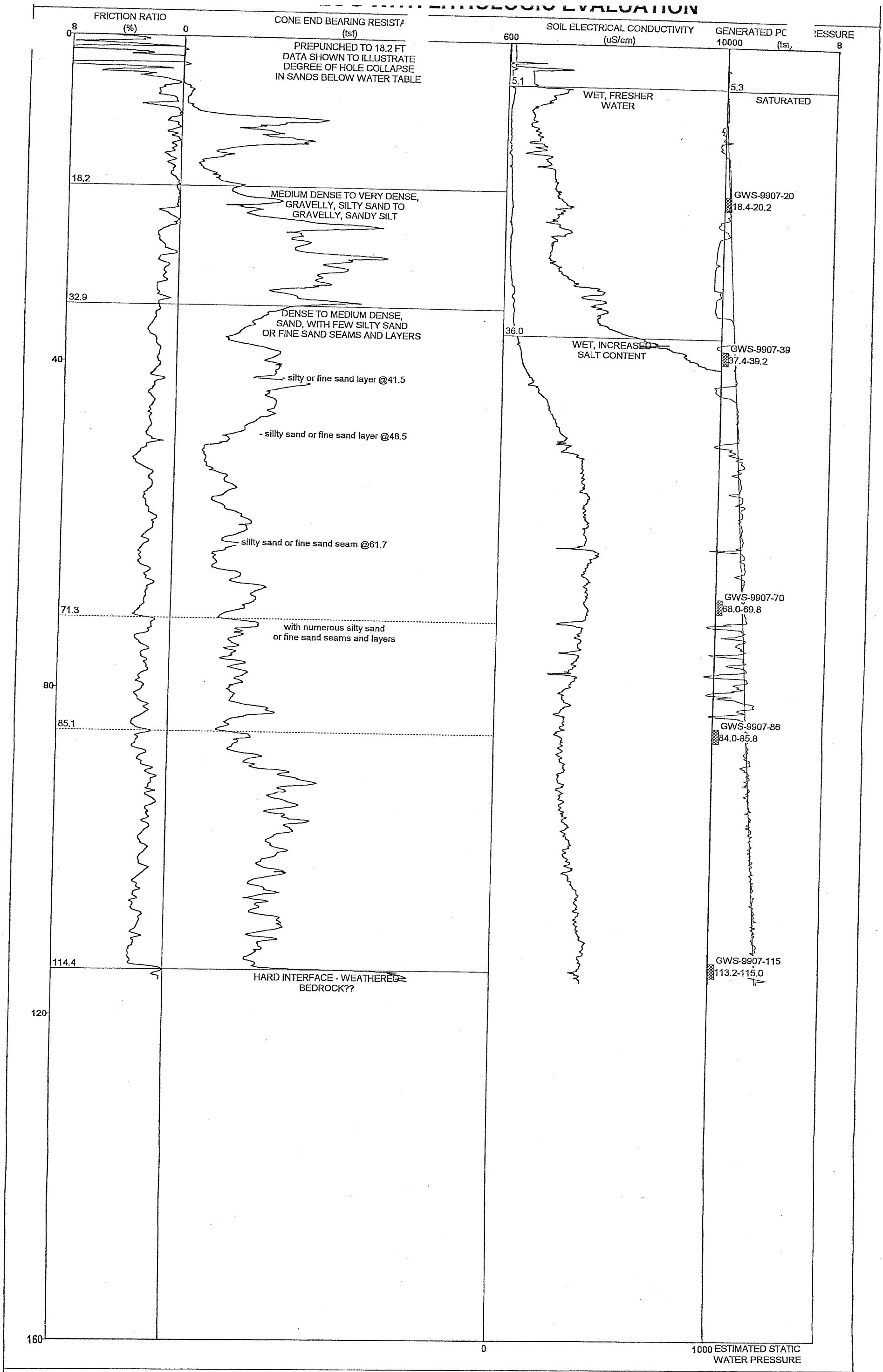
SOUNDING NUMBER:cp-9906

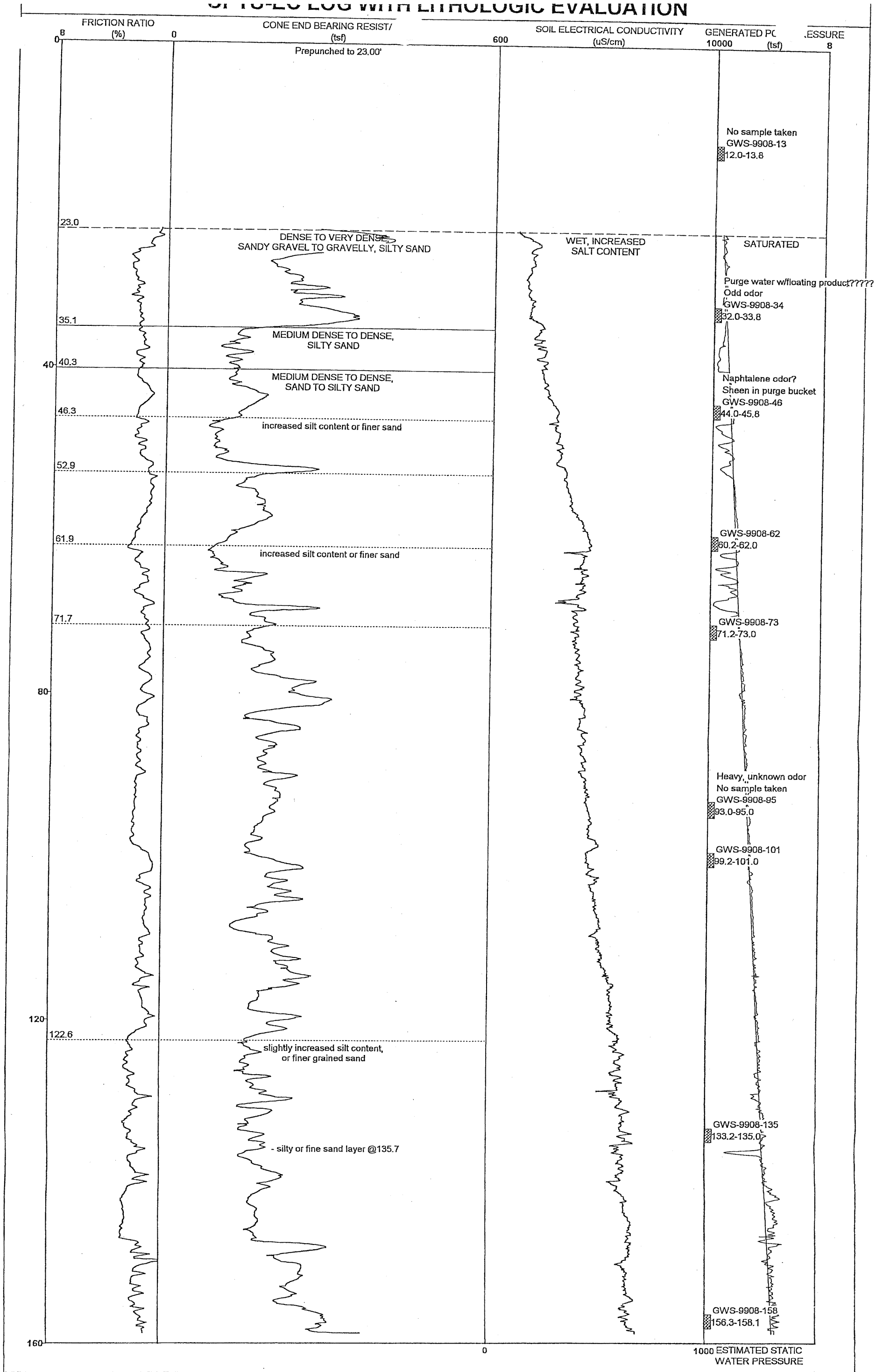


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

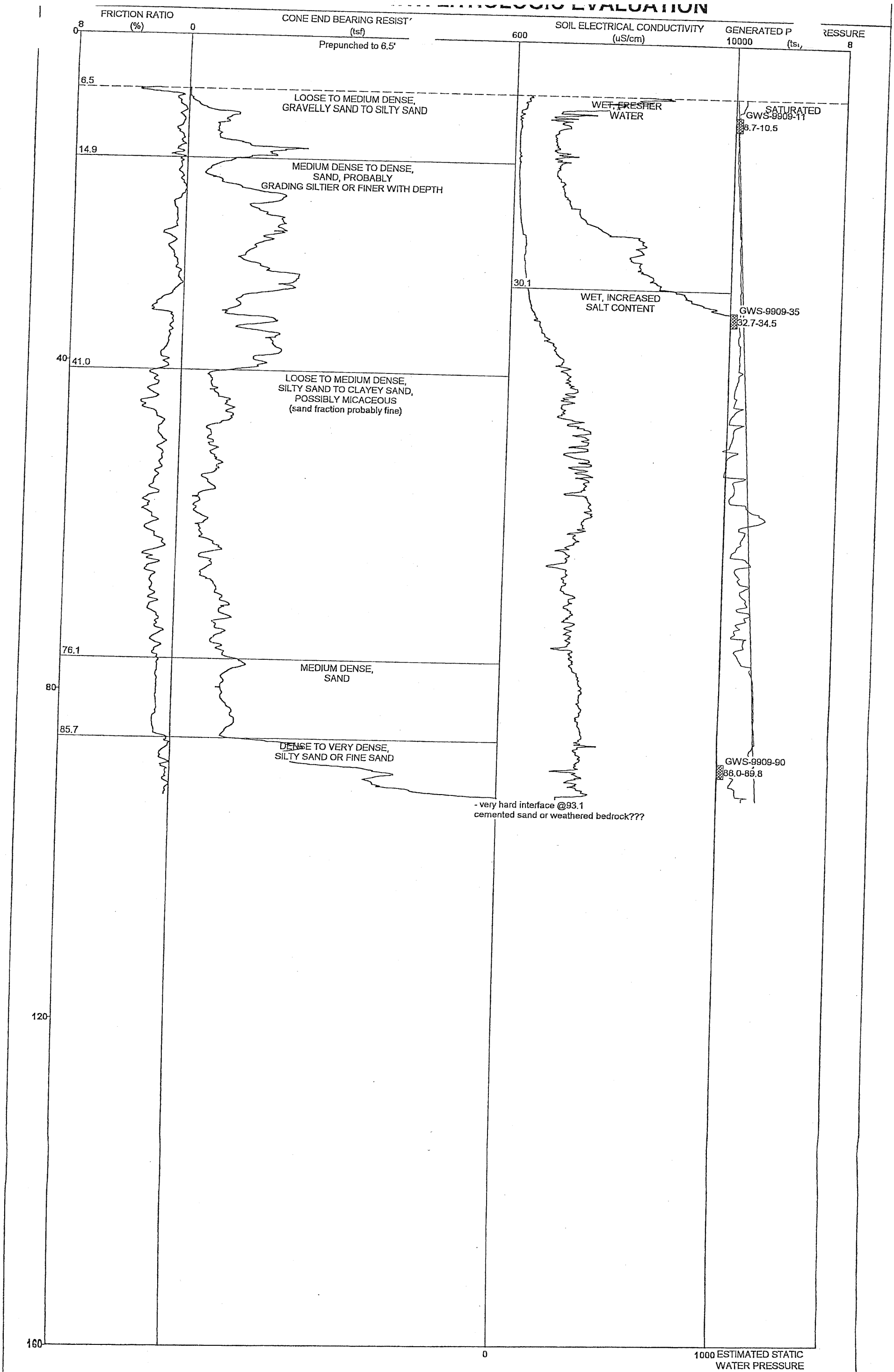
CPT0-20 LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50

STRATIGRAPHICS

DATE: 05/08/99
SOUNDING NUMBER:cp-9908

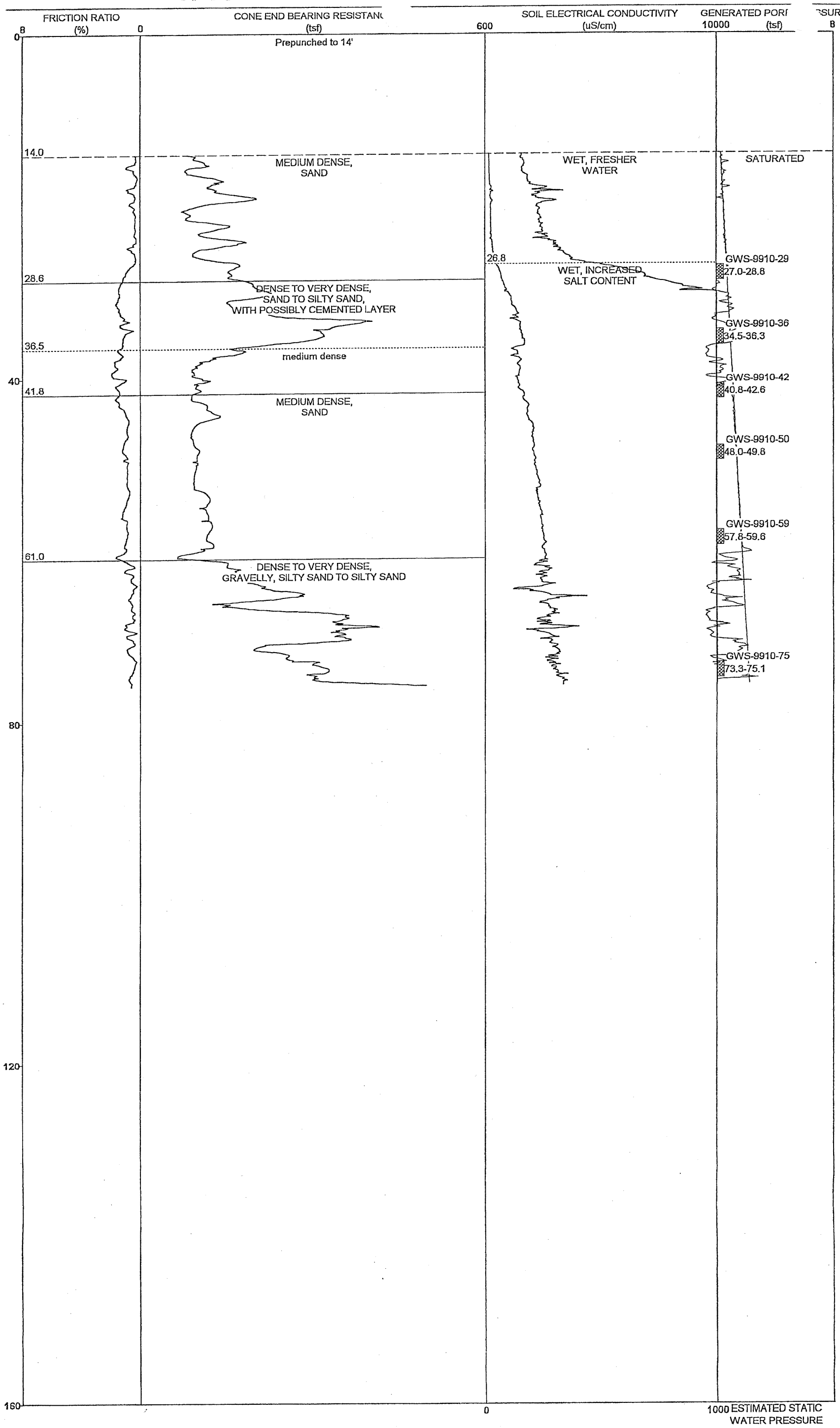


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

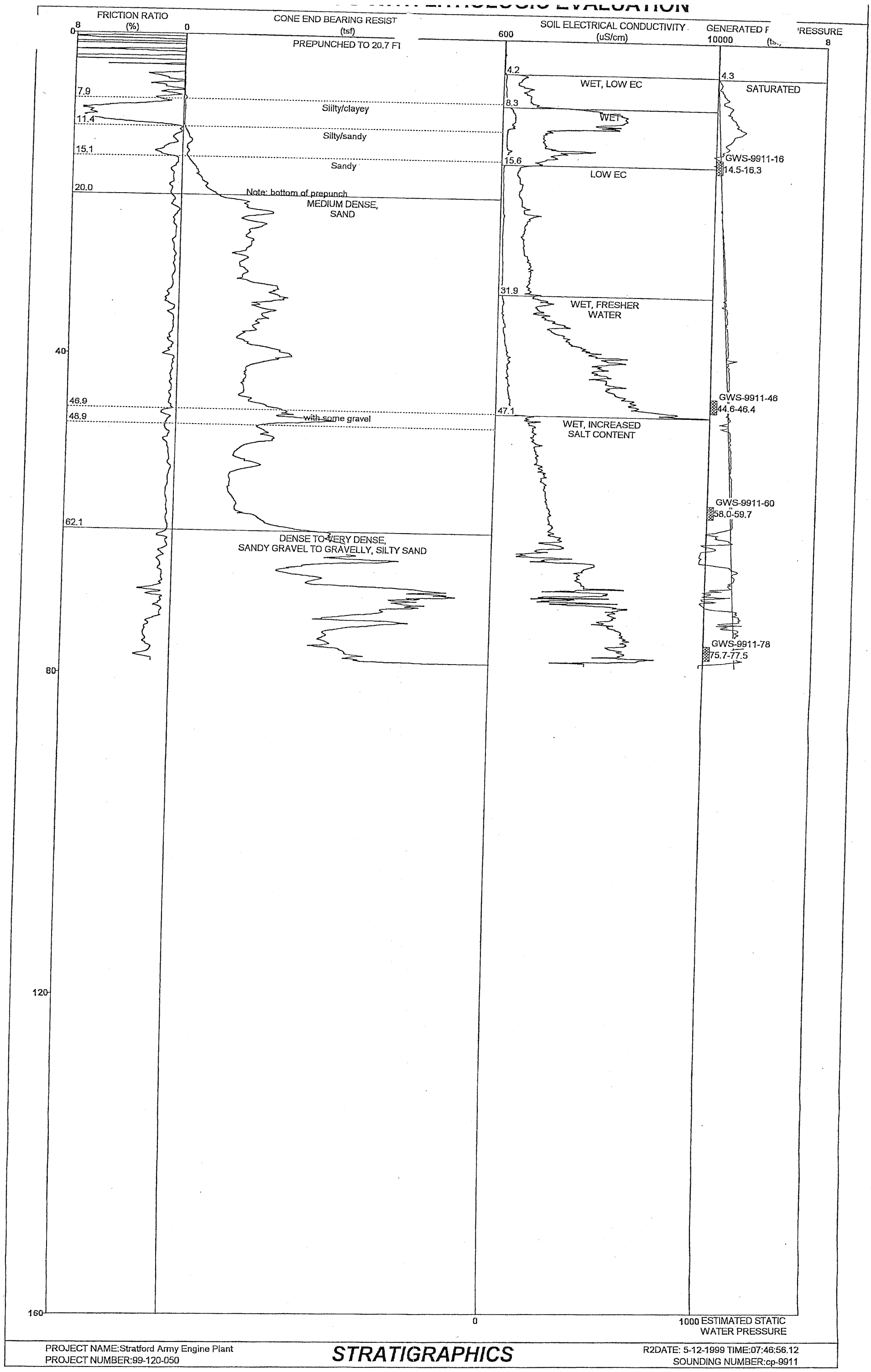
CPTU-EC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

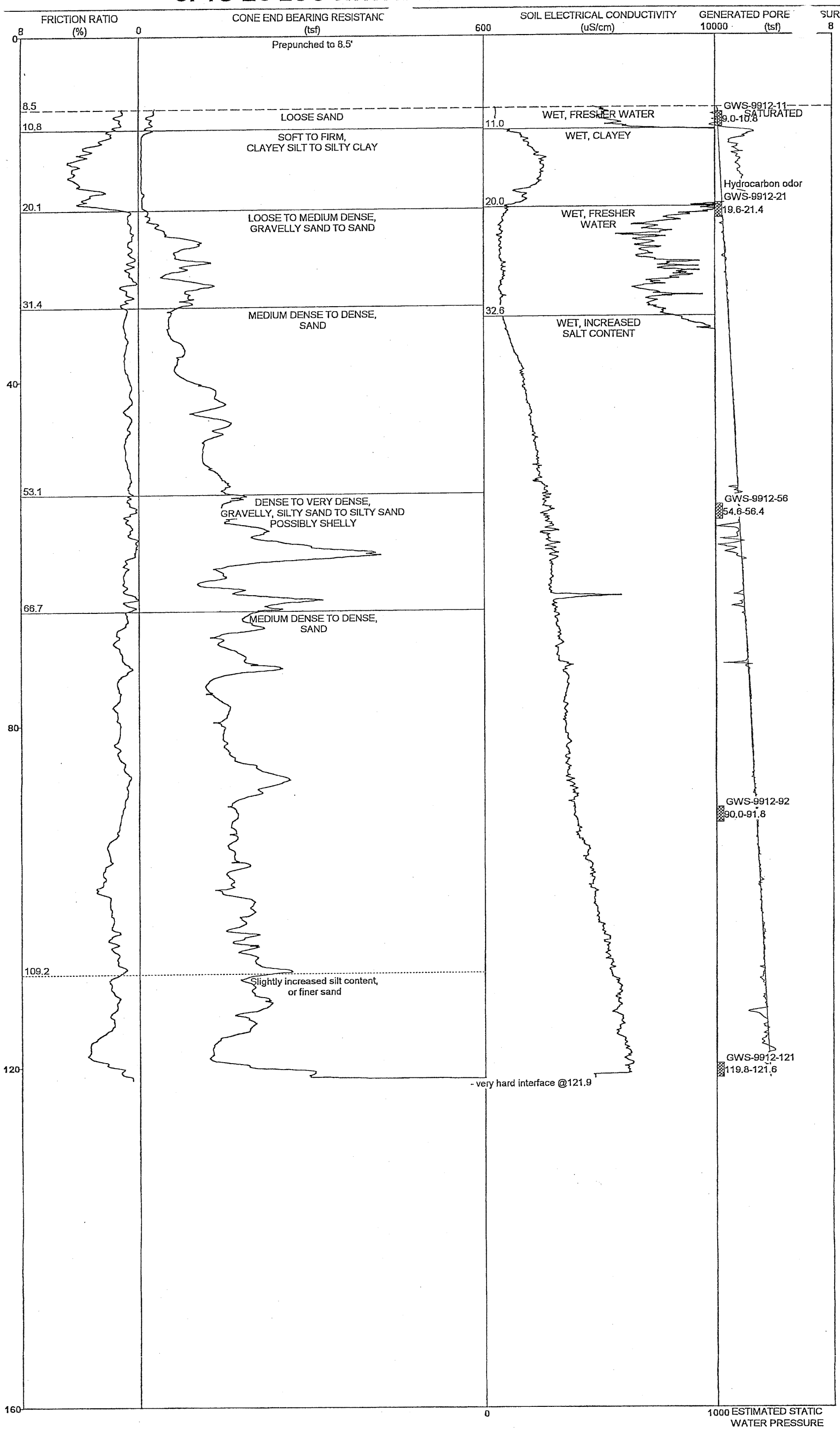


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

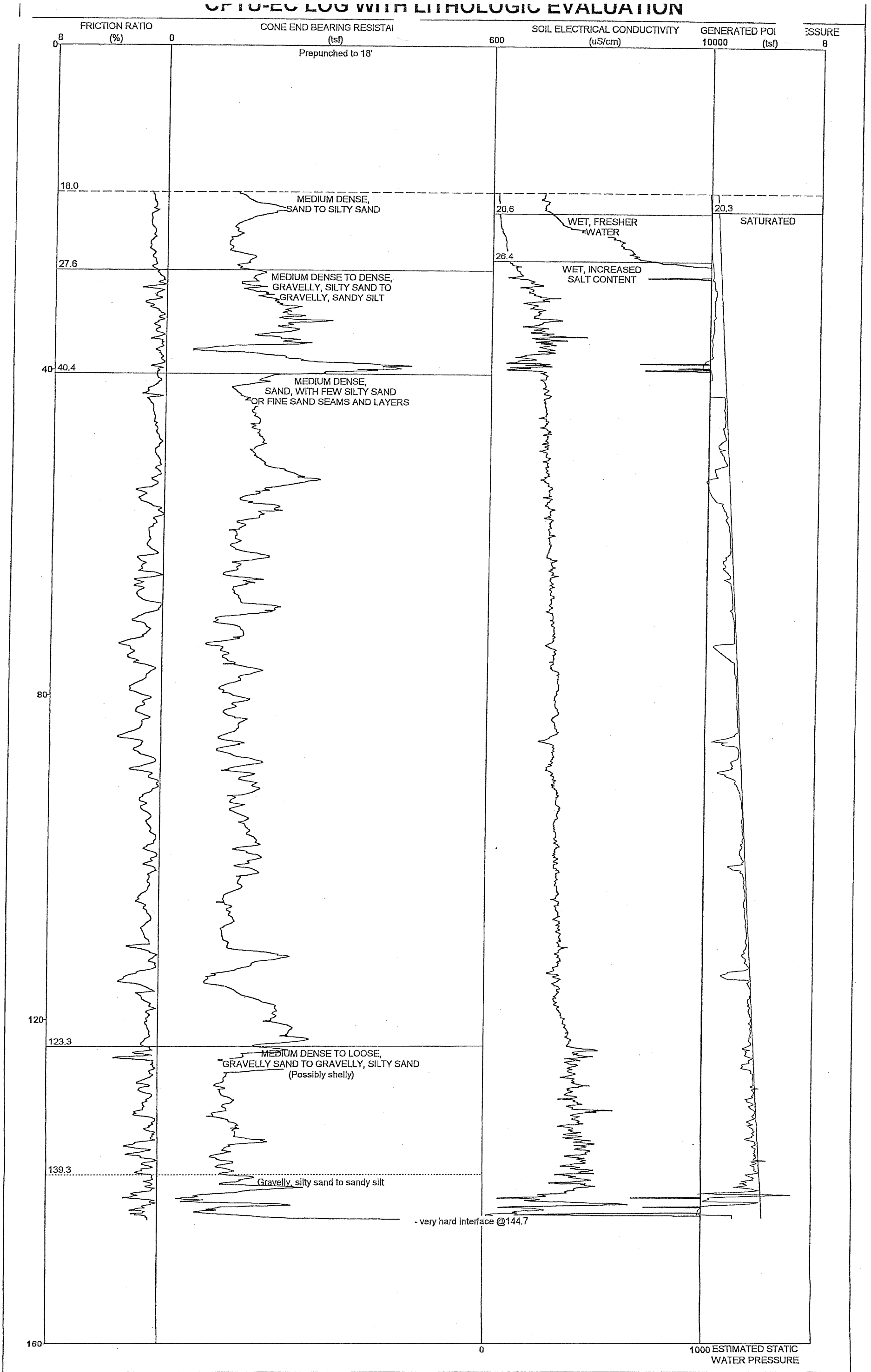


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-10-1999 TIME:13:53:20.59
SOUNDING NUMBER:CP-9912

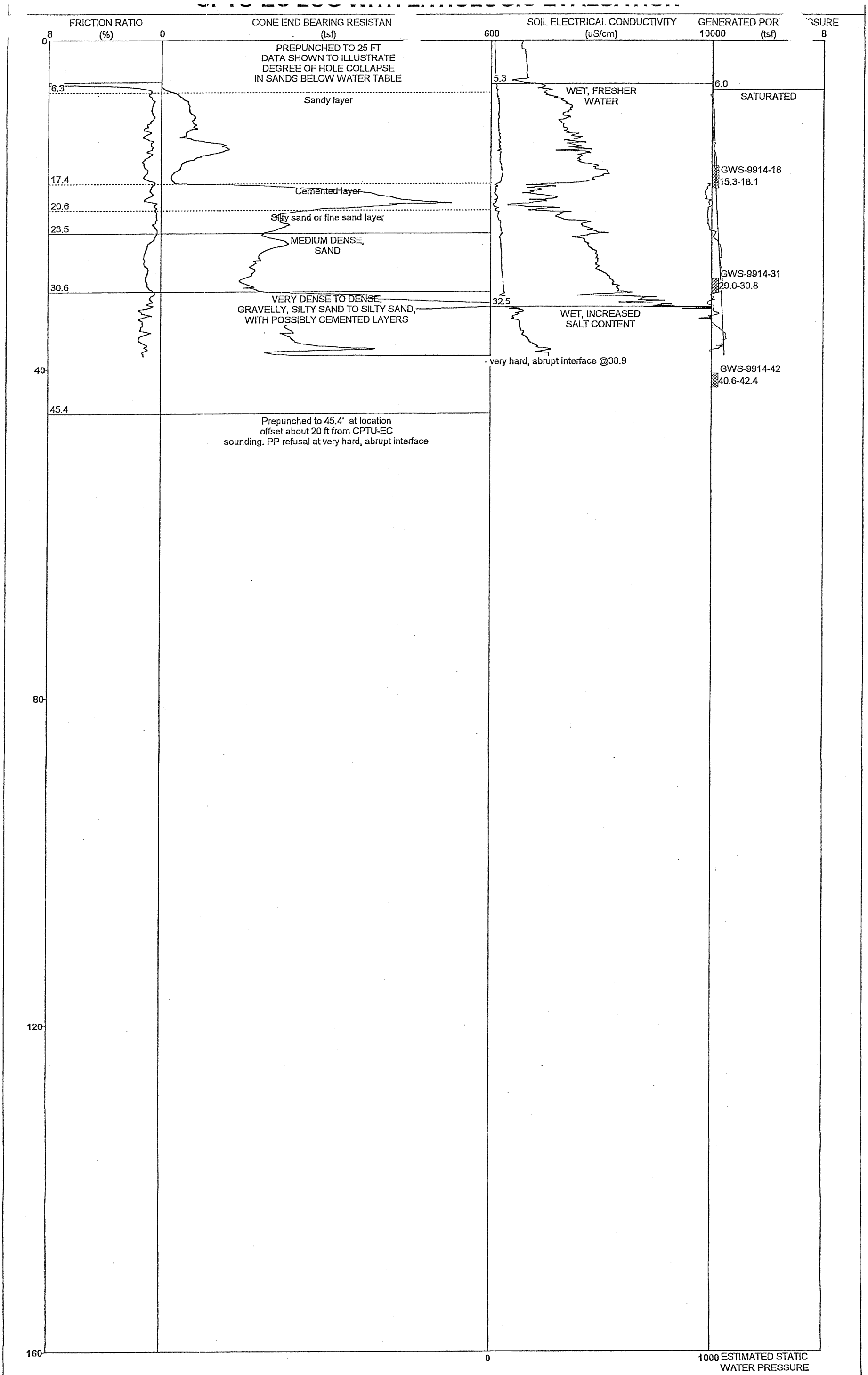
CPTU-EC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-12-1999 TIME:14:46:19.41
SOUNDING NUMBER:CP-9913

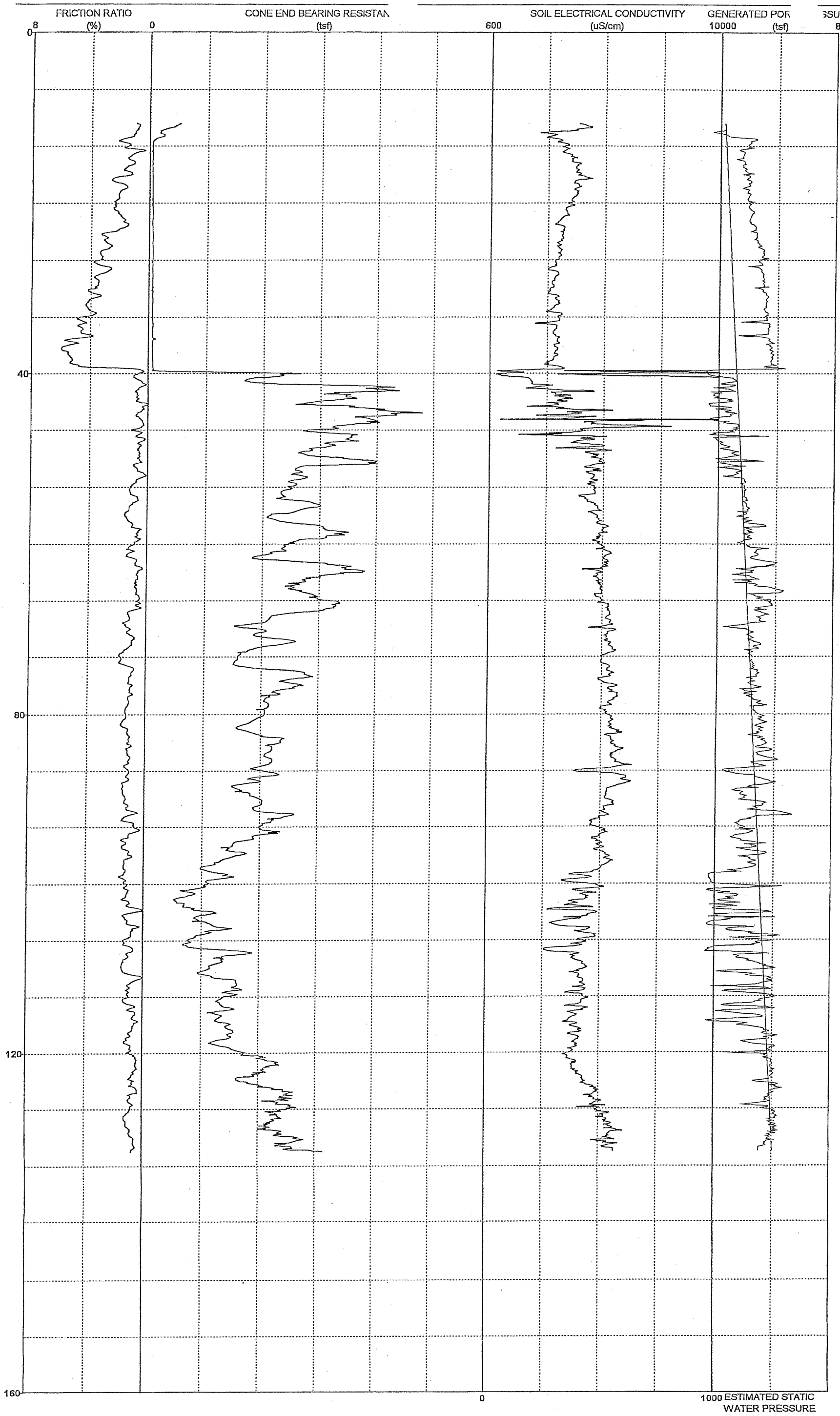


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-18-1999 TIME:16:50:05.11
SOUNDING NUMBER:CP-9914A

CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

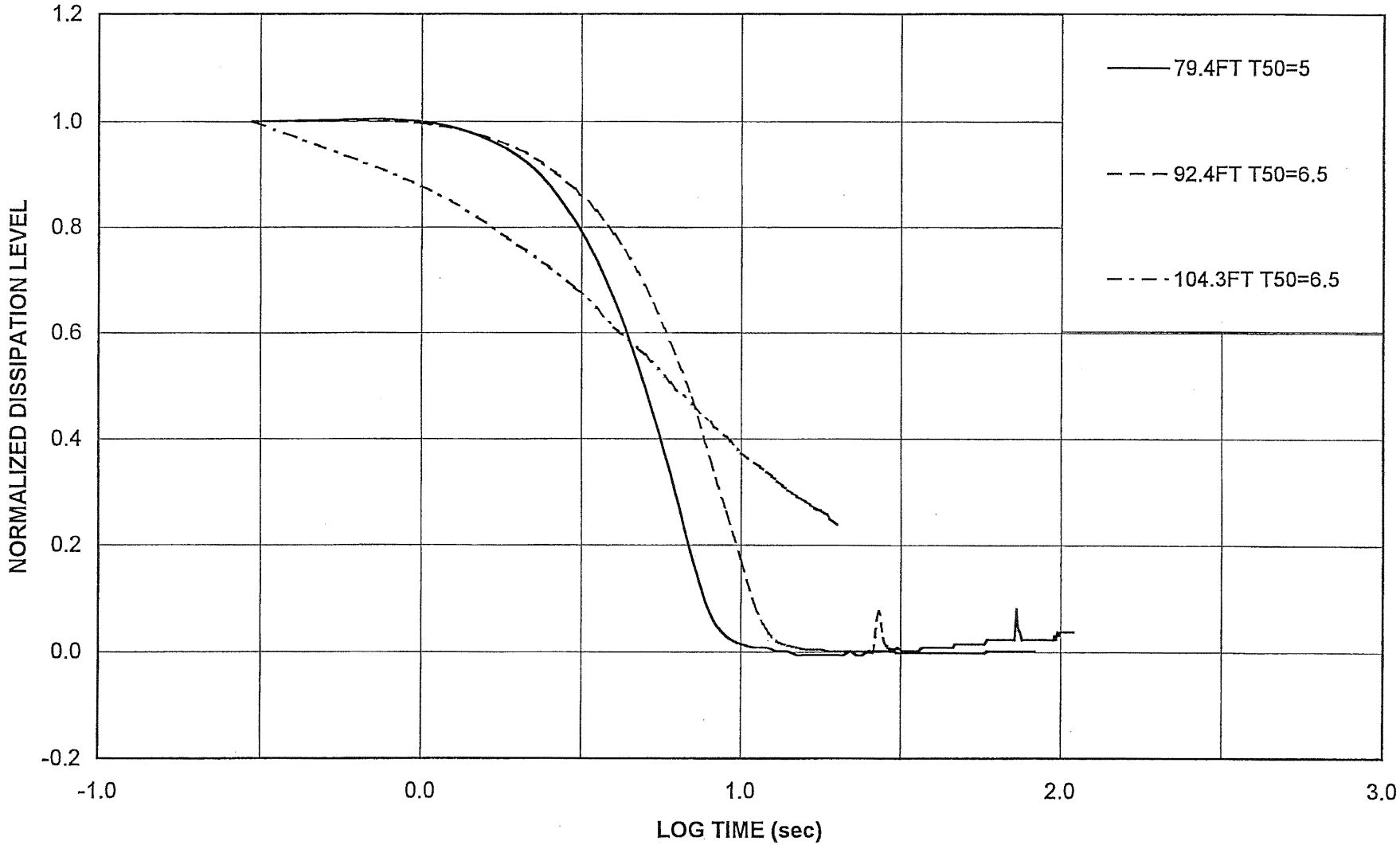
STRATIGRAPHICS

R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9901



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 10.60'												
1.5	Prepunched To 10.60'												
2.0	Prepunched To 10.60'												
2.5	Prepunched To 10.60'												
3.0	Prepunched To 10.60'												
3.5	Prepunched To 10.60'												
4.0	Prepunched To 10.60'												
4.5	Prepunched To 10.60'												
5.0	Prepunched To 10.60'												
5.5	Prepunched To 10.60'												
6.0	Prepunched To 10.60'												
6.5	Prepunched To 10.60'												
7.0	Prepunched To 10.60'												
7.5	Prepunched To 10.60'												
8.0	Prepunched To 10.60'												
8.5	Prepunched To 10.60'												
9.0	Prepunched To 10.60'												
9.5	Prepunched To 10.60'												
10.0	Prepunched To 10.60'												
10.5	Prepunched To 10.60'												
11.0	42.7	51.7	0.37	0.7	4349	Loose, Sand to silty sand	37-40	20-40				05 - 08	06 - 10
11.5	17.9	21.5	0.30	1.0	3423	Loose, Silty sand to sandy silt	31-36	20-40				02 - 03	02 - 04
12.0	24.5	29.3	0.23	1.1	2826	Loose, Silty sand to sandy silt	31-36	20-40				03 - 05	04 - 06
12.5	9.6	11.4	0.33	1.8	2948	Stiff, Sandy silt to clayey silt			15	1.19	0.67	00 - 02	00 - 02
13.0	5.0	5.9	0.09	1.5	3205	Firm, Clayey silt to silty clay			10	0.84	0.19	00 - 02	00 - 02
13.5	5.2	6.1	0.09	1.7	3269	Firm, Clayey silt to silty clay			10	0.87	0.18	00 - 02	00 - 02
14.0	4.3	5.0	0.03	0.7	3134	Soft, Sensitive fine grained soil			18	0.39	0.07	00 - 02	00 - 02
14.5	5.0	5.8	0.07	1.3	3513	Soft, Clayey silt to silty clay			18	0.46	0.13	00 - 02	00 - 02
15.0	4.2	4.8	0.06	1.2	3556	Soft, Clayey silt to silty clay			18	0.37	0.12	00 - 02	00 - 02
15.5	4.3	4.9	0.05	1.2	3766	Soft, Clayey silt to silty clay			18	0.37	0.10	00 - 02	00 - 02
16.0	4.5	5.1	0.08	1.7	3748	Soft, Clayey silt to silty clay			18	0.39	0.16	00 - 02	00 - 02
16.5	4.4	5.0	0.06	1.2	3885	Soft, Clayey silt to silty clay			18	0.38	0.12	00 - 02	00 - 02
17.0	4.9	5.6	0.12	2.4	4227	Firm, Clayey silt to silty clay			10	0.78	0.23	00 - 02	00 - 02
17.5	4.7	5.3	0.11	2.4	3665	Soft, Clayey silt to silty clay			18	0.40	0.22	00 - 02	00 - 02
18.0	4.5	5.1	0.07	1.6	3874	Soft, Clayey silt to silty clay			18	0.38	0.14	00 - 02	00 - 02
18.5	4.7	5.3	0.09	1.9	3703	Soft, Clayey silt to silty clay			18	0.40	0.19	00 - 02	00 - 02
19.0	4.9	5.4	0.10	2.1	3755	Soft, Clayey silt to silty clay			18	0.42	0.20	00 - 02	00 - 02
19.5	4.7	5.2	0.11	2.2	3549	Soft, Clayey silt to silty clay			18	0.39	0.22	00 - 02	00 - 02
20.0	5.1	5.5	0.10	2.3	3385	Firm, Clayey silt to silty clay			10	0.77	0.21	00 - 02	00 - 02
20.5	5.2	5.7	0.13	2.4	3328	Firm, Clayey silt to silty clay			10	0.80	0.26	00 - 02	00 - 02
21.0	5.2	5.6	0.11	2.2	3319	Firm, Clayey silt to silty clay			10	0.79	0.22	00 - 02	00 - 02
21.5	5.2	5.6	0.10	2.0	3270	Firm, Clayey silt to silty clay			10	0.78	0.20	00 - 02	00 - 02
22.0	5.0	5.4	0.08	1.7	3032	Soft, Clayey silt to silty clay			18	0.41	0.16	00 - 02	00 - 02
22.5	5.0	5.4	0.08	1.5	2868	Soft, Clayey silt to silty clay			18	0.41	0.16	00 - 02	00 - 02
23.0	5.3	5.7	0.12	2.0	3198	Firm, Clayey silt to silty clay			10	0.79	0.23	00 - 02	00 - 02
23.5	5.7	6.1	0.19	3.2	3168	Firm, Silty clay to clay			10	0.86	0.38	00 - 02	00 - 02
24.0	5.8	6.2	0.17	2.9	3171	Firm, Silty clay to clay			10	0.88	0.34	00 - 02	00 - 02
24.5	5.6	5.9	0.17	3.0	3004	Firm, Silty clay to clay			10	0.82	0.34	00 - 02	00 - 02
25.0	5.8	6.1	0.16	2.6	2975	Firm, Silty clay to clay			10	0.86	0.31	00 - 02	00 - 02

Notes:

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	6.3	6.6	0.20	3.2	3089	Firm, Silty clay to clay			10	0.95	0.39	00 - 02	00 - 02
26.0	6.0	6.3	0.21	3.3	3059	Firm, Silty clay to clay			10	0.89	0.42	00 - 02	00 - 02
26.5	5.9	6.2	0.20	3.2	2980	Firm, Silty clay to clay			10	0.87	0.40	00 - 02	00 - 02
27.0	6.1	6.3	0.22	3.7	2860	Firm, Silty clay to clay			10	0.90	0.43	00 - 02	00 - 02
27.5	5.6	5.8	0.15	2.7	2645	Firm, Silty clay to clay			10	0.80	0.31	00 - 02	00 - 02
28.0	5.9	6.0	0.17	2.9	2919	Firm, Silty clay to clay			10	0.84	0.34	00 - 02	00 - 02
28.5	5.9	6.1	0.22	3.7	2881	Firm, Silty clay to clay			10	0.85	0.44	00 - 02	00 - 02
29.0	6.0	6.1	0.21	3.5	2805	Firm, Silty clay to clay			10	0.85	0.42	00 - 02	00 - 02
29.5	6.2	6.3	0.22	3.5	2723	Firm, Silty clay to clay			10	0.88	0.44	00 - 02	00 - 02
30.0	6.1	6.2	0.24	3.8	2622	Firm, Silty clay to clay			10	0.87	0.49	00 - 02	00 - 02
30.5	6.1	6.1	0.24	3.9	2536	Firm, Silty clay to clay			10	0.85	0.48	00 - 02	00 - 02
31.0	6.3	6.3	0.23	3.6	2959	Firm, Silty clay to clay			10	0.88	0.46	00 - 02	00 - 02
31.5	6.4	6.4	0.27	4.2	3000	Firm, Silty clay to clay			10	0.90	0.53	00 - 02	00 - 02
32.0	6.1	6.1	0.27	4.3	2839	Firm, Silty clay to clay			10	0.83	0.54	00 - 02	00 - 02
32.5	6.1	6.1	0.25	4.0	2630	Firm, Silty clay to clay			10	0.83	0.50	00 - 02	00 - 02
33.0	6.2	6.2	0.23	3.8	3126	Firm, Silty clay to clay			10	0.85	0.47	00 - 02	00 - 02
33.5	6.4	6.4	0.32	4.9	3045	Firm, Clay			10	0.88	0.64	02 - 04	02 - 04
34.0	6.5	6.4	0.29	4.3	2161	Firm, Silty clay to clay			10	0.89	0.58	00 - 02	00 - 02
34.5	6.7	6.6	0.32	4.6	2902	Firm, Clay			10	0.92	0.64	00 - 02	00 - 02
35.0	6.6	6.5	0.31	4.6	2771	Firm, Clay			10	0.90	0.62	00 - 02	00 - 02
35.5	6.7	6.6	0.30	3.8	2869	Firm, Silty clay to clay			10	0.91	0.60	00 - 02	00 - 02
36.0	7.9	7.7	0.46	5.7	2953	Firm, Silty clay to clay *			12	0.95	0.92	04 - 06	04 - 06
36.5	6.5	6.3	0.35	5.2	2967	Firm, Clay			10	0.86	0.70	02 - 04	02 - 04
37.0	7.0	6.8	0.40	6.0	2962	Firm, Clay			12	0.79	0.80	04 - 06	04 - 06
37.5	6.6	6.4	0.37	5.5	2850	Firm, Clay			12	0.72	0.74	02 - 04	02 - 04
38.0	6.6	6.4	0.37	5.4	2826	Firm, Clay			10	0.87	0.74	02 - 04	02 - 04
38.5	7.2	6.9	0.38	5.3	2689	Firm, Clay			10	0.97	0.76	02 - 04	02 - 04
39.0	7.1	6.8	0.36	4.8	2562	Firm, Clay			10	0.95	0.72	02 - 04	02 - 04
39.5	7.7	7.4	0.44	0.7	2703	Stiff, Sandy silt to clayey silt			10	1.06	0.88	00 - 02	00 - 02
40.0	243.8	233.2	1.63	0.7	844	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
40.5	190.1	181.3	2.08	0.9	1635	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
41.0	177.6	169.0	1.07	0.4	1863	Med dense, Sand to silty sand	42-46	40-60				32 - 42	30 - 40
41.5	375.4	356.2	1.62	0.4	2369	Dense, Sa gravel to gr sand	+46	60-80				42 - 63	40 - 60
42.0	428.9	405.9	3.43	0.8	3864	V dense, Sand to silty sand	+46	80-100				+ 106	+ 100
42.5	341.2	322.1	2.66	0.7	3300	Dense, Sand to silty sand	42-46	60-80				64 - 105	60 - 99
43.0	348.0	327.6	1.88	0.7	3309	Dense, Sand to silty sand	42-46	60-80				64 - 105	60 - 99
43.5	274.9	258.2	0.25	0.1	2849	Med dense, Sa gravel to gr sand	+46	40-60				43 - 64	40 - 60
44.0	357.8	335.2	1.55	0.4	3133	Dense, Sa gravel to gr sand	+46	60-80				43 - 64	40 - 60
44.5	429.0	400.9	1.94	0.5	3559	Dense, Sa gravel to gr sand	+46	60-80				64 - 106	60 - 99
45.0	408.0	380.3	3.48	0.8	2492	V dense, Sand to silty sand	42-46	80-100				64 - 106	60 - 99
45.5	393.0	365.4	1.96	0.5	6911	Dense, Sa gravel to gr sand	+46	60-80				65 - 106	60 - 99
46.0	360.7	334.5	1.15	0.3	4715	Dense, Sa gravel to gr sand	+46	60-80				43 - 65	40 - 60
46.5	327.5	303.1	2.52	0.8	4134	Dense, Sand to silty sand	42-46	60-80				65 - 107	60 - 99
47.0	311.7	287.7	1.47	0.5	2759	Dense, Sa gravel to gr sand	+46	60-80				43 - 65	40 - 60
47.5	355.6	327.5	2.78	0.7	4436	Dense, Sand to silty sand	42-46	60-80				65 - 108	60 - 99
48.0	355.1	326.2	1.41	0.4	3779	Dense, Sa gravel to gr sand	+46	60-80				44 - 65	40 - 60
48.5	321.7	294.9	1.55	0.5	5010	Dense, Sa gravel to gr sand	+46	60-80				44 - 65	40 - 60
49.0	285.8	261.3	2.05	0.7	5288	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
49.5	272.9	248.9	1.78	0.6	4776	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
50.0	344.0	313.1	2.55	0.6	4880	Dense, Sand to silty sand	42-46	60-80				66 - 109	60 - 99

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	391.1	355.1	2.68	0.7	5022	Dense, Sand to silty sand	+46	60-80				66 - 109	60 - 99
51.0	262.7	238.1	2.65	0.8	4251	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
51.5	267.1	241.5	1.68	0.5	4271	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
52.0	268.7	242.3	0.32	0.1	4594	Med dense, Sa gravel to gr sand	+46	40-60				44 - 67	40 - 60
52.5	254.9	229.4	2.12	0.8	4722	Dense, Sand to silty sand	42-46	60-80				44 - 67	40 - 60
53.0	259.2	232.8	2.54	1.0	4376	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
53.5	250.7	224.7	3.11	1.2	4641	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
54.0	231.5	207.0	2.79	1.2	4651	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
54.5	235.8	210.4	1.76	0.7	4167	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
55.0	275.5	245.3	2.25	0.8	4323	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
55.5	301.3	267.6	3.49	1.2	4734	Dense, Sand to silty sand	42-46	60-80				68 - 111	60 - 99
56.0	265.7	235.5	3.59	1.3	4879	Dense, Sand to silty sand	42-46	60-80				68 - 112	60 - 99
56.5	215.0	190.2	3.94	1.6	4656	Dense, Sand to silty sand	40-42	60-80				45 - 68	40 - 60
57.0	214.6	189.4	3.24	1.4	4805	Dense, Sand to silty sand	40-42	60-80				45 - 68	40 - 60
57.5	250.2	220.4	2.98	1.1	4748	Dense, Sand to silty sand	42-46	60-80				45 - 68	40 - 60
58.0	307.4	270.3	3.40	1.0	5177	Dense, Sand to silty sand	42-46	60-80				68 - 113	60 - 99
58.5	337.2	295.9	2.34	0.6	5001	Dense, Sand to silty sand	42-46	60-80				46 - 68	40 - 60
59.0	324.6	284.3	2.25	0.7	4910	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
59.5	267.0	233.3	1.70	0.6	4618	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
60.0	246.3	214.8	2.18	0.9	4863	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
60.5	233.9	203.6	3.07	1.3	4916	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
61.0	215.8	187.5	2.72	1.2	5357	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
61.5	186.9	162.0	2.66	1.3	5120	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
62.0	249.1	215.5	2.01	0.7	5253	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
62.5	331.0	285.9	2.83	0.8	5108	Dense, Sand to silty sand	42-46	60-80				46 - 69	40 - 60
63.0	351.3	302.8	1.27	0.4	4299	Dense, Sa gravel to gr sand	+46	60-80				46 - 70	40 - 60
63.5	341.6	293.8	2.56	0.7	4790	Dense, Sand to silty sand	42-46	60-80				46 - 70	40 - 60
64.0	280.2	240.6	1.91	0.6	4774	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
64.5	275.1	235.7	2.01	0.7	4854	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
65.0	245.7	210.1	2.29	0.8	4966	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
65.5	266.6	227.6	1.77	0.7	5004	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
66.0	290.4	247.4	1.56	0.6	4678	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
66.5	298.7	254.0	1.68	0.5	4946	Dense, Sand to silty sand	42-46	60-80				47 - 71	40 - 60
67.0	333.0	282.7	1.45	0.4	5175	Dense, Sa gravel to gr sand	+46	60-80				47 - 71	40 - 60
67.5	326.5	276.7	1.10	0.4	5204	Dense, Sa gravel to gr sand	+46	60-80				47 - 71	40 - 60
68.0	275.3	232.9	3.89	1.3	5346	Dense, Sand to silty sand	42-46	60-80				71 - 117	60 - 99
68.5	217.2	183.4	2.85	1.2	5255	Dense, Sand to silty sand	42-46	60-80				47 - 71	40 - 60
69.0	210.5	177.4	2.59	1.2	5373	Dense, Sand to silty sand	40-42	60-80				47 - 71	40 - 60
69.5	175.2	147.4	2.72	1.4	5459	Dense, Sand to silty sand	40-42	60-80				48 - 71	40 - 60
70.0	190.4	159.9	2.16	1.1	5341	Dense, Sand to silty sand	40-42	60-80				48 - 71	40 - 60
70.5	194.9	163.4	2.63	1.3	5233	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
71.0	202.2	169.2	1.95	0.8	5204	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
71.5	258.9	216.2	2.49	1.0	5222	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
72.0	219.2	182.8	2.59	1.1	5323	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
72.5	181.8	151.3	2.77	1.4	5459	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
73.0	164.7	136.8	3.12	1.8	5256	Dense, Silty sand to sandy silt	40-42	60-80				48 - 72	40 - 60
73.5	158.8	131.7	2.70	1.7	5023	Dense, Silty sand to sandy silt	40-42	60-80				48 - 72	40 - 60
74.0	153.0	126.7	2.87	1.8	4985	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
74.5	167.5	138.5	2.05	1.0	5342	Med dense, Sand to silty sand	40-42	40-60				48 - 73	40 - 60
75.0	253.3	209.0	2.42	0.9	5247	Dense, Sand to silty sand	42-46	60-80					

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PROJECT NUMBER:99-120-050
R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	281.6	231.9	2.80	1.0	5342	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
76.0	244.8	201.3	3.02	1.1	4883	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
76.5	263.5	216.3	2.54	1.0	5423	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
77.0	250.5	205.3	2.80	1.1	5280	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
77.5	224.2	183.5	2.38	1.0	5586	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
78.0	213.4	174.3	2.70	1.2	5668	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
78.5	206.7	168.5	2.41	1.1	5332	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
79.0	214.0	174.2	2.60	1.2	5390	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
79.5	206.2	167.6	2.93	1.4	5184	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
80.0	205.9	167.1	2.72	1.3	5238	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
80.5	193.0	156.4	2.78	1.4	5418	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
81.0	179.5	145.2	3.11	1.6	5343	Dense, Silty sand to sandy silt	40-42	60-80				49 - 74	40 - 60
81.5	157.7	127.4	2.25	1.3	5463	Dense, Sand to silty sand	40-42	60-80				37 - 50	30 - 40
82.0	178.8	144.2	2.38	1.2	5698	Dense, Sand to silty sand	40-42	60-80				50 - 74	40 - 60
82.5	202.7	163.2	2.39	1.1	5261	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
83.0	235.6	189.4	2.64	1.1	5446	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
83.5	223.9	179.7	2.32	1.1	5527	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
84.0	220.7	176.8	2.86	1.3	5991	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
84.5	212.0	169.6	2.66	1.2	5562	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
85.0	211.6	169.0	2.18	1.0	5472	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
85.5	220.8	176.1	2.59	1.2	5658	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
86.0	208.0	165.6	3.10	1.4	6280	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
86.5	189.0	150.2	2.43	1.2	4517	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
87.0	230.5	182.9	2.47	1.2	5463	Dense, Sand to silty sand	42-46	60-80				50 - 76	40 - 60
87.5	182.4	144.5	2.39	1.1	6080	Dense, Sand to silty sand	40-42	60-80				50 - 76	40 - 60
88.0	194.9	154.3	2.89	1.5	6271	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
88.5	151.1	119.4	2.47	1.5	5653	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
89.0	167.7	132.3	2.56	1.5	5278	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
89.5	182.5	143.7	2.75	1.4	5259	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
90.0	200.1	157.4	2.61	1.3	5256	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
90.5	203.4	159.8	2.65	1.3	5516	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
91.0	189.2	148.4	2.50	1.3	5171	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
91.5	198.3	155.3	1.52	0.7	5005	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
92.0	254.2	198.7	2.87	1.2	5344	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
92.5	223.7	174.7	3.56	1.5	4764	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
93.0	204.9	159.8	1.63	0.7	4620	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
93.5	201.2	156.6	1.06	0.5	5024	Med dense, Sand to silty sand	42-46	40-60				39 - 51	30 - 40
94.0	218.0	169.4	1.74	0.8	5296	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
94.5	187.3	145.4	2.14	1.1	4941	Dense, Sand to silty sand	40-42	60-80				39 - 52	30 - 40
95.0	164.7	127.7	2.40	1.3	4865	Dense, Sand to silty sand	40-42	60-80				39 - 52	30 - 40
95.5	153.0	118.4	2.39	1.5	4935	Dense, Silty sand to sandy silt	40-42	60-80				39 - 52	30 - 40
96.0	142.5	110.1	1.70	1.1	4786	Med dense, Sand to silty sand	40-42	40-60				26 - 39	20 - 30
96.5	172.3	133.0	1.76	1.1	5237	Med dense, Sand to silty sand	40-42	40-60				39 - 52	30 - 40
97.0	142.6	109.9	1.85	1.2	5196	Med dense, Sand to silty sand	40-42	40-60				26 - 39	20 - 30
97.5	122.6	94.4	1.73	1.3	5394	Med dense, Sand to silty sand	37-40	40-60				26 - 39	20 - 30
98.0	99.1	76.1	1.57	1.4	5053	Med dense, Silty sand to sandy silt	37-40	40-60				26 - 39	20 - 30
98.5	116.6	89.5	1.72	1.3	4698	Med dense, Sand to silty sand	37-40	40-60				26 - 39	20 - 30
99.0	142.7	109.3	2.31	1.6	4270	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
99.5	116.0	88.8	1.69	1.2	3753	Med dense, Sand to silty sand	37-40	40-60				26 - 39	20 - 30
100.0	110.2	84.2	1.30	1.2	4440	Med dense, Sand to silty sand	37-40	40-60				26 - 39	20 - 30

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PROJECT NUMBER:99-120-050
R2DATE: 5-05-1999 TIME:12:24:09.81
SOUNDING NUMBER:cp-9901

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	93.6	71.4	1.29	1.2	4946	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 26	15 - 20
101.0	86.2	65.7	0.92	1.1	4664	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 26	15 - 20
101.5	70.6	53.8	0.99	1.2	4454	Med dense, Silty sand to sandy silt	36-37	40-60				13 - 20	10 - 15
102.0	55.4	42.1	0.63	1.1	3813	Loose, Silty sand to sandy silt	36-37	20-40				08 - 13	06 - 10
102.5	69.6	52.8	0.94	1.2	3595	Med dense, Silty sand to sandy silt	36-37	40-60				13 - 20	10 - 15
103.0	85.4	64.7	0.06	0.1	2781	Loose, Sand to silty sand	40-42	20-40				08 - 13	06 - 10
103.5	114.1	86.3	1.50	1.3	4749	Med dense, Silty sand to sandy silt	37-40	40-60				26 - 40	20 - 30
104.0	89.2	67.5	1.25	1.3	4023	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 26	15 - 20
104.5	109.4	82.6	1.34	1.1	3117	Med dense, Sand to silty sand	37-40	40-60				26 - 40	20 - 30
105.0	124.6	94.0	0.29	0.3	3340	Med dense, Sand to silty sand	40-42	40-60				20 - 27	15 - 20
105.5	109.7	82.6	1.08	0.8	4334	Med dense, Sand to silty sand	40-42	40-60				20 - 27	15 - 20
106.0	96.0	72.2	0.93	0.9	4826	Med dense, Sand to silty sand	37-40	40-60				20 - 27	15 - 20
106.5	79.6	59.7	1.13	1.3	4313	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 27	15 - 20
107.0	75.2	56.4	1.03	1.3	4217	Med dense, Silty sand to sandy silt	36-37	40-60				13 - 20	10 - 15
107.5	81.3	60.9	0.98	0.8	3767	Loose, Sand to silty sand	37-40	20-40				13 - 20	10 - 15
108.0	175.6	131.3	1.34	0.8	2741	Med dense, Sand to silty sand	40-42	40-60				40 - 53	30 - 40
108.5	146.1	109.1	1.83	1.0	3785	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
109.0	134.8	100.6	1.86	1.4	3897	Med dense, Sand to silty sand	37-40	40-60				27 - 40	20 - 30
109.5	126.4	94.2	1.98	1.5	4264	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 40	20 - 30
110.0	114.9	85.5	1.73	1.5	4452	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 40	20 - 30
110.5	94.8	70.4	1.39	1.3	3922	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 27	15 - 20
111.0	118.6	88.0	0.11	0.1	4115	Loose, Sand to silty sand	40-42	20-40				13 - 20	10 - 15
111.5	161.5	119.6	1.05	0.6	4314	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
112.0	162.1	119.9	1.84	1.1	4377	Med dense, Sand to silty sand	40-42	40-60				41 - 54	30 - 40
112.5	171.0	126.4	1.81	1.1	4400	Med dense, Sand to silty sand	40-42	40-60				41 - 54	30 - 40
113.0	161.2	119.0	1.70	1.1	3878	Med dense, Sand to silty sand	40-42	40-60				41 - 54	30 - 40
113.5	136.4	100.5	1.90	1.3	4519	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
114.0	132.2	97.3	1.64	1.2	4240	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
114.5	140.4	103.3	0.78	0.6	3916	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
115.0	131.3	96.4	0.79	0.7	4159	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
115.5	135.9	99.7	0.83	0.6	4043	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
116.0	126.3	92.5	0.77	0.6	3689	Med dense, Sand to silty sand	40-42	40-60				20 - 27	15 - 20
116.5	150.3	110.0	0.91	0.6	4061	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
117.0	147.0	107.4	1.00	0.7	4098	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
117.5	155.8	113.7	1.54	1.0	4134	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
118.0	152.6	111.2	1.45	1.0	4064	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
118.5	124.3	90.5	1.79	1.2	3980	Med dense, Sand to silty sand	37-40	40-60				27 - 41	20 - 30
119.0	130.5	94.9	1.17	0.8	3991	Med dense, Sand to silty sand	40-42	40-60				28 - 41	20 - 30
119.5	154.5	112.2	1.45	0.9	3711	Med dense, Sand to silty sand	40-42	40-60				28 - 41	20 - 30
120.0	176.6	128.1	1.75	0.9	3744	Med dense, Sand to silty sand	40-42	40-60				41 - 55	30 - 40
120.5	212.4	153.9	0.90	0.5	3642	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
121.0	226.4	163.9	1.05	0.4	4008	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
121.5	221.7	160.3	1.28	0.5	3826	Med dense, Sand to silty sand	42-46	40-60				42 - 55	30 - 40
122.0	209.2	151.0	1.09	0.5	3869	Med dense, Sand to silty sand	42-46	40-60				42 - 55	30 - 40
122.5	202.7	146.1	1.24	0.6	4048	Med dense, Sand to silty sand	42-46	40-60				42 - 55	30 - 40
123.0	162.8	117.3	1.67	0.9	4318	Med dense, Sand to silty sand	40-42	40-60				28 - 42	20 - 30
123.5	182.3	131.1	1.51	0.8	4344	Med dense, Sand to silty sand	40-42	40-60				28 - 42	20 - 30
124.0	205.4	147.6	1.92	0.8	4700	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
124.5	244.0	175.1	0.94	0.4	4923	Med dense, Sand to silty sand	42-46	40-60				42 - 56	30 - 40
125.0	249.8	179.0	2.35	0.9	4740	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60

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125.5	239.6	171.5	2.44	0.9	4824	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60
126.0	233.0	166.6	1.95	0.8	4812	Med dense, Sand to silty sand	42-46	40-60				56 - 84	40 - 60
126.5	261.1	186.5	2.10	0.8	4459	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60
127.0	218.3	155.7	2.33	1.0	5023	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
127.5	235.7	167.9	3.07	1.3	5238	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
128.0	226.6	161.2	2.73	1.1	5227	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
128.5	209.5	148.9	2.54	1.1	5320	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
129.0	208.0	147.7	1.94	0.9	5597	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
129.5	240.3	170.4	2.23	0.9	5469	Dense, Sand to silty sand	42-46	60-80				56 - 85	40 - 60
130.0	263.0	186.3	1.59	0.6	5222	Med dense, Sand to silty sand	42-46	40-60				56 - 85	40 - 60
130.5	259.1	183.3	1.64	0.6	5376	Med dense, Sand to silty sand	42-46	40-60				57 - 85	40 - 60
131.0	251.9	178.0	1.30	0.5	5260	Med dense, Sand to silty sand	42-46	40-60				42 - 57	30 - 40
131.5	294.9	208.1	1.92	0.8	5662	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60

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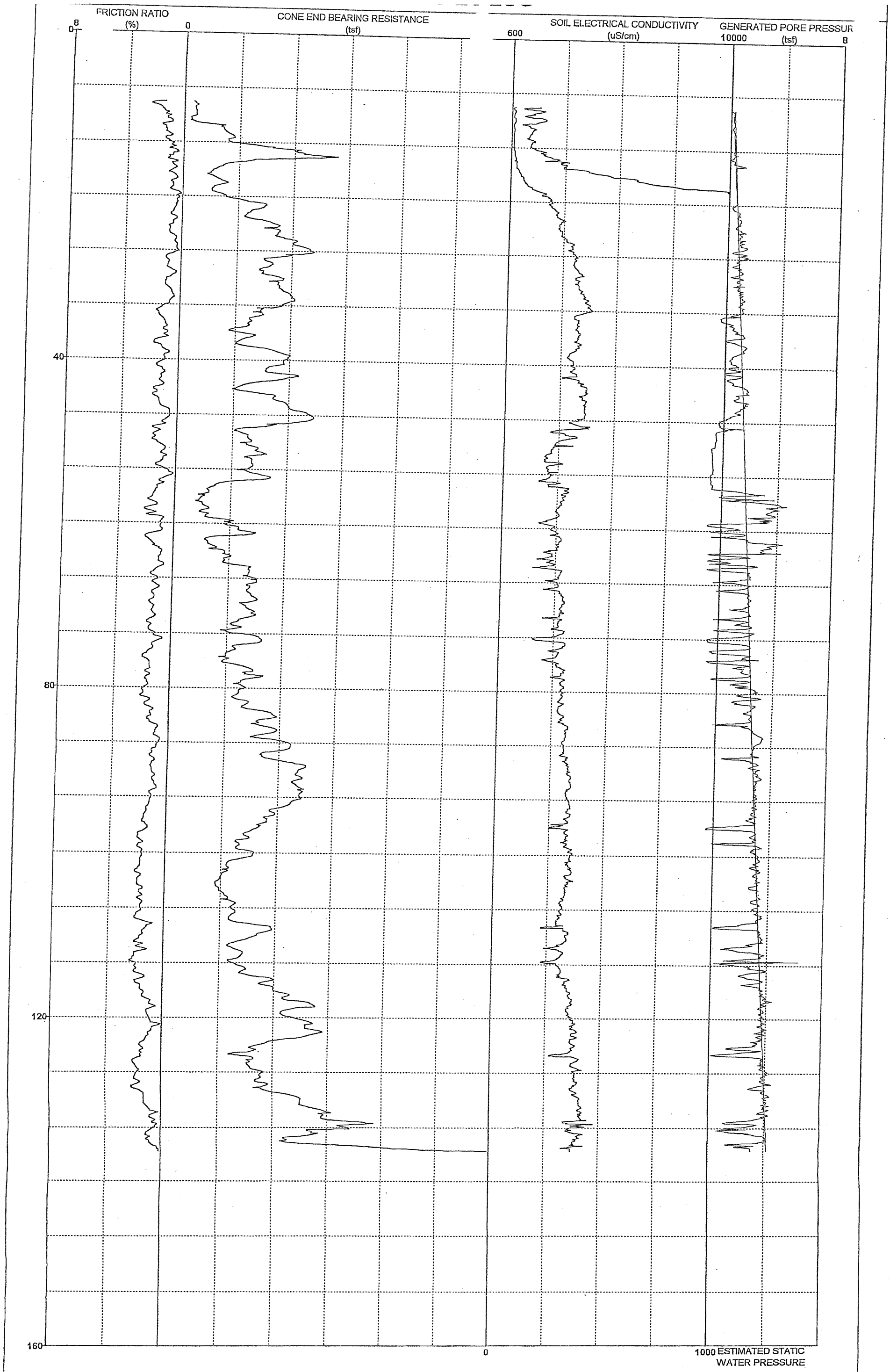

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PROJECT NUMBER:99-120-050

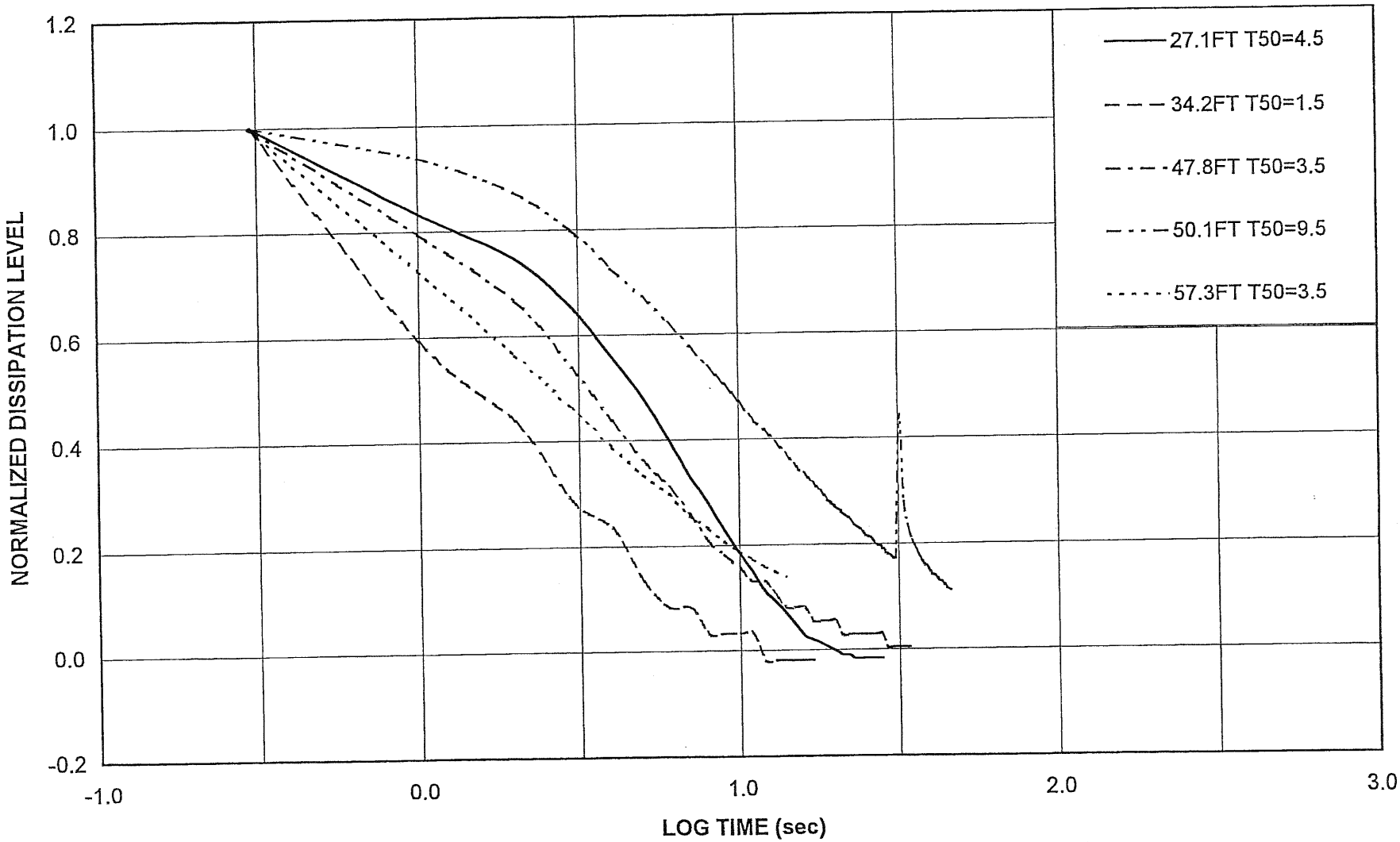
STRATIGRAPHICS

R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

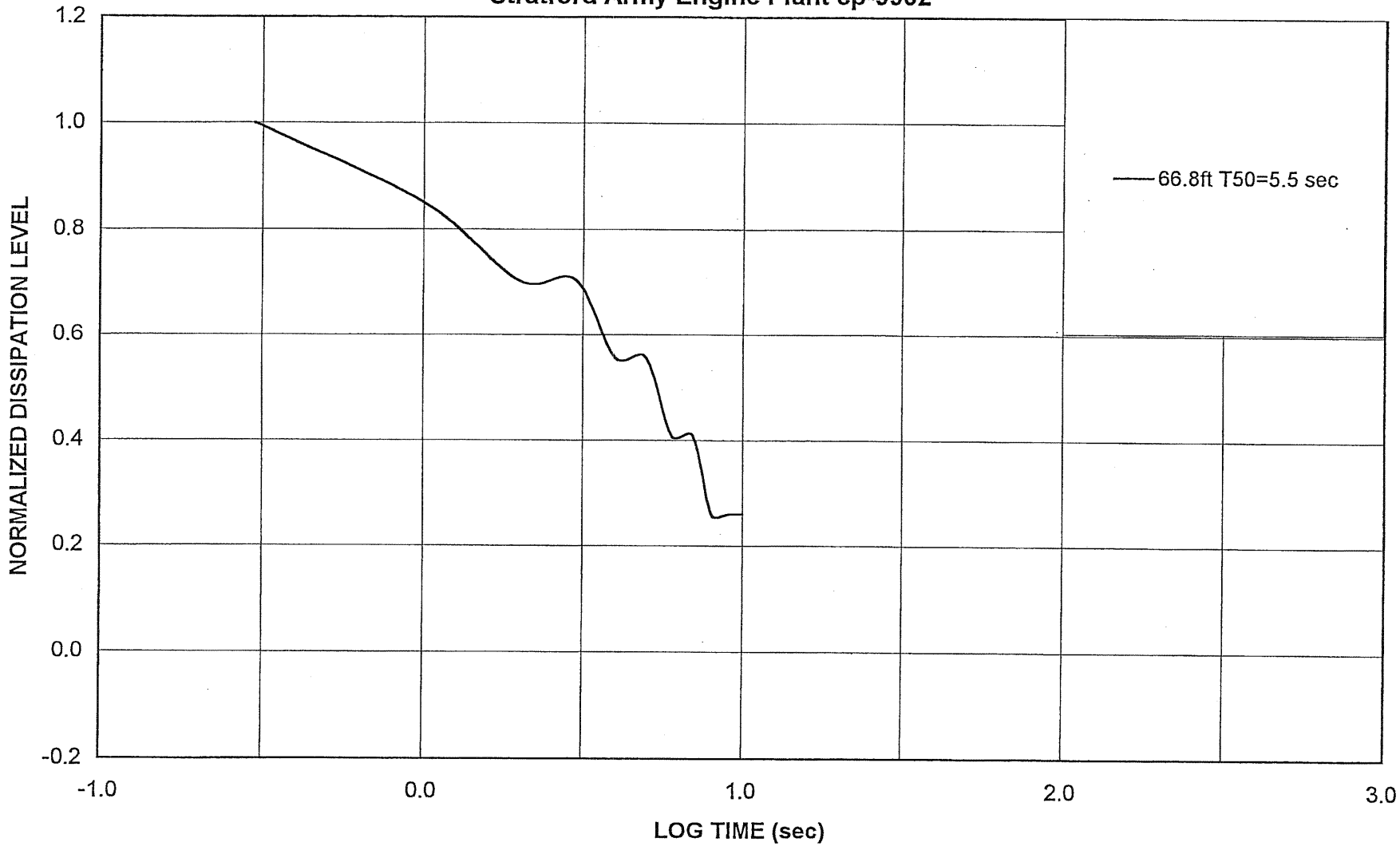
Stratford Army Engine Plant cp-9902



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

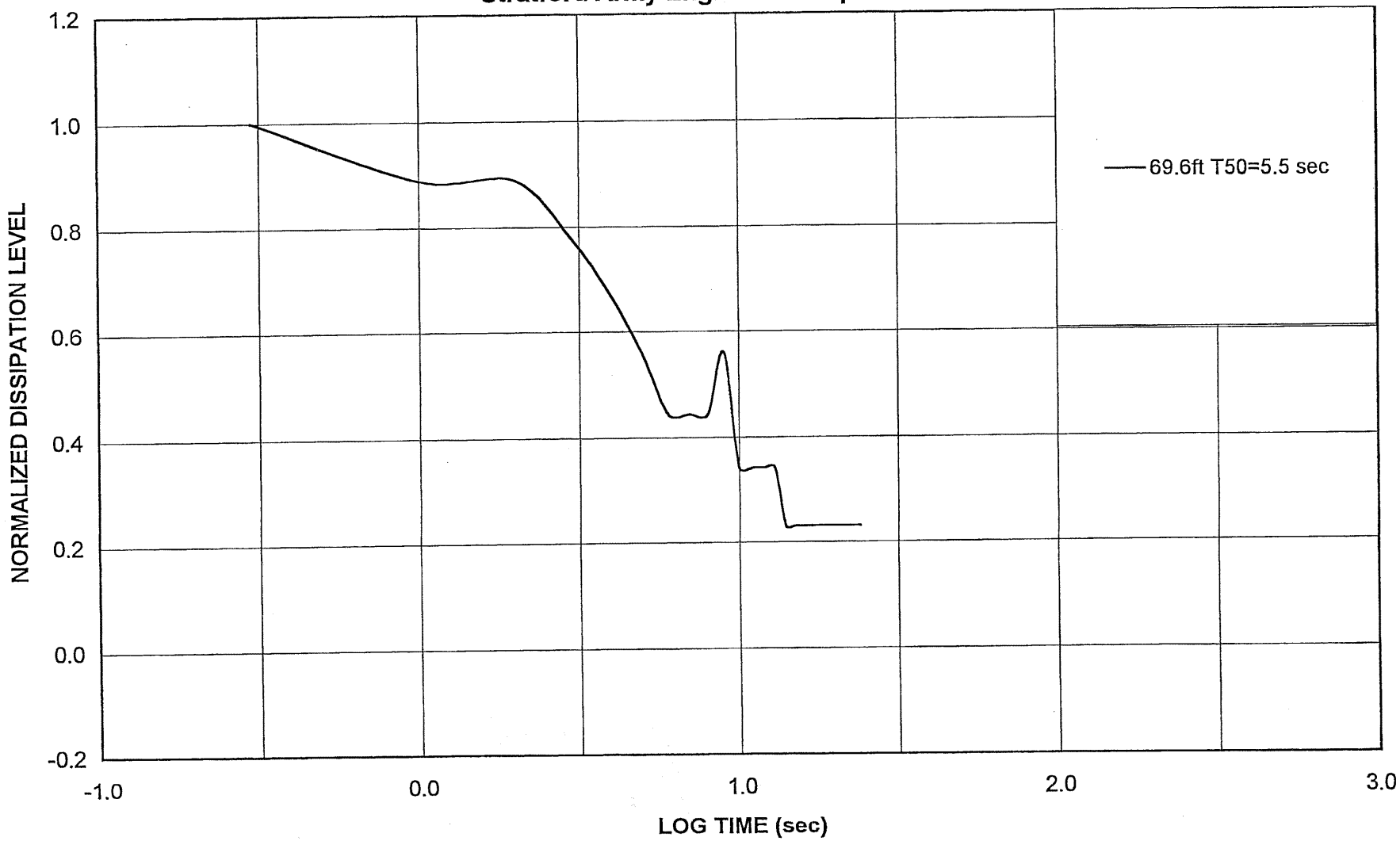
Stratford Army Engine Plant cp-9902



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

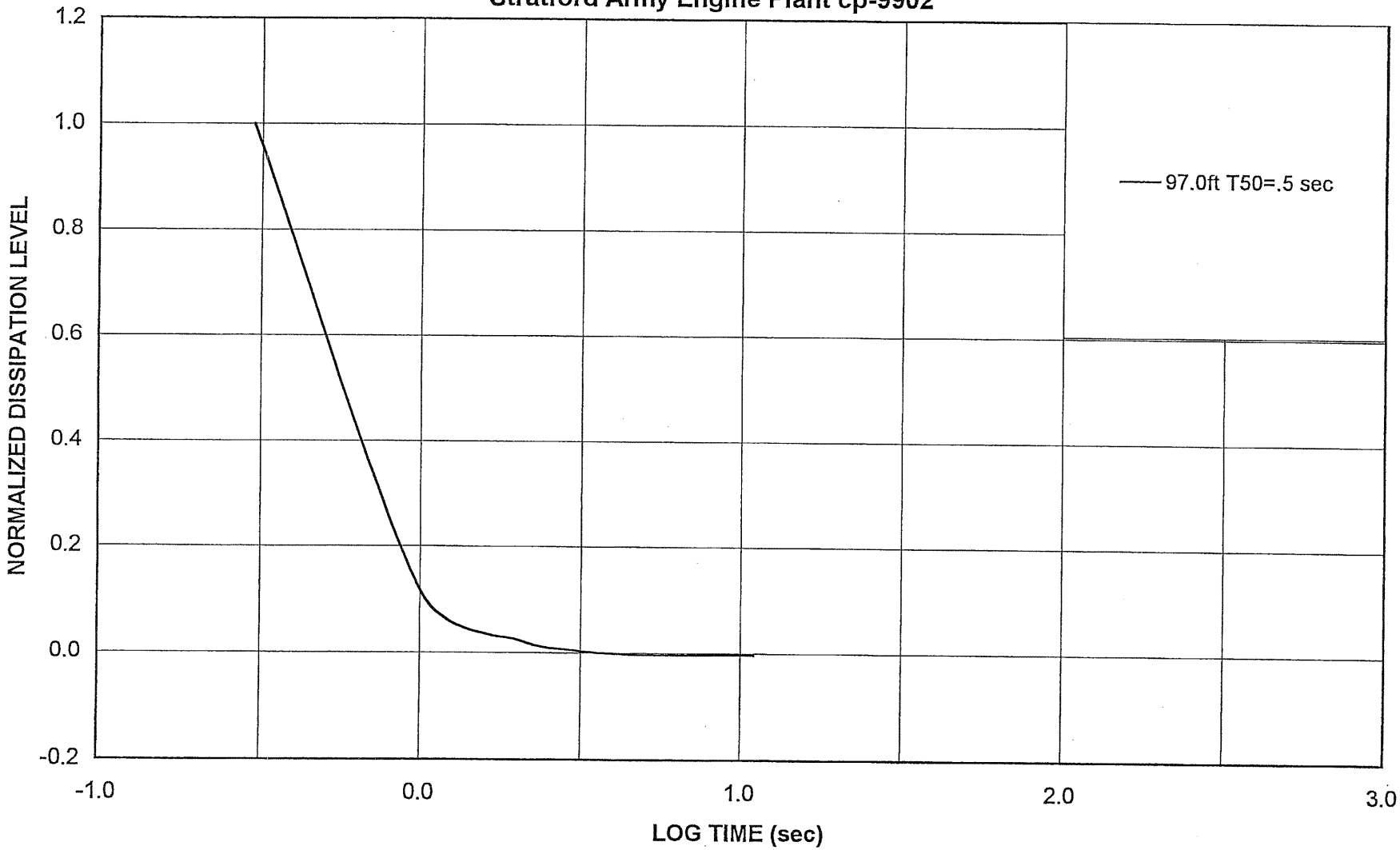
Stratford Army Engine Plant cp-9902



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

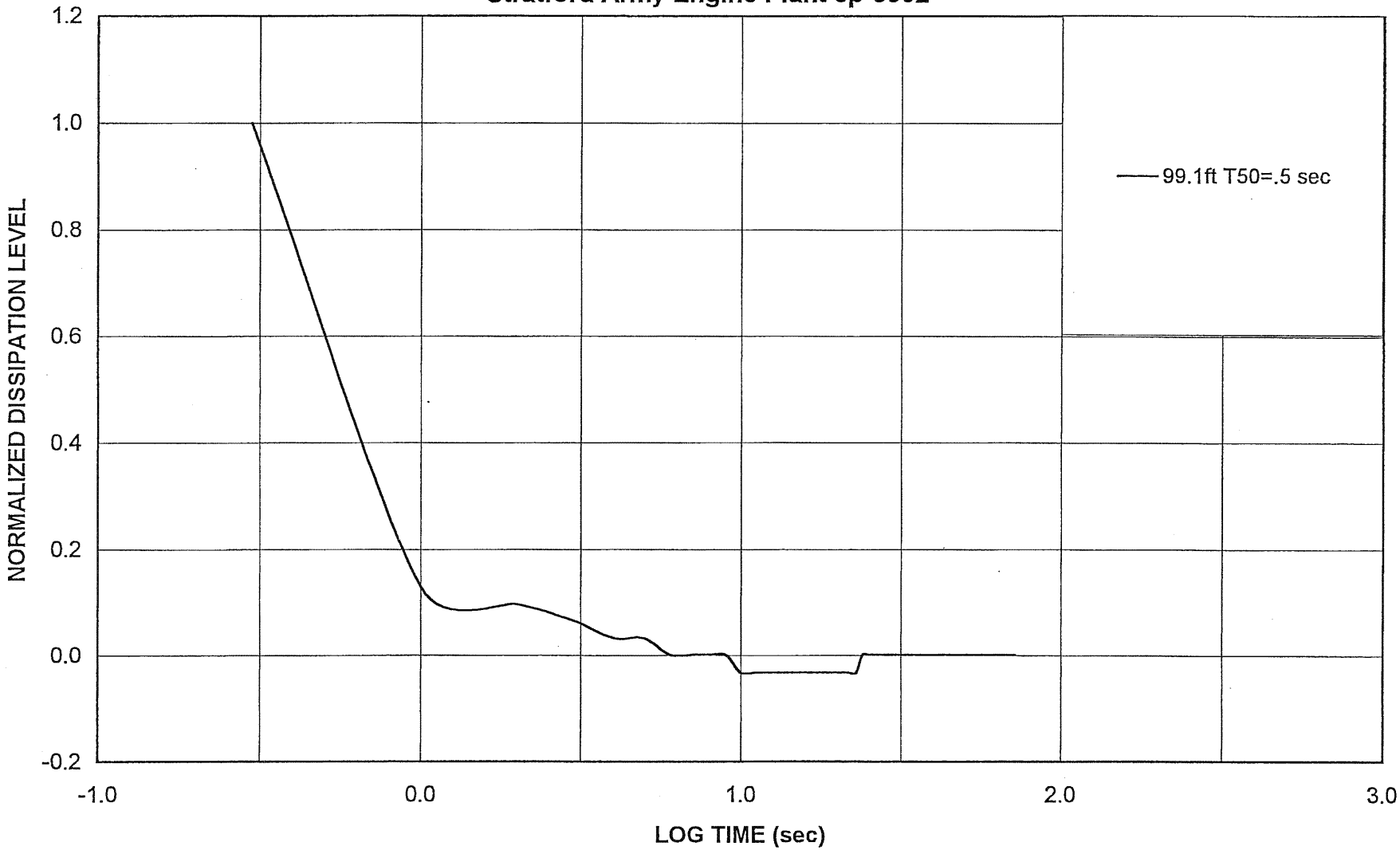
Stratford Army Engine Plant cp-9902



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9902



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 8.50'												
1.5	Prepunched To 8.50'												
2.0	Prepunched To 8.50'												
2.5	Prepunched To 8.50'												
3.0	Prepunched To 8.50'												
3.5	Prepunched To 8.50'												
4.0	Prepunched To 8.50'												
4.5	Prepunched To 8.50'												
5.0	Prepunched To 8.50'												
5.5	Prepunched To 8.50'												
6.0	Prepunched To 8.50'												
6.5	Prepunched To 8.50'												
7.0	Prepunched To 8.50'												
7.5	Prepunched To 8.50'												
8.0	Prepunched To 8.50'												
8.5	Prepunched To 8.50'												
9.0	19.6	24.4	0.36	1.8	138	Loose, Silty sand to sandy silt	27-31	20-40				03 - 05	04 - 06
9.5	20.8	25.7	0.30	1.4	62	Loose, Silty sand to sandy silt	27-31	20-40				03 - 05	04 - 06
10.0	21.7	26.6	0.26	1.2	154	Loose, Silty sand to sandy silt	27-31	20-40				03 - 05	04 - 06
10.5	12.8	15.6	0.20	1.1	50	Loose, Silty sand to sandy silt	27-31	20-40				00 - 02	00 - 02
11.0	31.5	38.1	0.60	1.1	105	Loose, Silty sand to sandy silt	36-37	20-40				05 - 08	06 - 10
11.5	69.6	83.7	0.92	1.3	91	Med dense, Silty sand to sandy silt	37-40	40-60				17 - 25	20 - 30
12.0	75.3	89.9	1.05	1.3	79	Med dense, Sand to silty sand	37-40	40-60				17 - 25	20 - 30
12.5	88.8	105.3	0.63	0.9	105	Med dense, Sand to silty sand	40-42	40-60				17 - 25	20 - 30
13.0	79.3	93.5	1.05	1.2	86	Med dense, Sand to silty sand	37-40	40-60				17 - 25	20 - 30
13.5	105.8	123.9	0.95	0.7	109	Med dense, Sand to silty sand	40-42	40-60				17 - 26	20 - 30
14.0	169.7	197.7	1.73	0.8	141	Dense, Sand to silty sand	42-46	60-80				34 - 52	40 - 60
14.5	214.3	248.2	1.18	0.4	185	Dense, Sa gravel to gr sand	42-46	60-80				35 - 52	40 - 60
15.0	273.0	314.4	2.71	1.0	232	Dense, Sand to silty sand	42-46	60-80				52 - 86	60 - 99
15.5	124.5	142.6	1.90	0.9	256	Med dense, Sand to silty sand	40-42	40-60				26 - 35	30 - 40
16.0	75.9	86.5	0.74	0.8	334	Med dense, Sand to silty sand	40-42	40-60				13 - 18	15 - 20
16.5	60.7	68.8	0.35	0.5	419	Loose, Sand to silty sand	40-42	20-40				09 - 13	10 - 15
17.0	49.5	55.8	0.59	1.0	574	Med dense, Sand to silty sand	37-40	40-60				09 - 13	10 - 15
17.5	54.4	61.0	0.30	0.5	627	Loose, Sand to silty sand	37-40	20-40				05 - 09	06 - 10
18.0	70.4	78.6	0.55	0.7	782	Med dense, Sand to silty sand	40-42	40-60				13 - 18	15 - 20
18.5	68.5	76.1	0.56	0.7	1073	Med dense, Sand to silty sand	40-42	40-60				13 - 18	15 - 20
19.0	52.7	58.3	0.49	0.9	1634	Loose, Sand to silty sand	37-40	20-40				09 - 14	10 - 15
19.5	59.7	65.8	0.20	0.3	1774	Loose, Sand to silty sand	40-42	20-40				05 - 09	06 - 10
20.0	78.1	85.7	0.36	0.4	1938	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
20.5	114.3	124.7	0.56	0.4	1899	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
21.0	151.1	164.2	0.64	0.4	2098	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
21.5	135.7	146.9	0.84	0.6	2128	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
22.0	117.8	127.0	0.93	0.8	2296	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
22.5	115.1	123.5	0.60	0.5	2381	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
23.0	154.5	165.1	1.09	0.6	2312	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
23.5	176.2	187.5	1.26	0.8	2350	Dense, Sand to silty sand	42-46	60-80				38 - 56	40 - 60
24.0	173.8	184.2	1.52	0.9	2429	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24.5	173.0	182.7	1.50	0.9	2608	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
25.0	183.9	193.5	0.76	0.4	2822	Med dense, Sand to silty sand	42-46	40-60				38 - 57	40 - 60

Notes:

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
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Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	206.7	216.7	1.10	0.5	2917	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
26.0	212.2	221.5	0.64	0.3	2827	Med dense, Sa gravel to gr sand	42-46	40-60				38 - 57	40 - 60
26.5	232.7	242.0	0.73	0.3	3059	Dense, Sa gravel to gr sand	42-46	60-80				38 - 58	40 - 60
27.0	220.9	229.0	1.28	0.6	3043	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27.5	164.6	170.0	2.06	1.1	3015	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
28.0	159.0	163.6	1.37	0.9	3044	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
28.5	160.9	165.0	1.50	0.9	3223	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
29.0	141.3	144.5	1.05	0.7	3414	Med dense, Sand to silty sand	40-42	40-60				29 - 39	30 - 40
29.5	149.9	152.7	0.63	0.4	3102	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
30.0	182.9	185.7	1.42	0.8	3185	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
30.5	176.2	178.3	1.95	1.1	3257	Dense, Sand to silty sand	42-46	60-80				40 - 59	40 - 60
31.0	178.4	179.9	1.89	1.0	3410	Dense, Sand to silty sand	42-46	60-80				40 - 59	40 - 60
31.5	184.9	185.9	1.31	0.7	3505	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
32.0	198.6	199.0	1.08	0.5	3660	Med dense, Sand to silty sand	42-46	40-60				40 - 60	40 - 60
32.5	205.3	205.0	1.06	0.5	3669	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
33.0	192.9	192.1	1.55	0.8	3766	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
33.5	177.5	176.2	2.21	1.3	3669	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
34.0	145.4	143.9	2.62	1.7	3094	Dense, Silty sand to sandy silt	40-42	60-80				40 - 61	40 - 60
34.5	148.8	146.8	2.16	1.5	3270	Dense, Sand to silty sand	40-42	60-80				41 - 61	40 - 60
35.0	125.5	123.5	1.55	1.2	3211	Med dense, Sand to silty sand	40-42	40-60				30 - 41	30 - 40
35.5	122.9	120.6	1.29	1.0	3195	Med dense, Sand to silty sand	40-42	40-60				31 - 41	30 - 40
36.0	110.6	108.2	1.13	0.9	3303	Med dense, Sand to silty sand	40-42	40-60				20 - 31	20 - 30
36.5	96.5	94.1	1.03	0.9	3308	Med dense, Sand to silty sand	40-42	40-60				21 - 31	20 - 30
37.0	135.2	131.5	1.33	1.0	3212	Med dense, Sand to silty sand	40-42	40-60				31 - 41	30 - 40
37.5	112.1	108.7	1.87	1.5	3415	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
38.0	102.7	99.3	2.14	1.8	3195	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
38.5	148.0	142.8	2.04	1.2	2972	Dense, Sand to silty sand	40-42	60-80				41 - 62	40 - 60
39.0	178.4	171.5	1.41	0.8	2811	Med dense, Sand to silty sand	42-46	40-60				42 - 62	40 - 60
39.5	200.4	192.2	2.09	1.1	3075	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
40.0	188.9	180.7	1.93	1.0	3002	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
40.5	187.6	178.9	2.89	1.5	3071	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
41.0	159.1	151.4	1.99	1.2	3191	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
41.5	169.0	160.3	1.91	1.0	2631	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
42.0	208.9	197.7	2.45	1.2	3356	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
42.5	165.2	155.9	2.58	1.3	3545	Dense, Sand to silty sand	40-42	60-80				42 - 64	40 - 60
43.0	117.9	111.0	1.38	1.0	3687	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
43.5	99.4	93.3	2.17	1.8	3674	Dense, Silty sand to sandy silt	37-40	60-80				21 - 32	20 - 30
44.0	148.5	139.1	2.61	1.6	3518	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
44.5	171.8	160.6	2.74	1.6	3663	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
45.0	189.2	176.4	2.63	1.4	3665	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
45.5	199.1	185.1	2.54	1.3	3618	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
46.0	208.2	193.1	1.46	0.7	3671	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
46.5	237.0	219.3	1.33	0.6	3480	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
47.0	246.5	227.5	1.45	0.6	3014	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
47.5	220.2	202.8	2.41	1.0	3762	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
48.0	166.9	153.3	1.96	1.1	2210	Dense, Sand to silty sand	40-42	60-80				44 - 65	40 - 60
48.5	104.8	96.1	1.76	1.4	2851	Med dense, Sand to silty sand	37-40	40-60				22 - 33	20 - 30
49.0	123.9	113.3	2.12	1.7	2882	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
49.5	128.4	117.2	2.09	1.6	2374	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
50.0	133.3	121.4	1.82	1.4	2258	Dense, Sand to silty sand	40-42	60-80				33 - 44	30 - 40

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	138.9	126.1	1.37	0.9	2158	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
51.0	142.5	129.1	1.31	0.9	1929	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
51.5	156.2	141.2	1.51	1.0	1869	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
52.0	135.1	121.8	1.32	0.9	2693	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
52.5	135.3	121.8	1.58	1.2	1957	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
53.0	136.7	122.7	1.84	1.3	2293	Dense, Sand to silty sand	40-42	60-80				33 - 45	30 - 40
53.5	126.3	113.2	0.75	0.6	2157	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
54.0	154.1	137.8	0.31	0.2	1797	Med dense, Sand to silty sand	42-46	40-60				22 - 34	20 - 30
54.5	163.0	145.4	1.45	0.9	2339	Med dense, Sand to silty sand	40-42	40-60				34 - 45	30 - 40
55.0	83.6	74.4	1.02	0.9	2951	Med dense, Sand to silty sand	37-40	40-60				17 - 22	15 - 20
55.5	65.7	58.4	0.97	1.3	3019	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
56.0	60.4	53.5	0.84	1.4	2883	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
56.5	43.7	38.6	0.91	1.6	2804	Med dense, Silty sand to sandy silt	27-31	40-60				07 - 11	06 - 10
57.0	44.8	39.5	0.87	1.8	2683	Med dense, Silty sand to sandy silt	27-31	40-60				11 - 17	10 - 15
57.5	49.1	43.3	0.73	1.4	2534	Med dense, Silty sand to sandy silt	36-37	40-60				07 - 11	06 - 10
58.0	59.1	51.9	0.93	1.7	2535	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
58.5	45.5	39.9	1.01	1.8	2570	Med dense, Silty sand to sandy silt	27-31	40-60				11 - 17	10 - 15
59.0	56.2	49.2	1.31	1.9	2035	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
59.5	89.0	77.8	0.84	0.8	2068	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
60.0	95.6	83.4	0.99	1.0	2279	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
60.5	116.3	101.2	1.21	1.0	2524	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
61.0	135.9	118.1	1.23	0.9	2655	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
61.5	97.9	84.9	2.63	2.0	2736	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
62.0	55.8	48.3	1.20	1.8	2552	Med dense, Silty sand to sandy silt	36-37	40-60				12 - 17	10 - 15
62.5	63.1	54.5	1.03	1.5	2544	Med dense, Silty sand to sandy silt	36-37	40-60				12 - 17	10 - 15
63.0	71.7	61.8	0.84	1.0	2147	Med dense, Sand to silty sand	37-40	40-60				12 - 17	10 - 15
63.5	92.7	79.8	0.82	0.8	2254	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
64.0	103.4	88.8	0.94	1.0	2355	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
64.5	93.0	79.7	1.04	1.0	2450	Med dense, Sand to silty sand	37-40	40-60				18 - 23	15 - 20
65.0	110.9	94.9	0.84	0.7	2271	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
65.5	135.7	115.9	1.58	1.1	2731	Med dense, Sand to silty sand	40-42	40-60				35 - 47	30 - 40
66.0	137.0	116.8	1.97	1.5	2642	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
66.5	139.8	118.9	1.72	1.2	2218	Med dense, Sand to silty sand	40-42	40-60				35 - 47	30 - 40
67.0	151.2	128.3	1.99	1.3	2668	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
67.5	133.9	113.5	1.64	1.1	2161	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
68.0	134.9	114.1	1.54	1.2	2783	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
68.5	140.8	118.8	2.09	1.4	2883	Dense, Sand to silty sand	40-42	60-80				36 - 47	30 - 40
69.0	150.4	126.7	1.93	1.3	2966	Dense, Sand to silty sand	40-42	60-80				36 - 47	30 - 40
69.5	138.7	116.7	2.45	1.6	2851	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
70.0	132.7	111.4	1.75	1.3	2821	Med dense, Sand to silty sand	40-42	40-60				36 - 48	30 - 40
70.5	145.6	122.0	2.17	1.5	2750	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
71.0	151.4	126.7	1.88	1.3	2569	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
71.5	127.2	106.2	1.97	1.4	2693	Dense, Sand to silty sand	37-40	60-80				36 - 48	30 - 40
72.0	112.3	93.7	2.13	1.8	2711	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
72.5	125.7	104.7	1.79	1.6	2992	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
73.0	98.1	81.5	1.84	1.5	2719	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 36	20 - 30
73.5	147.9	122.7	2.01	1.3	1578	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
74.0	163.0	135.0	1.01	0.6	3047	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
74.5	149.8	123.8	2.04	1.3	2931	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
75.0	113.7	93.8	1.53	1.3	2425	Med dense, Sand to silty sand	37-40	40-60				24 - 36	20 - 30

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	105.3	86.7	1.86	1.6	2688	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
76.0	98.9	81.4	2.03	2.0	2081	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
76.5	98.4	80.7	1.69	1.7	2768	Dense, Silty sand to sandy silt	37-40	60-80				24 - 37	20 - 30
77.0	109.8	90.0	1.88	1.5	2839	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 37	20 - 30
77.5	141.0	115.3	2.16	1.5	2975	Dense, Sand to silty sand	40-42	60-80				37 - 49	30 - 40
78.0	138.4	113.1	2.63	1.8	2875	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
78.5	165.7	135.1	2.33	1.5	3053	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
79.0	131.7	107.2	2.59	1.7	2877	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
79.5	120.2	97.7	2.04	1.6	3036	Dense, Silty sand to sandy silt	37-40	60-80				25 - 37	20 - 30
80.0	134.6	109.3	2.45	1.9	2961	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
80.5	124.5	100.8	2.37	1.9	2994	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
81.0	113.3	91.6	2.54	2.1	2891	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
81.5	134.8	108.9	1.97	1.4	3037	Dense, Sand to silty sand	40-42	60-80				37 - 50	30 - 40
82.0	137.9	111.2	2.49	1.8	2802	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
82.5	138.2	111.3	1.95	1.2	2791	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
83.0	183.5	147.5	2.64	1.4	3038	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
83.5	193.9	155.6	2.66	1.4	2984	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
84.0	158.5	127.0	2.40	1.4	3083	Dense, Sand to silty sand	40-42	60-80				37 - 50	30 - 40
84.5	161.5	129.2	1.69	1.0	3260	Med dense, Sand to silty sand	40-42	40-60				38 - 50	30 - 40
85.0	194.3	155.2	1.72	0.9	3202	Med dense, Sand to silty sand	40-42	40-60				38 - 50	30 - 40
85.5	180.0	143.6	1.95	1.0	3189	Dense, Sand to silty sand	40-42	60-80				38 - 50	30 - 40
86.0	152.2	121.2	1.43	0.8	3126	Med dense, Sand to silty sand	40-42	40-60				25 - 38	20 - 30
86.5	208.3	165.6	1.48	0.7	3062	Med dense, Sand to silty sand	42-46	40-60				38 - 50	30 - 40
87.0	220.3	174.9	1.95	0.9	3079	Dense, Sand to silty sand	42-46	60-80				50 - 76	40 - 60
87.5	213.0	168.8	2.42	1.1	3082	Dense, Sand to silty sand	42-46	60-80				50 - 76	40 - 60
88.0	168.3	133.2	2.19	1.2	3140	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
88.5	174.0	137.5	2.22	1.2	3162	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
89.0	214.8	169.5	2.39	1.0	3255	Dense, Sand to silty sand	42-46	60-80				51 - 76	40 - 60
89.5	249.9	196.8	3.04	1.2	3300	Dense, Sand to silty sand	42-46	60-80				51 - 76	40 - 60
90.0	237.8	187.0	2.80	1.1	3330	Dense, Sand to silty sand	42-46	60-80				51 - 76	40 - 60
90.5	231.7	182.0	2.43	1.0	3437	Dense, Sand to silty sand	42-46	60-80				51 - 76	40 - 60
91.0	243.5	191.0	2.51	1.1	3380	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
91.5	225.0	176.2	2.22	1.0	3456	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
92.0	234.9	183.7	1.97	0.8	3401	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
92.5	239.5	187.0	2.28	0.9	3225	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
93.0	238.8	186.1	2.91	1.2	3289	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
93.5	241.3	187.9	2.83	1.2	3387	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
94.0	223.7	173.9	2.85	1.2	3436	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
94.5	210.1	163.1	3.05	1.4	3345	Dense, Sand to silty sand	40-42	60-80				52 - 77	40 - 60
95.0	186.2	144.3	2.80	1.4	3433	Dense, Sand to silty sand	40-42	60-80				52 - 77	40 - 60
95.5	192.6	149.1	3.18	1.6	3323	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
96.0	181.4	140.2	3.03	1.7	3364	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
96.5	171.0	132.0	2.64	1.5	3030	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
97.0	164.5	126.8	2.14	1.3	3311	Dense, Sand to silty sand	40-42	60-80				39 - 52	30 - 40
97.5	147.1	113.2	2.77	1.8	3353	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
98.0	146.3	112.4	2.84	2.0	3296	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
98.5	126.9	97.4	2.59	1.8	3166	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
99.0	132.9	101.8	2.52	2.0	3293	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
99.5	129.3	99.0	2.51	1.7	3428	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
100.0	159.0	121.5	2.70	1.7	3495	Dense, Silty sand to sandy silt	37-40	60-80				52 - 79	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	148.2	113.1	2.72	1.8	3476	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
101.0	115.1	87.7	2.29	1.8	3369	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
101.5	109.3	83.2	2.02	1.8	3517	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
102.0	104.6	79.5	2.28	2.1	3575	Dense, Silty sand to sandy silt	36-37	60-80				26 - 39	20 - 30
102.5	102.3	77.6	2.03	1.9	3356	Dense, Silty sand to sandy silt	37-40	60-80				26 - 40	20 - 30
103.0	99.5	75.4	1.92	1.9	3434	Dense, Silty sand to sandy silt	36-37	60-80				26 - 40	20 - 30
103.5	90.8	68.8	1.88	2.0	3421	Dense, Silty sand to sandy silt	36-37	60-80				26 - 40	20 - 30
104.0	91.9	69.5	1.72	1.8	3253	Med dense, Silty sand to sandy silt	36-37	40-60				26 - 40	20 - 30
104.5	97.0	73.2	1.82	1.8	3308	Med dense, Silty sand to sandy silt	37-40	40-60				26 - 40	20 - 30
105.0	106.7	80.4	1.87	1.7	3267	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 40	20 - 30
105.5	114.1	85.9	2.22	2.0	3235	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
106.0	126.1	94.8	1.94	1.6	3112	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
106.5	119.5	89.7	2.18	1.8	3193	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
107.0	127.3	95.5	2.09	1.7	3071	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
107.5	119.9	89.8	2.53	2.0	3039	Dense, Silty sand to sandy silt	37-40	60-80				40 - 53	30 - 40
108.0	116.4	87.1	2.48	2.0	2925	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
108.5	144.9	108.2	1.57	0.9	2920	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
109.0	192.0	143.2	2.38	1.3	3270	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
109.5	186.4	138.8	3.05	1.6	3452	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
110.0	166.5	123.9	2.85	1.6	3361	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
110.5	145.2	107.9	2.93	1.9	3381	Dense, Silty sand to sandy silt	37-40	60-80				40 - 54	30 - 40
111.0	118.1	87.6	1.88	1.5	2978	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 40	20 - 30
111.5	122.8	91.0	2.38	1.8	2964	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
112.0	141.6	104.8	2.64	1.8	3256	Dense, Silty sand to sandy silt	37-40	60-80				41 - 54	30 - 40
112.5	138.1	102.1	2.96	2.1	3072	Dense, Silty sand to sandy silt	37-40	60-80				41 - 54	30 - 40
113.0	116.2	85.8	3.13	2.4	2286	Dense, Silty sand to sandy silt	36-37	60-80				41 - 54	30 - 40
113.5	130.7	96.4	2.70	2.0	3044	Dense, Silty sand to sandy silt	37-40	60-80				41 - 54	30 - 40
114.0	148.1	109.1	2.69	1.9	3171	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
114.5	137.9	101.4	2.94	1.9	3070	Dense, Silty sand to sandy silt	37-40	60-80				41 - 54	30 - 40
115.0	178.0	130.8	2.53	1.3	3418	Dense, Sand to silty sand	40-42	60-80				41 - 54	30 - 40
115.5	190.9	140.1	3.96	2.0	3362	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
116.0	185.3	135.7	3.09	1.6	3395	Dense, Silty sand to sandy silt	40-42	60-80				55 - 82	40 - 60
116.5	198.8	145.4	3.28	1.6	3475	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
117.0	225.2	164.6	3.15	1.4	3521	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
117.5	216.1	157.7	2.94	1.3	3678	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
118.0	261.6	190.7	2.50	0.9	3669	Dense, Sand to silty sand	42-46	60-80				55 - 82	40 - 60
118.5	276.1	201.0	1.16	0.5	3532	Med dense, Sand to silty sand	42-46	40-60				55 - 82	40 - 60
119.0	223.4	162.5	2.80	1.1	3456	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
119.5	214.3	155.7	2.44	1.1	3522	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
120.0	237.0	171.9	2.42	1.0	3704	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
120.5	265.8	192.6	2.17	0.8	3782	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
121.0	258.1	186.8	1.02	0.4	3701	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
121.5	269.2	194.6	2.15	0.8	3880	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
122.0	279.8	201.9	2.85	1.0	3702	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
122.5	248.0	178.8	3.09	1.2	3893	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
123.0	191.2	137.7	3.01	1.4	3663	Dense, Sand to silty sand	40-42	60-80				56 - 83	40 - 60
123.5	166.3	119.6	2.70	1.5	3854	Dense, Silty sand to sandy silt	40-42	60-80				42 - 56	30 - 40
124.0	169.0	121.4	2.33	1.4	3713	Dense, Sand to silty sand	40-42	60-80				42 - 56	30 - 40
124.5	122.0	87.5	2.41	1.5	2754	Med dense, Silty sand to sandy silt	37-40	40-60				28 - 42	20 - 30
125.0	165.6	118.7	3.03	1.9	4057	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-06-1999 TIME:08:39:23.18
SOUNDING NUMBER:cp-9902

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
125.5	156.3	111.9	3.24	2.0	3759	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
126.0	158.9	113.6	3.00	1.8	3844	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
126.5	177.8	127.0	2.90	1.6	3796	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
127.0	176.8	126.1	3.31	1.8	3880	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
127.5	172.0	122.5	3.31	1.9	3896	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
128.0	190.1	135.3	3.07	1.7	3974	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
128.5	168.1	119.5	3.88	2.1	3764	Dense, Silty sand to sandy silt	37-40	60-80				56 - 85	40 - 60
129.0	197.6	140.3	3.05	1.4	3930	Dense, Sand to silty sand	40-42	60-80				56 - 85	40 - 60
129.5	239.6	169.9	3.07	1.2	3961	Dense, Sand to silty sand	40-42	60-80				56 - 85	40 - 60
130.0	250.7	177.5	3.13	1.3	4089	Dense, Sand to silty sand	40-42	60-80				57 - 85	40 - 60
130.5	249.9	176.8	3.05	1.2	4109	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
131.0	276.4	195.3	2.64	0.9	4150	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
131.5	302.6	213.6	0.61	0.3	4229	Med dense, Sa gravel to gr sand	42-46	40-60				57 - 85	40 - 60
132.0	291.3	205.4	2.61	0.9	4107	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
132.5	327.6	230.7	2.09	0.5	3880	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
133.0	335.5	236.0	1.34	0.4	3975	Dense, Sa gravel to gr sand	42-46	60-80				57 - 85	40 - 60
133.5	320.8	225.4	2.41	0.7	3635	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
134.0	281.2	197.4	3.02	1.1	4065	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
134.5	227.7	159.6	2.28	0.9	4060	Dense, Sand to silty sand	40-42	40-60				43 - 57	30 - 40
135.0	216.6	151.7	2.15	0.9	3921	Med dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
135.5	314.6	220.0	2.30	0.6	3835	Dense, Sand to silty sand	+46	60-80				57 - 86	40 - 60
136.0	443.9	310.1	1.54	0.3	3733	Dense, Sa gravel to gr sand							

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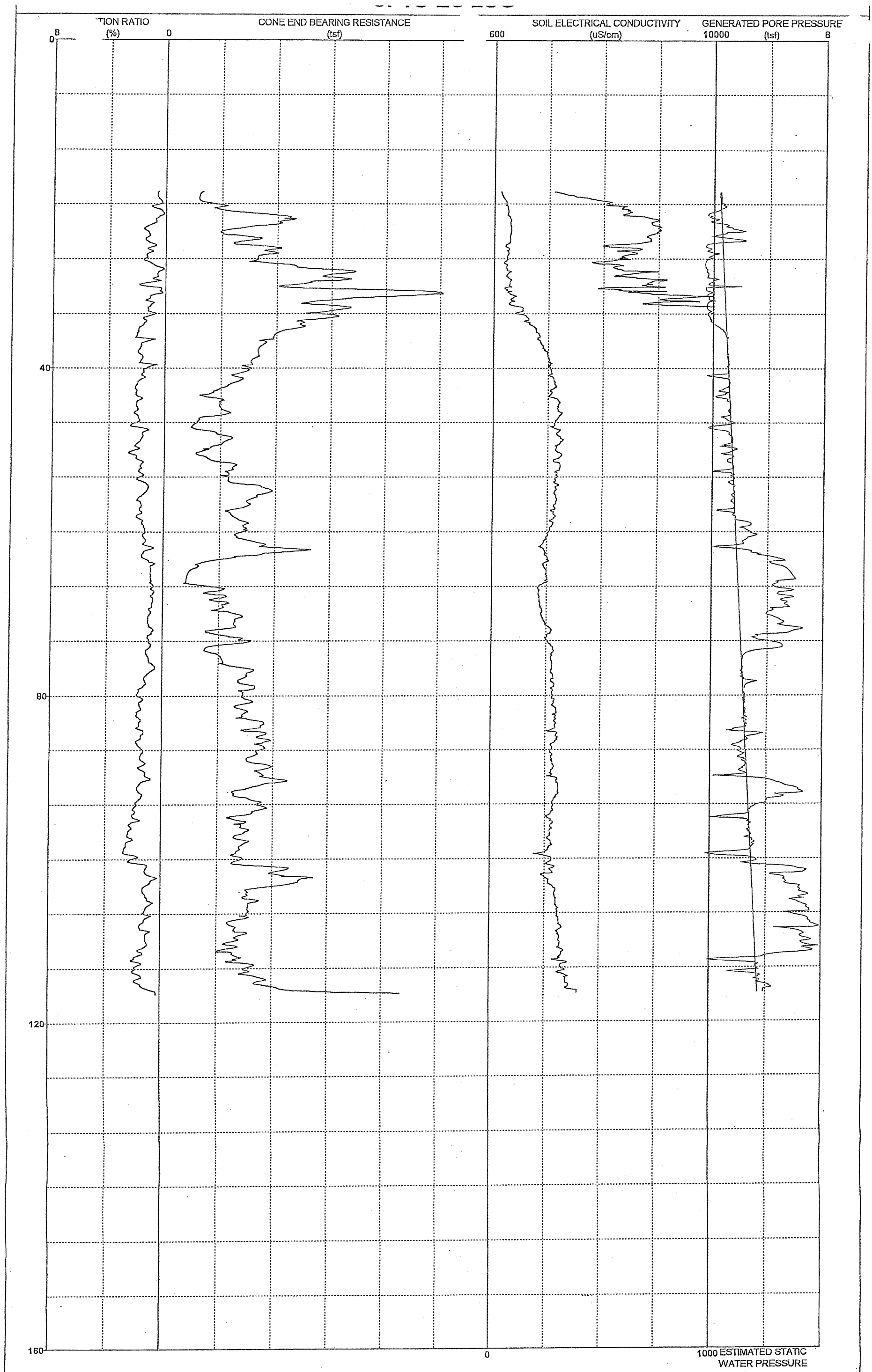


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

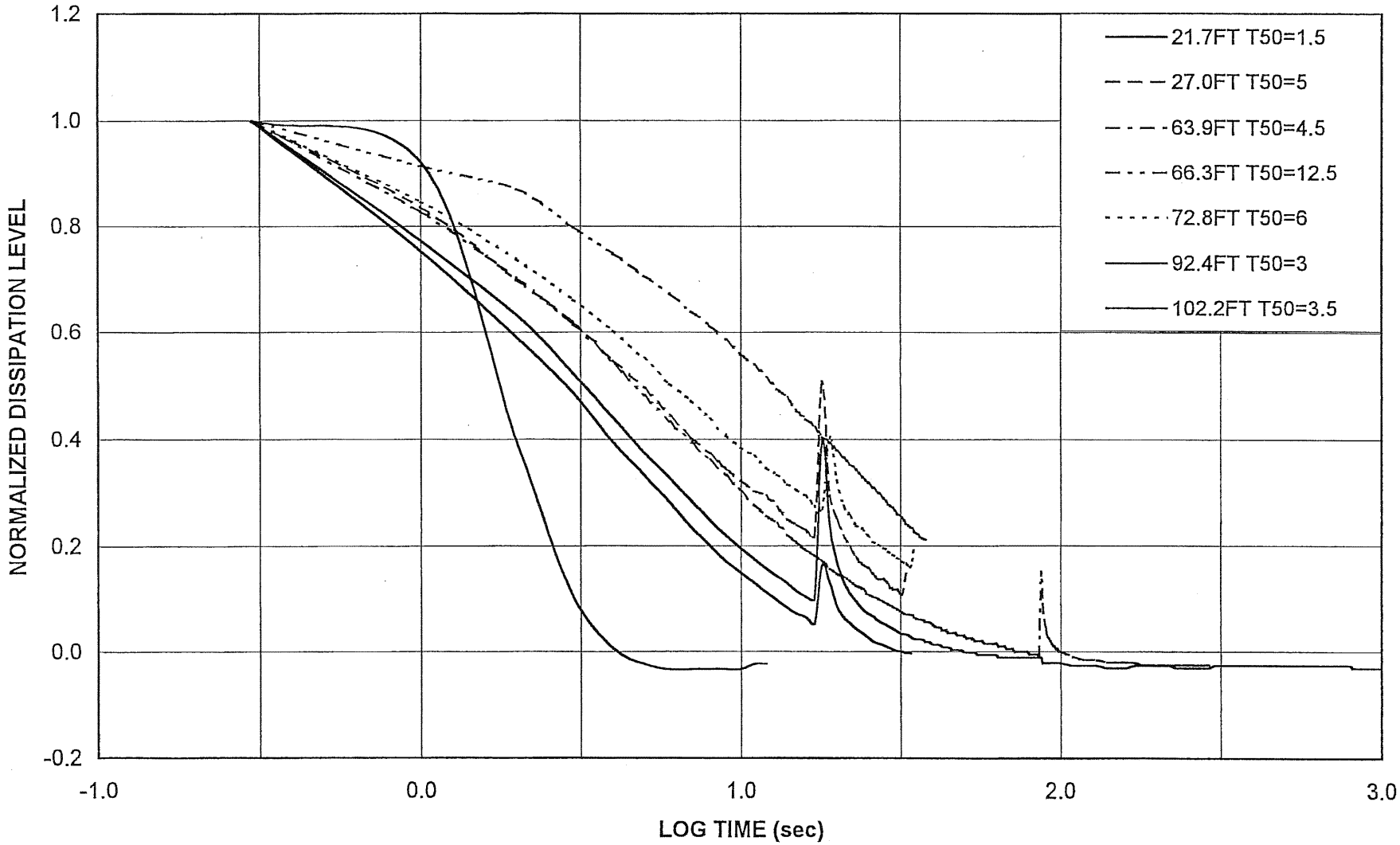
STRATIGRAPHICS

R2DATE: 5-10-1999 TIME:08:21:07.97
SOUNDING NUMBER:cp-9903

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

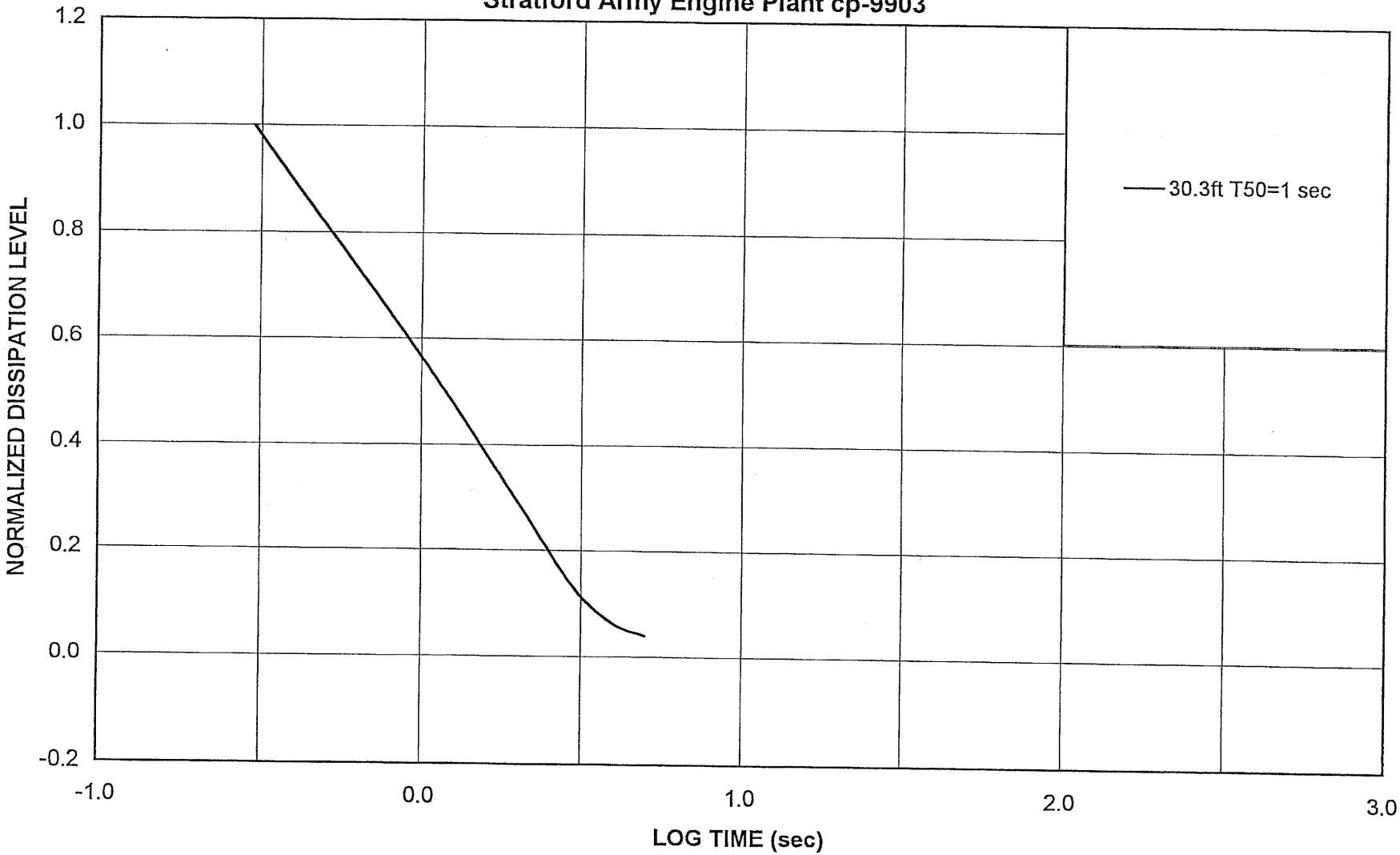
Stratford Army Engine Plant cp-9903



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9903



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-10-1999 TIME:08:21:07.97
SOUNDING NUMBER:cp-9903

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 18.50'												
1.5	Prepunched To 18.50'												
2.0	Prepunched To 18.50'												
2.5	Prepunched To 18.50'												
3.0	Prepunched To 18.50'												
3.5	Prepunched To 18.50'												
4.0	Prepunched To 18.50'												
4.5	Prepunched To 18.50'												
5.0	Prepunched To 18.50'												
5.5	Prepunched To 18.50'												
6.0	Prepunched To 18.50'												
6.5	Prepunched To 18.50'												
7.0	Prepunched To 18.50'												
7.5	Prepunched To 18.50'												
8.0	Prepunched To 18.50'												
8.5	Prepunched To 18.50'												
9.0	Prepunched To 18.50'												
9.5	Prepunched To 18.50'												
10.0	Prepunched To 18.50'												
10.5	Prepunched To 18.50'												
11.0	Prepunched To 18.50'												
11.5	Prepunched To 18.50'												
12.0	Prepunched To 18.50'												
12.5	Prepunched To 18.50'												
13.0	Prepunched To 18.50'												
13.5	Prepunched To 18.50'												
14.0	Prepunched To 18.50'												
14.5	Prepunched To 18.50'												
15.0	Prepunched To 18.50'												
15.5	Prepunched To 18.50'												
16.0	Prepunched To 18.50'												
16.5	Prepunched To 18.50'												
17.0	Prepunched To 18.50'												
17.5	Prepunched To 18.50'												
18.0	Prepunched To 18.50'												
18.5	Prepunched To 18.50'												
19.0	59.6	63.5	0.39	0.6	366	Loose, Sand to silty sand	37-40	20-40				09 - 14	10 - 15
19.5	59.2	62.8	0.29	0.4	462	Loose, Sand to silty sand	40-42	20-40				06 - 09	06 - 10
20.0	88.4	93.6	0.34	0.4	525	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
20.5	88.1	92.9	0.83	0.8	583	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
21.0	135.9	142.7	0.38	0.2	624	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
21.5	216.1	226.1	1.24	0.5	661	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
22.0	220.5	229.7	1.61	0.7	751	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
22.5	192.0	199.4	2.30	1.1	723	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
23.0	128.4	132.8	2.46	1.6	750	Dense, Silty sand to sandy silt	40-42	60-80				39 - 58	40 - 60
23.5	98.0	101.0	1.48	1.3	744	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30
24.0	148.4	152.5	2.05	1.3	696	Dense, Sand to silty sand	40-42	60-80				39 - 58	40 - 60
24.5	141.5	144.8	2.16	1.3	715	Dense, Sand to silty sand	40-42	60-80				39 - 59	40 - 60
25.0	147.5	150.5	1.26	0.7	525	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40

Notes:

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-10-1999 TIME:08:21:07.97
SOUNDING NUMBER:cp-9903

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	199.3	202.6	2.40	1.2	672	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
26.0	200.5	203.2	2.44	1.3	652	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
26.5	164.4	166.1	2.35	1.3	590	Dense, Sand to silty sand	40-42	60-80				40 - 59	40 - 60
27.0	153.4	154.4	2.49	1.3	513	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
27.5	232.5	233.3	1.94	0.8	587	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
28.0	309.0	309.2	0.75	0.2	586	Dense, Sa gravel to gr sand	+46	60-80				40 - 60	40 - 60
28.5	311.4	310.6	1.96	0.6	626	Dense, Sa gravel to gr sand	+46	60-80				40 - 60	40 - 60
29.0	316.7	314.9	2.65	0.9	650	Dense, Sand to silty sand	42-46	60-80				60 - 100	60 - 99
29.5	263.1	260.8	3.37	1.1	719	Dense, Sand to silty sand	42-46	60-80				61 - 100	60 - 99
30.0	204.4	202.0	3.69	1.3	711	Dense, Sand to silty sand	42-46	60-80				40 - 61	40 - 60
30.5	428.6	422.3	1.94	0.4	577	Dense, Sa gravel to gr sand	+46	60-80				61 - 100	60 - 99
31.0	478.8	470.3	4.05	0.8	765	V dense, Sa gravel to gr sand	+46	80-100				+ 102	+ 100
31.5	326.1	319.3	4.73	1.2	788	V dense, Sand to silty sand	42-46	80-100				+ 102	+ 100
32.0	254.6	248.6	2.49	0.9	718	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
32.5	329.0	320.4	3.79	1.2	1170	V dense, Sand to silty sand	42-46	80-100				62 - 102	60 - 99
33.0	298.6	290.0	4.12	1.2	1324	V dense, Sand to silty sand	42-46	80-100				62 - 102	60 - 99
33.5	305.6	295.9	3.07	1.0	1393	Dense, Sand to silty sand	42-46	60-80				62 - 102	60 - 99
34.0	268.3	259.1	4.61	1.5	1589	V dense, Sand to silty sand	42-46	80-100				62 - 103	60 - 99
34.5	246.0	236.8	3.80	1.5	1631	V dense, Sand to silty sand	42-46	80-100				62 - 103	60 - 99
35.0	244.0	234.3	4.68	1.9	1876	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 104	+ 100
35.5	206.1	197.4	4.31	1.9	1941	V dense, Silty sand to sandy silt	40-42	80-100				63 - 103	60 - 99
36.0	195.3	186.6	4.08	2.0	2100	V dense, Silty sand to sandy silt	40-42	80-100				63 - 104	60 - 99
36.5	186.5	177.7	1.59	0.8	2029	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
37.0	178.8	169.8	3.08	1.7	2177	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
37.5	168.8	160.0	3.10	1.8	2258	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
38.0	166.9	157.7	3.28	1.9	2465	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
38.5	168.3	158.7	2.74	1.6	2485	Dense, Sand to silty sand	40-42	60-80				42 - 64	40 - 60
39.0	155.3	146.0	2.77	1.7	2551	Dense, Silty sand to sandy silt	40-42	60-80				43 - 64	40 - 60
39.5	156.9	147.2	0.71	1.0	2621	Dense, Sand to silty sand	40-42	60-80				32 - 43	30 - 40
40.0	151.0	141.3	2.05	1.3	2612	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
40.5	140.7	131.3	2.26	1.5	2651	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
41.0	124.2	115.7	2.03	1.5	2610	Dense, Silty sand to sandy silt	40-42	60-80				32 - 43	30 - 40
41.5	135.1	125.4	2.48	1.8	2775	Dense, Silty sand to sandy silt	37-40	60-80				43 - 65	40 - 60
42.0	115.7	107.1	2.50	2.0	2820	Dense, Silty sand to sandy silt	37-40	60-80				43 - 65	40 - 60
42.5	101.4	93.7	2.32	2.1	2804	Dense, Silty sand to sandy silt	37-40	60-80				32 - 43	30 - 40
43.0	86.4	79.6	1.83	2.1	2686	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
43.5	72.9	67.1	1.74	1.9	2562	Med dense, Silty sand to sandy silt	36-37	40-60				22 - 33	20 - 30
44.0	101.9	93.5	1.92	1.9	2983	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
44.5	97.8	89.5	2.02	2.0	2975	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
45.0	100.8	92.1	2.09	1.9	2933	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
45.5	117.2	106.8	2.43	2.2	3144	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
46.0	73.2	66.6	1.91	1.9	3007	Med dense, Silty sand to sandy silt	36-37	40-60				22 - 33	20 - 30
46.5	59.1	53.6	1.13	1.8	2845	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 22	15 - 20
47.0	49.9	45.1	1.35	2.5	2818	V stiff, Sandy silt to sandy clay			25	3.77	2.70	17 - 22	15 - 20
47.5	58.7	53.0	0.91	1.2	2981	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
48.0	93.2	84.0	1.76	1.6	2902	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 33	20 - 30
48.5	120.5	108.3	1.88	1.6	3075	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
49.0	107.9	96.8	2.10	1.8	3140	Dense, Silty sand to sandy silt	37-40	60-80				33 - 45	30 - 40
49.5	91.9	82.2	2.13	2.1	2920	Dense, Silty sand to sandy silt	36-37	60-80				22 - 34	20 - 30
50.0	76.7	68.5	1.64	2.0	2855	Dense, Silty sand to sandy silt	36-37	60-80				22 - 34	20 - 30

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50.5	56.7	50.5	1.60	2.4	3122	Dense, Silty sand to sandy silt	27-31	60-80				17 - 22	15 - 20
51.0	76.4	67.9	1.73	2.0	3039	Dense, Silty sand to sandy silt	36-37	60-80				22 - 34	20 - 30
51.5	102.0	90.5	1.83	1.5	2820	Med dense, Silty sand to sandy silt	37-40	40-60				23 - 34	20 - 30
52.0	126.0	111.6	2.16	1.7	3073	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
52.5	121.3	107.2	2.24	1.8	3037	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
53.0	116.3	102.6	1.73	1.5	2932	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
53.5	115.1	101.3	2.28	2.0	2857	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
54.0	120.0	105.4	2.10	1.4	2806	Dense, Sand to silty sand	37-40	60-80				23 - 34	20 - 30
54.5	175.1	153.5	2.09	1.1	2888	Dense, Sand to silty sand	40-42	60-80				46 - 68	40 - 60
55.0	193.9	169.6	2.31	1.2	2864	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
55.5	168.6	147.2	2.87	1.6	2860	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
56.0	155.8	135.7	3.13	1.9	2931	Dense, Silty sand to sandy silt	37-40	60-80				46 - 69	40 - 60
56.5	152.3	132.4	2.52	1.7	2903	Dense, Silty sand to sandy silt	40-42	60-80				46 - 69	40 - 60
57.0	141.7	123.0	2.51	1.7	2834	Dense, Silty sand to sandy silt	37-40	60-80				46 - 69	40 - 60
57.5	113.9	98.6	1.98	1.6	2786	Dense, Silty sand to sandy silt	37-40	60-80				35 - 46	30 - 40
58.0	122.4	105.8	2.55	2.0	2874	Dense, Silty sand to sandy silt	37-40	60-80				35 - 46	30 - 40
58.5	134.5	116.0	2.28	1.6	2708	Dense, Silty sand to sandy silt	37-40	60-80				35 - 46	30 - 40
59.0	150.9	129.9	2.31	1.6	2782	Dense, Silty sand to sandy silt	40-42	60-80				46 - 70	40 - 60
59.5	148.0	127.2	2.09	1.4	2642	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
60.0	141.3	121.2	1.96	1.4	2586	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
60.5	131.7	112.7	2.06	1.5	2511	Dense, Silty sand to sandy silt	40-42	60-80				35 - 47	30 - 40
61.0	154.3	131.9	2.12	1.3	2399	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
61.5	184.0	156.9	2.80	1.4	2298	Dense, Sand to silty sand	40-42	60-80				47 - 70	40 - 60
62.0	232.5	197.9	1.87	0.8	2334	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
62.5	197.9	168.1	3.40	1.4	2452	Dense, Sand to silty sand	40-42	60-80				47 - 71	40 - 60
63.0	128.1	108.7	2.60	1.5	2505	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
63.5	85.6	72.5	1.17	1.1	2577	Med dense, Sand to silty sand	37-40	40-60				18 - 24	15 - 20
64.0	59.8	50.6	0.53	0.7	2342	Loose, Sand to silty sand	37-40	20-40				07 - 12	06 - 10
64.5	53.3	45.0	0.53	0.9	2436	Loose, Silty sand to sandy silt	36-37	20-40				07 - 12	06 - 10
65.0	44.4	37.4	0.44	0.9	2491	Loose, Silty sand to sandy silt	36-37	20-40				07 - 12	06 - 10
65.5	41.7	35.0	0.40	0.9	2490	Loose, Silty sand to sandy silt	36-37	20-40				05 - 07	04 - 06
66.0	40.4	33.9	0.37	0.9	2483	Loose, Silty sand to sandy silt	36-37	20-40				05 - 07	04 - 06
66.5	65.4	54.8	0.68	0.7	2216	Loose, Sand to silty sand	37-40	20-40				07 - 12	06 - 10
67.0	108.6	90.8	0.85	0.9	2115	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
67.5	75.8	63.2	0.76	0.7	2128	Loose, Sand to silty sand	37-40	20-40				12 - 18	10 - 15
68.0	107.1	89.2	0.78	0.8	2175	Med dense, Sand to silty sand	40-42	40-60				18 - 24	15 - 20
68.5	108.3	90.1	0.84	0.7	2173	Med dense, Sand to silty sand	40-42	40-60				18 - 24	15 - 20
69.0	106.0	88.0	0.90	0.8	2210	Med dense, Sand to silty sand	40-42	40-60				18 - 24	15 - 20
69.5	93.3	77.3	1.15	1.0	2290	Med dense, Sand to silty sand	37-40	40-60				18 - 24	15 - 20
70.0	131.2	108.5	1.27	0.9	2257	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
70.5	137.8	113.8	1.50	1.1	2329	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
71.0	128.3	105.8	1.43	1.1	2411	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
71.5	129.8	106.8	1.30	1.0	2540	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
72.0	87.9	72.2	0.77	0.7	2743	Med dense, Sand to silty sand	40-42	40-60				12 - 18	10 - 15
72.5	95.5	78.4	0.91	0.9	2614	Med dense, Sand to silty sand	40-42	40-60				18 - 24	15 - 20
73.0	143.4	117.4	1.64	1.1	2457	Med dense, Sand to silty sand	40-42	40-60				24 - 37	20 - 30
73.5	149.5	122.2	1.43	1.0	2597	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
74.0	85.6	69.8	1.01	0.9	2764	Med dense, Sand to silty sand	37-40	40-60				18 - 25	15 - 20
74.5	74.8	60.9	1.05	1.2	2837	Med dense, Silty sand to sandy silt	37-40	40-60				12 - 18	10 - 15
75.0	100.0	81.3	1.18	1.1	2739	Med dense, Sand to silty sand	37-40	40-60				25 - 37	20 - 30

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75.5	105.7	85.8	1.07	1.0	2734	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
76.0	108.5	88.0	0.96	0.9	2777	Med dense, Sand to silty sand	40-42	40-60				19 - 25	15 - 20
76.5	133.6	108.2	0.80	0.5	2760	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
77.0	162.6	131.4	1.29	0.8	2732	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
77.5	150.9	121.7	1.78	1.2	2835	Med dense, Sand to silty sand	40-42	40-60				37 - 50	30 - 40
78.0	140.0	112.8	1.95	1.3	2801	Dense, Sand to silty sand	40-42	60-80				37 - 50	30 - 40
78.5	140.3	112.9	1.82	1.2	2856	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
79.0	166.9	134.0	2.32	1.5	2838	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
79.5	144.1	115.5	2.65	1.7	2808	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
80.0	143.5	114.9	2.57	1.7	2816	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
80.5	155.9	124.6	2.19	1.4	2924	Dense, Sand to silty sand	40-42	60-80				38 - 50	30 - 40
81.0	148.1	118.2	2.60	1.6	2864	Dense, Silty sand to sandy silt	37-40	60-80				38 - 50	30 - 40
81.5	135.4	107.9	2.22	1.5	2936	Dense, Silty sand to sandy silt	37-40	60-80				38 - 50	30 - 40
82.0	152.3	121.2	2.67	1.8	2985	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
82.5	144.6	114.8	2.59	1.8	2986	Dense, Silty sand to sandy silt	37-40	60-80				50 - 76	40 - 60
83.0	169.9	134.7	2.75	1.5	2921	Dense, Sand to silty sand	40-42	60-80				50 - 76	40 - 60
83.5	181.5	143.7	2.98	1.7	2971	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
84.0	165.5	130.9	3.10	1.7	2971	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
84.5	187.2	147.8	2.44	1.3	3025	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
85.0	170.4	134.3	2.82	1.5	3023	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
85.5	191.9	151.0	3.33	1.8	3004	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
86.0	175.6	138.0	3.17	1.7	2774	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
86.5	182.9	143.6	2.62	1.4	2825	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
87.0	170.9	133.9	2.45	1.4	2752	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
87.5	158.3	123.8	2.57	1.5	2767	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
88.0	153.9	120.3	2.31	1.3	2791	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
88.5	193.2	150.7	2.60	1.4	2862	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
89.0	181.8	141.6	2.85	1.5	2852	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
89.5	177.8	138.3	2.08	1.2	2741	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
90.0	187.7	145.8	1.94	0.9	2807	Med dense, Sand to silty sand	40-42	40-60				39 - 51	30 - 40
90.5	224.6	174.2	2.89	1.3	3030	Dense, Sand to silty sand	40-42	60-80				39 - 51	30 - 40
91.0	175.4	135.9	3.20	1.6	3120	Dense, Silty sand to sandy silt	40-42	60-80				52 - 77	40 - 60
91.5	142.8	110.4	2.73	1.7	3116	Dense, Silty sand to sandy silt	37-40	60-80				52 - 77	40 - 60
92.0	130.7	100.9	1.91	1.4	3129	Med dense, Silty sand to sandy silt	37-40	40-60				39 - 52	30 - 40
92.5	154.5	119.1	2.39	1.5	2981	Dense, Sand to silty sand	40-42	60-80				26 - 39	20 - 30
93.0	179.1	137.9	3.17	1.8	2863	Dense, Silty sand to sandy silt	40-42	60-80				39 - 52	30 - 40
93.5	179.5	138.0	3.34	1.8	2889	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
94.0	175.5	134.8	3.65	2.0	2891	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
94.5	158.1	121.3	3.31	2.0	2765	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
95.0	125.5	96.1	2.58	1.8	2633	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
95.5	151.3	115.7	3.00	2.1	2871	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
96.0	142.4	108.7	3.28	2.2	2756	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
96.5	156.3	119.2	3.50	2.3	2732	V dense, Silty sand to sandy silt	37-40	80-100				52 - 79	40 - 60
97.0	139.7	106.4	3.55	2.4	2733	Dense, Silty sand to sandy silt	37-40	60-80				52 - 79	40 - 60
97.5	134.5	102.2	3.03	2.1	2625	Dense, Silty sand to sandy silt	37-40	60-80				53 - 79	40 - 60
98.0	151.0	114.7	3.79	2.5	2777	V dense, Silty sand to sandy silt	37-40	80-100				39 - 53	30 - 40
98.5	140.0	106.2	3.68	2.5	2725	V dense, Silty sand to sandy silt	36-37	80-100				53 - 79	40 - 60
99.0	136.0	103.0	3.72	2.7	2620	V dense, Silty sand to sandy silt	36-37	80-100				53 - 79	40 - 60
99.5	126.4	95.6	2.65	2.0	2225	Dense, Silty sand to sandy silt	37-40	60-80				53 - 79	40 - 60
100.0	144.8	109.3	3.04	2.2	2813	Dense, Silty sand to sandy silt	37-40	60-80				40 - 53	30 - 40
												53 - 79	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-10-1999 TIME:08:21:07.97
SOUNDING NUMBER:cp-9903

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	127.6	96.3	2.60	1.6	2627	Dense, Silty sand to sandy silt	37-40	60-80				27 - 40	20 - 30
101.0	214.8	161.8	2.30	1.0	2958	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
101.5	209.0	157.2	2.60	1.2	2804	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
102.0	217.1	163.1	1.70	0.8	2354	Med dense, Sand to silty sand	42-46	40-60				53 - 80	40 - 60
102.5	251.0	188.3	1.39	0.6	2619	Med dense, Sand to silty sand	42-46	40-60				53 - 80	40 - 60
103.0	240.3	180.0	2.02	0.8	2666	Dense, Sand to silty sand	42-46	60-80				53 - 80	40 - 60
103.5	186.7	139.7	2.74	1.3	2883	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
104.0	155.5	116.2	2.09	1.3	3000	Dense, Sand to silty sand	40-42	60-80				40 - 54	30 - 40
104.5	155.4	116.0	1.68	1.1	2951	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
105.0	165.2	123.2	1.61	1.0	3018	Med dense, Sand to silty sand	40-42	40-60				40 - 54	30 - 40
105.5	156.9	116.8	1.14	0.7	3023	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
106.0	156.4	116.2	1.66	1.1	3115	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
106.5	156.8	116.4	1.91	1.2	3121	Med dense, Sand to silty sand	40-42	40-60				40 - 54	30 - 40
107.0	148.1	109.8	1.24	0.8	3092	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
107.5	130.2	96.4	1.74	1.2	3168	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
108.0	123.3	91.2	1.92	1.5	3165	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 41	20 - 30
108.5	132.6	97.9	1.96	1.4	3310	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 41	20 - 30
109.0	154.7	114.1	1.39	0.9	3108	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
109.5	135.9	100.2	1.58	1.1	3191	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
110.0	133.9	98.5	1.44	1.1	3172	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
110.5	122.4	90.0	1.26	1.0	3204	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
111.0	115.9	85.1	1.98	1.5	3198	Med dense, Silty sand to sandy silt	37-40	40-60				27 - 41	20 - 30
111.5	129.4	94.8	1.66	1.3	3312	Med dense, Sand to silty sand	37-40	40-60				27 - 41	20 - 30
112.0	142.6	104.4	2.72	1.9	3231	Dense, Silty sand to sandy silt	37-40	60-80				41 - 55	30 - 40
112.5	118.8	86.9	2.54	1.7	3079	Dense, Silty sand to sandy silt	37-40	60-80				27 - 41	20 - 30
113.0	167.0	122.0	2.69	1.7	3273	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
113.5	150.9	110.1	2.91	1.9	3437	Dense, Silty sand to sandy silt	37-40	60-80				41 - 55	30 - 40
114.0	143.7	104.7	2.59	1.6	3206	Dense, Silty sand to sandy silt	37-40	60-80				41 - 55	30 - 40
114.5	181.6	132.1	2.71	1.5	3500	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
115.0	171.0	124.2	3.09	1.7	3489	Dense, Silty sand to sandy silt	40-42	60-80				55 - 83	40 - 60
115.5	200.5	145.5	2.80	1.3	3619	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
116.0	240.6	174.4	1.48	0.5	3849	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40

Notes:

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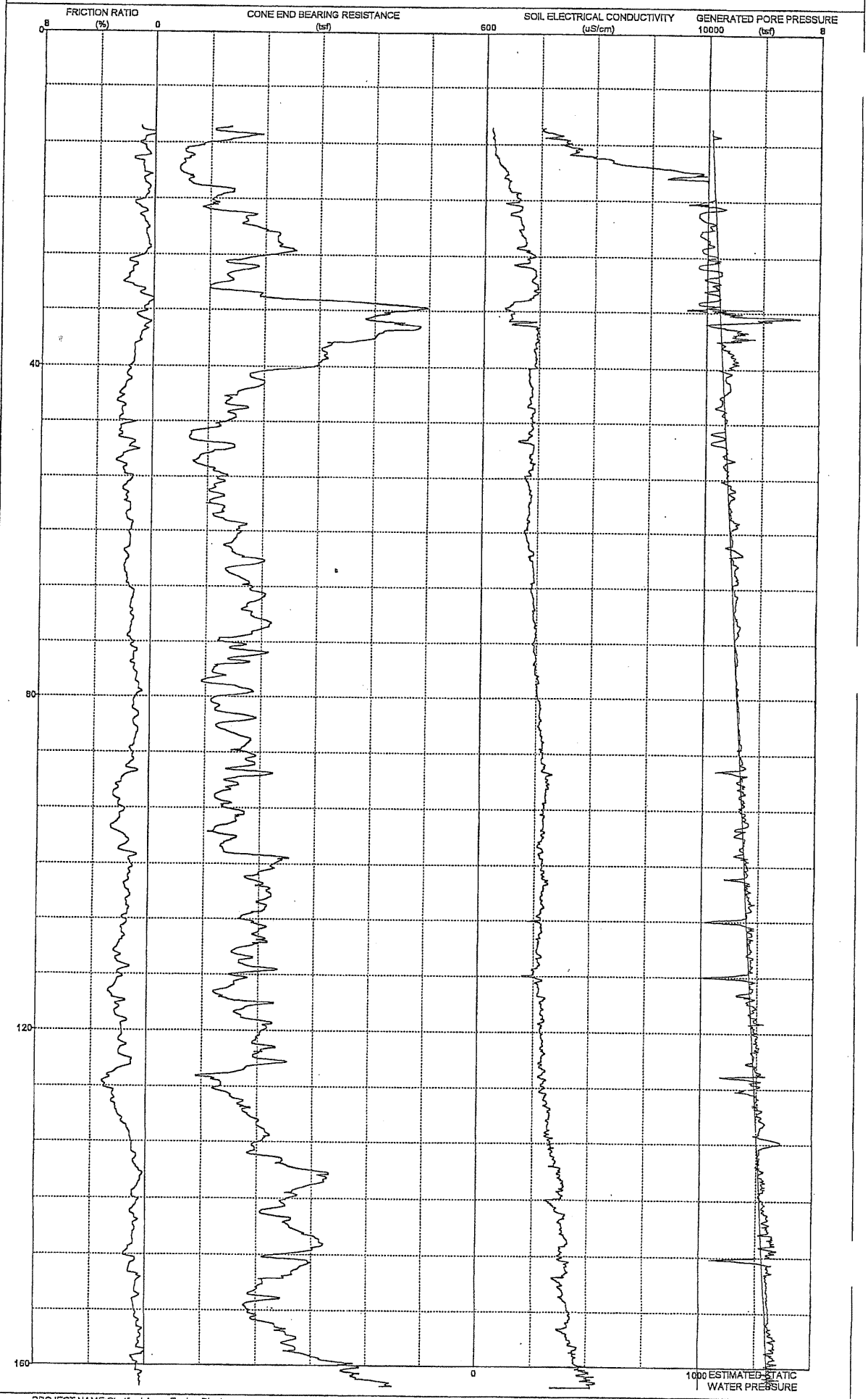
CPTU-EC LOG

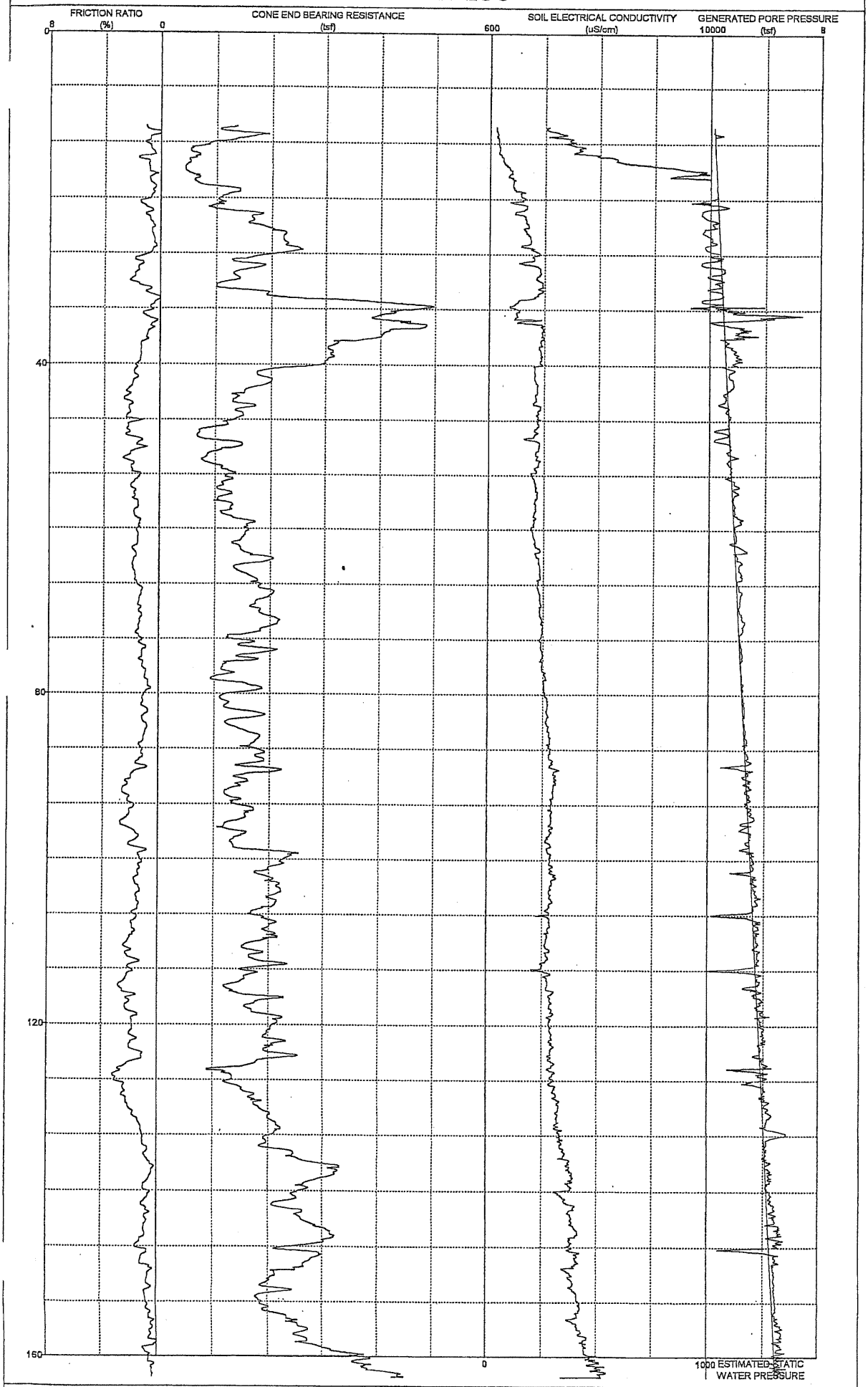


PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

05/06/99
SOUNDING NUMBER:cp9904

CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

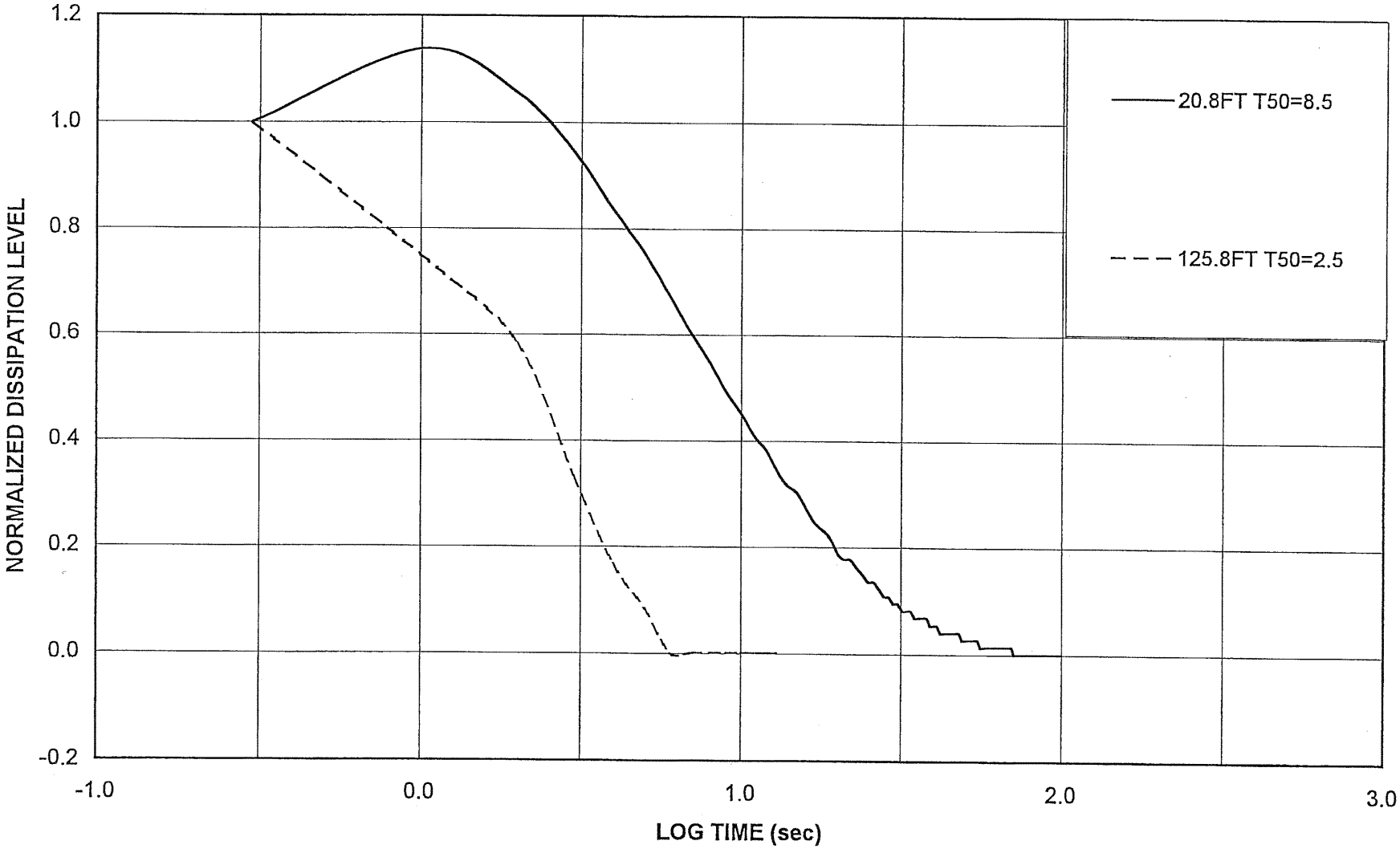
STRATIGRAPHICS

05/06/99
SOUNDING NUMBER:cp9904

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp9904



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 11.50'												
1.5	Prepunched To 11.50'												
2.0	Prepunched To 11.50'												
2.5	Prepunched To 11.50'												
3.0	Prepunched To 11.50'												
3.5	Prepunched To 11.50'												
4.0	Prepunched To 11.50'												
4.5	Prepunched To 11.50'												
5.0	Prepunched To 11.50'												
5.5	Prepunched To 11.50'												
6.0	Prepunched To 11.50'												
6.5	Prepunched To 11.50'												
7.0	Prepunched To 11.50'												
7.5	Prepunched To 11.50'												
8.0	Prepunched To 11.50'												
8.5	Prepunched To 11.50'												
9.0	Prepunched To 11.50'												
9.5	Prepunched To 11.50'												
10.0	Prepunched To 11.50'												
10.5	Prepunched To 11.50'												
11.0	Prepunched To 11.50'												
11.5	Prepunched To 11.50'												
12.0	119.4	138.9	0.40	0.3	300	Med dense, Sand to silty sand	42-46	40-60				17 - 26	20 - 30
12.5	173.5	200.7	0.58	0.4	286	Med dense, Sand to silty sand	42-46	40-60				35 - 52	40 - 60
13.0	134.0	154.1	1.12	0.8	365	Med dense, Sand to silty sand	42-46	40-60				26 - 35	30 - 40
13.5	87.5	100.1	0.95	0.9	376	Med dense, Sand to silty sand	40-42	40-60				17 - 26	20 - 30
14.0	58.1	66.1	0.54	0.7	405	Med dense, Sand to silty sand	37-40	40-60				09 - 13	10 - 15
14.5	58.6	66.3	0.28	0.4	392	Loose, Sand to silty sand	40-42	20-40				09 - 13	10 - 15
15.0	63.5	71.5	0.87	1.3	556	Med dense, Silty sand to sandy silt	37-40	40-60				13 - 18	15 - 20
15.5	52.9	59.3	0.47	0.9	592	Med dense, Sand to silty sand	37-40	40-60				09 - 13	10 - 15
16.0	46.4	51.7	0.46	0.9	763	Loose, Sand to silty sand	37-40	20-40				05 - 09	06 - 10
16.5	44.4	49.3	0.39	0.8	927	Loose, Sand to silty sand	37-40	20-40				05 - 09	06 - 10
17.0	55.9	61.7	0.09	0.3	897	Loose, Sand to silty sand	40-42	20-40				05 - 09	06 - 10
17.5	68.6	75.4	0.52	0.8	1008	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
18.0	64.4	70.5	0.53	0.7	1057	Med dense, Sand to silty sand	40-42	40-60				09 - 14	10 - 15
18.5	91.1	99.3	0.41	0.3	1031	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
19.0	142.2	154.3	0.72	0.6	1184	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
19.5	121.4	131.2	0.67	0.5	1378	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
20.0	106.3	114.4	0.78	0.7	1572	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
20.5	106.8	114.4	1.57	1.4	1180	Dense, Sand to silty sand	40-42	60-80				28 - 37	30 - 40
21.0	87.5	93.4	1.09	1.0	1651	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
21.5	134.5	143.0	0.87	0.5	1158	Med dense, Sand to silty sand	42-46	40-60				28 - 38	30 - 40
22.0	174.5	184.8	1.77	1.0	1579	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
22.5	167.7	176.9	1.25	0.8	1627	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
23.0	159.9	168.0	0.94	0.5	1701	Med dense, Sand to silty sand	42-46	40-60				29 - 38	30 - 40
23.5	193.5	202.6	0.77	0.5	1562	Med dense, Sand to silty sand	42-46	40-60				38 - 57	40 - 60
24.0	224.0	233.7	1.38	0.6	1652	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
24.5	222.2	231.0	1.11	0.5	1822	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
25.0	222.2	230.1	0.93	0.4	1873	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	228.5	235.8	0.95	0.4	1649	Dense, Sa gravel to gr sand	42-46	60-80				39 - 58	40 - 60
26.0	250.4	257.5	1.07	0.4	2006	Dense, Sa gravel to gr sand	42-46	60-80				39 - 58	40 - 60
26.5	227.6	233.2	1.50	0.6	2248	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
27.0	172.9	176.6	2.50	1.3	1950	Dense, Sand to silty sand	40-42	60-80				39 - 59	40 - 60
27.5	130.0	132.3	2.77	1.7	1847	Dense, Silty sand to sandy silt	40-42	60-80				39 - 59	40 - 60
28.0	185.4	188.1	2.28	1.3	2006	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.5	162.8	164.6	2.77	1.5	2293	Dense, Sand to silty sand	40-42	60-80				40 - 59	40 - 60
29.0	132.8	133.8	2.53	1.7	2322	Dense, Silty sand to sandy silt	40-42	60-80				40 - 60	40 - 60
29.5	139.1	139.8	2.47	1.8	2148	Dense, Silty sand to sandy silt	40-42	60-80				40 - 60	40 - 60
30.0	126.3	126.4	3.03	2.2	2352	Dense, Silty sand to sandy silt	37-40	60-80				40 - 60	40 - 60
30.5	101.4	101.2	1.65	1.4	2407	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 30	20 - 30
31.0	138.6	137.9	1.18	0.7	2404	Med dense, Sand to silty sand	40-42	40-60				30 - 40	30 - 40
31.5	193.1	191.6	1.63	0.8	2188	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
32.0	235.4	232.8	0.29	0.1	1921	Med dense, Sa gravel to gr sand	42-46	40-60				40 - 61	40 - 60
32.5	400.2	394.6	1.63	0.3	1252	Dense, Sa gravel to gr sand	+46	60-80				61 - 100	60 - 99
33.0	496.3	487.9	3.02	0.6	917	V dense, Sa gravel to gr sand	+46	80-100				+ 102	+ 100
33.5	432.5	423.9	2.12	0.5	1354	Dense, Sa gravel to gr sand	+46	60-80				61 - 101	60 - 99
34.0	401.8	392.6	5.01	1.2	1210	V dense, Sand to silty sand	42-46	80-100				+ 102	+ 100
34.5	391.7	381.7	2.78	0.6	1285	Dense, Sa gravel to gr sand	+46	60-80				62 - 102	60 - 99
35.0	456.4	443.5	1.91	0.4	1861	Dense, Sa gravel to gr sand	+46	60-80				62 - 102	60 - 99
35.5	478.6	463.8	2.58	0.5	2421	V dense, Sa gravel to gr sand	+46	80-100				62 - 102	60 - 99
36.0	412.8	398.9	3.67	0.8	2403	V dense, Sand to silty sand	42-46	80-100				+ 103	+ 100
36.5	401.8	387.2	3.70	0.9	2413	V dense, Sand to silty sand	42-46	80-100				+ 104	+ 100
37.0	365.5	351.2	3.26	0.9	2368	Dense, Sand to silty sand	42-46	60-80				62 - 103	60 - 99
37.5	319.2	305.9	4.54	1.4	2349	V dense, Sand to silty sand	42-46	80-100				+ 104	+ 100
38.0	304.6	291.1	4.15	1.3	2273	V dense, Sand to silty sand	42-46	80-100				63 - 104	60 - 99
38.5	313.3	298.7	4.32	1.4	2368	V dense, Sand to silty sand	42-46	80-100				+ 105	+ 100
39.0	315.2	299.6	4.32	1.4	2341	V dense, Sand to silty sand	42-46	80-100				+ 105	+ 100
39.5	301.2	285.6	4.29	1.4	2316	V dense, Sand to silty sand	42-46	80-100				63 - 104	60 - 99
40.0	289.8	274.1	5.11	1.7	2328	V dense, Sa gravel to si gr sand	40-42	80-100				+ 106	+ 100
40.5	209.0	197.1	4.23	1.7	2072	V dense, Sand to silty sand	40-42	80-100				64 - 105	60 - 99
41.0	174.3	164.0	3.49	1.9	2099	Dense, Silty sand to sandy silt	40-42	60-80				43 - 64	40 - 60
41.5	186.4	174.9	3.03	1.6	2057	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
42.0	200.4	187.6	3.83	1.9	2136	V dense, Silty sand to sandy silt	40-42	80-100				64 - 106	60 - 99
42.5	186.3	174.0	3.87	2.0	2197	V dense, Silty sand to sandy silt	40-42	80-100				64 - 106	60 - 99
43.0	156.0	145.3	3.84	2.3	2178	V dense, Silty sand to sandy silt	37-40	80-100				43 - 64	40 - 60
43.5	145.4	135.1	3.07	2.1	2148	Dense, Silty sand to sandy silt	37-40	60-80				43 - 65	40 - 60
44.0	139.1	128.9	3.49	2.5	2142	V dense, Silty sand to sandy silt	37-40	80-100				43 - 65	40 - 60
44.5	130.8	121.0	3.26	2.2	2067	Dense, Silty sand to sandy silt	37-40	60-80				43 - 65	40 - 60
45.0	172.0	158.7	3.42	2.2	2324	V dense, Silty sand to sandy silt	37-40	80-100				65 - 107	60 - 99
45.5	136.4	125.5	3.34	2.2	2233	Dense, Silty sand to sandy silt	37-40	60-80				43 - 65	40 - 60
46.0	149.8	137.5	3.26	2.2	2166	V dense, Silty sand to sandy silt	37-40	80-100				44 - 65	40 - 60
46.5	138.9	127.2	3.50	2.4	2203	V dense, Silty sand to sandy silt	37-40	80-100				44 - 66	40 - 60
47.0	120.3	109.9	2.36	1.9	2196	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
47.5	106.6	97.2	2.61	2.2	2198	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
48.0	70.6	64.2	1.88	2.2	2112	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
48.5	67.2	61.0	1.76	2.4	2058	Dense, Silty sand to sandy silt	27-31	60-80				22 - 33	20 - 30
49.0	80.4	72.8	1.55	1.3	1821	Med dense, Silty sand to sandy silt	37-40	40-60				17 - 22	15 - 20
49.5	147.3	133.1	2.24	1.5	2308	Dense, Sand to silty sand	40-42	60-80				44 - 66	40 - 60
50.0	135.2	121.9	1.40	1.0	2250	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40

Notes:

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Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	100.0	90.0	2.24	2.0	2127	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
51.0	85.0	76.3	1.97	2.2	2210	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
51.5	75.1	67.3	2.06	2.5	2304	Dense, Silty sand to sandy silt	27-31	60-80				22 - 33	20 - 30
52.0	93.1	83.2	1.92	1.8	2247	Dense, Silty sand to sandy silt	37-40	60-80				22 - 34	20 - 30
52.5	110.2	98.3	2.43	2.1	2065	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
53.0	129.7	115.4	2.60	1.9	2074	Dense, Silty sand to sandy silt	37-40	60-80				45 - 67	40 - 60
53.5	118.6	105.3	1.81	1.4	1973	Dense, Sand to silty sand	37-40	60-80				34 - 45	30 - 40
54.0	127.8	113.2	2.12	1.7	2088	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
54.5	113.8	100.6	2.31	2.0	2119	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
55.0	102.8	90.7	2.25	2.0	2134	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
55.5	127.6	112.4	2.22	1.8	2210	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
56.0	114.2	100.3	2.16	1.7	2201	Dense, Silty sand to sandy silt	37-40	60-80				34 - 46	30 - 40
56.5	106.4	93.3	1.89	1.7	2104	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
57.0	131.3	114.9	2.01	1.5	2137	Dense, Silty sand to sandy silt	37-40	60-80				34 - 46	30 - 40
57.5	127.0	110.9	2.03	1.6	2133	Dense, Silty sand to sandy silt	37-40	60-80				34 - 46	30 - 40
58.0	110.7	96.5	2.23	1.8	2085	Dense, Silty sand to sandy silt	37-40	60-80				34 - 46	30 - 40
58.5	129.6	112.7	2.47	1.7	2095	Dense, Silty sand to sandy silt	37-40	60-80				34 - 46	30 - 40
59.0	161.1	139.8	2.23	1.4	2083	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
59.5	157.0	136.0	2.31	1.4	2056	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
60.0	161.0	139.3	2.50	1.6	1955	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
60.5	154.8	133.6	2.40	1.5	2011	Dense, Sand to silty sand	40-42	60-80				46 - 70	40 - 60
61.0	149.9	129.1	2.32	1.5	2063	Dense, Sand to silty sand	40-42	60-80				46 - 70	40 - 60
61.5	140.8	121.0	2.23	1.5	2135	Dense, Silty sand to sandy silt	40-42	60-80				35 - 47	30 - 40
62.0	142.8	122.5	2.34	1.6	2136	Dense, Silty sand to sandy silt	40-42	60-80				47 - 70	40 - 60
62.5	146.2	125.3	2.94	1.9	2335	Dense, Silty sand to sandy silt	37-40	60-80				47 - 70	40 - 60
63.0	165.6	141.6	2.94	1.6	2165	Dense, Silty sand to sandy silt	40-42	60-80				47 - 70	40 - 60
63.5	204.3	174.3	3.53	1.8	2297	Dense, Silty sand to sandy silt	40-42	60-80				47 - 70	40 - 60
64.0	183.8	156.6	3.75	1.9	2286	Dense, Silty sand to sandy silt	40-42	60-80				47 - 70	40 - 60
64.5	135.7	115.4	2.93	1.9	2319	Dense, Silty sand to sandy silt	37-40	60-80				47 - 71	40 - 60
65.0	140.9	119.6	2.75	1.8	2344	Dense, Silty sand to sandy silt	37-40	60-80				47 - 71	40 - 60
65.5	159.2	134.8	2.90	1.7	2363	Dense, Silty sand to sandy silt	40-42	60-80				47 - 71	40 - 60
66.0	173.8	146.9	2.90	1.7	2343	Dense, Silty sand to sandy silt	40-42	60-80				47 - 71	40 - 60
66.5	174.3	147.1	2.87	1.6	2276	Dense, Sand to silty sand	40-42	60-80				47 - 71	40 - 60
67.0	178.5	150.3	2.57	1.4	2233	Dense, Sand to silty sand	40-42	60-80				47 - 71	40 - 60
67.5	205.3	172.6	2.59	1.3	2299	Dense, Sand to silty sand	40-42	60-80				48 - 71	40 - 60
68.0	201.6	169.2	2.65	1.3	2350	Dense, Sand to silty sand	40-42	60-80				48 - 71	40 - 60
68.5	184.3	154.4	2.77	1.4	2341	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
69.0	173.5	145.1	2.56	1.5	2372	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
69.5	165.6	138.2	2.24	1.3	2323	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
70.0	180.1	150.1	2.72	1.5	2338	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
70.5	193.7	161.2	2.51	1.2	2351	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
71.0	216.7	180.0	3.03	1.4	2454	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
71.5	212.6	176.3	3.06	1.4	2453	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
72.0	188.4	155.9	2.89	1.4	2465	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
72.5	177.4	146.6	2.94	1.6	2475	Dense, Sand to silty sand	40-42	60-80				48 - 73	40 - 60
73.0	125.5	103.5	2.20	1.5	2410	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
73.5	156.9	129.2	1.97	1.2	2363	Dense, Sand to silty sand	40-42	60-80				36 - 49	30 - 40
74.0	144.1	118.4	2.13	1.3	2388	Dense, Sand to silty sand	40-42	60-80				36 - 49	30 - 40
74.5	202.1	165.9	2.07	1.0	2421	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
75.0	182.0	149.1	2.51	1.2	2469	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	144.6	118.2	1.90	1.2	2468	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
76.0	147.2	120.2	1.88	1.2	2451	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
76.5	115.2	93.9	1.49	1.2	2444	Med dense, Sand to silty sand	37-40	40-60				25 - 37	20 - 30
77.0	112.6	91.7	1.26	1.0	2444	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
77.5	129.9	105.6	1.23	1.0	2529	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
78.0	95.8	77.7	1.17	1.1	2617	Med dense, Sand to silty sand	37-40	40-60				18 - 25	15 - 20
78.5	127.4	103.1	1.19	0.8	2541	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
79.0	170.8	138.1	1.48	0.8	2552	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
79.5	180.0	145.3	1.27	0.7	2551	Med dense, Sand to silty sand	40-42	40-60				37 - 50	30 - 40
80.0	122.0	98.4	1.59	1.0	2602	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
80.5	109.7	88.2	1.39	1.2	2698	Med dense, Sand to silty sand	37-40	40-60				25 - 37	20 - 30
81.0	124.5	100.0	1.39	1.1	2695	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
81.5	118.1	94.7	1.52	1.2	2718	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
82.0	145.7	116.7	1.36	0.8	2659	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
82.5	190.9	152.7	1.73	1.0	2730	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
83.0	153.3	122.4	2.07	1.2	2676	Med dense, Sand to silty sand	40-42	40-60				38 - 50	30 - 40
83.5	119.6	95.4	1.40	1.1	2671	Med dense, Sand to silty sand	40-42	40-60				25 - 38	20 - 30
84.0	136.4	108.6	1.21	0.8	2753	Med dense, Sand to silty sand	40-42	40-60				25 - 38	20 - 30
84.5	157.6	125.2	1.61	1.0	2779	Med dense, Sand to silty sand	40-42	40-60				38 - 50	30 - 40
85.0	181.7	144.2	1.87	1.0	2782	Dense, Sand to silty sand	40-42	60-80				38 - 50	30 - 40
85.5	178.6	141.5	1.96	1.1	2855	Dense, Sand to silty sand	40-42	60-80				38 - 50	30 - 40
86.0	170.3	134.7	2.16	1.3	2799	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
86.5	164.0	129.5	2.34	1.3	2843	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
87.0	190.1	149.9	2.23	1.2	2847	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
87.5	174.3	137.2	2.09	1.1	2792	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
88.0	190.9	150.1	2.55	1.4	2977	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
88.5	157.1	123.4	3.01	1.6	2873	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
89.0	206.6	162.0	1.84	0.9	3131	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
89.5	194.5	152.2	3.75	1.8	3026	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
90.0	136.7	106.8	3.15	2.0	3032	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
90.5	160.4	125.2	3.62	2.3	3046	V dense, Silty sand to sandy silt	37-40	80-100				51 - 77	40 - 60
91.0	144.3	112.5	3.32	2.2	3009	Dense, Silty sand to sandy silt	37-40	60-80				51 - 77	40 - 60
91.5	127.4	99.1	3.56	2.6	2988	V dense, Silty sand to sandy silt	36-37	80-100				51 - 77	40 - 60
92.0	119.0	92.5	3.13	2.5	2977	Dense, Silty sand to sandy silt	36-37	60-80				51 - 77	40 - 60
92.5	132.4	102.7	2.85	2.1	2990	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
93.0	134.6	104.3	3.14	2.2	2926	Dense, Silty sand to sandy silt	37-40	60-80				52 - 77	40 - 60
93.5	154.5	119.5	2.83	1.7	2897	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
94.0	172.6	133.3	3.59	2.1	2883	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
94.5	156.1	120.4	3.35	2.1	2886	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
95.0	154.0	118.6	3.58	2.3	2899	V dense, Silty sand to sandy silt	37-40	80-100				52 - 78	40 - 60
95.5	124.7	95.9	3.81	2.7	2900	V dense, Silty sand to sandy silt	36-37	80-100				52 - 78	40 - 60
96.0	118.0	90.7	2.83	2.4	2968	Dense, Silty sand to sandy silt	36-37	60-80				39 - 52	30 - 40
96.5	140.1	107.5	2.74	1.8	2889	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
97.0	151.1	115.7	2.27	1.5	2841	Dense, Sand to silty sand	40-42	60-80				39 - 52	30 - 40
97.5	136.7	104.6	2.13	1.5	2686	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
98.0	132.8	101.5	2.75	2.0	2834	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
98.5	135.9	103.6	2.83	1.7	2768	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
99.0	213.5	162.6	2.03	0.9	2753	Dense, Sand to silty sand	42-46	60-80				53 - 79	40 - 60
99.5	241.7	183.9	3.41	1.4	2855	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
100.0	226.1	171.8	2.98	1.3	2870	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	227.2	172.4	2.72	1.2	2815	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
101.0	198.7	150.5	2.69	1.3	2865	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
101.5	177.9	134.6	2.83	1.5	2855	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
102.0	192.3	145.3	2.86	1.4	3049	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
102.5	205.4	155.0	3.57	1.7	2932	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
103.0	219.2	165.2	3.50	1.6	2949	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
103.5	220.1	165.7	3.01	1.4	2912	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
104.0	220.0	165.3	2.95	1.3	2829	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
104.5	198.5	149.0	3.31	1.6	2845	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
105.0	213.9	160.3	3.26	1.5	2972	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
105.5	211.1	158.0	2.85	1.4	2812	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
106.0	185.8	138.9	2.86	1.5	2696	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
106.5	168.7	126.0	3.33	1.9	2833	Dense, Silty sand to sandy silt	37-40	60-80				54 - 80	40 - 60
107.0	191.7	142.9	2.88	1.5	2824	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
107.5	211.4	157.4	3.73	1.8	2860	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
108.0	200.9	149.4	3.76	1.8	2901	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
108.5	188.7	140.2	3.44	1.7	2748	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
109.0	211.9	157.2	3.71	1.8	2726	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
109.5	206.9	153.2	4.19	2.0	2700	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
110.0	176.4	130.5	4.13	2.2	2688	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
110.5	154.1	113.8	3.98	2.4	2677	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
111.0	169.4	125.0	3.40	1.9	2889	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
111.5	176.0	129.7	4.15	2.3	2690	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
112.0	169.1	124.4	3.50	1.9	2779	Dense, Silty sand to sandy silt	37-40	60-80				54 - 82	40 - 60
112.5	210.5	154.8	2.77	1.3	2454	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
113.0	193.2	141.8	4.65	2.1	2503	V dense, Silty sand to sandy silt	37-40	80-100				54 - 82	40 - 60
113.5	158.7	116.4	2.95	1.7	2604	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
114.0	164.2	120.2	3.74	2.2	2698	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
114.5	156.6	114.6	3.63	2.3	2739	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
115.0	141.4	103.3	3.91	2.6	2761	V dense, Silty sand to sandy silt	36-37	80-100				55 - 82	40 - 60
115.5	121.3	88.5	3.52	2.7	2703	V dense, Silty sand to sandy silt	36-37	80-100				55 - 82	40 - 60
116.0	131.5	95.8	3.82	2.5	3057	V dense, Silty sand to sandy silt	36-37	80-100				55 - 82	40 - 60
116.5	178.8	130.1	3.15	1.5	2818	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
117.0	191.5	139.2	4.34	2.1	2889	V dense, Silty sand to sandy silt	37-40	80-100				55 - 83	40 - 60
117.5	170.6	123.9	3.88	2.2	2867	Dense, Silty sand to sandy silt	37-40	60-80				55 - 83	40 - 60
118.0	164.0	118.9	3.85	2.3	2947	V dense, Silty sand to sandy silt	37-40	80-100				55 - 83	40 - 60
118.5	171.7	124.3	3.54	1.8	3002	Dense, Silty sand to sandy silt	37-40	60-80				55 - 83	40 - 60
119.0	222.8	161.1	3.26	1.5	2749	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
119.5	216.0	156.0	3.94	1.8	2883	Dense, Silty sand to sandy silt	40-42	60-80				55 - 83	40 - 60
120.0	208.3	150.3	3.88	1.8	2866	Dense, Silty sand to sandy silt	40-42	60-80				55 - 83	40 - 60
120.5	204.3	147.2	3.60	1.8	2863	Dense, Silty sand to sandy silt	40-42	60-80				55 - 83	40 - 60
121.0	197.5	142.2	4.00	2.0	2973	Dense, Silty sand to sandy silt	37-40	60-80				56 - 83	40 - 60
121.5	191.7	137.8	3.42	1.6	2968	Dense, Silty sand to sandy silt	40-42	60-80				56 - 83	40 - 60
122.0	230.6	165.6	4.10	1.8	2908	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
122.5	204.1	146.4	4.29	2.0	3062	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
123.0	191.8	137.4	3.62	1.7	2918	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
123.5	233.5	167.1	2.44	1.0	2912	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60
124.0	211.9	151.4	2.51	1.1	2820	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
124.5	177.7	126.9	3.67	1.9	3076	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
125.0	154.3	110.0	3.97	2.4	2961	V dense, Silty sand to sandy silt	37-40	80-100				56 - 84	40 - 60

Notes:

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Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
125.5	100.0	71.2	3.22	2.7	2928	Hard, Sandy silt to sandy clay			25	7.40	6.45	28 - 42	20 - 30
126.0	133.1	94.7	4.30	3.1	3016	Hard, Sandy silt to sandy clay			30	8.37	8.60	56 - 84	40 - 60
126.5	135.5	96.3	3.96	2.9	3013	Hard, Sandy silt to sandy clay			30	8.53	7.92	56 - 84	40 - 60
127.0	123.2	87.4	3.49	2.6	2871	Dense, Silty sand to sandy silt	36-37	60-80				42 - 56	30 - 40
127.5	149.6	106.1	3.71	2.4	3115	V dense, Silty sand to sandy silt	37-40	80-100				56 - 85	40 - 60
128.0	155.7	110.3	3.82	2.3	3026	Dense, Silty sand to sandy silt	37-40	60-80				56 - 85	40 - 60
128.5	174.1	123.1	4.32	2.5	3194	V dense, Silty sand to sandy silt	37-40	80-100				57 - 85	40 - 60
129.0	177.6	125.5	3.89	2.2	3219	V dense, Silty sand to sandy silt	37-40	80-100				57 - 85	40 - 60
129.5	174.3	123.0	3.86	2.2	3217	Dense, Silty sand to sandy silt	37-40	60-80				57 - 85	40 - 60
130.0	183.4	129.3	3.89	2.0	3286	Dense, Silty sand to sandy silt	37-40	60-80				57 - 85	40 - 60
130.5	196.4	138.3	3.39	1.7	3187	Dense, Silty sand to sandy silt	40-42	60-80				57 - 85	40 - 60
131.0	199.9	140.6	3.44	1.7	3230	Dense, Silty sand to sandy silt	40-42	60-80				57 - 85	40 - 60
131.5	204.9	143.9	2.94	1.4	3220	Dense, Sand to silty sand	40-42	60-80				57 - 85	40 - 60
132.0	215.0	150.8	2.72	1.2	3107	Dense, Sand to silty sand	40-42	60-80				57 - 86	40 - 60
132.5	223.0	156.3	2.51	1.2	3185	Dense, Sand to silty sand	40-42	60-80				57 - 86	40 - 60
133.0	211.5	148.0	2.36	1.1	3276	Dense, Sand to silty sand	40-42	60-80				57 - 86	40 - 60
133.5	195.0	136.3	2.07	1.0	3278	Med dense, Sand to silty sand	40-42	40-60				43 - 57	30 - 40
134.0	195.7	136.7	2.00	1.0	3306	Med dense, Sand to silty sand	40-42	40-60				43 - 57	30 - 40
134.5	188.9	131.8	1.97	1.0	3349	Med dense, Sand to silty sand	40-42	40-60				43 - 57	30 - 40
135.0	215.7	150.3	1.60	0.7	3522	Med dense, Sand to silty sand	42-46	40-60				43 - 57	30 - 40
135.5	247.1	172.0	2.09	0.9	3578	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
136.0	250.8	174.4	2.10	0.8	3379	Dense, Sand to silty sand	42-46	60-80				58 - 86	40 - 60
136.5	276.2	191.8	1.70	0.6	3755	Med dense, Sand to silty sand	42-46	40-60				58 - 86	40 - 60
137.0	330.4	229.2	0.54	0.3	3700	Med dense, Sa gravel to gr sand	42-46	40-60				58 - 86	40 - 60
137.5	326.9	226.5	1.21	0.4	3787	Med dense, Sa gravel to gr sand	42-46	40-60				58 - 87	40 - 60
138.0	322.4	223.2	1.34	0.4	3876	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
138.5	293.1	202.7	1.73	0.6	3935	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
139.0	267.9	185.0	2.13	0.8	3685	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
139.5	270.3	186.5	2.57	1.0	3900	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
140.0	255.0	175.7	1.61	0.6	3098	Med dense, Sand to silty sand	42-46	40-60				58 - 87	40 - 60
140.5	246.1	169.4	1.58	0.6	3397	Med dense, Sand to silty sand	42-46	40-60				44 - 58	30 - 40
141.0	247.7	170.3	2.08	0.8	3601	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
141.5	208.7	143.4	2.49	1.1	3742	Dense, Sand to silty sand	40-42	60-80				44 - 58	30 - 40
142.0	228.0	156.5	1.96	0.8	3951	Med dense, Sand to silty sand	42-46	40-60				44 - 58	30 - 40
142.5	262.6	180.0	1.35	0.6	3737	Med dense, Sand to silty sand	42-46	40-60				58 - 88	40 - 60
143.0	256.0	175.3	2.35	0.9	3854	Dense, Sand to silty sand	42-46	60-80				58 - 88	40 - 60
143.5	264.3	180.8	1.99	0.7	3847	Dense, Sand to silty sand	42-46	60-80				58 - 88	40 - 60
144.0	283.9	194.0	2.71	0.9	3862	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
144.5	305.8	208.7	2.89	0.9	4056	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
145.0	314.9	214.7	2.80	0.9	4141	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
145.5	321.0	218.6	2.84	0.9	3962	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
146.0	303.2	206.3	3.76	1.2	3796	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
146.5	259.1	176.1	4.35	1.5	3779	Dense, Sand to silty sand	40-42	60-80				59 - 88	40 - 60
147.0	217.9	147.9	2.31	0.9	3709	Med dense, Sand to silty sand	40-42	40-60				44 - 59	30 - 40
147.5	294.5	199.8	2.39	0.8	4084	Dense, Sand to silty sand	42-46	60-80				59 - 88	40 - 60
148.0	282.5	191.4	3.27	1.1	4037	Dense, Sand to silty sand	42-46	60-80				59 - 89	40 - 60
148.5	269.6	182.4	3.35	1.2	4162	Dense, Sand to silty sand	42-46	60-80				59 - 89	40 - 60
149.0	265.7	179.6	1.18	0.5	3953	Med dense, Sand to silty sand	42-46	40-60				44 - 59	30 - 40
149.5	210.6	142.2	1.04	0.4	3660	Med dense, Sand to silty sand	42-46	40-60				30 - 44	20 - 30
150.0	213.1	143.8	1.41	0.7	3896	Med dense, Sand to silty sand	40-42	40-60				44 - 59	30 - 40

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
05/06/99
SOUNDING NUMBER:cp9904

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
150.5	199.7	134.6	1.44	0.7	3854	Med dense, Sand to silty sand	40-42	40-60				45 - 59	30 - 40
151.0	194.7	131.1	1.52	0.8	3975	Med dense, Sand to silty sand	40-42	40-60				45 - 59	30 - 40
151.5	201.1	135.3	0.86	0.4	3819	Med dense, Sand to silty sand	42-46	40-60				30 - 45	20 - 30
152.0	228.4	153.5	2.12	0.9	4045	Med dense, Sand to silty sand	40-42	40-60				45 - 60	30 - 40
152.5	181.4	121.8	1.61	0.8	4123	Med dense, Sand to silty sand	40-42	40-60				30 - 45	20 - 30
153.0	183.8	123.3	1.40	0.8	4135	Med dense, Sand to silty sand	40-42	40-60				30 - 45	20 - 30
153.5	186.7	125.0	1.32	0.7	4278	Med dense, Sand to silty sand	40-42	40-60				30 - 45	20 - 30
154.0	200.9	134.4	1.50	0.7	4288	Med dense, Sand to silty sand	40-42	40-60				45 - 60	30 - 40
154.5	198.4	132.6	0.95	0.4	4233	Med dense, Sand to silty sand	40-42	40-60				30 - 45	20 - 30
155.0	233.9	156.2	1.36	0.6	4143	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
155.5	246.9	164.7	0.40	0.3	3724	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
156.0	254.4	169.5	1.16	0.4	4137	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
156.5	271.8	180.9	0.79	0.3	4150	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
157.0	257.9	171.5	1.36	0.5	4345	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
157.5	260.6	173.1	1.36	0.5	4554	Med dense, Sand to silty sand	42-46	40-60				45 - 60	30 - 40
158.0	272.9	181.1	1.49	0.5	4417	Med dense, Sand to silty sand	42-46	40-60				60 - 90	40 - 60
158.5	282.5	187.3	1.29	0.4	4417	Med dense, Sand to silty sand	42-46	40-60				60 - 90	40 - 60
159.0	310.7	205.8	3.16	1.0	4480	Dense, Sand to silty sand	42-46	60-80				60 - 91	40 - 60
159.5	345.7	228.7	2.91	0.7	4477	Dense, Sand to silty sand	42-46	60-80				60 - 91	40 - 60
160.0	380.4	251.4	2.27	0.6	4757	Dense, Sand to silty sand	42-46	60-80				61 - 91	40 - 60
160.5	356.2	235.2	2.38	0.6	4961	Dense, Sand to silty sand	42-46	60-80				61 - 91	40 - 60
161.0	377.3	248.9	1.11	0.3	4782	Dense, Sa gravel to gr sand	+46	60-80				61 - 91	40 - 60
161.5	382.6	252.1	1.49	0.4	5089	Dense, Sa gravel to gr sand	42-46	60-80				61 - 91	40 - 60
162.0	442.7	291.5	1.12	0.3	5176	Dense, Sa gravel to gr sand	+46	60-80				61 - 91	40 - 60

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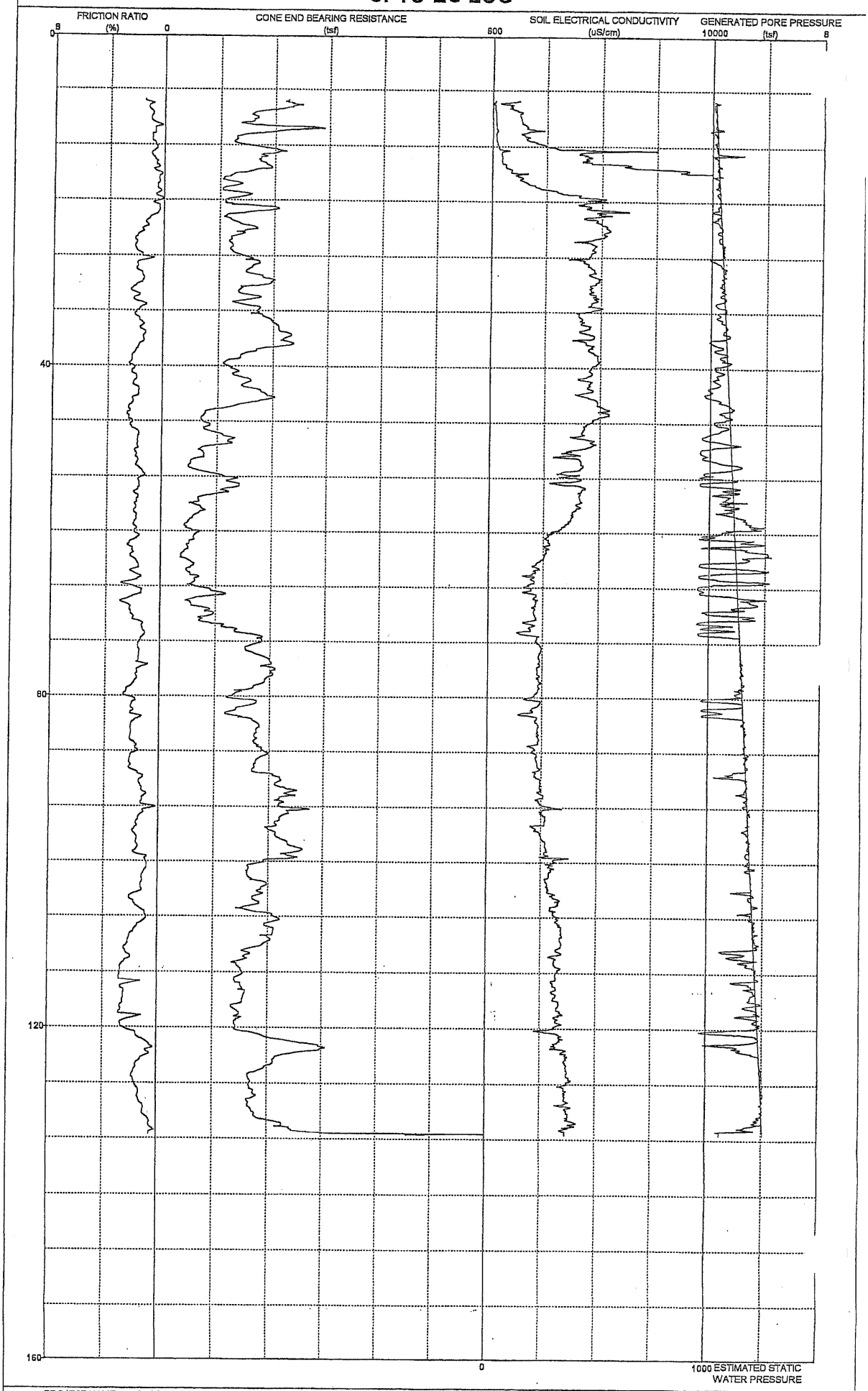
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

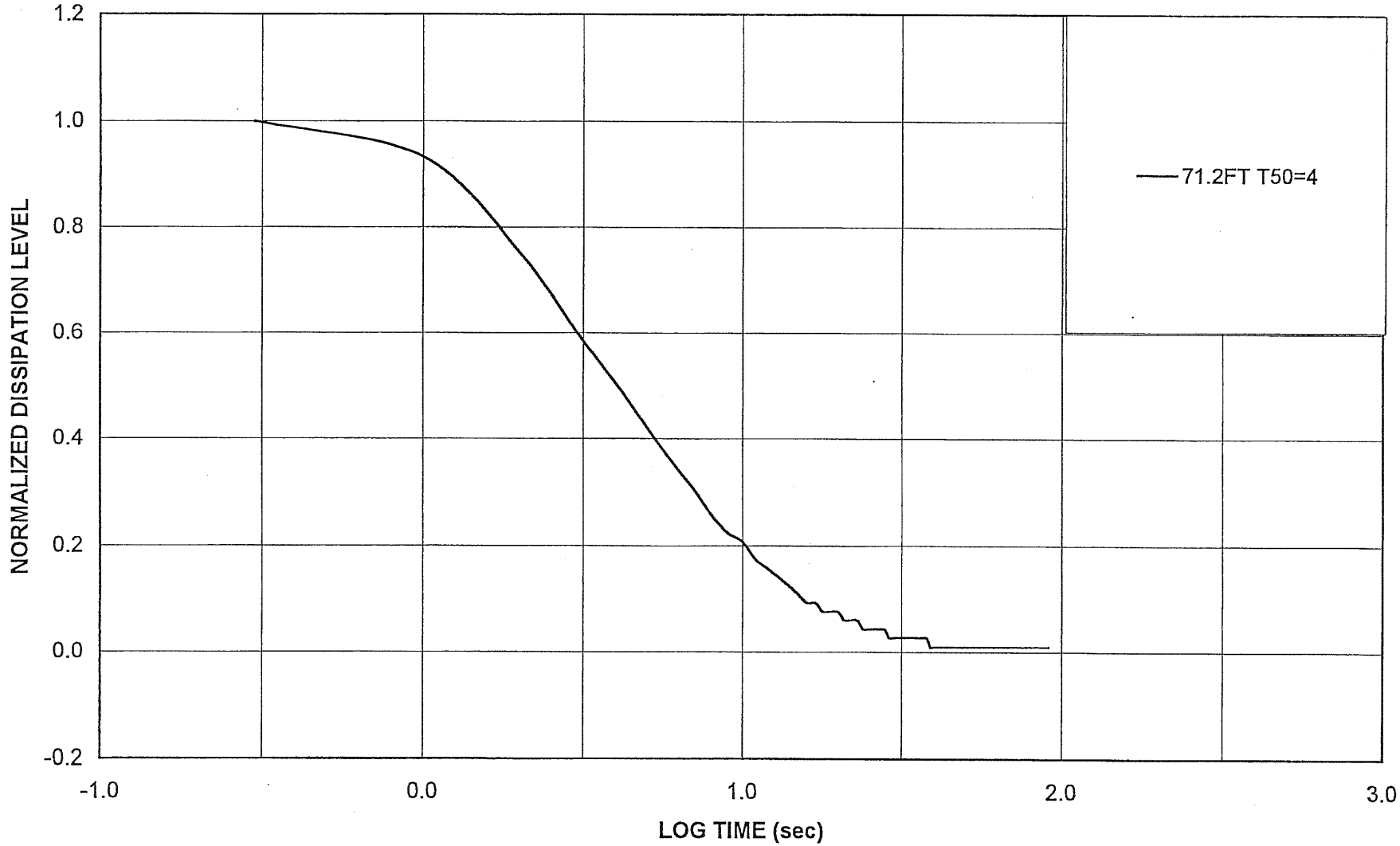
STRATIGRAPHICS

R2DATE: 5-07-1999 TIME:11:20:49.02

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant CP-9905



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 8.00'												
1.5	Prepunched To 8.00'												
2.0	Prepunched To 8.00'												
2.5	Prepunched To 8.00'												
3.0	Prepunched To 8.00'												
3.5	Prepunched To 8.00'												
4.0	Prepunched To 8.00'												
4.5	Prepunched To 8.00'												
5.0	Prepunched To 8.00'												
5.5	Prepunched To 8.00'												
6.0	Prepunched To 8.00'												
6.5	Prepunched To 8.00'												
7.0	Prepunched To 8.00'												
7.5	Prepunched To 8.00'												
8.0	Prepunched To 8.00'												
8.5	244.4	306.8	2.38	1.0	91	Dense, Sand to silty sand	42-46	60-80				48 - 79	60 - 99
9.0	216.3	269.4	2.70	1.2	99	Dense, Sand to silty sand	42-46	60-80				48 - 79	60 - 99
9.5	162.1	200.4	1.55	0.8	126	Dense, Sand to silty sand	42-46	60-80				32 - 49	40 - 60
10.0	169.2	207.5	1.64	1.0	131	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
10.5	160.5	195.5	1.44	0.9	137	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
11.0	194.5	235.2	0.34	0.2	160	Med dense, Sa gravel to gr sand	42-46	40-60				33 - 50	40 - 60
11.5	233.8	280.9	1.77	0.7	221	Dense, Sand to silty sand	42-46	60-80				33 - 50	40 - 60
12.0	155.7	185.8	1.54	0.8	146	Dense, Sand to silty sand	42-46	60-80				34 - 50	40 - 60
12.5	130.0	154.2	1.25	0.9	156	Med dense, Sand to silty sand	40-42	40-60				25 - 34	30 - 40
13.0	126.9	149.6	1.03	0.7	209	Med dense, Sand to silty sand	42-46	40-60				25 - 34	30 - 40
13.5	171.1	200.5	1.08	0.6	290	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
14.0	215.8	251.3	1.47	0.8	439	Dense, Sand to silty sand	42-46	60-80				34 - 52	40 - 60
14.5	178.6	206.9	1.82	0.9	437	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
15.0	171.7	197.7	1.26	0.7	424	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
15.5	184.0	210.8	1.32	0.6	621	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
16.0	194.3	221.4	0.92	0.4	771	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
16.5	154.0	174.5	0.98	0.5	949	Med dense, Sand to silty sand	42-46	40-60				26 - 35	30 - 40
17.0	120.5	135.9	0.43	0.3	1268	Med dense, Sand to silty sand	42-46	40-60				18 - 27	20 - 30
17.5	107.5	120.7	0.49	0.4	1419	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
18.0	140.2	156.5	0.54	0.4	1793	Med dense, Sand to silty sand	42-46	40-60				27 - 36	30 - 40
18.5	109.6	121.8	0.63	0.5	2250	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
19.0	126.8	140.3	0.36	0.3	3162	Med dense, Sand to silty sand	42-46	40-60				18 - 27	20 - 30
19.5	148.2	163.2	0.82	0.5	4111	Med dense, Sand to silty sand	42-46	40-60				27 - 36	30 - 40
20.0	111.6	122.3	0.14	0.2	5164	Med dense, Sand to silty sand	42-46	40-60				18 - 27	20 - 30
20.5	123.8	135.2	0.92	0.5	4249	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
21.0	207.7	225.7	0.57	0.3	4863	Med dense, Sa gravel to gr sand	42-46	40-60				37 - 55	40 - 60
21.5	145.0	156.9	0.81	0.5	4867	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
22.0	109.0	117.5	1.21	1.0	4214	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
22.5	128.1	137.5	1.77	1.3	4845	Dense, Sand to silty sand	40-42	60-80				37 - 56	40 - 60
23.0	151.3	161.7	1.81	1.1	5224	Dense, Sand to silty sand	40-42	60-80				37 - 56	40 - 60
23.5	156.6	166.7	2.68	1.6	5366	Dense, Sand to silty sand	40-42	60-80				38 - 56	40 - 60
24.0	143.7	152.3	2.59	1.8	5209	Dense, Silty sand to sandy silt	40-42	60-80				38 - 57	40 - 60
24.5	121.3	128.1	2.66	2.0	4656	Dense, Silty sand to sandy silt	37-40	60-80				38 - 57	40 - 60
25.0	119.3	125.5	2.39	2.0	4561	Dense, Silty sand to sandy silt	37-40	60-80				38 - 57	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	125.0	131.0	2.60	2.1	4660	Dense, Silty sand to sandy silt	37-40	60-80				38 - 57	40 - 60
26.0	123.1	128.5	2.53	2.0	4711	Dense, Silty sand to sandy silt	37-40	60-80				38 - 57	40 - 60
26.5	137.9	143.5	2.30	1.5	4492	Dense, Sand to silty sand	40-42	60-80				38 - 58	40 - 60
27.0	162.6	168.6	1.40	0.9	4182	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27.5	174.4	180.2	3.27	1.9	4429	V dense, Silty sand to sandy silt	40-42	80-100				58 - 96	60 - 99
28.0	160.9	165.6	3.14	1.9	4584	Dense, Silty sand to sandy silt	40-42	60-80				39 - 58	40 - 60
28.5	149.7	153.6	2.76	1.7	4734	Dense, Silty sand to sandy silt	40-42	60-80				39 - 58	40 - 60
29.0	177.3	181.2	2.83	1.5	4663	Dense, Sand to silty sand	40-42	60-80				39 - 59	40 - 60
29.5	194.6	198.3	2.79	1.4	4905	Dense, Sand to silty sand	40-42	60-80				39 - 59	40 - 60
30.0	195.0	198.0	3.36	1.7	4719	V dense, Sand to silty sand	40-42	80-100				59 - 98	60 - 99
30.5	144.6	146.3	3.69	2.2	4484	V dense, Silty sand to sandy silt	37-40	80-100				40 - 59	40 - 60
31.0	135.6	136.7	3.28	2.2	4486	V dense, Silty sand to sandy silt	37-40	80-100				40 - 59	40 - 60
31.5	167.4	168.3	2.90	1.8	4698	Dense, Silty sand to sandy silt	40-42	60-80				40 - 60	40 - 60
32.0	152.4	152.7	3.64	2.1	4819	V dense, Silty sand to sandy silt	37-40	80-100				40 - 60	40 - 60
32.5	142.1	142.0	2.02	1.3	4537	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
33.0	175.4	174.7	2.93	1.7	4883	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
33.5	173.8	172.6	3.27	2.0	4009	V dense, Silty sand to sandy silt	40-42	80-100				60 - 100	60 - 99
34.0	182.0	180.2	3.73	2.0	4096	V dense, Silty sand to sandy silt	40-42	80-100				61 - 100	60 - 99
34.5	196.7	194.1	3.49	1.7	4217	V dense, Sand to silty sand	40-42	80-100				61 - 100	60 - 99
35.0	206.6	203.2	2.91	1.4	4497	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
35.5	210.8	206.8	3.61	1.7	4258	V dense, Sand to silty sand	40-42	80-100				61 - 101	60 - 99
36.0	228.1	223.1	2.95	1.3	4490	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
36.5	226.8	221.2	3.38	1.4	4647	Dense, Sand to silty sand	42-46	60-80				62 - 102	60 - 99
37.0	224.5	218.4	3.26	1.4	4346	Dense, Sand to silty sand	42-46	60-80				62 - 102	60 - 99
37.5	226.7	219.9	4.09	1.8	4577	V dense, Sand to silty sand	40-42	80-100				62 - 102	60 - 99
38.0	170.2	164.5	3.77	1.9	4525	V dense, Silty sand to sandy silt	40-42	80-100				41 - 62	40 - 60
38.5	146.4	141.2	3.47	2.2	4877	V dense, Silty sand to sandy silt	37-40	80-100				41 - 62	40 - 60
39.0	139.8	134.5	3.15	2.2	4872	V dense, Silty sand to sandy silt	37-40	80-100				42 - 62	40 - 60
39.5	112.2	107.6	2.90	2.4	4865	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
40.0	121.5	116.2	2.59	2.1	4590	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
40.5	135.7	129.4	2.94	2.2	4558	V dense, Silty sand to sandy silt	37-40	80-100				42 - 63	40 - 60
41.0	128.2	122.0	2.80	2.0	4464	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
41.5	155.5	147.5	3.01	1.9	4283	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
42.0	153.2	145.0	3.37	2.1	4495	V dense, Silty sand to sandy silt	37-40	80-100				42 - 63	40 - 60
42.5	149.5	141.2	3.04	1.8	4467	Dense, Silty sand to sandy silt	40-42	60-80				42 - 64	40 - 60
43.0	178.0	167.6	3.22	1.7	4387	Dense, Silty sand to sandy silt	40-42	60-80				42 - 64	40 - 60
43.5	190.0	178.4	3.46	1.8	4357	Dense, Silty sand to sandy silt	40-42	60-80				43 - 64	40 - 60
44.0	189.5	177.5	4.31	2.2	4850	V dense, Gr si sand to cl gr sand	37-40	80-100				64 - 106	60 - 99
44.5	148.1	138.4	3.76	2.2	4870	V dense, Silty sand to sandy silt	37-40	80-100				43 - 64	40 - 60
45.0	116.7	108.7	3.33	2.5	5278	V dense, Silty sand to sandy silt	37-40	80-100				43 - 64	40 - 60
45.5	78.0	72.5	2.27	2.4	5349	Dense, Silty sand to sandy silt	36-37	60-80				22 - 32	20 - 30
46.0	74.7	69.3	1.87	2.5	4979	Dense, Silty sand to sandy silt	27-31	60-80				22 - 32	20 - 30
46.5	71.3	66.0	1.78	2.3	4660	Dense, Silty sand to sandy silt	36-37	60-80				22 - 32	20 - 30
47.0	86.0	79.4	1.92	2.3	4372	Dense, Silty sand to sandy silt	36-37	60-80				22 - 32	20 - 30
47.5	75.4	69.4	1.85	2.2	4283	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
48.0	97.0	89.1	1.86	1.7	4238	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
48.5	119.3	109.3	2.27	1.8	4059	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
49.0	119.7	109.4	2.26	1.8	4583	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
49.5	98.8	90.1	2.15	1.8	4530	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
50.0	67.6	61.5	1.52	1.9	3555	Med dense, Silty sand to sandy silt	36-37	40-60				16 - 22	15 - 20

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	76.2	69.2	1.41	1.9	4104	Med dense, Silty sand to sandy silt	36-37	40-60				22 - 33	20 - 30
51.0	75.1	68.0	1.42	1.9	4080	Med dense, Silty sand to sandy silt	36-37	40-60				22 - 33	20 - 30
51.5	52.4	47.4	1.07	1.8	4186	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
52.0	48.3	43.6	1.01	1.9	4230	Med dense, Silty sand to sandy silt	27-31	40-60				11 - 17	10 - 15
52.5	61.5	55.4	1.16	1.5	3618	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 22	15 - 20
53.0	97.1	87.2	1.45	1.3	4025	Med dense, Sand to silty sand	37-40	40-60				22 - 33	20 - 30
53.5	136.8	122.6	2.03	1.6	4185	Dense, Silty sand to sandy silt	40-42	60-80				45 - 67	40 - 60
54.0	124.9	111.7	2.24	1.6	2987	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
54.5	139.8	124.7	2.21	1.6	4345	Dense, Silty sand to sandy silt	40-42	60-80				45 - 67	40 - 60
55.0	110.3	98.2	2.20	1.8	4192	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
55.5	94.1	83.6	2.06	1.9	4087	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
56.0	66.2	58.7	1.36	1.8	4136	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
56.5	61.6	54.5	1.19	1.8	4031	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
57.0	71.5	63.2	1.38	1.9	4107	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
57.5	75.8	66.7	1.50	2.0	3779	Dense, Silty sand to sandy silt	36-37	60-80				23 - 34	20 - 30
58.0	61.7	54.2	1.23	1.8	3808	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
58.5	53.6	47.0	1.05	1.8	3723	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
59.0	47.8	41.9	1.00	2.0	3523	Med dense, Silty sand to sandy silt	27-31	40-60				11 - 17	10 - 15
59.5	46.9	41.0	1.01	1.9	3311	Med dense, Silty sand to sandy silt	27-31	40-60				11 - 17	10 - 15
60.0	69.8	60.9	1.25	2.0	2937	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
60.5	60.2	52.4	1.02	1.6	2727	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
61.0	59.0	51.2	1.19	2.0	2726	Med dense, Silty sand to sandy silt	27-31	40-60				17 - 23	15 - 20
61.5	50.7	43.9	1.22	2.3	2745	V stiff, Sandy silt to sandy clay			25	3.76	2.44	17 - 23	15 - 20
62.0	49.9	43.2	1.01	2.1	2667	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 17	10 - 15
62.5	41.4	35.8	0.91	2.0	2605	Med dense, Silty sand to sandy silt	27-31	40-60				07 - 12	06 - 10
63.0	37.5	32.3	0.96	2.2	2525	V stiff, Sandy silt to sandy clay			20	3.37	1.92	07 - 12	06 - 10
63.5	50.0	43.0	1.02	1.8	2323	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 17	10 - 15
64.0	60.4	51.8	0.93	1.6	2071	Med dense, Silty sand to sandy silt	36-37	40-60				12 - 17	10 - 15
64.5	49.3	42.2	0.99	1.8	2210	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 18	10 - 15
65.0	52.4	44.8	1.16	2.0	2026	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 18	10 - 15
65.5	69.7	59.5	0.90	1.4	2023	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 23	15 - 20
66.0	62.5	53.2	1.31	2.1	2105	Med dense, Silty sand to sandy silt	27-31	40-60				18 - 23	15 - 20
66.5	52.0	44.3	1.63	2.4	1814	V stiff, Sandy silt to sandy clay			25	3.84	3.26	18 - 24	15 - 20
67.0	89.3	75.8	1.38	1.4	1933	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 35	20 - 30
67.5	115.6	98.0	1.45	1.4	2161	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 35	20 - 30
68.0	69.7	58.9	2.17	2.2	2063	Dense, Silty sand to sandy silt	27-31	60-80				24 - 35	20 - 30
68.5	51.8	43.7	1.70	3.0	2205	V stiff, Sandy silt to sandy clay			25	3.82	3.39	18 - 24	15 - 20
69.0	56.1	47.3	1.71	2.3	2056	Med dense, Silty sand to sandy silt	27-31	40-60				18 - 24	15 - 20
69.5	89.3	75.2	2.08	2.3	2095	Dense, Silty sand to sandy silt	36-37	60-80				24 - 36	20 - 30
70.0	96.5	81.1	1.99	2.2	2128	Dense, Silty sand to sandy silt	36-37	60-80				24 - 36	20 - 30
70.5	69.5	58.2	1.72	2.0	2184	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
71.0	76.2	63.8	1.42	1.4	1721	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 24	15 - 20
71.5	110.1	91.9	1.74	1.4	1896	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 36	20 - 30
72.0	134.5	112.2	1.89	1.3	1548	Med dense, Sand to silty sand	40-42	40-60				36 - 48	30 - 40
72.5	171.3	142.6	2.08	1.1	2152	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
73.0	179.4	149.1	2.61	1.4	2228	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
73.5	180.4	149.6	2.90	1.6	2336	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
74.0	156.7	129.8	2.78	1.7	2465	Dense, Silty sand to sandy silt	40-42	60-80				48 - 72	40 - 60
74.5	160.9	133.0	2.58	1.5	2429	Dense, Sand to silty sand	40-42	60-80				48 - 73	40 - 60
75.0	181.5	149.8	2.98	1.6	2319	Dense, Sand to silty sand	40-42	60-80				48 - 73	40 - 60

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PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
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Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	198.2	163.3	3.19	1.6	2379	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
76.0	203.3	167.2	2.96	1.3	2388	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
76.5	205.4	168.6	2.99	1.4	2241	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
77.0	201.0	164.7	3.42	1.7	2272	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
77.5	203.1	166.2	3.63	1.8	2350	Dense, Silty sand to sandy silt	40-42	60-80				49 - 73	40 - 60
78.0	190.9	156.0	3.49	1.8	2348	Dense, Silty sand to sandy silt	40-42	60-80				49 - 73	40 - 60
78.5	181.9	148.4	3.70	2.0	2320	Dense, Silty sand to sandy silt	37-40	60-80				49 - 74	40 - 60
79.0	168.1	136.9	4.20	2.4	2308	V dense, Silty sand to sandy silt	37-40	80-100				49 - 74	40 - 60
79.5	141.7	115.2	3.76	2.5	2227	V dense, Silty sand to sandy silt	37-40	80-100				49 - 74	40 - 60
80.0	126.4	102.6	3.41	2.4	2007	Dense, Silty sand to sandy silt	37-40	60-80				49 - 74	40 - 60
80.5	173.9	140.9	3.05	1.8	2434	Dense, Silty sand to sandy silt	40-42	60-80				49 - 74	40 - 60
81.0	169.5	137.1	3.55	2.0	2322	Dense, Silty sand to sandy silt	37-40	60-80				49 - 74	40 - 60
81.5	139.1	112.3	3.03	2.0	2018	Dense, Silty sand to sandy silt	37-40	60-80				50 - 74	40 - 60
82.0	120.0	96.8	2.88	2.1	1459	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
82.5	145.7	117.3	2.17	1.3	2277	Dense, Sand to silty sand	40-42	60-80				37 - 50	30 - 40
83.0	172.4	138.5	3.34	1.9	2221	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
83.5	181.7	145.8	3.73	2.1	2369	V dense, Silty sand to sandy silt	37-40	80-100				50 - 75	40 - 60
84.0	175.8	140.9	3.75	2.1	2282	V dense, Silty sand to sandy silt	37-40	80-100				50 - 75	40 - 60
84.5	174.3	139.4	3.67	2.1	2369	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
85.0	175.1	139.8	3.77	2.2	2361	V dense, Silty sand to sandy silt	37-40	80-100				50 - 75	40 - 60
85.5	171.5	136.8	3.47	2.0	2334	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
86.0	178.1	141.8	2.99	1.6	2007	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
86.5	187.0	148.6	3.02	1.6	2086	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
87.0	197.8	157.0	4.01	2.0	2252	V dense, Silty sand to sandy silt	37-40	80-100				50 - 76	40 - 60
87.5	181.0	143.5	4.04	2.1	2235	V dense, Silty sand to sandy silt	37-40	80-100				50 - 76	40 - 60
88.0	175.5	138.9	3.89	2.2	2308	V dense, Silty sand to sandy silt	37-40	80-100				51 - 76	40 - 60
88.5	173.4	137.0	3.74	2.2	2338	V dense, Silty sand to sandy silt	37-40	80-100				51 - 76	40 - 60
89.0	168.9	133.3	3.47	1.8	2146	Dense, Silty sand to sandy silt	37-40	60-80				51 - 76	40 - 60
89.5	208.8	164.5	2.89	1.3	2169	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
90.0	221.0	173.8	2.90	1.3	2485	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
90.5	213.4	167.6	3.18	1.4	2459	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
91.0	225.6	176.9	3.06	1.3	2453	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
91.5	244.3	191.3	2.99	1.2	2338	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
92.0	247.7	193.7	2.46	1.0	2597	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
92.5	217.4	169.8	2.73	1.2	2380	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
93.0	220.2	171.7	3.03	1.3	2485	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
93.5	252.3	196.4	0.95	0.5	3138	Med dense, Sand to silty sand	42-46	40-60				51 - 77	40 - 60
94.0	236.2	183.6	2.72	1.1	2514	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
94.5	223.2	173.3	3.33	1.4	2689	Dense, Sand to silty sand	40-42	60-80				52 - 77	40 - 60
95.0	219.2	169.9	3.45	1.6	2655	Dense, Sand to silty sand	40-42	60-80				52 - 77	40 - 60
95.5	215.3	166.6	3.66	1.6	2030	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
96.0	198.7	153.6	3.71	1.8	2223	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
96.5	214.0	165.2	3.91	1.8	2457	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
97.0	216.4	166.8	3.59	1.6	2507	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
97.5	232.4	178.9	3.87	1.6	2724	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
98.0	238.7	183.5	3.90	1.6	2687	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
98.5	262.4	201.4	4.16	1.6	2741	Dense, Sand to silty sand	40-42	60-80				78 - 129	60 - 99
99.0	231.7	177.6	4.38	1.7	2673	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
99.5	251.5	192.5	1.97	0.9	3636	Dense, Sand to silty sand	42-46	60-80				52 - 78	40 - 60
100.0	192.1	146.8	1.98	0.9	3153	Med dense, Sand to silty sand	40-42	40-60				39 - 52	30 - 40

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	162.9	124.3	1.54	0.9	2856	Med dense, Sand to silty sand	40-42	40-60				26 - 39	20 - 30
101.0	164.0	125.0	1.55	0.9	3003	Med dense, Sand to silty sand	40-42	40-60				39 - 52	30 - 40
101.5	162.2	123.5	1.84	1.1	2919	Med dense, Sand to silty sand	40-42	40-60				39 - 53	30 - 40
102.0	167.8	127.5	2.20	1.2	2713	Dense, Sand to silty sand	40-42	60-80				39 - 53	30 - 40
102.5	194.2	147.4	2.32	1.2	2811	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
103.0	194.2	147.2	2.47	1.3	2821	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
103.5	183.6	139.0	2.11	1.2	2819	Dense, Sand to silty sand	40-42	60-80				40 - 53	30 - 40
104.0	187.7	141.9	3.42	1.8	3062	Dense, Silty sand to sandy silt	40-42	60-80				53 - 79	40 - 60
104.5	171.2	129.2	3.78	2.1	3279	Dense, Silty sand to sandy silt	37-40	60-80				53 - 79	40 - 60
105.0	184.6	139.2	3.17	1.8	3291	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
105.5	158.0	119.0	2.68	1.5	2963	Dense, Sand to silty sand	40-42	60-80				40 - 53	30 - 40
106.0	169.0	127.0	2.06	1.1	3125	Med dense, Sand to silty sand	40-42	40-60				40 - 53	30 - 40
106.5	207.5	155.8	1.95	0.9	3154	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
107.0	222.4	166.8	2.02	0.9	3292	Dense, Sand to silty sand	42-46	60-80				53 - 80	40 - 60
107.5	196.0	146.7	2.85	1.4	3313	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
108.0	208.4	155.9	3.36	1.6	3440	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
108.5	210.2	157.0	3.76	1.8	3466	Dense, Silty sand to sandy silt	40-42	60-80				54 - 80	40 - 60
109.0	194.8	145.3	4.24	2.1	3495	V dense, Silty sand to sandy silt	37-40	80-100				54 - 80	40 - 60
109.5	204.7	152.5	4.43	2.2	3414	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
110.0	191.7	142.6	4.39	2.2	3444	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
110.5	166.3	123.5	4.48	2.5	3233	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
111.0	167.4	124.2	3.74	2.3	3477	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
111.5	157.4	116.7	3.21	2.0	3115	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
112.0	145.5	107.7	3.77	2.4	3147	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
112.5	144.5	106.8	3.99	2.7	3198	V dense, Silty sand to sandy silt	36-37	80-100				54 - 81	40 - 60
113.0	151.0	111.5	4.12	2.7	3284	V dense, Silty sand to sandy silt	36-37	80-100				54 - 81	40 - 60
113.5	155.0	114.3	4.20	2.7	3222	V dense, Silty sand to sandy silt	36-37	80-100				54 - 81	40 - 60
114.0	141.2	103.9	4.18	2.8	3232	V dense, Silty sand to sandy silt	36-37	80-100				54 - 81	40 - 60
114.5	141.5	104.1	2.00	1.4	3060	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
115.0	151.2	111.0	4.06	2.6	3189	V dense, Silty sand to sandy silt	36-37	80-100				54 - 82	40 - 60
115.5	156.6	114.9	3.85	2.4	3108	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
116.0	157.3	115.2	4.01	2.5	3250	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
116.5	154.9	113.3	3.93	2.5	3113	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
117.0	153.5	112.2	3.91	2.5	3335	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
117.5	134.5	98.2	3.89	2.7	3270	V dense, Silty sand to sandy silt	36-37	80-100				55 - 82	40 - 60
118.0	145.1	105.8	3.99	2.7	3409	V dense, Silty sand to sandy silt	36-37	80-100				55 - 82	40 - 60
118.5	146.0	106.3	2.00	1.7	3354	Dense, Silty sand to sandy silt	37-40	60-80				41 - 55	30 - 40
119.0	144.2	104.9	3.14	2.2	3278	Dense, Silty sand to sandy silt	37-40	60-80				55 - 83	40 - 60
119.5	139.9	101.6	3.83	2.7	3494	V dense, Silty sand to sandy silt	36-37	80-100				55 - 83	40 - 60
120.0	141.6	102.7	3.70	2.5	3165	V dense, Silty sand to sandy silt	36-37	80-100				55 - 83	40 - 60
120.5	165.1	119.6	3.00	1.7	2907	Dense, Silty sand to sandy silt	37-40	60-80				55 - 83	40 - 60
121.0	191.9	138.9	3.14	1.5	3406	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
121.5	232.9	168.3	2.39	0.9	3410	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
122.0	290.5	209.7	1.68	0.6	3204	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
122.5	298.9	215.5	1.37	0.5	3513	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
123.0	247.7	178.3	1.51	0.6	3566	Med dense, Sand to silty sand	42-46	40-60				56 - 83	40 - 60
123.5	215.4	154.9	2.46	1.1	3685	Dense, Sand to silty sand	40-42	60-80				56 - 83	40 - 60
124.0	211.6	152.0	2.88	1.3	3620	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
124.5	202.6	145.4	3.29	1.6	3727	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
125.0	188.5	135.1	3.28	1.7	3707	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-07-1999 TIME:11:20:49.02
SOUNDING NUMBER:CP-9905

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
125.5	167.1	119.6	3.18	1.8	3715	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
126.0	166.5	119.1	3.01	1.8	3840	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
126.5	169.9	121.3	2.84	1.7	3729	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
127.0	168.2	120.0	2.65	1.5	3488	Dense, Silty sand to sandy silt	40-42	60-80				42 - 56	30 - 40
127.5	175.7	125.2	2.37	1.4	3698	Dense, Sand to silty sand	40-42	60-80				42 - 56	30 - 40
128.0	177.2	126.1	2.43	1.4	3604	Dense, Sand to silty sand	40-42	60-80				42 - 56	30 - 40
128.5	169.4	120.4	2.35	1.3	3621	Dense, Sand to silty sand	40-42	60-80				42 - 56	30 - 40
129.0	166.9	118.5	2.04	1.2	3670	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
129.5	168.1	119.2	1.68	1.0	3891	Med dense, Sand to silty sand	40-42	40-60				28 - 42	20 - 30
130.0	172.3	122.1	1.84	1.0	3713	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
130.5	176.0	124.5	1.68	0.9	3789	Med dense, Sand to silty sand	40-42	40-60				42 - 57	30 - 40
131.0	193.4	136.6	1.28	0.6	3704	Med dense, Sand to silty sand	40-42	40-60				28 - 42	20 - 30
131.5	227.4	160.5	1.36	0.6	4001	Med dense, Sand to silty sand	42-46	40-60				43 - 57	30 - 40
132.0	241.7	170.4	1.04	0.4	3783	Med dense, Sand to silty sand	42-46	40-60				43 - 57	30 - 40
132.5	269.0	189.4	1.21	0.5	3673	Med dense, Sand to silty sand	42-46	40-60				57 - 85	40 - 60

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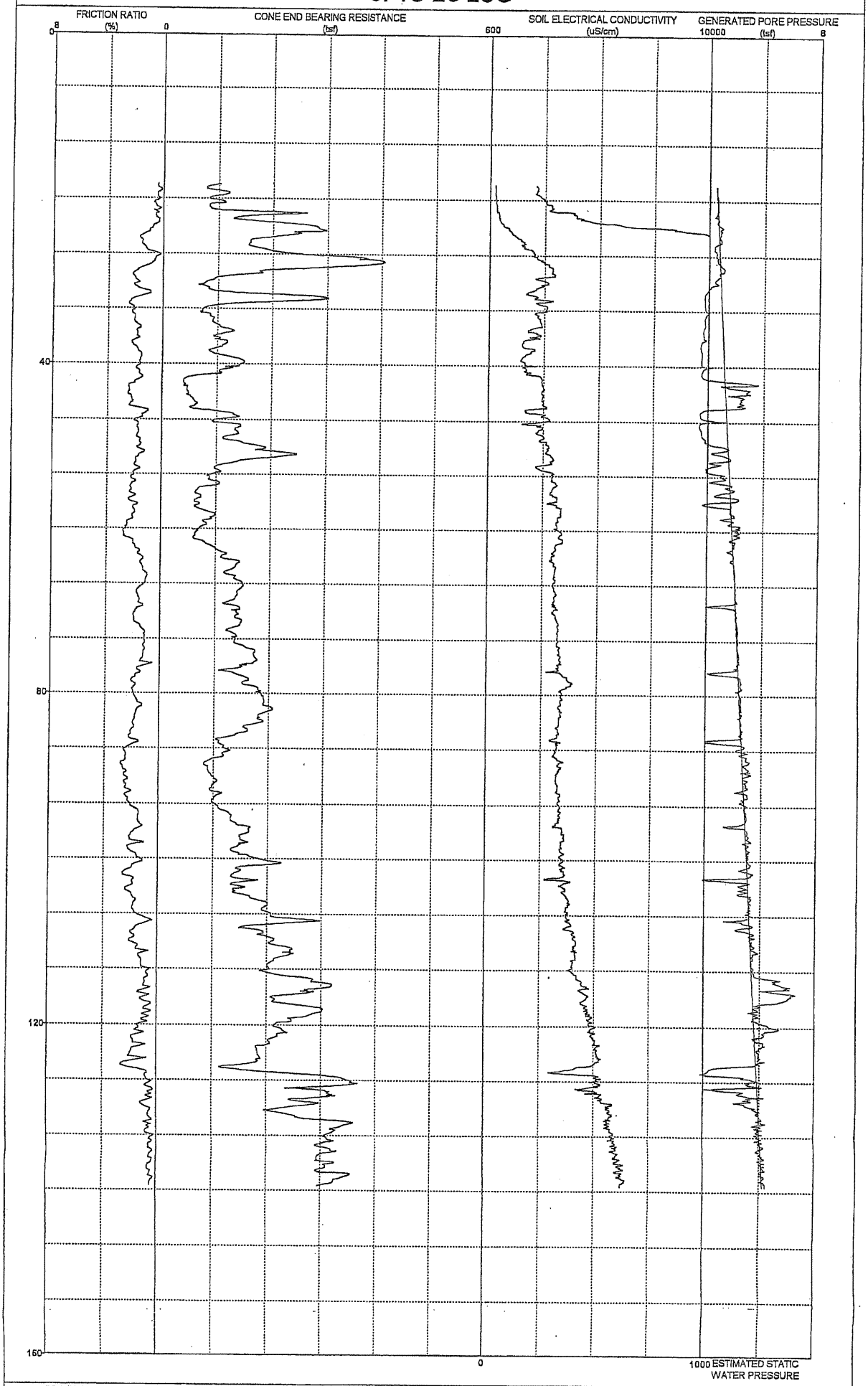
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

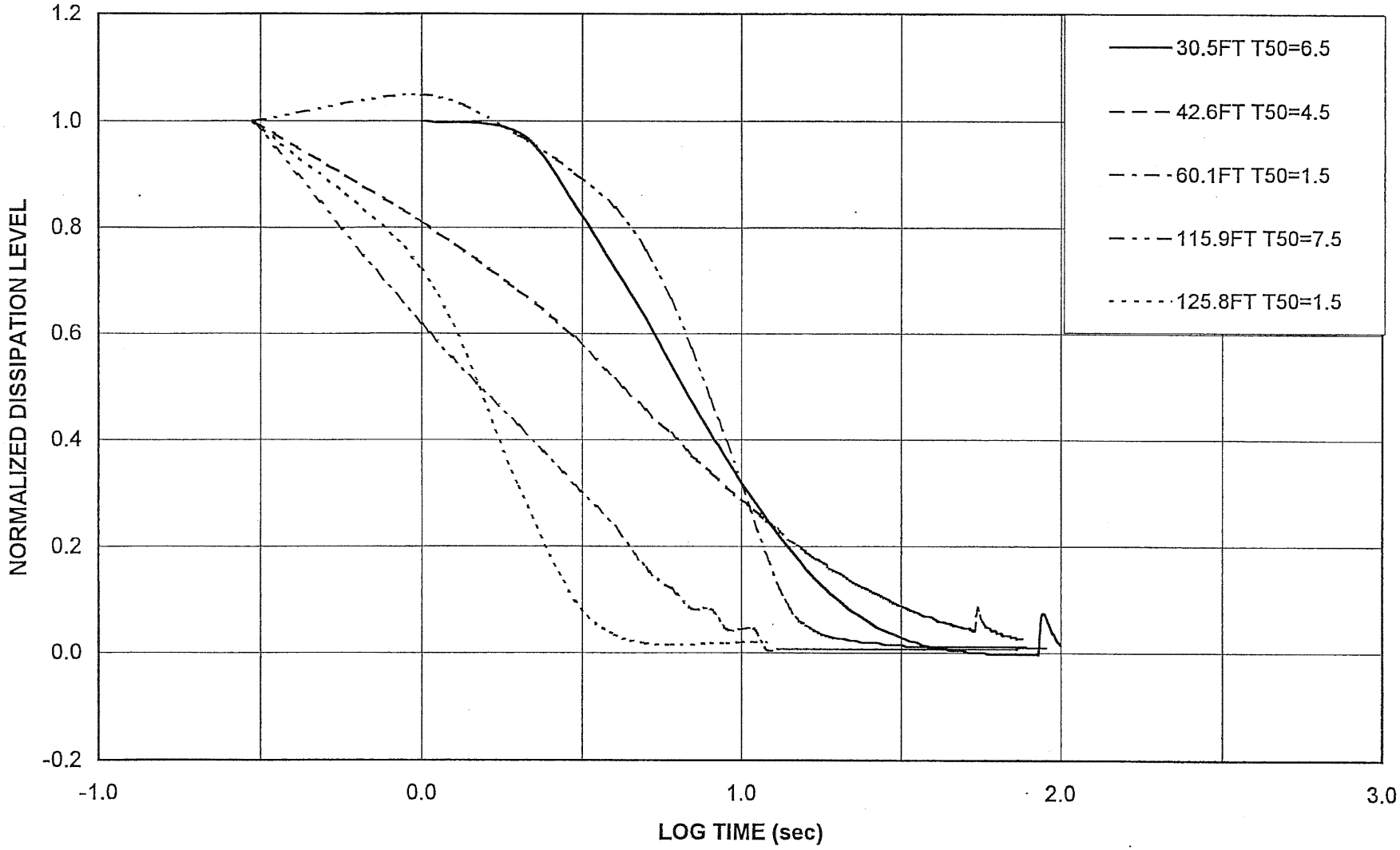
STRATIGRAPHICS

R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-0006

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9906



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 18.30'												
1.5	Prepunched To 18.30'												
2.0	Prepunched To 18.30'												
2.5	Prepunched To 18.30'												
3.0	Prepunched To 18.30'												
3.5	Prepunched To 18.30'												
4.0	Prepunched To 18.30'												
4.5	Prepunched To 18.30'												
5.0	Prepunched To 18.30'												
5.5	Prepunched To 18.30'												
6.0	Prepunched To 18.30'												
6.5	Prepunched To 18.30'												
7.0	Prepunched To 18.30'												
7.5	Prepunched To 18.30'												
8.0	Prepunched To 18.30'												
8.5	Prepunched To 18.30'												
9.0	Prepunched To 18.30'												
9.5	Prepunched To 18.30'												
10.0	Prepunched To 18.30'												
10.5	Prepunched To 18.30'												
11.0	Prepunched To 18.30'												
11.5	Prepunched To 18.30'												
12.0	Prepunched To 18.30'												
12.5	Prepunched To 18.30'												
13.0	Prepunched To 18.30'												
13.5	Prepunched To 18.30'												
14.0	Prepunched To 18.30'												
14.5	Prepunched To 18.30'												
15.0	Prepunched To 18.30'												
15.5	Prepunched To 18.30'												
16.0	Prepunched To 18.30'												
16.5	Prepunched To 18.30'												
17.0	Prepunched To 18.30'												
17.5	Prepunched To 18.30'												
18.0	Prepunched To 18.30'												
18.5	86.8	94.6	0.47	0.5	215	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
19.0	91.7	99.6	0.16	0.2	213	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
19.5	113.6	122.8	0.56	0.5	227	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
20.0	83.7	90.1	0.32	0.3	246	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
20.5	109.9	117.8	0.68	0.7	264	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
21.0	84.7	90.4	0.47	0.4	288	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
21.5	161.9	172.1	1.80	0.6	376	Med dense, Sand to silty sand	42-46	40-60				28 - 38	30 - 40
22.0	172.1	182.3	1.25	0.6	390	Med dense, Sand to silty sand	42-46	40-60				38 - 57	40 - 60
22.5	138.3	145.9	0.52	0.3	457	Med dense, Sand to silty sand	42-46	40-60				19 - 28	20 - 30
23.0	247.1	259.7	1.30	0.5	609	Dense, Sa gravel to gr sand	42-46	60-80				38 - 57	40 - 60
23.5	284.4	297.8	2.24	0.8	855	Dense, Sand to silty sand	42-46	60-80				57 - 95	60 - 99
24.0	244.6	255.1	2.93	1.1	1000	Dense, Sand to silty sand	42-46	60-80				58 - 95	60 - 99
24.5	208.0	216.2	3.84	1.6	1265	V dense, Sand to silty sand	40-42	80-100				58 - 95	60 - 99
25.0	158.5	164.1	2.68	1.5	1539	Dense, Sand to silty sand	40-42	60-80				39 - 58	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	156.1	161.1	2.55	1.5	1497	Dense, Sand to silty sand	40-42	60-80				39 - 58	40 - 60
26.0	182.7	187.8	2.50	1.2	1887	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
26.5	221.1	226.5	1.75	0.6	2037	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
27.0	351.8	359.3	1.81	0.4	2145	Dense, Sa gravel to gr sand	+46	60-80				59 - 97	60 - 99
27.5	403.7	410.8	2.39	0.6	2479	Dense, Sa gravel to gr sand	+46	60-80				59 - 97	60 - 99
28.0	362.6	367.9	3.76	1.0	2703	V dense, Sand to silty sand	42-46	80-100				+ 99	+ 100
28.5	232.0	234.5	5.24	1.7	2855	V dense, Sand to silty sand	40-42	80-100				59 - 98	60 - 99
29.0	179.1	180.5	4.03	2.1	2970	V dense, Silty sand to sandy silt	40-42	80-100				60 - 98	60 - 99
29.5	103.4	103.9	2.88	2.1	2111	Dense, Silty sand to sandy silt	37-40	60-80				30 - 40	30 - 40
30.0	83.5	83.7	1.77	1.9	2652	Dense, Silty sand to sandy silt	37-40	60-80				20 - 30	20 - 30
30.5	64.5	64.4	1.69	2.1	2343	Dense, Silty sand to sandy silt	36-37	60-80				20 - 30	20 - 30
31.0	84.6	84.2	1.83	1.6	1976	Med dense, Silty sand to sandy silt	37-40	40-60				20 - 30	20 - 30
31.5	170.7	169.3	2.28	0.9	1859	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
32.0	301.6	298.2	5.14	1.9	2247	V dense, Sa gravel to si gr sand	40-42	80-100				+ 101	+ 100
32.5	199.3	196.5	6.22	2.4	2149	V dense, Gr si sand to cl gr sand	37-40	80-100				+ 101	+ 100
33.0	89.7	88.2	3.04	2.3	2633	Dense, Silty sand to sandy silt	36-37	60-80				31 - 41	30 - 40
33.5	71.6	70.2	1.60	2.1	2470	Dense, Silty sand to sandy silt	36-37	60-80				20 - 31	20 - 30
34.0	86.8	84.8	1.90	2.1	2240	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
34.5	93.9	91.5	1.86	2.0	2305	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
35.0	93.8	91.1	1.99	2.0	2350	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
35.5	105.0	101.7	1.87	1.6	1992	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
36.0	129.5	125.1	2.28	1.9	2064	Dense, Silty sand to sandy silt	37-40	60-80				41 - 62	40 - 60
36.5	100.2	96.5	2.12	1.8	2071	Dense, Silty sand to sandy silt	37-40	60-80				31 - 42	30 - 40
37.0	99.9	96.0	2.08	1.8	1581	Dense, Silty sand to sandy silt	37-40	60-80				31 - 42	30 - 40
37.5	117.3	112.4	2.53	2.2	1497	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
38.0	103.8	99.2	2.07	1.9	2002	Dense, Silty sand to sandy silt	37-40	60-80				31 - 42	30 - 40
38.5	86.7	82.7	1.71	1.8	1867	Dense, Silty sand to sandy silt	37-40	60-80				21 - 31	20 - 30
39.0	114.5	108.9	1.96	1.5	1536	Dense, Silty sand to sandy silt	37-40	60-80				32 - 42	30 - 40
39.5	145.1	137.6	2.38	1.6	1487	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
40.0	143.3	135.5	2.42	1.6	1908	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
40.5	125.9	118.7	2.57	1.9	1702	Dense, Silty sand to sandy silt	37-40	60-80				42 - 64	40 - 60
41.0	107.3	101.0	1.87	1.7	1694	Dense, Silty sand to sandy silt	37-40	60-80				32 - 43	30 - 40
41.5	53.5	50.2	1.18	1.4	2403	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 16	10 - 15
42.0	39.2	36.7	0.84	1.9	2414	Med dense, Silty sand to sandy silt	27-31	40-60				06 - 11	06 - 10
42.5	42.7	39.8	1.08	2.4	2472	V stiff, Sandy silt to sandy clay			25	3.21	2.15	11 - 16	10 - 15
43.0	45.4	42.3	1.10	2.4	2479	V stiff, Sandy silt to sandy clay			25	3.42	2.19	16 - 21	15 - 20
43.5	48.4	45.0	1.25	2.5	2480	V stiff, Sandy silt to sandy clay			25	3.66	2.51	16 - 22	15 - 20
44.0	53.4	49.5	1.27	2.2	2429	Med dense, Silty sand to sandy silt	27-31	40-60				16 - 22	15 - 20
44.5	60.0	55.5	1.30	2.1	2513	Dense, Silty sand to sandy silt	27-31	60-80				16 - 22	15 - 20
45.0	59.3	54.7	1.50	2.4	2652	Dense, Silty sand to sandy silt	27-31	60-80				16 - 22	15 - 20
45.5	82.0	75.4	1.14	1.1	1688	Med dense, Sand to silty sand	37-40	40-60				16 - 22	15 - 20
46.0	130.4	119.8	1.78	1.3	2447	Dense, Sand to silty sand	40-42	60-80				33 - 44	30 - 40
46.5	119.2	109.2	2.12	1.6	2801	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
47.0	97.5	89.1	2.34	1.8	1565	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
47.5	142.9	130.3	2.50	1.8	2471	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
48.0	136.7	124.3	2.33	1.7	2202	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
48.5	130.9	118.8	2.47	1.8	2508	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
49.0	114.2	103.4	2.08	1.6	2311	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
49.5	150.6	136.1	2.64	1.6	2667	Dense, Sand to silty sand	40-42	60-80				44 - 66	40 - 60
50.0	189.7	171.0	3.40	1.8	2690	Dense, Silty sand to sandy silt	40-42	60-80				44 - 67	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	206.1	185.4	2.83	1.3	2623	Dense, Sand to silty sand	42-46	60-80				44 - 67	40 - 60
51.0	231.4	207.7	3.85	1.7	2895	V dense, Sand to silty sand	40-42	80-100				67 - 110	60 - 99
51.5	159.4	142.7	3.73	1.9	2926	Dense, Silty sand to sandy silt	37-40	60-80				45 - 67	40 - 60
52.0	121.9	108.9	2.68	1.9	2591	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
52.5	97.4	86.9	1.77	1.7	2356	Dense, Silty sand to sandy silt	37-40	60-80				22 - 34	20 - 30
53.0	107.9	96.0	1.99	2.0	2980	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
53.5	83.9	74.5	1.98	2.1	2926	Dense, Silty sand to sandy silt	36-37	60-80				23 - 34	20 - 30
54.0	86.9	77.0	2.05	2.1	2890	Dense, Silty sand to sandy silt	36-37	60-80				23 - 34	20 - 30
54.5	106.2	93.9	2.12	2.1	3152	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
55.0	69.1	60.9	1.98	2.2	2930	Dense, Silty sand to sandy silt	27-31	60-80				23 - 34	20 - 30
55.5	62.8	55.3	1.56	2.3	2839	Dense, Silty sand to sandy silt	27-31	60-80				17 - 23	15 - 20
56.0	73.2	64.3	1.32	1.9	3156	Med dense, Silty sand to sandy silt	36-37	40-60				23 - 34	20 - 30
56.5	62.3	54.7	1.66	2.4	3082	Dense, Silty sand to sandy silt	27-31	60-80				17 - 23	15 - 20
57.0	69.1	60.5	1.09	1.7	3127	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
57.5	68.2	59.5	1.60	2.0	3344	Dense, Silty sand to sandy silt	36-37	60-80				17 - 23	15 - 20
58.0	91.3	79.6	1.85	1.9	3330	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
58.5	95.4	83.0	2.04	2.1	3191	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
59.0	77.6	67.4	2.07	2.3	3157	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
59.5	83.2	72.1	1.99	2.5	3180	Dense, Silty sand to sandy silt	27-31	60-80				23 - 35	20 - 30
60.0	70.3	60.8	1.87	2.5	3245	Hard, Sandy silt to sandy clay			25	5.34	3.74	23 - 35	20 - 30
60.5	63.0	54.4	1.78	2.7	3378	Hard, Sandy silt to sandy clay			25	4.75	3.55	23 - 35	20 - 30
61.0	59.3	51.1	1.69	2.6	3351	Hard, Sandy silt to sandy clay			25	4.45	3.39	17 - 23	15 - 20
61.5	76.7	66.0	1.63	2.0	3378	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
62.0	90.2	77.4	1.84	1.9	3068	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
62.5	101.0	86.5	1.86	1.7	3054	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
63.0	119.3	102.0	1.96	1.7	3064	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
63.5	110.8	94.6	1.62	1.3	2949	Med dense, Sand to silty sand	37-40	40-60				23 - 35	20 - 30
64.0	144.3	122.9	2.10	1.5	3053	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
64.5	137.3	116.7	1.89	1.4	3126	Dense, Sand to silty sand	40-42	60-80				35 - 47	30 - 40
65.0	126.7	107.5	1.72	1.3	3087	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
65.5	120.9	102.4	1.23	0.9	3039	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
66.0	134.3	113.6	1.48	1.0	3086	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
66.5	149.0	125.8	1.58	1.1	2993	Med dense, Sand to silty sand	40-42	40-60				36 - 47	30 - 40
67.0	150.5	126.8	2.13	1.4	3046	Dense, Sand to silty sand	40-42	60-80				36 - 47	30 - 40
67.5	142.0	119.4	2.50	1.7	3117	Dense, Silty sand to sandy silt	37-40	60-80				48 - 71	40 - 60
68.0	140.6	118.0	2.34	1.7	3099	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
68.5	136.4	114.3	2.14	1.5	3077	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
69.0	118.2	98.8	2.08	1.6	3022	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
69.5	143.8	120.0	1.93	1.4	3150	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
70.0	138.6	115.5	2.53	1.8	2967	Dense, Silty sand to sandy silt	37-40	60-80				48 - 72	40 - 60
70.5	138.9	115.6	2.76	2.0	3145	Dense, Silty sand to sandy silt	37-40	60-80				48 - 72	40 - 60
71.0	146.8	121.9	2.80	1.9	3201	Dense, Silty sand to sandy silt	37-40	60-80				48 - 72	40 - 60
71.5	146.4	121.4	2.45	1.7	3252	Dense, Silty sand to sandy silt	37-40	60-80				48 - 72	40 - 60
72.0	132.2	109.4	2.01	1.4	3258	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
72.5	129.5	107.0	1.50	1.1	3214	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
73.0	140.4	115.8	1.50	1.1	3221	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
73.5	136.3	112.2	1.61	1.1	3244	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
74.0	146.6	120.5	1.90	1.2	3228	Med dense, Sand to silty sand	40-42	40-60				36 - 49	30 - 40
74.5	165.2	135.6	1.89	1.1	3282	Dense, Sand to silty sand	40-42	60-80				37 - 49	30 - 40
75.0	172.5	141.3	2.06	1.2	3279	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	172.6	141.1	2.16	1.2	3345	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
76.0	175.9	143.6	2.50	1.4	3372	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
76.5	157.3	128.3	1.47	0.9	3304	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
77.0	131.7	107.2	2.52	1.7	3213	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
77.5	136.6	111.0	2.09	1.5	3447	Dense, Silty sand to sandy silt	40-42	60-80				37 - 49	30 - 40
78.0	156.8	127.2	2.85	1.8	3659	Dense, Silty sand to sandy silt	37-40	60-80				49 - 74	40 - 60
78.5	156.8	127.0	3.33	2.1	3856	Dense, Silty sand to sandy silt	37-40	60-80				49 - 74	40 - 60
79.0	161.6	130.7	3.02	1.7	3707	Dense, Silty sand to sandy silt	40-42	60-80				49 - 74	40 - 60
79.5	179.9	145.2	3.62	2.0	3392	Dense, Silty sand to sandy silt	37-40	60-80				50 - 74	40 - 60
80.0	185.5	149.5	3.59	1.9	3442	Dense, Silty sand to sandy silt	40-42	60-80				50 - 74	40 - 60
80.5	190.3	153.1	3.41	1.8	3484	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
81.0	191.8	154.1	3.12	1.6	3412	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
81.5	193.4	155.1	2.54	1.3	3286	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
82.0	207.0	165.8	3.33	1.6	3362	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
82.5	186.1	148.8	3.39	1.7	3405	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
83.0	181.5	144.9	3.30	1.8	3338	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
83.5	188.5	150.2	3.57	1.9	3324	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
84.0	155.9	124.1	3.12	1.8	3201	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
84.5	162.0	128.8	3.22	2.0	3263	Dense, Silty sand to sandy silt	37-40	60-80				50 - 76	40 - 60
85.0	139.7	110.8	3.20	2.1	3257	Dense, Silty sand to sandy silt	37-40	60-80				50 - 76	40 - 60
85.5	109.0	86.3	2.76	2.1	2909	Dense, Silty sand to sandy silt	37-40	60-80				38 - 50	30 - 40
86.0	108.2	85.6	1.74	1.6	3253	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 38	20 - 30
86.5	117.3	92.6	2.77	2.2	3222	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
87.0	129.6	102.2	3.18	2.6	3173	V dense, Silty sand to sandy silt	36-37	80-100				51 - 76	40 - 60
87.5	117.7	92.7	2.89	2.4	3131	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
88.0	95.2	74.9	2.66	2.4	3379	Dense, Silty sand to sandy silt	36-37	60-80				25 - 38	20 - 30
88.5	82.4	64.7	2.48	2.8	3275	Hard, Sandy silt to sandy clay			25	6.17	4.97	25 - 38	20 - 30
89.0	89.3	70.0	2.39	2.7	3347	Hard, Sandy silt to sandy clay			25	6.71	4.77	26 - 38	20 - 30
89.5	91.4	71.6	2.20	2.3	3258	Dense, Silty sand to sandy silt	36-37	60-80				26 - 38	20 - 30
90.0	97.4	76.1	2.58	2.5	3202	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
90.5	106.5	83.1	2.45	2.4	3217	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
91.0	99.6	77.6	2.54	2.4	3290	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
91.5	94.1	73.3	2.48	2.5	3275	Dense, Silty sand to sandy silt	36-37	60-80				26 - 39	20 - 30
92.0	114.8	89.2	2.37	2.2	3419	Dense, Silty sand to sandy silt	37-40	60-80				39 - 51	30 - 40
92.5	103.5	80.3	2.61	2.4	3337	Dense, Silty sand to sandy silt	36-37	60-80				39 - 52	30 - 40
93.0	96.8	75.0	2.33	2.3	3279	Dense, Silty sand to sandy silt	36-37	60-80				26 - 39	20 - 30
93.5	107.1	82.9	2.27	2.1	3403	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
94.0	113.9	88.0	1.96	1.6	3359	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
94.5	129.4	99.8	1.91	1.5	3335	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
95.0	132.0	101.7	2.04	1.5	3324	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
95.5	137.0	105.4	2.14	1.5	3213	Dense, Silty sand to sandy silt	37-40	60-80				39 - 52	30 - 40
96.0	158.7	121.9	1.87	1.2	3403	Med dense, Sand to silty sand	40-42	40-60				39 - 52	30 - 40
96.5	165.3	126.8	2.80	1.7	3522	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
97.0	156.5	119.9	3.25	2.0	3590	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
97.5	149.6	114.5	3.26	2.1	3616	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
98.0	163.5	124.9	1.23	1.1	3475	Med dense, Sand to silty sand	40-42	40-60				39 - 52	30 - 40
98.5	144.5	110.2	3.37	2.2	3508	Dense, Silty sand to sandy silt	37-40	60-80				52 - 79	40 - 60
99.0	134.2	102.2	2.96	2.1	3485	Dense, Silty sand to sandy silt	37-40	60-80				39 - 53	30 - 40
99.5	156.4	119.0	2.71	1.6	3430	Dense, Silty sand to sandy silt	37-40	60-80				39 - 53	30 - 40
100.0	183.4	139.3	2.75	1.4	3571	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	225.3	171.0	2.82	1.4	3402	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
101.0	148.4	112.4	3.54	1.9	3504	Dense, Silty sand to sandy silt	37-40	60-80				53 - 79	40 - 60
101.5	149.1	112.8	3.57	2.4	3615	V dense, Silty sand to sandy silt	37-40	80-100				53 - 79	40 - 60
102.0	134.5	101.6	3.66	2.5	3569	V dense, Silty sand to sandy silt	36-37	80-100				53 - 79	40 - 60
102.5	166.5	125.6	2.78	1.8	3704	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
103.0	135.8	102.3	2.92	1.8	3526	Dense, Silty sand to sandy silt	37-40	60-80				40 - 53	30 - 40
103.5	155.7	117.2	3.41	2.3	3699	V dense, Silty sand to sandy silt	37-40	80-100				53 - 80	40 - 60
104.0	138.0	103.7	3.22	2.1	3593	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
104.5	166.7	125.1	3.28	1.9	3736	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
105.0	184.2	138.0	3.14	1.6	3821	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
105.5	200.9	150.4	3.57	1.8	3810	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
106.0	190.7	142.6	3.73	1.9	3720	Dense, Silty sand to sandy silt	40-42	60-80				54 - 80	40 - 60
106.5	205.1	153.2	3.51	1.7	3726	Dense, Silty sand to sandy silt	40-42	60-80				54 - 80	40 - 60
107.0	213.3	159.0	2.73	1.1	3768	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
107.5	294.3	219.1	1.27	0.5	3833	Dense, Sand to silty sand	42-46	60-80				54 - 81	40 - 60
108.0	183.4	136.4	3.09	1.3	3815	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
108.5	171.9	127.7	3.15	1.7	3909	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
109.0	193.2	143.3	3.75	2.0	3996	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
109.5	205.4	152.2	3.50	1.7	4036	Dense, Silty sand to sandy silt	40-42	60-80				54 - 81	40 - 60
110.0	209.5	155.0	4.36	2.0	4197	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
110.5	222.9	164.7	3.43	1.4	4038	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
111.0	244.9	180.7	3.78	1.6	4007	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
111.5	244.7	180.3	3.13	1.3	4162	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
112.0	218.0	160.5	3.01	1.3	4158	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
112.5	208.6	153.3	2.59	1.2	4000	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
113.0	201.4	147.9	2.37	1.2	4019	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
113.5	188.8	138.5	1.27	0.6	3983	Med dense, Sand to silty sand	40-42	40-60				41 - 55	30 - 40
114.0	218.7	160.2	1.76	0.7	4205	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
114.5	284.6	208.2	2.66	0.9	4379	Dense, Sand to silty sand	42-46	60-80				55 - 82	40 - 60
115.0	311.0	227.2	2.79	0.9	4458	Dense, Sand to silty sand	42-46	60-80				55 - 82	40 - 60
115.5	312.3	227.9	1.97	0.7	4687	Dense, Sand to silty sand	42-46	60-80				55 - 82	40 - 60
116.0	281.5	205.1	3.71	1.3	4526	Dense, Sand to silty sand	42-46	60-80				55 - 82	40 - 60
116.5	225.3	164.0	1.46	0.6	4700	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
117.0	215.9	156.9	2.68	1.2	4507	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
117.5	245.8	178.4	1.22	0.5	4630	Med dense, Sand to silty sand	42-46	40-60				41 - 55	30 - 40
118.0	302.2	219.1	2.87	1.0	4702	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
118.5	291.4	211.1	1.72	0.6	4793	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
119.0	266.6	192.8	1.60	0.6	4870	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
119.5	245.5	177.4	2.12	0.9	4900	Dense, Sand to silty sand	42-46	60-80				55 - 83	40 - 60
120.0	214.4	154.7	3.32	1.4	5040	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
120.5	229.0	165.0	3.35	1.4	4840	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
121.0	224.8	161.8	2.43	1.1	4895	Dense, Sand to silty sand	40-42	60-80				56 - 83	40 - 60
121.5	214.9	154.5	4.14	1.9	4991	Dense, Silty sand to sandy silt	40-42	60-80				56 - 83	40 - 60
122.0	205.8	147.8	3.47	1.7	5042	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
122.5	181.2	130.0	2.06	1.0	5104	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
123.0	183.3	131.3	3.41	1.9	5096	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
123.5	184.8	132.2	3.68	2.0	5146	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
124.0	189.9	135.7	1.27	0.9	5253	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
124.5	178.8	127.7	4.33	2.3	5030	V dense, Silty sand to sandy silt	37-40	80-100				56 - 84	40 - 60
125.0	117.9	84.1	3.61	2.4	4201	Dense, Silty sand to sandy silt	36-37	60-80				42 - 56	30 - 40

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-08-1999 TIME:16:44:36.88
SOUNDING NUMBER:cp-9906

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
125.5	168.2	119.8	2.08	0.9	3195	Med dense, Sand to silty sand	40-42	40-60				28 - 42	20 - 30
126.0	294.6	209.5	2.77	0.8	5178	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60
126.5	343.1	243.8	2.60	0.7	5101	Dense, Sand to silty sand	42-46	60-80				56 - 84	40 - 60
127.0	364.9	259.0	1.94	0.5	5301	Dense, Sand to silty sand	42-46	60-80				56 - 85	40 - 60
127.5	276.4	195.9	1.80	0.7	4654	Dense, Sand to silty sand	42-46	60-80				56 - 85	40 - 60
128.0	311.2	220.3	1.17	0.4	5145	Med dense, Sand to silty sand	42-46	40-60				56 - 85	40 - 60
128.5	316.9	224.2	1.79	0.5	5251	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
129.0	243.8	172.2	1.27	0.4	5289	Med dense, Sand to silty sand	42-46	40-60				42 - 57	30 - 40
129.5	296.0	208.9	3.37	1.2	5869	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
130.0	235.2	165.7	2.05	0.7	5586	Med dense, Sand to silty sand	42-46	40-60				43 - 57	30 - 40
130.5	213.3	150.2	1.28	0.5	5669	Med dense, Sand to silty sand	42-46	40-60				43 - 57	30 - 40
131.0	254.0	178.6	1.64	0.6	5748	Med dense, Sand to silty sand	42-46	40-60				57 - 85	40 - 60
131.5	323.4	227.2	1.00	0.3	5583	Med dense, Sa gravel to gr sand	42-46	40-60				57 - 85	40 - 60
132.0	347.1	243.5	1.16	0.4	5689	Dense, Sa gravel to gr sand	42-46	60-80				57 - 86	40 - 60
132.5	318.9	223.5	1.73	0.5	5786	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
133.0	319.8	223.9	2.68	0.8	5914	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
133.5	308.5	215.7	1.10	0.4	5897	Med dense, Sa gravel to gr sand	42-46	40-60				57 - 86	40 - 60
134.0	321.7	224.7	0.95	0.4	5939	Med dense, Sa gravel to gr sand	42-46	40-60				57 - 86	40 - 60
134.5	291.0	203.0	1.85	0.6	5868	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
135.0	317.9	221.5	1.29	0.5	6063	Dense, Sand to silty sand	42-46	60-80				57 - 86	40 - 60
135.5	304.1	211.7	1.42	0.4	6129	Med dense, Sand to silty sand	42-46	40-60				57 - 86	40 - 60
136.0	293.6	204.1	1.74	0.6	5928	Dense, Sand to silty sand	42-46	60-80				58 - 86	40 - 60
136.5	308.7	214.4	1.20	0.4	6008	Med dense, Sand to silty sand	42-46	40-60				58 - 86	40 - 60
137.0	307.6	213.4	1.95	0.6	6083	Dense, Sand to silty sand	42-46	60-80				58 - 86	40 - 60
137.5	295.2	204.6	1.97	0.6	6268	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
138.0	352.5	244.0	1.78	0.5	6187	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60
138.5	335.8	232.2	0.65	0.2	6287	Med dense, Sa gravel to gr sand	42-46	40-60				58 - 87	40 - 60
139.0	322.2	222.6	1.49	0.5	6335	Dense, Sand to silty sand	42-46	60-80				58 - 87	40 - 60

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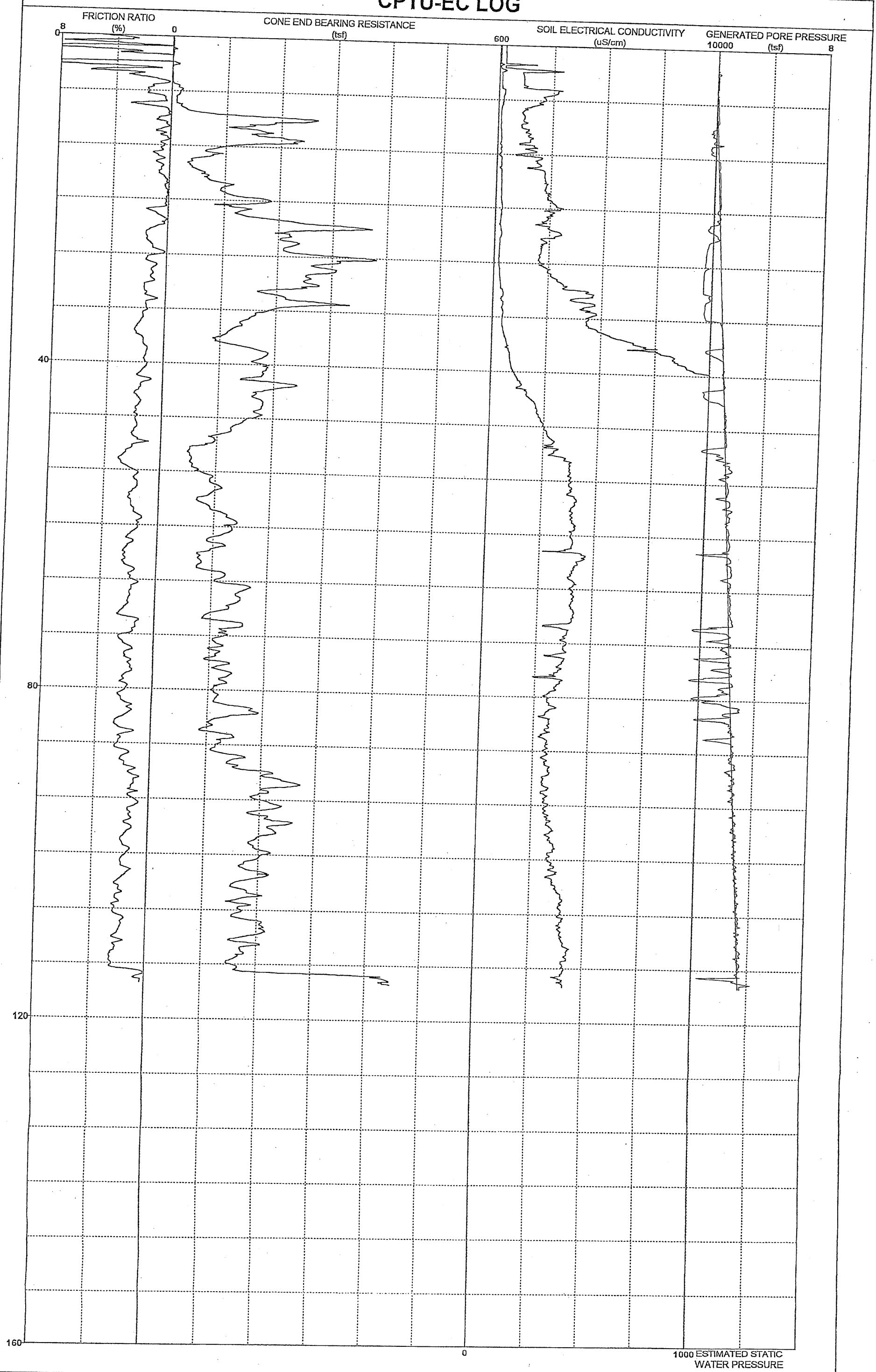
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 18.20'												
1.5	Prepunched To 18.20'												
2.0	Prepunched To 18.20'												
2.5	Prepunched To 18.20'												
3.0	Prepunched To 18.20'												
3.5	Prepunched To 18.20'												
4.0	Prepunched To 18.20'												
4.5	Prepunched To 18.20'												
5.0	Prepunched To 18.20'												
5.5	Prepunched To 18.20'												
6.0	Prepunched To 18.20'												
6.5	Prepunched To 18.20'												
7.0	Prepunched To 18.20'												
7.5	Prepunched To 18.20'												
8.0	Prepunched To 18.20'												
8.5	Prepunched To 18.20'												
9.0	Prepunched To 18.20'												
9.5	Prepunched To 18.20'												
10.0	Prepunched To 18.20'												
10.5	Prepunched To 18.20'												
11.0	Prepunched To 18.20'												
11.5	Prepunched To 18.20'												
12.0	Prepunched To 18.20'												
12.5	Prepunched To 18.20'												
13.0	Prepunched To 18.20'												
13.5	Prepunched To 18.20'												
14.0	Prepunched To 18.20'												
14.5	Prepunched To 18.20'												
15.0	Prepunched To 18.20'												
15.5	Prepunched To 18.20'												
16.0	Prepunched To 18.20'												
16.5	Prepunched To 18.20'												
17.0	Prepunched To 18.20'												
17.5	Prepunched To 18.20'												
18.0	Prepunched To 18.20'												
18.5	95.3	100.3	0.25	0.3	240	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
19.0	98.7	103.5	0.12	0.1	253	Loose, Sand to silty sand	40-42	20-40				14 - 19	15 - 20
19.5	124.6	130.2	0.09	0.0	276	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
20.0	185.1	192.7	0.20	0.1	299	Med dense, Sa gravel to gr sand	42-46	40-60				29 - 38	30 - 40
20.5	106.5	110.5	0.38	0.2	267	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
21.0	146.8	151.8	0.55	0.5	240	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
21.5	120.5	124.1	1.48	1.1	227	Med dense, Sand to silty sand	40-42	40-60				29 - 39	30 - 40
22.0	157.9	162.0	1.11	0.6	206	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
22.5	233.5	238.8	0.11	0.1	250	Med dense, Sa gravel to gr sand	+46	40-60				39 - 59	40 - 60
23.0	360.4	367.4	0.51	0.2	303	Dense, Sa gravel to gr sand	+46	60-80				39 - 59	40 - 60
23.5	237.9	241.7	3.44	1.1	267	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
24.0	220.0	222.8	3.38	1.5	237	V dense, Sand to silty sand	40-42	80-100				59 - 98	60 - 99
24.5	204.1	205.9	3.18	1.5	215	Dense, Sand to silty sand	40-42	60-80				40 - 59	40 - 60
25.0	238.1	239.5	3.22	1.4	215	Dense, Sand to silty sand	42-46	60-80				60 - 98	60 - 99

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	217.3	217.9	2.39	1.1	211	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
26.0	213.9	213.8	2.10	0.9	207	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
26.5	303.7	302.6	0.53	0.2	209	Dense, Sa gravel to gr sand	+46	60-80				40 - 60	40 - 60
27.0	336.0	333.8	4.90	1.4	224	V dense, Sand to silty sand	42-46	80-100				+ 101	+ 100
27.5	290.7	287.9	4.39	1.4	251	V dense, Sand to silty sand	42-46	80-100				61 - 100	60 - 99
28.0	284.5	280.9	2.06	0.7	263	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
28.5	303.5	298.7	3.27	1.1	286	Dense, Sand to silty sand	42-46	60-80				61 - 101	60 - 99
29.0	251.7	247.1	2.53	0.9	312	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
29.5	254.5	249.1	2.87	1.1	334	Dense, Sand to silty sand	42-46	60-80				61 - 101	60 - 99
30.0	270.4	263.8	2.28	0.9	436	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
30.5	248.0	241.3	4.02	1.5	458	V dense, Sand to silty sand	42-46	80-100				62 - 102	60 - 99
31.0	165.5	160.6	3.12	1.6	359	Dense, Sand to silty sand	40-42	60-80				41 - 62	40 - 60
31.5	208.0	201.2	3.00	1.4	465	Dense, Sand to silty sand	42-46	60-80				41 - 62	40 - 60
32.0	231.7	223.5	2.19	0.8	414	Dense, Sand to silty sand	42-46	60-80				41 - 62	40 - 60
32.5	309.0	297.3	3.97	1.4	429	V dense, Sand to silty sand	42-46	80-100				+ 104	+ 100
33.0	204.5	196.2	3.34	1.4	459	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
33.5	179.9	172.2	2.40	1.3	441	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
34.0	161.2	153.9	2.67	1.6	434	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
34.5	147.7	140.6	2.45	1.6	467	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
35.0	137.0	130.0	2.43	1.8	504	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
35.5	125.9	119.2	2.67	2.0	554	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
36.0	114.2	107.8	2.57	2.1	634	Dense, Silty sand to sandy silt	37-40	60-80				42 - 64	40 - 60
36.5	104.9	98.8	2.20	2.0	683	Dense, Silty sand to sandy silt	37-40	60-80				32 - 42	30 - 40
37.0	92.7	87.0	1.50	1.5	649	Med dense, Silty sand to sandy silt	37-40	40-60				21 - 32	20 - 30
37.5	116.5	109.2	2.08	1.5	785	Dense, Silty sand to sandy silt	37-40	60-80				32 - 43	30 - 40
38.0	158.4	148.1	2.19	1.3	836	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
38.5	186.1	173.5	2.30	1.2	854	Dense, Sand to silty sand	40-42	60-80				43 - 64	40 - 60
39.0	181.6	169.0	2.36	1.3	893	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
39.5	162.7	151.0	2.47	1.4	931	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
40.0	185.3	171.6	2.21	1.2	1035	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
40.5	186.1	171.9	2.33	1.3	1141	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
41.0	180.2	166.0	2.83	1.6	1251	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
41.5	173.3	159.2	3.31	1.8	1414	Dense, Silty sand to sandy silt	40-42	60-80				44 - 65	40 - 60
42.0	170.7	156.5	1.90	0.9	1194	Dense, Sand to silty sand	40-42	60-80				44 - 65	40 - 60
42.5	241.9	221.3	3.53	1.5	1673	Dense, Sand to silty sand	40-42	60-80				66 - 108	60 - 99
43.0	196.8	179.6	3.41	1.6	1724	Dense, Sand to silty sand	40-42	60-80				44 - 66	40 - 60
43.5	167.1	152.1	3.34	1.9	1952	Dense, Silty sand to sandy silt	40-42	60-80				44 - 66	40 - 60
44.0	161.8	147.0	3.24	1.9	2085	Dense, Silty sand to sandy silt	40-42	60-80				44 - 66	40 - 60
44.5	180.4	163.6	2.97	1.6	2146	Dense, Sand to silty sand	40-42	60-80				44 - 66	40 - 60
45.0	181.4	164.1	2.96	1.6	2152	Dense, Sand to silty sand	40-42	60-80				44 - 66	40 - 60
45.5	178.2	160.8	3.35	1.9	2275	Dense, Silty sand to sandy silt	40-42	60-80				44 - 66	40 - 60
46.0	170.9	153.9	3.17	1.8	2370	Dense, Silty sand to sandy silt	40-42	60-80				44 - 67	40 - 60
46.5	169.7	152.5	2.97	1.8	2473	Dense, Silty sand to sandy silt	40-42	60-80				45 - 67	40 - 60
47.0	146.8	131.6	3.00	1.9	2532	Dense, Silty sand to sandy silt	37-40	60-80				45 - 67	40 - 60
47.5	134.1	120.0	2.53	1.8	2661	Dense, Silty sand to sandy silt	37-40	60-80				45 - 67	40 - 60
48.0	124.8	111.4	2.27	1.8	2780	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
48.5	117.4	104.5	2.45	2.0	3021	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
49.0	88.3	78.5	2.14	2.1	2637	Dense, Silty sand to sandy silt	36-37	60-80				23 - 34	20 - 30
49.5	97.4	86.4	1.59	1.7	3187	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
50.0	82.3	72.9	1.41	1.5	2940	Med dense, Silty sand to sandy silt	37-40	40-60				23 - 34	20 - 30

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	52.7	46.5	1.26	2.1	3520	Med dense, Silty sand to sandy silt	27-31	40-60				17 - 23	15 - 20
51.0	49.9	44.0	1.31	2.5	3794	V stiff, Sandy silt to sandy clay			25	3.75	2.62	17 - 23	15 - 20
51.5	54.3	47.7	1.49	2.7	3771	Hard, Sandy silt to sandy clay			25	4.09	2.97	17 - 23	15 - 20
52.0	53.7	47.1	1.66	3.0	3756	Hard, Sandy silt to sandy clay			25	4.04	3.31	23 - 34	20 - 30
52.5	57.9	50.7	1.66	2.8	3776	Hard, Sandy silt to sandy clay			25	4.38	3.32	23 - 34	20 - 30
53.0	66.7	58.3	1.63	2.3	3840	Dense, Silty sand to sandy silt	27-31	60-80				23 - 34	20 - 30
53.5	78.3	68.3	1.40	1.6	3843	Med dense, Silty sand to sandy silt	37-40	40-60				17 - 23	15 - 20
54.0	95.1	82.8	1.62	1.8	3808	Dense, Silty sand to sandy silt	37-40	60-80				23 - 34	20 - 30
54.5	90.6	78.7	1.68	1.7	3841	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
55.0	106.7	92.6	1.75	1.6	3700	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
55.5	104.7	90.6	1.85	1.7	4079	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
56.0	92.2	79.7	1.96	2.0	4033	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
56.5	71.8	61.9	1.83	2.2	3984	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
57.0	73.3	63.1	1.65	2.0	3842	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
57.5	90.6	77.8	1.87	2.0	3866	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
58.0	98.7	84.6	1.97	1.8	3878	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
58.5	122.7	105.0	2.13	1.7	3992	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
59.0	130.4	111.4	1.62	1.2	4089	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
59.5	142.7	121.7	2.10	1.5	3866	Dense, Silty sand to sandy silt	40-42	60-80				35 - 47	30 - 40
60.0	132.9	113.0	2.01	1.5	3933	Dense, Silty sand to sandy silt	40-42	60-80				35 - 47	30 - 40
60.5	132.1	112.2	2.09	1.6	4002	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
61.0	114.0	96.6	2.41	2.0	4017	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
61.5	89.8	76.0	2.26	2.2	3966	Dense, Silty sand to sandy silt	36-37	60-80				24 - 35	20 - 30
62.0	111.0	93.7	2.02	1.7	3017	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
62.5	106.9	90.1	2.50	2.1	4615	Dense, Silty sand to sandy silt	37-40	60-80				36 - 47	30 - 40
63.0	87.5	73.7	2.31	2.4	4491	Dense, Silty sand to sandy silt	36-37	60-80				24 - 36	20 - 30
63.5	76.9	64.6	1.78	2.3	4284	Dense, Silty sand to sandy silt	27-31	60-80				24 - 36	20 - 30
64.0	76.2	63.9	1.79	2.3	4100	Dense, Silty sand to sandy silt	36-37	60-80				24 - 36	20 - 30
64.5	78.7	65.9	1.90	2.4	4029	Dense, Silty sand to sandy silt	27-31	60-80				24 - 36	20 - 30
65.0	72.9	60.9	1.73	1.9	3973	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
65.5	115.0	96.0	1.94	1.6	4007	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
66.0	123.7	103.0	2.44	2.0	4214	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
66.5	106.6	88.6	2.24	1.9	3984	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
67.0	137.9	114.4	1.99	1.3	4121	Med dense, Sand to silty sand	40-42	40-60				36 - 48	30 - 40
67.5	168.3	139.4	2.88	1.8	4138	Dense, Silty sand to sandy silt	40-42	60-80				48 - 72	40 - 60
68.0	149.9	123.9	2.91	1.8	4134	Dense, Silty sand to sandy silt	37-40	60-80				48 - 73	40 - 60
68.5	148.4	122.5	2.75	1.8	4021	Dense, Silty sand to sandy silt	37-40	60-80				48 - 73	40 - 60
69.0	151.4	124.7	2.95	1.9	4042	Dense, Silty sand to sandy silt	37-40	60-80				49 - 73	40 - 60
69.5	136.0	111.9	2.72	1.9	4190	Dense, Silty sand to sandy silt	37-40	60-80				49 - 73	40 - 60
70.0	132.7	109.0	2.94	2.2	4138	Dense, Silty sand to sandy silt	37-40	60-80				49 - 73	40 - 60
70.5	102.2	83.8	2.90	2.5	4101	Dense, Silty sand to sandy silt	36-37	60-80				37 - 49	30 - 40
71.0	88.0	72.1	2.58	2.6	3433	Dense, Silty sand to sandy silt	27-31	60-80				24 - 37	20 - 30
71.5	122.2	99.9	1.64	1.1	3628	Med dense, Sand to silty sand	40-42	40-60				24 - 37	20 - 30
72.0	158.6	129.4	2.20	1.4	3897	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
72.5	118.8	96.8	1.98	1.4	3727	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 37	20 - 30
73.0	117.9	95.8	1.97	1.6	3653	Dense, Silty sand to sandy silt	37-40	60-80				25 - 37	20 - 30
73.5	117.2	95.2	3.20	2.5	3862	V dense, Silty sand to sandy silt	36-37	80-100				49 - 74	40 - 60
74.0	108.1	87.6	2.72	2.4	3754	Dense, Silty sand to sandy silt	36-37	60-80				37 - 49	30 - 40
74.5	124.3	100.6	2.48	2.1	3793	Dense, Silty sand to sandy silt	37-40	60-80				37 - 49	30 - 40
75.0	101.9	82.3	1.75	1.6	3504	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 37	20 - 30

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	112.8	91.0	2.38	2.1	3743	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
76.0	101.2	81.5	2.24	2.1	3582	Dense, Silty sand to sandy silt	37-40	60-80				25 - 37	20 - 30
76.5	124.8	100.3	2.06	1.6	3688	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
77.0	119.6	96.0	2.23	1.7	3377	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
77.5	119.5	95.7	2.20	1.6	2449	Dense, Silty sand to sandy silt	37-40	60-80				25 - 37	20 - 30
78.0	140.6	112.5	2.35	1.7	3665	Dense, Silty sand to sandy silt	37-40	60-80				37 - 50	30 - 40
78.5	123.4	98.6	2.93	2.2	3499	Dense, Silty sand to sandy silt	37-40	60-80				38 - 50	30 - 40
79.0	131.9	105.2	2.87	2.3	3448	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
79.5	114.2	91.0	2.30	1.9	3155	Dense, Silty sand to sandy silt	37-40	60-80				25 - 38	20 - 30
80.0	105.3	83.7	2.13	1.9	3079	Dense, Silty sand to sandy silt	37-40	60-80				25 - 38	20 - 30
80.5	118.4	94.0	2.82	2.4	3088	Dense, Silty sand to sandy silt	36-37	60-80				38 - 50	30 - 40
81.0	113.5	90.0	2.62	2.3	3223	Dense, Silty sand to sandy silt	37-40	60-80				38 - 50	30 - 40
81.5	113.1	89.5	2.77	2.1	3261	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
82.0	158.5	125.3	2.46	1.5	3032	Dense, Sand to silty sand	40-42	60-80				38 - 51	30 - 40
82.5	176.8	139.5	2.82	1.6	2805	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
83.0	167.6	132.0	3.10	1.7	3210	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
83.5	118.4	93.2	3.06	2.2	3139	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
84.0	101.7	79.9	2.83	2.6	3015	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
84.5	103.1	80.9	2.64	2.5	2999	Dense, Silty sand to sandy silt	36-37	60-80				38 - 51	30 - 40
85.0	90.5	70.9	1.94	1.6	2866	Med dense, Silty sand to sandy silt	37-40	40-60				26 - 38	20 - 30
85.5	146.3	114.4	2.71	1.9	3150	Dense, Silty sand to sandy silt	37-40	60-80				51 - 77	40 - 60
86.0	125.9	98.4	3.08	2.1	3067	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
86.5	123.1	96.0	2.87	2.3	3008	Dense, Silty sand to sandy silt	37-40	60-80				38 - 51	30 - 40
87.0	114.8	89.4	3.07	2.6	3170	V dense, Silty sand to sandy silt	36-37	80-100				51 - 77	40 - 60
87.5	116.3	90.4	2.47	1.8	2947	Dense, Silty sand to sandy silt	37-40	60-80				26 - 39	20 - 30
88.0	166.3	129.1	2.78	1.7	3039	Dense, Silty sand to sandy silt	40-42	60-80				52 - 77	40 - 60
88.5	145.5	112.8	3.45	2.2	3233	Dense, Silty sand to sandy silt	37-40	60-80				52 - 77	40 - 60
89.0	147.9	114.5	2.86	1.9	3232	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
89.5	156.4	120.9	2.61	1.4	3254	Dense, Sand to silty sand	40-42	60-80				39 - 52	30 - 40
90.0	222.4	171.6	3.15	1.5	3028	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
90.5	210.8	162.5	2.70	1.1	2962	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
91.0	245.4	188.9	2.99	1.1	3122	Dense, Sand to silty sand	42-46	60-80				52 - 78	40 - 60
91.5	267.5	205.6	3.03	1.1	3112	Dense, Sand to silty sand	42-46	60-80				52 - 78	40 - 60
92.0	201.4	154.6	2.97	1.3	3102	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
92.5	208.7	160.0	1.44	0.8	3039	Med dense, Sand to silty sand	42-46	40-60				52 - 78	40 - 60
93.0	184.0	140.9	3.01	1.5	3062	Dense, Sand to silty sand	40-42	60-80				52 - 78	40 - 60
93.5	213.1	162.9	2.20	1.0	3149	Dense, Sand to silty sand	42-46	60-80				52 - 78	40 - 60
94.0	238.0	181.7	1.90	0.8	3174	Dense, Sand to silty sand	42-46	60-80				52 - 79	40 - 60
94.5	215.7	164.4	3.38	1.5	3264	Dense, Sand to silty sand	40-42	60-80				52 - 79	40 - 60
95.0	179.8	136.9	2.62	1.3	3234	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
95.5	210.7	160.1	3.06	1.4	3227	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
96.0	258.6	196.3	3.59	1.5	3381	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
96.5	220.8	167.4	3.58	1.5	3487	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
97.0	225.7	170.9	2.72	1.2	3217	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
97.5	224.6	169.8	3.64	1.6	3295	Dense, Sand to silty sand	40-42	60-80				53 - 79	40 - 60
98.0	196.1	148.0	3.81	1.9	3542	Dense, Silty sand to sandy silt	40-42	60-80				53 - 79	40 - 60
98.5	181.4	136.8	3.64	1.9	3583	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
99.0	190.7	143.6	3.48	1.8	3572	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
99.5	209.2	157.3	2.67	1.3	3405	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
100.0	207.1	155.6	3.29	1.5	3307	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60

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PROJECT NUMBER:99-120-050
R2DATE: 5-11-1999 TIME:08:18:37.47
SOUNDING NUMBER:cp-9907

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	197.4	148.0	3.72	1.8	3496	Dense, Silty sand to sandy silt	40-42	60-80				53 - 80	40 - 60
101.0	174.3	130.6	3.52	1.9	3592	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
101.5	168.7	126.2	3.32	1.8	3756	Dense, Silty sand to sandy silt	37-40	60-80				53 - 80	40 - 60
102.0	197.2	147.3	2.39	1.2	3344	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
102.5	218.9	163.3	3.25	1.5	3551	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
103.0	183.2	136.5	3.87	1.9	3545	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
103.5	154.9	115.3	3.79	2.3	3659	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
104.0	160.2	119.0	3.44	2.0	3819	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
104.5	180.9	134.2	3.61	1.9	3950	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
105.0	201.6	149.4	4.34	2.2	4032	V dense, Silty sand to sandy silt	37-40	80-100				81 - 134	60 - 99
105.5	156.6	115.9	3.69	2.2	3965	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
106.0	185.3	137.0	4.10	2.3	3930	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
106.5	166.3	122.8	3.90	2.3	3951	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
107.0	164.4	121.2	4.06	2.4	3939	V dense, Silty sand to sandy silt	37-40	80-100				54 - 81	40 - 60
107.5	159.7	117.6	3.17	1.8	4014	Dense, Silty sand to sandy silt	37-40	60-80				54 - 81	40 - 60
108.0	206.7	152.0	3.59	1.7	3852	Dense, Silty sand to sandy silt	40-42	60-80				54 - 82	40 - 60
108.5	207.8	152.6	3.58	1.7	3883	Dense, Silty sand to sandy silt	40-42	60-80				54 - 82	40 - 60
109.0	211.7	155.3	4.02	1.9	3958	Dense, Silty sand to sandy silt	40-42	60-80				55 - 82	40 - 60
109.5	205.5	150.6	4.33	2.0	3970	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
110.0	164.8	120.6	4.48	2.4	4089	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
110.5	172.1	125.8	3.03	1.6	4116	Dense, Silty sand to sandy silt	40-42	60-80				55 - 82	40 - 60
111.0	187.2	136.6	4.38	2.3	4337	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
111.5	172.1	125.5	3.89	2.2	4294	Dense, Silty sand to sandy silt	37-40	60-80				55 - 82	40 - 60
112.0	177.0	128.9	4.30	2.5	4255	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
112.5	162.8	118.4	4.22	2.5	4060	V dense, Silty sand to sandy silt	37-40	80-100				55 - 82	40 - 60
113.0	146.6	106.5	3.95	2.5	4113	V dense, Silty sand to sandy silt	36-37	80-100				55 - 83	40 - 60
113.5	163.6	118.7	4.01	2.4	4183	V dense, Silty sand to sandy silt	37-40	80-100				55 - 83	40 - 60
114.0	161.5	117.0	3.68	1.7	4072	Dense, Silty sand to sandy silt	37-40	60-80				41 - 55	30 - 40
114.5	349.5	253.0	0.44	0.1	3778	Med dense, Sa gravel to gr sand	+46	40-60				55 - 83	40 - 60
115.0	436.0	315.1	3.27	0.7	4058	Dense, Sand to silty sand	42-46	60-80				83 - 137	60 - 99
115.5	433.4	312.9	1.97	0.3	4152	Dense, Sa gravel to gr sand	+46	60-80				55 - 83	40 - 60

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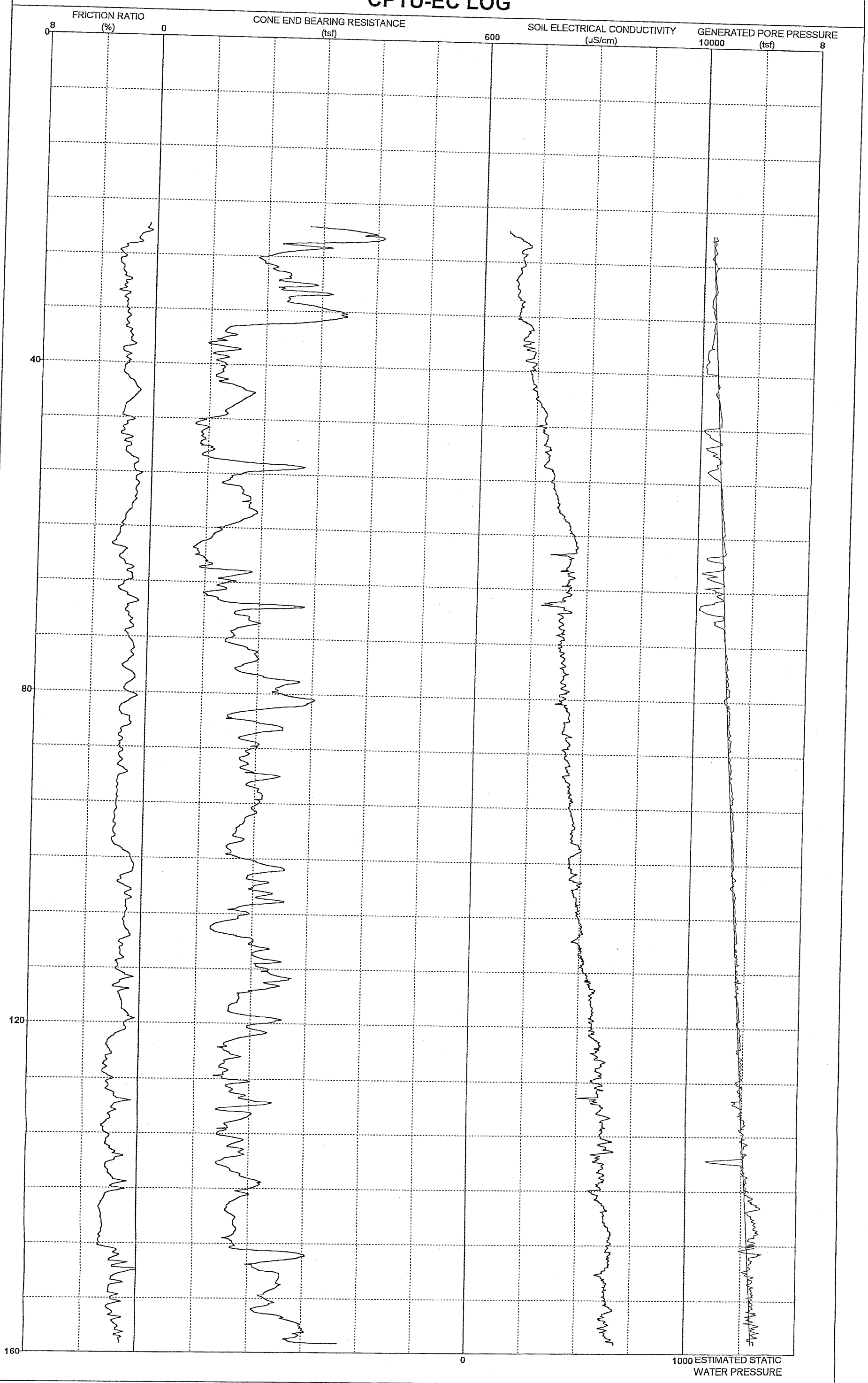
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50

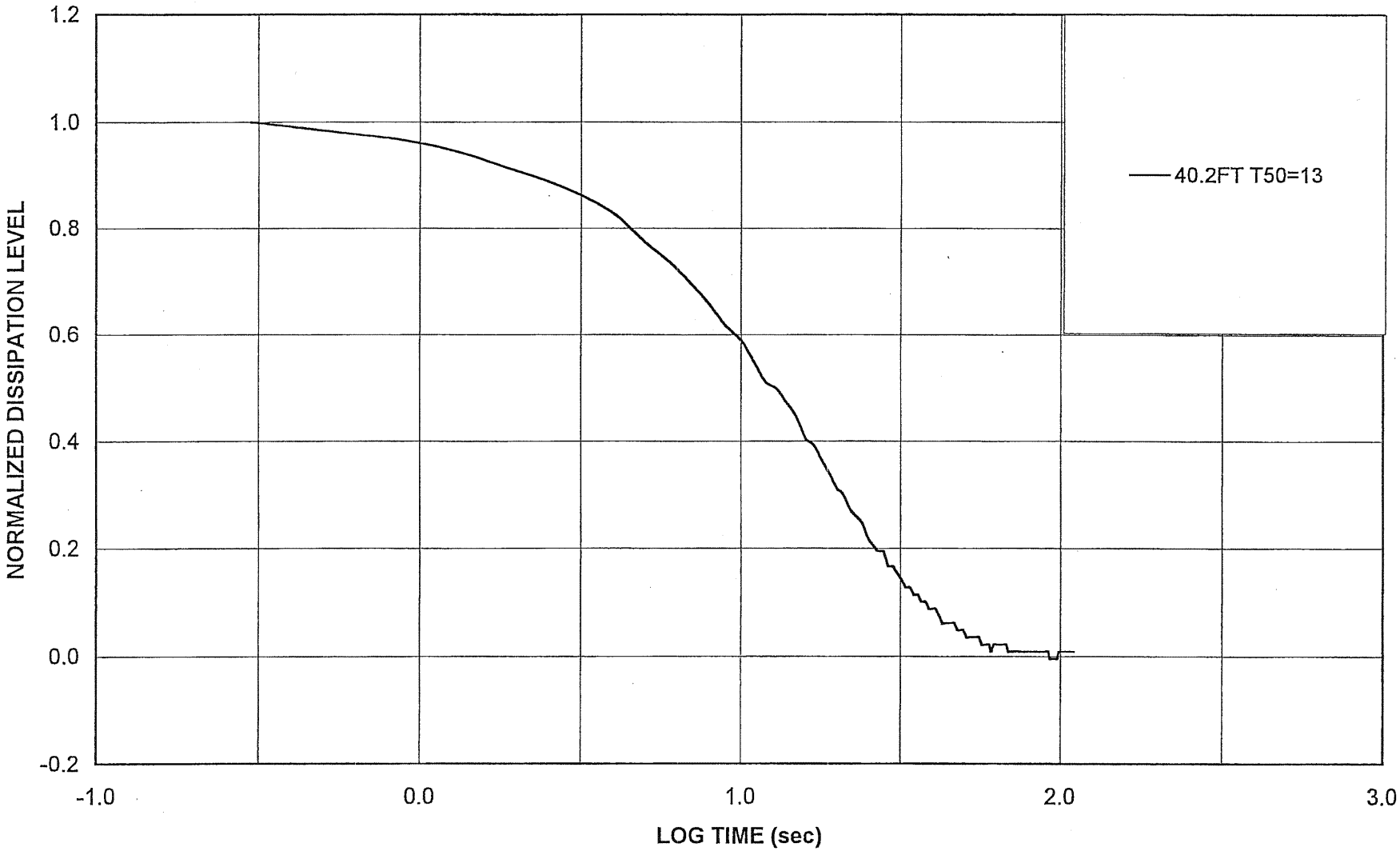
STRATIGRAPHICS

DATE: 05/08/99
SOUNDING NUMBER:cp-9908

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9908



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PROJECT NUMBER:99-120-50
DATE: 05/08/99
SOUNDING NUMBER:cp-9908

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 23.00'												
1.5	Prepunched To 23.00'												
2.0	Prepunched To 23.00'												
2.5	Prepunched To 23.00'												
3.0	Prepunched To 23.00'												
3.5	Prepunched To 23.00'												
4.0	Prepunched To 23.00'												
4.5	Prepunched To 23.00'												
5.0	Prepunched To 23.00'												
5.5	Prepunched To 23.00'												
6.0	Prepunched To 23.00'												
6.5	Prepunched To 23.00'												
7.0	Prepunched To 23.00'												
7.5	Prepunched To 23.00'												
8.0	Prepunched To 23.00'												
8.5	Prepunched To 23.00'												
9.0	Prepunched To 23.00'												
9.5	Prepunched To 23.00'												
10.0	Prepunched To 23.00'												
10.5	Prepunched To 23.00'												
11.0	Prepunched To 23.00'												
11.5	Prepunched To 23.00'												
12.0	Prepunched To 23.00'												
12.5	Prepunched To 23.00'												
13.0	Prepunched To 23.00'												
13.5	Prepunched To 23.00'												
14.0	Prepunched To 23.00'												
14.5	Prepunched To 23.00'												
15.0	Prepunched To 23.00'												
15.5	Prepunched To 23.00'												
16.0	Prepunched To 23.00'												
16.5	Prepunched To 23.00'												
17.0	Prepunched To 23.00'												
17.5	Prepunched To 23.00'												
18.0	Prepunched To 23.00'												
18.5	Prepunched To 23.00'												
19.0	Prepunched To 23.00'												
19.5	Prepunched To 23.00'												
20.0	Prepunched To 23.00'												
20.5	Prepunched To 23.00'												
21.0	Prepunched To 23.00'												
21.5	Prepunched To 23.00'												
22.0	Prepunched To 23.00'												
22.5	Prepunched To 23.00'												
23.0	Prepunched To 23.00'												
23.5	380.3	395.0	2.74	0.8	1277	V dense, Sand to silty sand	+46	80-100				58 - 95	60 - 99
24.0	404.8	419.0	3.02	0.7	1690	V dense, Sa gravel to gr sand	+46	80-100				+ 97	+ 100
24.5	398.9	411.4	4.95	1.2	2029	V dense, Sand to silty sand	42-46	80-100				+ 97	+ 100
25.0	254.1	261.2	3.91	1.2	1877	Dense, Sand to silty sand	42-46	60-80				58 - 96	60 - 99

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50
DATE: 05/08/99
SOUNDING NUMBER:cp-9908

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	315.8	323.5	6.13	2.1	1638	V dense, Gr si sand to cl gr sand	40-42	+100				+ 98	+ 100
26.0	246.7	251.8	6.53	2.3	1748	V dense, Gr si sand to cl gr sand	40-42	+100				+ 98	+ 100
26.5	208.7	212.3	5.61	2.5	1778	V dense, Gr si sand to cl gr sand	37-40	+100				+ 98	+ 100
27.0	186.7	189.3	4.17	2.2	1819	V dense, Gr si sand to cl gr sand	40-42	80-100				59 - 98	60 - 99
27.5	195.4	197.5	5.43	2.6	1628	V dense, Gr si sand to cl gr sand	37-40	+100				+ 99	+ 100
28.0	216.9	218.5	5.26	2.4	1651	V dense, Gr si sand to cl gr sand	37-40	+100				+ 99	+ 100
28.5	226.8	227.7	5.75	2.4	1507	V dense, Gr si sand to cl gr sand	37-40	+100				+ 100	+ 100
29.0	240.1	240.4	5.26	2.2	1503	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 100	+ 100
29.5	223.9	223.4	5.20	2.1	1522	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 100	+ 100
30.0	284.0	282.5	5.71	2.1	1554	V dense, Gr si sand to cl gr sand	40-42	+100				+ 101	+ 100
30.5	226.7	224.7	6.03	2.2	1552	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 101	+ 100
31.0	293.8	290.4	6.65	2.3	1591	V dense, Gr si sand to cl gr sand	40-42	+100				+ 101	+ 100
31.5	248.7	245.1	5.29	1.9	1837	V dense, Sa gravel to si gr sand	40-42	80-100				+ 101	+ 100
32.0	240.5	236.4	5.62	2.3	1717	V dense, Gr si sand to cl gr sand	40-42	+100				+ 102	+ 100
32.5	269.6	264.2	6.00	2.1	1649	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 102	+ 100
33.0	310.5	303.3	6.64	2.0	1624	V dense, Gr si sand to cl gr sand	40-42	+100				+ 102	+ 100
33.5	342.6	333.7	6.49	1.9	1619	V dense, Sa gravel to si gr sand	40-42	+100				+ 103	+ 100
34.0	341.3	331.5	6.75	2.0	1887	V dense, Sa gravel to si gr sand	40-42	+100				+ 103	+ 100
34.5	298.8	289.5	6.08	1.9	2178	V dense, Sa gravel to si gr sand	40-42	80-100				+ 103	+ 100
35.0	200.0	193.1	5.14	2.0	2156	V dense, Silty sand to sandy silt	40-42	80-100				62 - 102	60 - 99
35.5	132.4	127.5	3.30	2.1	2036	Dense, Silty sand to sandy silt	37-40	60-80				42 - 62	40 - 60
36.0	126.0	121.0	2.28	1.7	1843	Dense, Silty sand to sandy silt	37-40	60-80				42 - 62	40 - 60
36.5	137.5	131.7	2.34	1.7	2131	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
37.0	122.3	116.9	2.15	1.7	2082	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
37.5	96.5	92.0	1.83	1.5	2282	Med dense, Silty sand to sandy silt	37-40	40-60				21 - 31	20 - 30
38.0	150.2	142.7	2.63	1.9	2332	Dense, Silty sand to sandy silt	40-42	60-80				42 - 63	40 - 60
38.5	117.0	110.9	3.17	2.3	2123	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
39.0	129.2	122.2	2.07	1.7	2435	Dense, Silty sand to sandy silt	37-40	60-80				42 - 63	40 - 60
39.5	111.2	104.8	2.43	2.0	2278	Dense, Silty sand to sandy silt	37-40	60-80				32 - 42	30 - 40
40.0	128.3	120.6	2.18	1.9	2184	Dense, Silty sand to sandy silt	37-40	60-80				43 - 64	40 - 60
40.5	125.3	117.6	2.68	2.1	2266	Dense, Silty sand to sandy silt	37-40	60-80				43 - 64	40 - 60
41.0	122.8	114.9	2.68	2.2	2249	Dense, Silty sand to sandy silt	37-40	60-80				43 - 64	40 - 60
41.5	111.1	103.7	2.35	2.0	2324	Dense, Silty sand to sandy silt	37-40	60-80				32 - 43	30 - 40
42.0	124.9	116.3	2.18	1.7	2387	Dense, Silty sand to sandy silt	37-40	60-80				32 - 43	30 - 40
42.5	144.6	134.3	2.06	1.3	2497	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
43.0	162.4	150.5	2.06	1.2	2549	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
43.5	180.3	166.6	1.80	1.0	2567	Dense, Sand to silty sand	42-46	60-80				43 - 65	40 - 60
44.0	168.0	154.9	2.26	1.3	2699	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
44.5	156.9	144.4	2.59	1.6	2823	Dense, Sand to silty sand	40-42	60-80				43 - 65	40 - 60
45.0	144.0	132.1	2.94	2.0	2951	Dense, Silty sand to sandy silt	37-40	60-80				44 - 65	40 - 60
45.5	131.7	120.6	2.86	2.1	2921	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
46.0	133.9	122.3	2.80	2.1	2904	Dense, Silty sand to sandy silt	37-40	60-80				44 - 66	40 - 60
46.5	106.2	96.8	2.61	2.0	2682	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
47.0	84.5	76.8	1.34	1.5	2822	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 33	20 - 30
47.5	86.2	78.2	1.71	1.8	2896	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
48.0	93.6	84.7	2.03	2.1	3021	Dense, Silty sand to sandy silt	37-40	60-80				33 - 44	30 - 40
48.5	88.7	80.1	2.01	2.2	2986	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
49.0	91.3	82.3	1.45	1.6	2908	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 33	20 - 30
49.5	86.9	78.1	1.82	2.0	3185	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
50.0	95.6	85.8	1.66	1.5	3057	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 33	20 - 30

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50
DATE: 05/08/99
SOUNDING NUMBER:cp-9908

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	109.7	98.2	2.01	1.9	3120	Dense, Silty sand to sandy silt	37-40	60-80				34 - 45	30 - 40
51.0	89.7	80.1	1.80	1.8	3029	Dense, Silty sand to sandy silt	37-40	60-80				22 - 34	20 - 30
51.5	109.4	97.6	2.03	1.4	2919	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 34	20 - 30
52.0	193.2	171.9	2.40	1.0	3305	Dense, Sand to silty sand	42-46	60-80				45 - 67	40 - 60
52.5	271.0	240.6	3.24	1.3	3393	Dense, Sand to silty sand	42-46	60-80				68 - 112	60 - 99
53.0	187.7	166.3	2.88	1.2	3380	Dense, Sand to silty sand	40-42	60-80				45 - 68	40 - 60
53.5	152.2	134.5	1.14	0.7	3329	Med dense, Sand to silty sand	40-42	40-60				34 - 45	30 - 40
54.0	142.0	125.2	1.63	1.1	3405	Med dense, Sand to silty sand	40-42	40-60				34 - 45	30 - 40
54.5	127.2	112.0	1.43	1.0	3461	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
55.0	162.3	142.5	1.61	1.0	3517	Med dense, Sand to silty sand	40-42	40-60				34 - 46	30 - 40
55.5	166.3	145.8	1.86	1.1	3576	Dense, Sand to silty sand	40-42	60-80				46 - 68	40 - 60
56.0	173.2	151.5	1.80	1.0	3606	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
56.5	179.1	156.4	2.19	1.1	3562	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
57.0	178.4	155.5	2.14	1.2	3684	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
57.5	177.0	153.9	2.57	1.4	3842	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
58.0	191.6	166.3	2.77	1.5	3946	Dense, Sand to silty sand	40-42	60-80				46 - 69	40 - 60
58.5	183.8	159.2	3.24	1.7	4113	Dense, Silty sand to sandy silt	40-42	60-80				46 - 69	40 - 60
59.0	165.7	143.2	3.12	1.8	4204	Dense, Silty sand to sandy silt	40-42	60-80				46 - 69	40 - 60
59.5	149.3	128.8	3.10	2.0	4254	Dense, Silty sand to sandy silt	37-40	60-80				46 - 70	40 - 60
60.0	119.5	102.9	2.61	1.9	4366	Dense, Silty sand to sandy silt	37-40	60-80				35 - 46	30 - 40
60.5	121.7	104.6	2.73	2.2	4420	Dense, Silty sand to sandy silt	37-40	60-80				47 - 70	40 - 60
61.0	112.3	96.3	2.54	2.2	4469	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
61.5	102.7	87.9	2.61	2.4	4562	Dense, Silty sand to sandy silt	36-37	60-80				35 - 47	30 - 40
62.0	86.9	74.2	2.43	2.6	4515	Dense, Silty sand to sandy silt	27-31	60-80				35 - 47	30 - 40
62.5	80.5	68.7	1.83	2.1	4070	Dense, Silty sand to sandy silt	36-37	60-80				23 - 35	20 - 30
63.0	88.2	75.1	1.62	1.8	4246	Dense, Silty sand to sandy silt	37-40	60-80				23 - 35	20 - 30
63.5	94.8	80.6	2.08	2.1	4229	Dense, Silty sand to sandy silt	36-37	60-80				24 - 35	20 - 30
64.0	103.9	88.1	2.13	2.0	4060	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
64.5	112.4	95.2	1.84	1.7	4313	Dense, Silty sand to sandy silt	37-40	60-80				35 - 47	30 - 40
65.0	105.2	88.9	1.80	1.1	4252	Med dense, Sand to silty sand	37-40	40-60				24 - 35	20 - 30
65.5	176.9	149.3	2.72	1.6	4155	Dense, Sand to silty sand	40-42	60-80				47 - 71	40 - 60
66.0	141.9	119.5	1.94	1.2	4102	Med dense, Sand to silty sand	40-42	40-60				36 - 47	30 - 40
66.5	151.5	127.4	1.81	1.3	4235	Dense, Sand to silty sand	40-42	60-80				36 - 48	30 - 40
67.0	123.5	103.7	2.45	1.8	4109	Dense, Silty sand to sandy silt	37-40	60-80				36 - 48	30 - 40
67.5	139.0	116.4	2.93	2.2	4095	Dense, Silty sand to sandy silt	37-40	60-80				48 - 72	40 - 60
68.0	98.7	82.5	2.04	1.7	4030	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
68.5	123.1	102.7	1.77	1.4	3432	Med dense, Sand to silty sand	37-40	40-60				24 - 36	20 - 30
69.0	139.1	115.9	1.57	0.8	3976	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
69.5	280.5	233.3	3.34	1.4	4078	Dense, Sand to silty sand	42-46	60-80				72 - 119	60 - 99
70.0	164.8	136.8	3.41	1.6	3951	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
70.5	162.6	134.7	2.41	1.4	3814	Dense, Sand to silty sand	40-42	60-80				48 - 72	40 - 60
71.0	181.2	149.9	2.45	1.3	3887	Dense, Sand to silty sand	40-42	60-80				48 - 73	40 - 60
71.5	202.5	167.3	2.49	1.3	4033	Dense, Sand to silty sand	40-42	60-80				48 - 73	40 - 60
72.0	168.7	139.1	1.89	1.0	4010	Med dense, Sand to silty sand	40-42	40-60				36 - 49	30 - 40
72.5	149.9	123.4	2.40	1.5	4014	Dense, Sand to silty sand	40-42	60-80				36 - 49	30 - 40
73.0	157.0	129.0	2.19	1.4	3897	Dense, Sand to silty sand	40-42	60-80				49 - 73	40 - 60
73.5	141.2	115.8	1.97	1.3	3925	Dense, Sand to silty sand	40-42	60-80				37 - 49	30 - 40
74.0	155.1	127.0	1.75	1.0	3855	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
74.5	180.7	147.8	1.79	1.0	3953	Med dense, Sand to silty sand	40-42	40-60				37 - 49	30 - 40
75.0	197.9	161.5	2.26	1.1	4075	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60

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Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	198.0	161.4	1.90	1.0	3940	Dense, Sand to silty sand	42-46	60-80				49 - 74	40 - 60
76.0	197.7	160.9	2.48	1.2	4092	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
76.5	172.7	140.3	2.87	1.6	4045	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
77.0	158.9	128.9	2.82	1.7	4142	Dense, Silty sand to sandy silt	40-42	60-80				49 - 74	40 - 60
77.5	175.8	142.3	2.26	1.1	4032	Dense, Sand to silty sand	40-42	60-80				49 - 74	40 - 60
78.0	214.5	173.4	2.07	0.8	3968	Dense, Sand to silty sand	42-46	60-80				49 - 74	40 - 60
78.5	277.0	223.6	2.49	1.0	3994	Dense, Sand to silty sand	42-46	60-80				50 - 74	40 - 60
79.0	245.6	197.9	3.64	1.4	4300	Dense, Sand to silty sand	42-46	60-80				50 - 74	40 - 60
79.5	237.1	190.7	3.95	1.6	3889	Dense, Sand to silty sand	40-42	60-80				50 - 75	40 - 60
80.0	247.1	198.4	3.30	1.2	4066	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
80.5	293.1	235.1	1.97	0.7	3807	Dense, Sand to silty sand	42-46	60-80				50 - 75	40 - 60
81.0	295.2	236.4	3.57	1.2	4219	Dense, Sand to silty sand	42-46	60-80				75 - 124	60 - 99
81.5	261.7	209.2	4.83	1.7	4299	V dense, Sand to silty sand	40-42	80-100				75 - 124	60 - 99
82.0	196.3	156.7	4.23	1.9	4331	Dense, Silty sand to sandy silt	40-42	60-80				50 - 75	40 - 60
82.5	154.6	123.2	3.06	1.8	4369	Dense, Silty sand to sandy silt	37-40	60-80				50 - 75	40 - 60
83.0	153.0	121.7	2.02	1.1	4157	Med dense, Sand to silty sand	40-42	40-60				38 - 50	30 - 40
83.5	203.6	161.7	2.57	1.1	4125	Dense, Sand to silty sand	40-42	60-80				50 - 76	40 - 60
84.0	246.6	195.6	2.77	1.1	4038	Dense, Sand to silty sand	42-46	60-80				50 - 76	40 - 60
84.5	229.2	181.5	4.31	1.8	4454	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
85.0	184.9	146.2	3.65	1.8	4269	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
85.5	172.7	136.3	3.15	1.7	4414	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
86.0	203.5	160.4	3.51	1.8	4321	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
86.5	203.0	159.8	3.72	1.8	4232	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
87.0	182.5	143.5	2.99	1.6	4189	Dense, Sand to silty sand	40-42	60-80				51 - 76	40 - 60
87.5	185.7	145.8	3.42	1.8	4316	Dense, Silty sand to sandy silt	40-42	60-80				51 - 76	40 - 60
88.0	171.9	134.7	3.10	1.7	4405	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
88.5	186.6	146.1	3.12	1.7	4275	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
89.0	173.0	135.2	3.28	1.8	4401	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
89.5	195.9	152.9	2.70	1.3	4159	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
90.0	245.1	191.0	3.69	1.6	4267	Dense, Sand to silty sand	40-42	60-80				51 - 77	40 - 60
90.5	209.2	162.7	4.36	1.9	4398	Dense, Silty sand to sandy silt	40-42	60-80				51 - 77	40 - 60
91.0	185.1	143.8	3.80	2.0	4413	Dense, Silty sand to sandy silt	37-40	60-80				51 - 77	40 - 60
91.5	205.6	159.5	3.98	1.9	4492	Dense, Silty sand to sandy silt	40-42	60-80				52 - 77	40 - 60
92.0	209.0	161.9	4.03	1.9	4474	Dense, Silty sand to sandy silt	40-42	60-80				52 - 77	40 - 60
92.5	213.5	165.2	4.10	2.0	4555	V dense, Silty sand to sandy silt	40-42	80-100				52 - 78	40 - 60
93.0	209.0	161.4	4.10	1.9	4438	V dense, Silty sand to sandy silt	40-42	80-100				52 - 78	40 - 60
93.5	203.2	156.7	4.13	2.0	4474	V dense, Silty sand to sandy silt	40-42	80-100				52 - 78	40 - 60
94.0	195.4	150.5	3.90	1.9	4526	Dense, Silty sand to sandy silt	40-42	60-80				52 - 78	40 - 60
94.5	204.1	157.0	4.14	2.1	4590	V dense, Silty sand to sandy silt	37-40	80-100				52 - 78	40 - 60
95.0	185.5	142.5	4.01	2.1	4666	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
95.5	182.6	140.0	3.85	2.1	4683	V dense, Silty sand to sandy silt	37-40	80-100				52 - 78	40 - 60
96.0	173.9	133.2	3.47	2.0	4570	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
96.5	168.4	128.8	3.62	2.1	4605	Dense, Silty sand to sandy silt	37-40	60-80				52 - 78	40 - 60
97.0	165.5	126.4	3.59	2.1	4543	Dense, Silty sand to sandy silt	37-40	60-80				52 - 79	40 - 60
97.5	176.2	134.4	3.59	2.0	4621	Dense, Silty sand to sandy silt	37-40	60-80				52 - 79	40 - 60
98.0	171.9	130.9	3.95	2.2	4937	V dense, Silty sand to sandy silt	37-40	80-100				53 - 79	40 - 60
98.5	151.2	115.0	3.15	2.0	5013	Dense, Silty sand to sandy silt	37-40	60-80				53 - 79	40 - 60
99.0	158.5	120.4	2.29	1.5	4690	Dense, Sand to silty sand	40-42	60-80				39 - 53	30 - 40
99.5	153.0	116.1	1.64	1.0	4478	Med dense, Sand to silty sand	40-42	40-60				26 - 40	20 - 30
100.0	184.2	139.5	1.69	0.8	4486	Med dense, Sand to silty sand	40-42	40-60				40 - 53	30 - 40

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50
DATE: 05/08/99
SOUNDING NUMBER:cp-9908

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
100.5	210.9	159.5	1.64	0.7	4482	Med dense, Sand to silty sand	42-46	40-60				40 - 53	30 - 40
101.0	249.0	188.1	1.52	0.6	4584	Med dense, Sand to silty sand	42-46	40-60				53 - 79	40 - 60
101.5	238.1	179.7	1.69	0.7	4702	Med dense, Sand to silty sand	42-46	40-60				53 - 80	40 - 60
102.0	191.5	144.3	2.54	1.2	4562	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
102.5	194.1	146.1	3.16	1.5	4920	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
103.0	219.1	164.6	3.66	1.7	4879	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
103.5	197.6	148.3	2.18	1.1	4658	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
104.0	226.8	169.9	1.98	0.9	4738	Dense, Sand to silty sand	42-46	60-80				53 - 80	40 - 60
104.5	211.3	158.2	2.56	1.1	4845	Dense, Sand to silty sand	40-42	60-80				53 - 80	40 - 60
105.0	251.4	187.9	2.22	0.9	4938	Dense, Sand to silty sand	42-46	60-80				54 - 80	40 - 60
105.5	202.9	151.5	2.58	1.1	4912	Dense, Sand to silty sand	40-42	60-80				54 - 80	40 - 60
106.0	171.1	127.5	1.93	1.1	4881	Med dense, Sand to silty sand	40-42	40-60				40 - 54	30 - 40
106.5	192.1	143.0	2.06	1.1	4912	Dense, Sand to silty sand	40-42	60-80				40 - 54	30 - 40
107.0	174.4	129.7	2.10	1.1	4982	Dense, Sand to silty sand	40-42	60-80				40 - 54	30 - 40
107.5	154.0	114.3	2.23	1.3	5098	Dense, Sand to silty sand	40-42	60-80				40 - 54	30 - 40
108.0	129.8	96.2	1.68	1.2	5069	Med dense, Sand to silty sand	40-42	40-60				27 - 40	20 - 30
108.5	125.7	93.1	1.47	1.1	5170	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
109.0	145.7	107.8	1.40	0.9	4942	Med dense, Sand to silty sand	40-42	40-60				27 - 41	20 - 30
109.5	189.9	140.3	1.63	0.8	4678	Med dense, Sand to silty sand	40-42	40-60				41 - 54	30 - 40
110.0	202.8	149.6	3.06	1.5	5050	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
110.5	202.1	148.9	2.81	1.3	5083	Dense, Sand to silty sand	40-42	60-80				54 - 81	40 - 60
111.0	225.6	166.0	3.33	1.5	4998	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
111.5	201.1	147.8	3.05	1.5	5112	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
112.0	215.3	158.1	2.90	1.2	5228	Dense, Sand to silty sand	40-42	60-80				54 - 82	40 - 60
112.5	250.8	183.9	4.16	1.7	5145	Dense, Sand to silty sand	40-42	60-80				82 - 135	60 - 99
113.0	209.5	153.4	3.53	1.6	5188	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
113.5	231.2	169.1	3.96	1.7	5349	Dense, Silty sand to sandy silt	40-42	60-80				55 - 82	40 - 60
114.0	236.7	172.9	3.01	1.2	5409	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
114.5	271.6	198.1	1.33	0.5	5513	Med dense, Sand to silty sand	42-46	40-60				55 - 82	40 - 60
115.0	226.3	164.9	3.69	1.5	5485	Dense, Sand to silty sand	40-42	60-80				55 - 82	40 - 60
115.5	249.1	181.3	4.54	1.9	5763	V dense, Silty sand to sandy silt	40-42	80-100				82 - 136	60 - 99
116.0	196.8	143.1	2.42	1.1	5577	Dense, Sand to silty sand	40-42	60-80				41 - 55	30 - 40
116.5	177.7	129.0	2.84	1.5	5560	Dense, Sand to silty sand	40-42	60-80				55 - 83	40 - 60
117.0	179.0	129.8	2.50	1.4	5600	Dense, Sand to silty sand	40-42	60-80				41 - 55	30 - 40
117.5	173.9	125.9	2.26	1.3	5632	Dense, Sand to silty sand	40-42	60-80				41 - 55	30 - 40
118.0	160.6	116.1	2.07	1.3	5632	Med dense, Sand to silty sand	40-42	40-60				41 - 55	30 - 40
118.5	159.5	115.2	1.96	1.1	5686	Med dense, Sand to silty sand	40-42	40-60				42 - 55	30 - 40
119.0	191.0	137.8	1.76	0.8	5582	Med dense, Sand to silty sand	40-42	40-60				42 - 55	30 - 40
119.5	256.4	184.8	0.82	0.4	5630	Med dense, Sand to silty sand	42-46	40-60				42 - 56	30 - 40
120.0	223.0	160.5	2.57	1.1	5598	Dense, Sand to silty sand	40-42	60-80				56 - 83	40 - 60
120.5	194.4	139.8	2.11	1.0	5719	Med dense, Sand to silty sand	40-42	40-60				42 - 56	30 - 40
121.0	226.9	162.9	2.47	1.1	5541	Dense, Sand to silty sand	40-42	60-80				56 - 84	40 - 60
121.5	205.0	147.0	3.84	1.7	5814	Dense, Silty sand to sandy silt	40-42	60-80				56 - 84	40 - 60
122.0	170.5	122.2	3.95	2.1	5988	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
122.5	152.5	109.1	3.59	2.3	5963	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
123.0	151.8	108.5	3.47	2.2	5879	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
123.5	163.5	116.7	3.48	2.0	5926	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
124.0	184.5	131.5	4.11	2.3	6157	V dense, Silty sand to sandy silt	37-40	80-100				56 - 84	40 - 60
124.5	153.1	109.0	3.73	2.3	6085	Dense, Silty sand to sandy silt	37-40	60-80				56 - 84	40 - 60
125.0	148.0	105.3	3.86	2.5	5872	V dense, Silty sand to sandy silt	36-37	80-100				56 - 84	40 - 60

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-50
DATE: 05/08/99
SOUNDING NUMBER:cp-9908

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
125.5	159.9	113.6	3.77	2.4	6079	V dense, Silty sand to sandy silt	37-40	80-100				56 - 84	40 - 60
126.0	152.5	108.2	3.99	2.5	6130	V dense, Silty sand to sandy silt	37-40	80-100				56 - 85	40 - 60
126.5	151.3	107.2	3.42	1.9	5694	Dense, Silty sand to sandy silt	37-40	60-80				42 - 56	30 - 40
127.0	197.2	139.6	4.13	2.3	6189	V dense, Silty sand to sandy silt	37-40	80-100				57 - 85	40 - 60
127.5	158.6	112.2	3.64	2.1	6103	Dense, Silty sand to sandy silt	37-40	60-80				57 - 85	40 - 60
128.0	169.5	119.7	3.98	2.3	5946	V dense, Silty sand to sandy silt	37-40	80-100				57 - 85	40 - 60
128.5	185.8	131.1	3.17	1.7	5787	Dense, Silty sand to sandy silt	40-42	60-80				57 - 85	40 - 60
129.0	181.7	128.0	3.22	1.6	5738	Dense, Silty sand to sandy silt	40-42	60-80				57 - 85	40 - 60
129.5	234.0	164.7	2.27	1.0	6064	Dense, Sand to silty sand	42-46	60-80				57 - 85	40 - 60
130.0	198.5	139.6	3.99	1.8	6157	Dense, Silty sand to sandy silt	40-42	60-80				57 - 85	40 - 60
130.5	140.5	98.7	3.16	1.8	5967	Dense, Silty sand to sandy silt	37-40	60-80				43 - 57	30 - 40
131.0	203.4	142.7	3.87	1.9	6423	Dense, Silty sand to sandy silt	37-40	60-80				57 - 86	40 - 60
131.5	192.1	134.6	3.92	2.0	6162	Dense, Silty sand to sandy silt	37-40	60-80				57 - 86	40 - 60
132.0	162.7	113.8	4.15	2.3	6214	Dense, Silty sand to sandy silt	37-40	60-80				57 - 86	40 - 60
132.5	160.7	112.3	4.44	2.6	6195	V dense, Silty sand to sandy silt	36-37	80-100				57 - 86	40 - 60
133.0	154.5	107.9	3.91	2.5	6147	V dense, Silty sand to sandy silt	37-40	80-100				57 - 86	40 - 60
133.5	148.7	103.7	3.47	2.1	6140	Dense, Silty sand to sandy silt	37-40	60-80				43 - 57	30 - 40
134.0	190.3	132.6	4.10	2.3	6449	V dense, Silty sand to sandy silt	37-40	80-100				57 - 86	40 - 60
134.5	170.3	118.5	4.22	2.3	6366	V dense, Silty sand to sandy silt	37-40	80-100				57 - 86	40 - 60
135.0	186.7	129.8	3.74	2.0	6673	Dense, Silty sand to sandy silt	37-40	60-80				58 - 86	40 - 60
135.5	183.9	127.7	2.88	1.6	5896	Dense, Silty sand to sandy silt	40-42	60-80				58 - 86	40 - 60
136.0	178.6	123.9	1.83	1.0	6015	Med dense, Sand to silty sand	40-42	40-60				43 - 58	30 - 40
136.5	150.5	104.3	2.58	1.6	6143	Dense, Silty sand to sandy silt	37-40	60-80				43 - 58	30 - 40
137.0	145.1	100.5	3.54	2.3	6246	Dense, Silty sand to sandy silt	37-40	60-80				58 - 87	40 - 60
137.5	165.9	114.7	3.84	2.3	6079	Dense, Silty sand to sandy silt	37-40	60-80				58 - 87	40 - 60
138.0	175.8	121.4	3.73	2.1	6295	Dense, Silty sand to sandy silt	37-40	60-80				58 - 87	40 - 60
138.5	185.9	128.3	3.77	1.9	6178	Dense, Silty sand to sandy silt	37-40	60-80				58 - 87	40 - 60
139.0	214.2	147.6	3.65	1.7	6089	Dense, Silty sand to sandy silt	40-42	60-80				58 - 87	40 - 60
139.5	221.6	152.6	3.21	1.5	6090	Dense, Sand to silty sand	40-42	60-80				58 - 87	40 - 60
140.0	202.7	139.4	2.38	1.2	5611	Dense, Sand to silty sand	40-42	60-80				44 - 58	30 - 40
140.5	191.4	131.5	3.85	2.0	5989	Dense, Silty sand to sandy silt	37-40	60-80				58 - 87	40 - 60
141.0	186.7	128.1	4.50	2.3	5903	V dense, Silty sand to sandy silt	37-40	80-100				58 - 87	40 - 60
141.5	173.2	118.7	4.41	2.5	6212	V dense, Silty sand to sandy silt	37-40	80-100				58 - 88	40 - 60
142.0	162.9	111.5	4.35	2.6	6324	V dense, Silty sand to sandy silt	36-37	80-100				58 - 88	40 - 60
142.5	159.7	109.2	4.34	2.7	6201	V dense, Silty sand to sandy silt	36-37	80-100				58 - 88	40 - 60
143.0	167.7	114.5	4.47	2.6	6294	V dense, Silty sand to sandy silt	36-37	80-100				59 - 88	40 - 60
143.5	177.9	121.4	4.54	2.6	6300	V dense, Silty sand to sandy silt	37-40	80-100				59 - 88	40 - 60
144.0	174.4	118.9	4.35	2.5	6347	V dense, Silty sand to sandy silt	37-40	80-100				59 - 88	40 - 60
144.5	175.7	119.7	4.37	2.5	6513	V dense, Silty sand to sandy silt	37-40	80-100				59 - 88	40 - 60
145.0	179.1	121.8	4.55	2.5	6625	V dense, Silty sand to sandy silt	37-40	80-100				59 - 88	40 - 60
145.5	174.2	118.4	4.66	2.6	6595	V dense, Silty sand to sandy silt	36-37	80-100				59 - 88	40 - 60
146.0	159.8	108.5	4.57	2.7	6499	V dense, Silty sand to sandy silt	36-37	80-100				59 - 88	40 - 60
146.5	171.8	116.5	4.75	2.7	6633	V dense, Silty sand to sandy silt	36-37	80-100				59 - 88	40 - 60
147.0	174.9	118.4	4.86	2.7	6531	V dense, Silty sand to sandy silt	36-37	80-100				59 - 89	40 - 60
147.5	219.8	148.7	3.73	1.4	6641	Dense, Sand to silty sand	40-42	60-80				59 - 89	40 - 60
148.0	302.6	204.6	3.48	1.3	6508	Dense, Sand to silty sand	42-46	60-80				59 - 89	40 - 60
148.5	276.5	186.7	5.58	1.9	6563	V dense, Silty sand to sandy silt	40-42	80-100				89 - 147	60 - 99
149.0	217.5	146.7	1.81	0.8	6532	Med dense, Sand to silty sand	40-42	40-60				44 - 59	30 - 40
149.5	211.0	142.2	3.77	1.7	6414	Dense, Silty sand to sandy silt	40-42	60-80				59 - 89	40 - 60
150.0	235.7	158.6	1.36	0.6	6192	Med dense, Sand to silty sand	42-46	40-60				45 - 59	30 - 40

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PROJECT NUMBER:99-120-50
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Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
150.5	259.2	174.3	4.04	1.5	6203	Dense, Sand to silty sand	40-42	60-80				59 - 89	40 - 60
151.0	256.6	172.4	4.72	1.8	6373	Dense, Silty sand to sandy silt	40-42	60-80				60 - 89	40 - 60
151.5	259.2	173.9	3.59	1.4	6415	Dense, Sand to silty sand	40-42	60-80				60 - 89	40 - 60
152.0	253.0	169.6	4.99	1.9	6401	V dense, Silty sand to sandy silt	40-42	80-100				90 - 148	60 - 99
152.5	235.4	157.6	4.78	2.0	6377	Dense, Silty sand to sandy silt	40-42	60-80				60 - 90	40 - 60
153.0	222.4	148.8	3.44	1.5	6379	Dense, Sand to silty sand	40-42	60-80				60 - 90	40 - 60
153.5	237.3	158.6	4.33	1.8	6450	Dense, Silty sand to sandy silt	40-42	60-80				60 - 90	40 - 60
154.0	242.1	161.7	3.80	1.5	6477	Dense, Sand to silty sand	40-42	60-80				60 - 90	40 - 60
154.5	215.6	143.8	4.85	2.1	6741	V dense, Silty sand to sandy silt	37-40	80-100				60 - 90	40 - 60
155.0	215.3	143.4	4.04	1.7	6321	Dense, Silty sand to sandy silt	40-42	60-80				60 - 90	40 - 60
155.5	263.8	175.6	5.52	1.7	6137	Dense, Silty sand to sandy silt	40-42	60-80				60 - 90	40 - 60
156.0	278.5	185.2	4.82	1.6	6376	Dense, Sand to silty sand	40-42	60-80				60 - 90	40 - 60
156.5	298.4	198.2	4.39	1.5	6421	Dense, Sand to silty sand	40-42	60-80				60 - 90	40 - 60
157.0	302.2	200.5	4.32	1.4	6502	Dense, Sand to silty sand	40-42	60-80				60 - 90	40 - 60
157.5	296.0	196.2	2.81	0.9	6408	Dense, Sand to silty sand	42-46	60-80				60 - 91	40 - 60
158.0	292.0	193.4	2.65	1.1	6549	Dense, Sand to silty sand	42-46	60-80				60 - 91	40 - 60
158.5	276.2	182.8	3.39	1.1	6838	Dense, Sand to silty sand	42-46	60-80				60 - 91	40 - 60

Notes:

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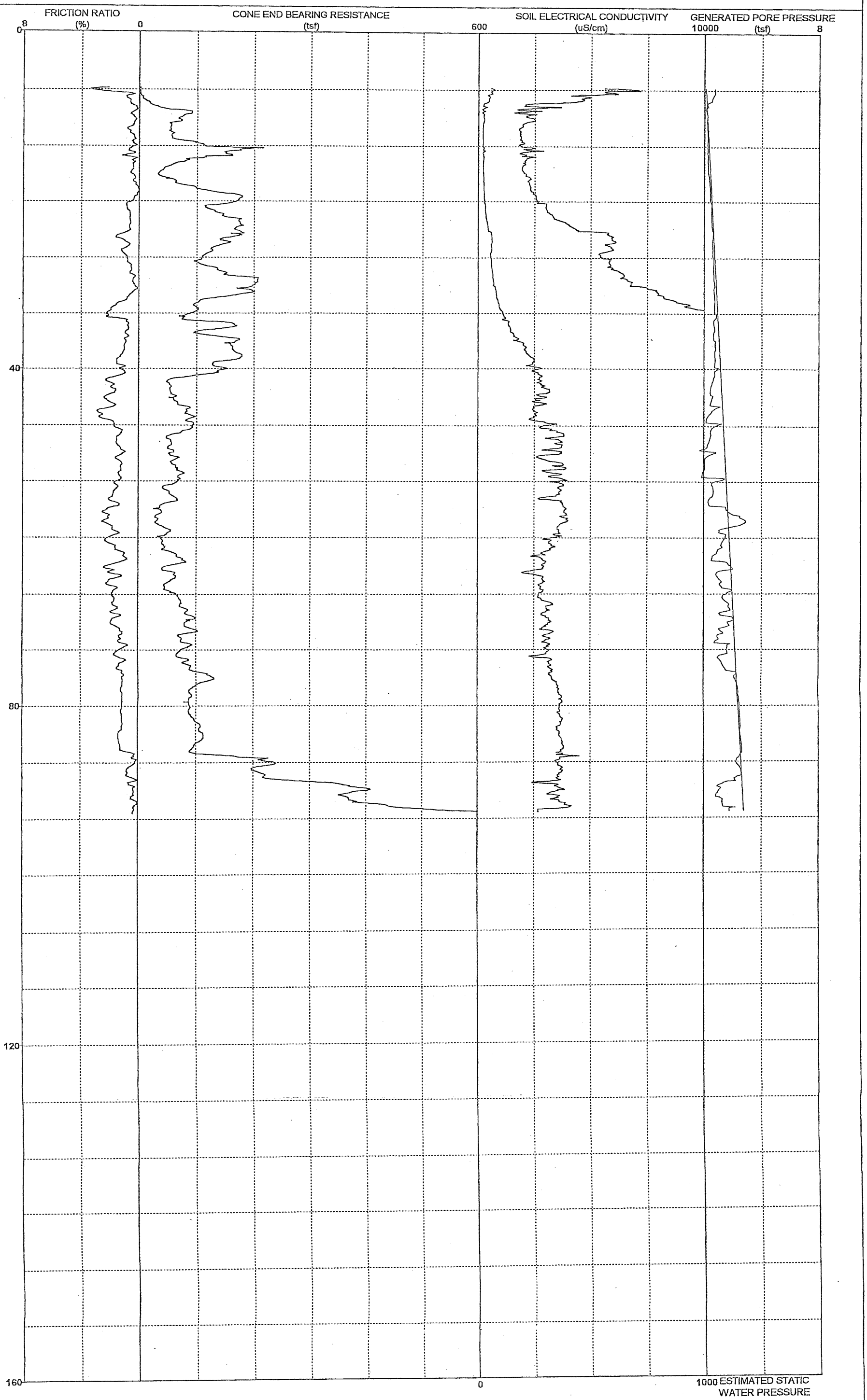
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

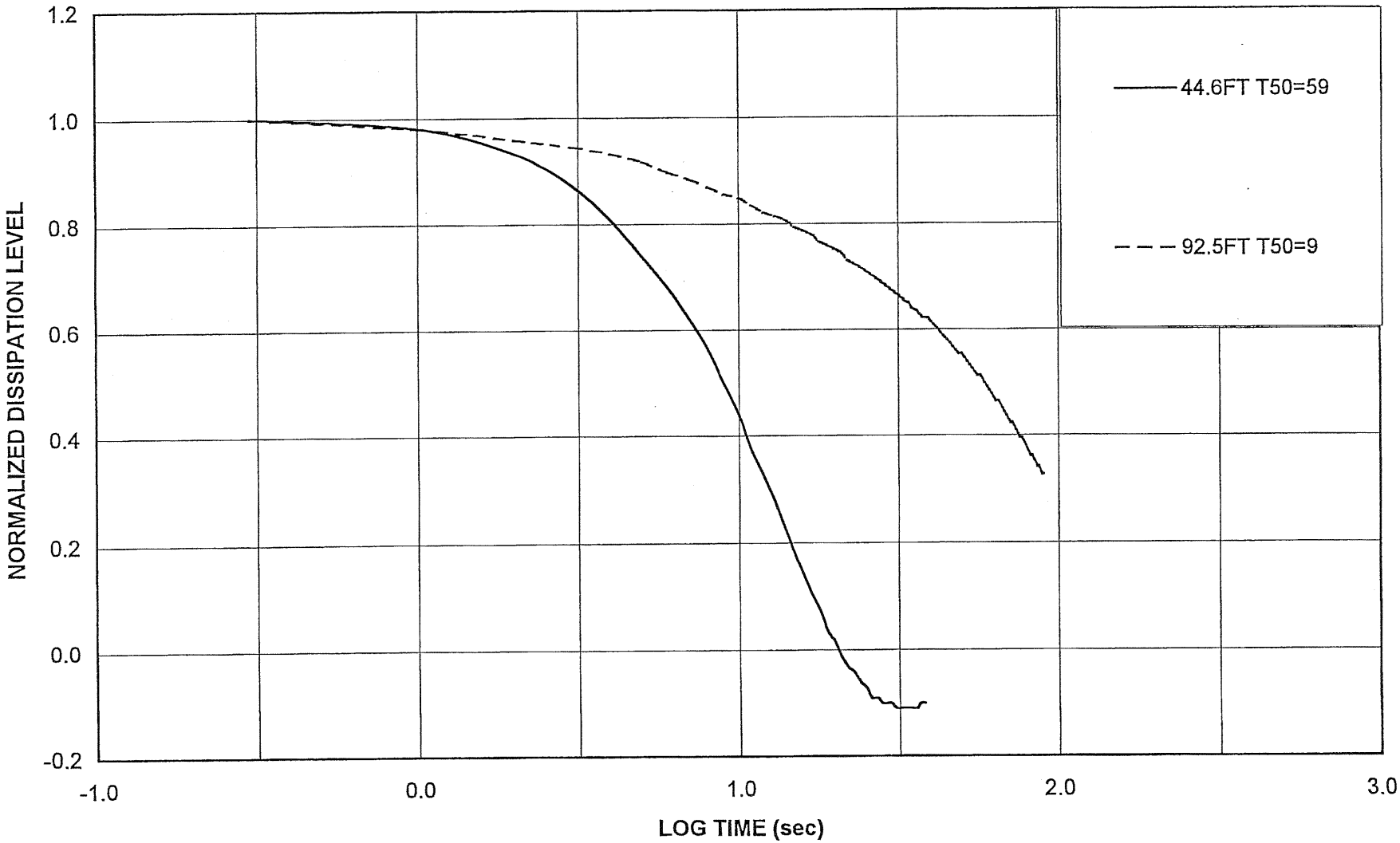
STRATIGRAPHICS

R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9909



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 6.50'												
1.5	Prepunched To 6.50'												
2.0	Prepunched To 6.50'												
2.5	Prepunched To 6.50'												
3.0	Prepunched To 6.50'												
3.5	Prepunched To 6.50'												
4.0	Prepunched To 6.50'												
4.5	Prepunched To 6.50'												
5.0	Prepunched To 6.50'												
5.5	Prepunched To 6.50'												
6.0	Prepunched To 6.50'												
6.5	Prepunched To 6.50'												
7.0	1.1	1.3	0.02	1.5	603	V soft, Sensitive fine grained soil			25	0.05	0.05	00 - 02	00 - 02
7.5	5.8	7.1	0.06	0.9	496	Stiff, Sandy silt to clayey silt			10	1.06	0.12	00 - 02	00 - 02
8.0	11.4	13.9	0.10	0.6	453	V loose, Silty sand to sandy silt	31-36	0-20				00 - 02	00 - 02
8.5	22.8	27.7	0.14	0.4	208	Loose, Silty sand to sandy silt	36-37	20-40				03 - 05	04 - 06
9.0	48.2	58.2	0.10	0.1	174	Loose, Sand to silty sand	40-42	20-40				05 - 08	06 - 10
9.5	90.5	108.5	0.50	0.6	205	Med dense, Sand to silty sand	40-42	40-60				17 - 25	20 - 30
10.0	70.7	84.3	0.25	0.3	232	Loose, Sand to silty sand	40-42	20-40				08 - 13	10 - 15
10.5	69.7	82.6	0.23	0.3	220	Loose, Sand to silty sand	40-42	20-40				08 - 13	10 - 15
11.0	55.2	65.0	0.27	0.5	198	Loose, Sand to silty sand	40-42	20-40				08 - 13	10 - 15
11.5	53.2	62.2	0.37	0.7	183	Loose, Sand to silty sand	37-40	20-40				09 - 13	10 - 15
12.0	56.1	65.2	0.21	0.4	184	Loose, Sand to silty sand	40-42	20-40				09 - 13	10 - 15
12.5	58.6	67.7	0.19	0.3	187	Loose, Sand to silty sand	40-42	20-40				09 - 13	10 - 15
13.0	100.7	115.8	0.47	0.4	202	Med dense, Sand to silty sand	40-42	40-60				17 - 26	20 - 30
13.5	153.2	175.2	0.65	0.5	242	Med dense, Sand to silty sand	42-46	40-60				26 - 35	30 - 40
14.0	155.3	176.7	1.15	0.6	217	Med dense, Sand to silty sand	42-46	40-60				35 - 53	40 - 60
14.5	161.5	182.8	2.11	1.2	195	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
15.0	85.2	96.0	0.55	0.5	208	Med dense, Sand to silty sand	40-42	40-60				13 - 18	15 - 20
15.5	59.2	66.4	0.34	0.5	205	Loose, Sand to silty sand	40-42	20-40				09 - 13	10 - 15
16.0	42.7	47.7	0.19	0.4	193	Loose, Sand to silty sand	37-40	20-40				05 - 09	06 - 10
16.5	34.6	38.4	0.24	0.6	204	Loose, Sand to silty sand	36-37	20-40				04 - 05	04 - 06
17.0	38.7	42.8	0.18	0.3	223	Loose, Sand to silty sand	37-40	20-40				04 - 05	04 - 06
17.5	63.0	69.3	0.31	0.4	221	Loose, Sand to silty sand	40-42	20-40				09 - 14	10 - 15
18.0	75.0	82.2	0.24	0.3	228	Loose, Sand to silty sand	40-42	20-40				09 - 14	10 - 15
18.5	100.6	109.7	0.09	0.1	231	Med dense, Sand to silty sand	42-46	40-60				14 - 18	15 - 20
19.0	142.4	154.6	0.25	0.1	244	Med dense, Sand to silty sand	42-46	40-60				18 - 28	20 - 30
19.5	178.7	193.1	0.63	0.4	256	Med dense, Sand to silty sand	42-46	40-60				37 - 56	40 - 60
20.0	169.8	182.7	0.90	0.5	264	Med dense, Sand to silty sand	42-46	40-60				37 - 56	40 - 60
20.5	120.8	129.4	1.33	0.9	304	Med dense, Sand to silty sand	40-42	40-60				28 - 37	30 - 40
21.0	126.6	135.1	1.08	0.8	305	Med dense, Sand to silty sand	40-42	40-60				28 - 37	30 - 40
21.5	146.9	156.2	0.98	0.6	324	Med dense, Sand to silty sand	42-46	40-60				28 - 38	30 - 40
22.0	164.5	174.3	1.15	0.7	337	Med dense, Sand to silty sand	42-46	40-60				38 - 57	40 - 60
22.5	174.9	184.5	1.07	0.6	387	Med dense, Sand to silty sand	42-46	40-60				38 - 57	40 - 60
23.0	173.9	182.8	1.24	0.7	416	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
23.5	173.5	181.6	1.07	0.7	444	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24.0	177.4	185.0	2.57	1.5	583	Dense, Sand to silty sand	40-42	60-80				38 - 58	40 - 60
24.5	140.6	146.2	1.76	1.1	594	Dense, Sand to silty sand	40-42	60-80				38 - 58	40 - 60
25.0	150.4	155.7	1.00	0.7	577	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	127.0	131.1	1.29	0.9	593	Med dense, Sand to silty sand	40-42	40-60				29 - 39	30 - 40
26.0	124.0	127.5	1.44	1.1	557	Med dense, Sand to silty sand	40-42	40-60				29 - 39	30 - 40
26.5	111.0	113.7	0.98	0.8	544	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
27.0	102.3	104.4	0.81	0.8	585	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
27.5	108.8	110.8	0.68	0.6	589	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
28.0	136.5	138.5	0.74	0.5	593	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
28.5	152.5	154.2	1.07	0.6	641	Med dense, Sand to silty sand	42-46	40-60				30 - 40	30 - 40
29.0	192.7	194.2	0.63	0.3	637	Med dense, Sand to silty sand	42-46	40-60				30 - 40	30 - 40
29.5	206.9	207.9	0.93	0.4	677	Med dense, Sand to silty sand	42-46	40-60				40 - 60	40 - 60
30.0	198.9	199.1	0.55	0.3	675	Med dense, Sa gravel to gr sand	42-46	40-60				40 - 60	40 - 60
30.5	191.2	190.8	0.49	0.2	788	Med dense, Sa gravel to gr sand	42-46	40-60				30 - 40	30 - 40
31.0	181.4	180.5	1.14	0.6	799	Med dense, Sand to silty sand	42-46	40-60				40 - 60	40 - 60
31.5	130.8	129.7	1.33	0.8	826	Med dense, Sand to silty sand	40-42	40-60				30 - 40	30 - 40
32.0	103.7	102.6	1.50	1.3	883	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
32.5	97.0	95.6	1.75	1.8	918	Dense, Silty sand to sandy silt	37-40	60-80				30 - 41	30 - 40
33.0	100.7	99.0	1.94	2.0	1036	Dense, Silty sand to sandy silt	37-40	60-80				31 - 41	30 - 40
33.5	81.8	80.1	1.88	2.1	1129	Dense, Silty sand to sandy silt	36-37	60-80				20 - 31	20 - 30
34.0	74.6	72.9	0.94	1.0	1101	Med dense, Sand to silty sand	37-40	40-60				15 - 20	15 - 20
34.5	162.3	158.1	1.17	0.7	1334	Med dense, Sand to silty sand	42-46	40-60				31 - 41	30 - 40
35.0	160.3	155.8	1.16	0.7	1415	Med dense, Sand to silty sand	42-46	40-60				31 - 41	30 - 40
35.5	99.0	95.9	1.18	0.9	1445	Med dense, Sand to silty sand	40-42	40-60				21 - 31	20 - 30
36.0	130.4	126.0	1.10	0.7	1591	Med dense, Sand to silty sand	40-42	40-60				21 - 31	20 - 30
36.5	174.5	168.2	1.61	1.0	1650	Dense, Sand to silty sand	42-46	60-80				42 - 62	40 - 60
37.0	157.9	151.7	1.67	1.0	1984	Dense, Sand to silty sand	40-42	60-80				42 - 62	40 - 60
37.5	162.6	155.8	1.61	1.0	2094	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
38.0	168.5	161.1	1.95	1.1	2137	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
38.5	179.1	170.7	2.30	1.3	2322	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
39.0	155.4	147.7	2.66	1.5	2500	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
39.5	128.1	121.5	1.81	1.3	2316	Dense, Sand to silty sand	40-42	60-80				32 - 42	30 - 40
40.0	152.5	144.2	1.98	1.3	2781	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
40.5	137.7	129.8	1.32	0.9	2664	Med dense, Sand to silty sand	40-42	40-60				32 - 42	30 - 40
41.0	78.3	73.7	1.92	1.8	2735	Med dense, Silty sand to sandy silt	37-40	40-60				21 - 32	20 - 30
41.5	48.8	45.8	1.26	2.2	2762	Med dense, Silty sand to sandy silt	27-31	40-60				16 - 21	15 - 20
42.0	54.1	50.7	0.97	1.8	2906	Med dense, Silty sand to sandy silt	36-37	40-60				16 - 21	15 - 20
42.5	53.6	50.1	0.86	1.6	3171	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 16	10 - 15
43.0	56.2	52.3	1.13	1.9	2674	Med dense, Silty sand to sandy silt	36-37	40-60				16 - 21	15 - 20
43.5	58.0	53.9	1.48	2.4	2578	Dense, Silty sand to sandy silt	27-31	60-80				16 - 22	15 - 20
44.0	67.4	62.5	1.43	1.9	2859	Med dense, Silty sand to sandy silt	36-37	40-60				22 - 32	20 - 30
44.5	87.1	80.5	1.49	1.8	2464	Dense, Silty sand to sandy silt	37-40	60-80				22 - 32	20 - 30
45.0	83.8	77.3	2.45	2.9	2553	Hard, Sandy silt to sandy clay			30	5.40	4.90	33 - 43	30 - 40
45.5	90.9	83.7	2.38	2.6	2545	Dense, Silty sand to sandy silt	36-37	60-80				33 - 43	30 - 40
46.0	83.5	76.6	1.98	2.2	2425	Dense, Silty sand to sandy silt	36-37	60-80				22 - 33	20 - 30
46.5	95.0	87.0	1.60	1.7	3352	Dense, Silty sand to sandy silt	37-40	60-80				22 - 33	20 - 30
47.0	90.9	83.1	1.37	1.5	3223	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 33	20 - 30
47.5	73.1	66.7	1.00	1.2	3724	Med dense, Silty sand to sandy silt	37-40	40-60				16 - 22	15 - 20
48.0	48.8	44.4	0.91	1.5	3534	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 16	10 - 15
48.5	55.1	50.0	0.85	1.5	3685	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
49.0	56.5	51.2	0.84	1.5	3742	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
49.5	50.4	45.5	0.70	1.2	3053	Med dense, Silty sand to sandy silt	36-37	40-60				07 - 11	06 - 10
50.0	54.9	49.5	0.60	1.0	3712	Loose, Silty sand to sandy silt	36-37	20-40				07 - 11	06 - 10

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PROJECT NUMBER:99-120-050
R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	67.2	60.4	0.99	1.5	2633	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 22	15 - 20
51.0	57.1	51.2	0.80	1.3	3365	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
51.5	63.9	57.2	0.81	1.2	3355	Med dense, Silty sand to sandy silt	37-40	40-60				11 - 17	10 - 15
52.0	66.0	59.0	0.88	1.2	3101	Med dense, Silty sand to sandy silt	37-40	40-60				11 - 17	10 - 15
52.5	76.8	68.5	1.04	1.4	3704	Med dense, Silty sand to sandy silt	37-40	40-60				17 - 22	15 - 20
53.0	70.8	63.0	0.83	1.2	3749	Med dense, Silty sand to sandy silt	37-40	40-60				17 - 22	15 - 20
53.5	64.7	57.5	1.18	1.7	3618	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
54.0	41.0	36.3	0.74	1.4	3567	Med dense, Silty sand to sandy silt	36-37	40-60				07 - 11	06 - 10
54.5	52.5	46.5	0.94	1.7	3617	Med dense, Silty sand to sandy silt	36-37	40-60				11 - 17	10 - 15
55.0	58.3	51.4	1.15	1.8	3435	Med dense, Silty sand to sandy silt	36-37	40-60				17 - 23	15 - 20
55.5	67.2	59.2	1.31	2.0	3473	Dense, Silty sand to sandy silt	36-37	60-80				17 - 23	15 - 20
56.0	42.3	37.1	0.76	1.4	3780	Loose, Silty sand to sandy silt	36-37	20-40				07 - 11	06 - 10
56.5	30.1	26.4	0.81	2.1	3924	V stiff, Sandy silt to sandy clay			20	2.67	1.63	07 - 11	06 - 10
57.0	39.6	34.7	0.92	2.4	3897	V stiff, Sandy silt to sandy clay			20	3.62	1.84	11 - 17	10 - 15
57.5	27.7	24.2	0.73	2.1	3710	V stiff, Sandy silt to sandy clay			20	2.42	1.46	05 - 07	04 - 06
58.0	31.3	27.3	0.79	2.5	3985	V stiff, Sandy silt to sandy clay			20	2.79	1.59	07 - 11	06 - 10
58.5	35.4	30.8	0.84	2.0	3615	Med dense, Silty sand to sandy silt	27-31	40-60				07 - 11	06 - 10
59.0	51.3	44.5	0.97	1.8	3559	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 17	10 - 15
59.5	49.3	42.7	0.70	1.4	3628	Med dense, Silty sand to sandy silt	36-37	40-60				07 - 12	06 - 10
60.0	39.6	34.3	0.91	2.1	3304	V stiff, Sandy silt to sandy clay			20	3.60	1.82	07 - 12	06 - 10
60.5	41.9	36.1	0.92	2.2	3172	V stiff, Sandy silt to sandy clay			20	3.82	1.84	12 - 17	10 - 15
61.0	44.3	38.2	0.69	1.6	3431	Med dense, Silty sand to sandy silt	27-31	40-60				07 - 12	06 - 10
61.5	44.1	37.9	0.85	1.5	3177	Med dense, Silty sand to sandy silt	36-37	40-60				07 - 12	06 - 10
62.0	66.1	56.7	0.74	1.0	2961	Med dense, Silty sand to sandy silt	37-40	40-60				12 - 17	10 - 15
62.5	76.6	65.6	0.62	0.8	2848	Med dense, Sand to silty sand	37-40	40-60				12 - 18	10 - 15
63.0	74.3	63.5	1.22	1.6	2985	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 23	15 - 20
63.5	42.1	35.9	1.33	2.4	2892	V stiff, Sandy silt to sandy clay			20	3.82	2.66	12 - 18	10 - 15
64.0	58.0	49.4	1.32	2.1	2076	Med dense, Silty sand to sandy silt	27-31	40-60				18 - 23	15 - 20
64.5	63.8	54.3	0.69	1.2	2801	Med dense, Silty sand to sandy silt	36-37	40-60				12 - 18	10 - 15
65.0	56.4	47.9	1.30	2.1	2897	Med dense, Silty sand to sandy silt	27-31	40-60				18 - 24	15 - 20
65.5	44.7	37.9	1.10	2.1	2757	Med dense, Silty sand to sandy silt	27-31	40-60				12 - 18	10 - 15
66.0	44.7	37.8	0.81	1.5	2785	Med dense, Silty sand to sandy silt	27-31	40-60				07 - 12	06 - 10
66.5	61.6	52.0	1.21	1.8	2763	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
67.0	69.1	58.2	1.21	1.7	2689	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
67.5	74.3	62.4	1.24	1.7	3014	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
68.0	71.4	60.0	1.25	1.6	3221	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
68.5	85.8	71.9	1.38	1.7	3122	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 36	20 - 30
69.0	82.1	68.7	1.30	1.5	2835	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 24	15 - 20
69.5	99.1	82.7	1.61	1.7	3119	Dense, Silty sand to sandy silt	37-40	60-80				24 - 36	20 - 30
70.0	81.3	67.7	1.72	1.9	3241	Dense, Silty sand to sandy silt	36-37	60-80				24 - 36	20 - 30
70.5	82.0	68.3	1.39	1.5	3034	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 24	15 - 20
71.0	102.0	84.7	1.20	1.2	3222	Med dense, Sand to silty sand	37-40	40-60				24 - 36	20 - 30
71.5	70.7	58.6	1.10	1.2	3028	Med dense, Silty sand to sandy silt	37-40	40-60				12 - 18	10 - 15
72.0	75.3	62.3	0.92	1.2	3219	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 24	15 - 20
72.5	84.3	69.6	1.00	1.1	3054	Med dense, Sand to silty sand	37-40	40-60				18 - 24	15 - 20
73.0	85.8	70.7	0.88	1.0	3090	Med dense, Sand to silty sand	37-40	40-60				18 - 24	15 - 20
73.5	71.6	59.0	1.15	1.5	3150	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 24	15 - 20
74.0	66.3	54.5	1.14	1.5	2713	Med dense, Silty sand to sandy silt	36-37	40-60				12 - 18	10 - 15
74.5	87.8	72.0	0.70	0.9	3303	Med dense, Sand to silty sand	37-40	40-60				18 - 24	15 - 20
75.0	84.4	69.1	1.21	1.4	3195	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 24	15 - 20

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-09-1999 TIME:10:43:45.25
SOUNDING NUMBER:cvp-9909

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	89.0	72.8	1.44	1.5	3226	Med dense, Silty sand to sandy silt	37-40	40-60				24 - 37	20 - 30
76.0	111.2	90.8	1.48	1.2	3276	Med dense, Sand to silty sand	37-40	40-60				24 - 37	20 - 30
76.5	127.7	104.1	1.44	1.1	3296	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
77.0	119.8	97.5	1.42	1.1	3433	Med dense, Sand to silty sand	40-42	40-60				25 - 37	20 - 30
77.5	99.3	80.7	1.19	1.1	3529	Med dense, Sand to silty sand	37-40	40-60				25 - 37	20 - 30
78.0	89.0	72.2	1.15	1.2	3625	Med dense, Silty sand to sandy silt	37-40	40-60				18 - 25	15 - 20
78.5	90.6	73.4	1.01	1.1	3620	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
79.0	88.8	71.8	1.02	1.1	3737	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
79.5	82.2	66.3	0.97	1.1	3782	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
80.0	89.4	72.1	1.02	1.1	3650	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
80.5	87.3	70.3	1.06	1.2	3652	Med dense, Silty sand to sandy silt	37-40	40-60				19 - 25	15 - 20
81.0	89.4	71.8	1.07	1.1	3625	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
81.5	96.9	77.7	1.12	1.1	3744	Med dense, Sand to silty sand	37-40	40-60				19 - 25	15 - 20
82.0	103.3	82.7	1.15	1.1	3677	Med dense, Sand to silty sand	37-40	40-60				25 - 37	20 - 30
82.5	108.6	86.8	1.24	1.2	3586	Med dense, Sand to silty sand	37-40	40-60				25 - 38	20 - 30
83.0	106.9	85.4	1.46	1.3	3580	Med dense, Sand to silty sand	37-40	40-60				25 - 38	20 - 30
83.5	113.4	90.4	1.52	1.4	3614	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 38	20 - 30
84.0	110.6	88.0	1.49	1.3	3728	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 38	20 - 30
84.5	99.0	78.7	1.32	1.3	3759	Med dense, Silty sand to sandy silt	37-40	40-60				25 - 38	20 - 30
85.0	93.7	74.3	1.19	1.2	3830	Med dense, Silty sand to sandy silt	37-40	40-60				19 - 25	15 - 20
85.5	93.1	73.7	0.52	0.5	3612	Loose, Sand to silty sand	40-42	20-40				13 - 19	10 - 15
86.0	171.9	136.0	0.62	0.4	4310	Med dense, Sand to silty sand	42-46	40-60				25 - 38	20 - 30
86.5	223.1	176.2	0.51	0.2	3491	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
87.0	225.8	178.1	1.09	0.5	3578	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
87.5	197.6	155.6	1.69	0.8	3708	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
88.0	219.2	172.4	1.80	0.8	3646	Dense, Sand to silty sand	42-46	60-80				51 - 76	40 - 60
88.5	223.8	175.7	0.66	0.3	3534	Med dense, Sand to silty sand	42-46	40-60				38 - 51	30 - 40
89.0	322.5	252.8	2.42	0.7	2899	Dense, Sand to silty sand	42-46	60-80				51 - 77	40 - 60
89.5	373.0	292.0	1.14	0.3	3448	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
90.0	395.2	308.9	1.05	0.3	3644	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
90.5	352.2	274.9	0.98	0.4	3110	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
91.0	369.2	287.7	1.30	0.3	3399	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
91.5	410.7	319.6	0.44	0.1	3780	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
92.0	457.2	355.3	1.73	0.3	4111	Dense, Sa gravel to gr sand	+46	60-80				51 - 77	40 - 60
92.5	591.1	458.6	2.37	0.4	2703	Dense, Sa gravel to gr sand	+46	60-80				77 - 128	60 - 99

Notes:

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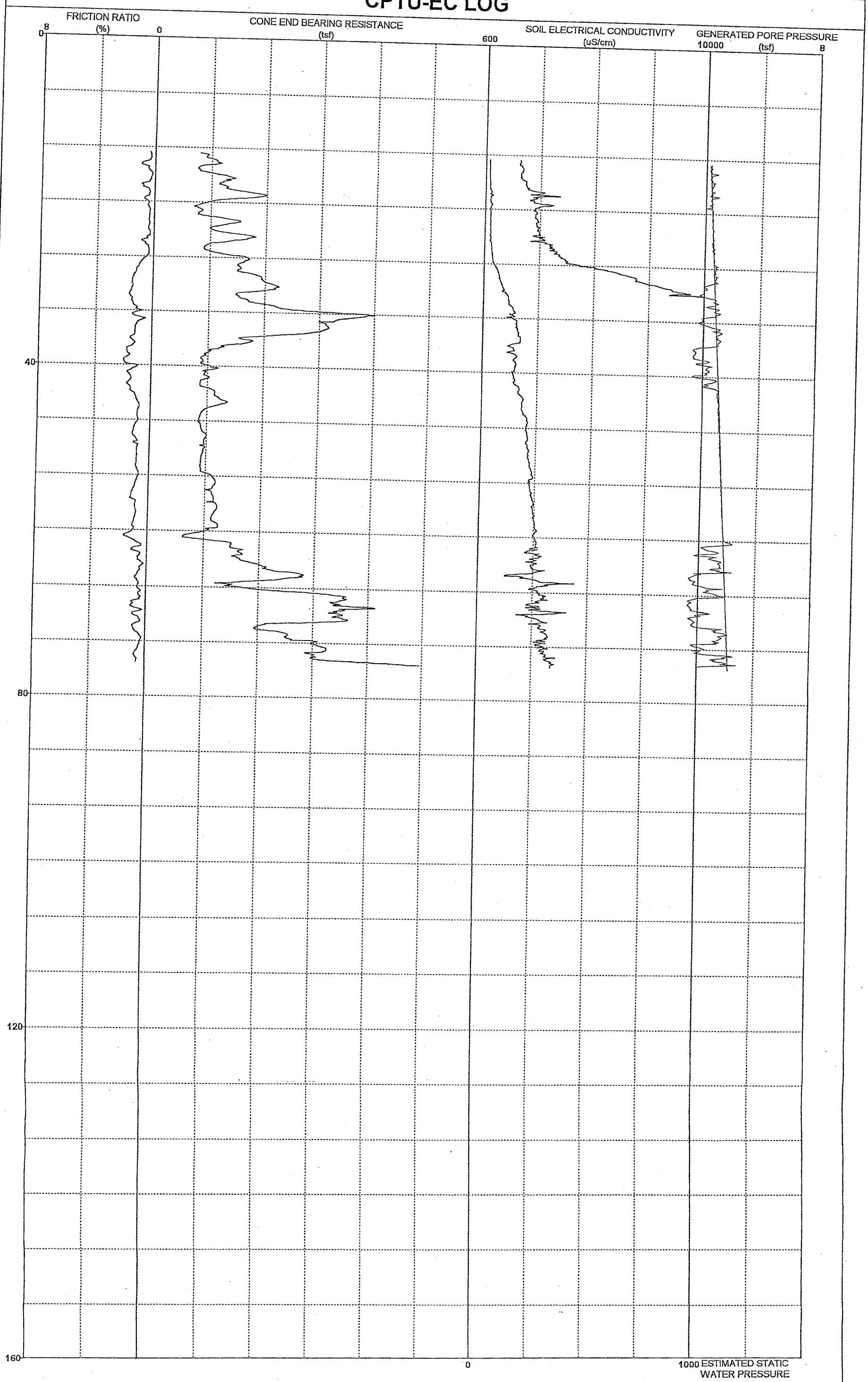
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

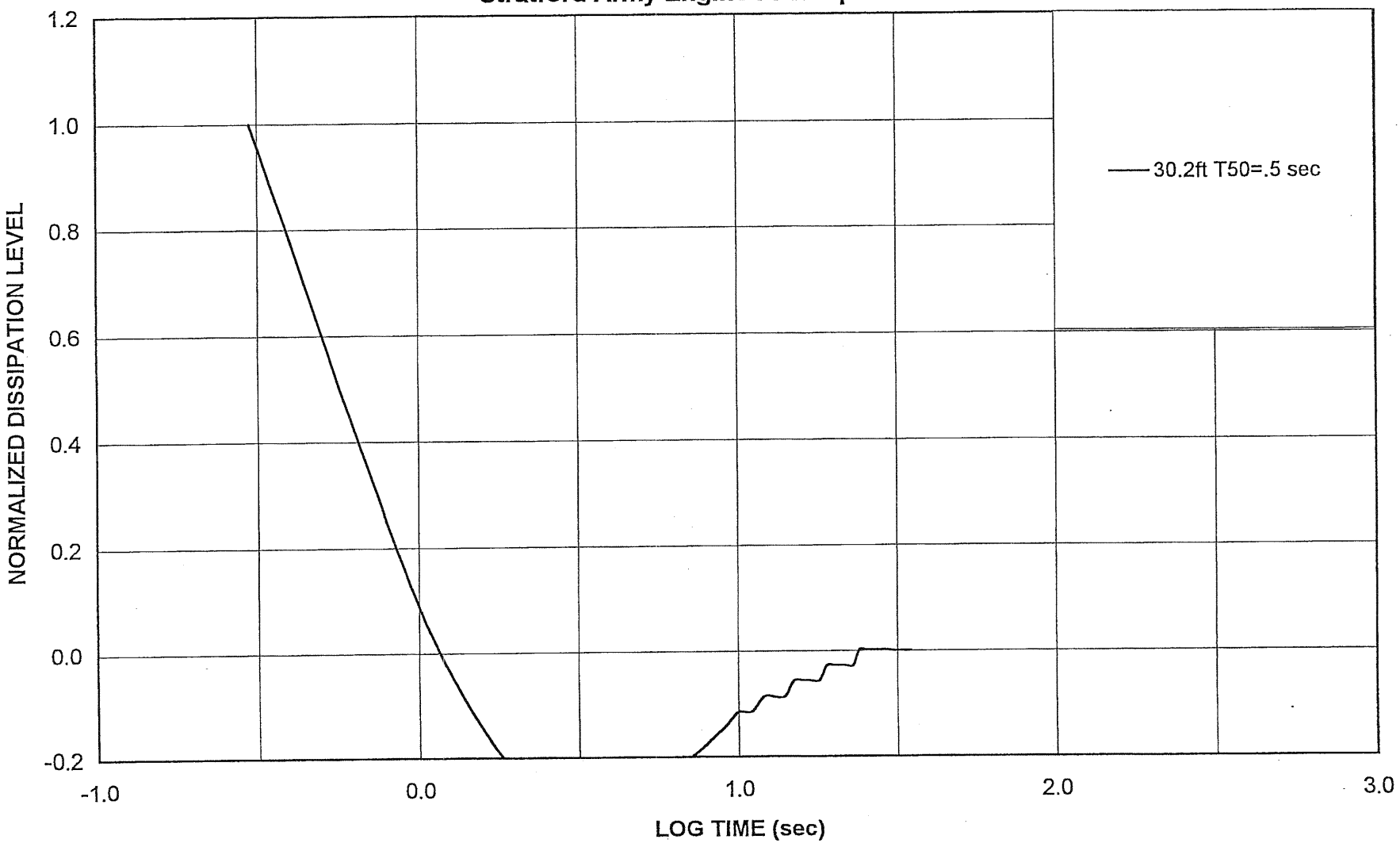
STRATIGRAPHICS

R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

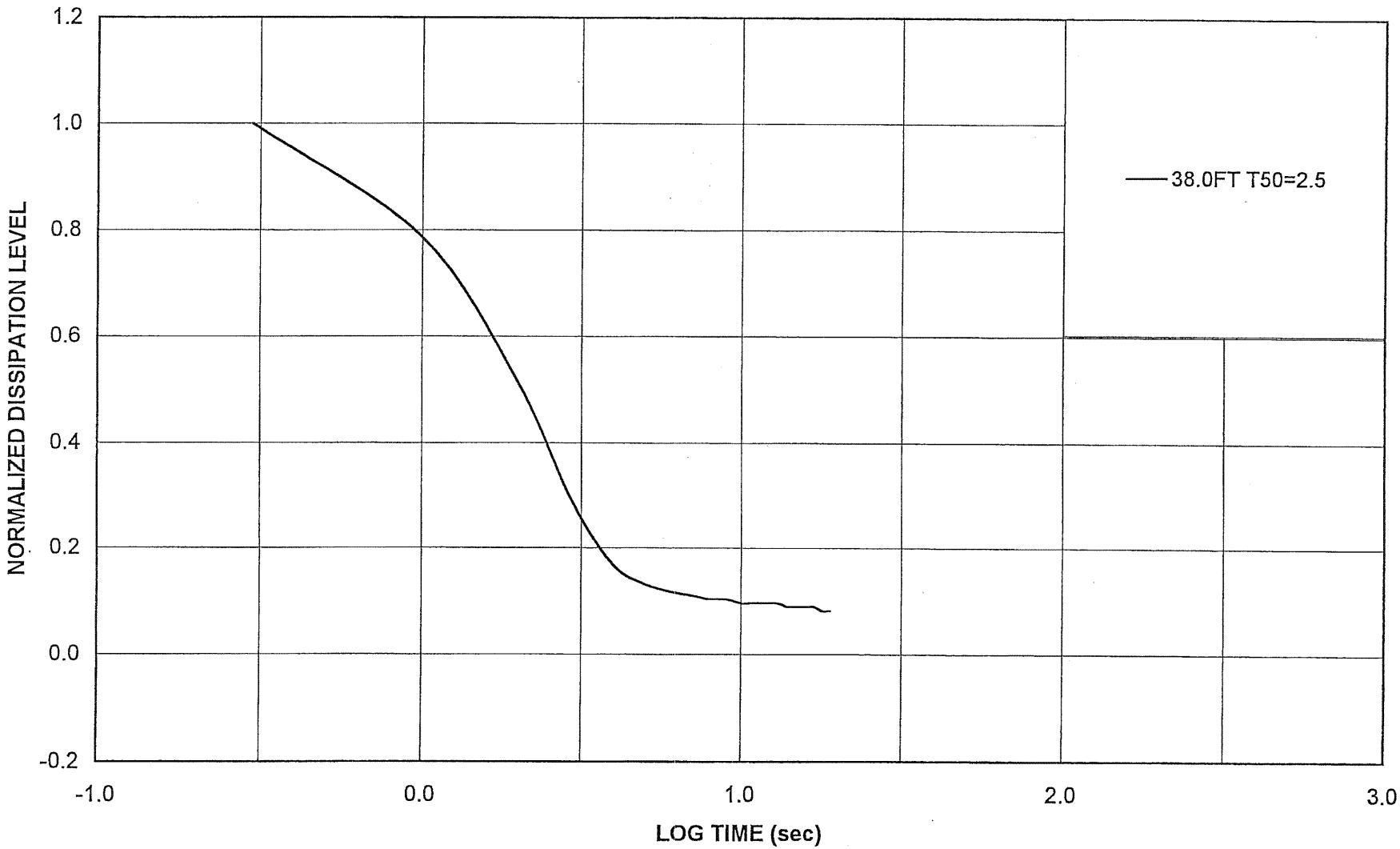
Stratford Army Engine Plant cp-9910



STRATIGRAPHICS

PORE WATER PRESSURE DISSIPATION TEST

Stratford Army Engine Plant cp-9910



STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 14.00'												
1.5	Prepunched To 14.00'												
2.0	Prepunched To 14.00'												
2.5	Prepunched To 14.00'												
3.0	Prepunched To 14.00'												
3.5	Prepunched To 14.00'												
4.0	Prepunched To 14.00'												
4.5	Prepunched To 14.00'												
5.0	Prepunched To 14.00'												
5.5	Prepunched To 14.00'												
6.0	Prepunched To 14.00'												
6.5	Prepunched To 14.00'												
7.0	Prepunched To 14.00'												
7.5	Prepunched To 14.00'												
8.0	Prepunched To 14.00'												
8.5	Prepunched To 14.00'												
9.0	Prepunched To 14.00'												
9.5	Prepunched To 14.00'												
10.0	Prepunched To 14.00'												
10.5	Prepunched To 14.00'												
11.0	Prepunched To 14.00'												
11.5	Prepunched To 14.00'												
12.0	Prepunched To 14.00'												
12.5	Prepunched To 14.00'												
13.0	Prepunched To 14.00'												
13.5	Prepunched To 14.00'												
14.0	Prepunched To 14.00'												
14.5	91.1	101.0	0.33	0.3	154	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
15.0	110.0	121.4	0.40	0.4	168	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
15.5	85.7	94.1	1.10	0.9	163	Med dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
16.0	78.7	86.1	0.43	0.5	159	Med dense, Sand to silty sand	40-42	40-60				14 - 18	15 - 20
16.5	106.9	116.4	0.29	0.2	183	Med dense, Sand to silty sand	40-42	40-60				18 - 28	20 - 30
17.0	141.6	153.5	0.34	0.3	183	Med dense, Sand to silty sand	42-46	40-60				18 - 28	20 - 30
17.5	121.8	131.5	0.53	0.4	192	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
18.0	127.6	137.1	0.96	0.8	262	Med dense, Sand to silty sand	40-42	40-60				28 - 37	30 - 40
18.5	147.6	158.0	0.74	0.4	223	Med dense, Sand to silty sand	42-46	40-60				28 - 37	30 - 40
19.0	196.8	209.8	0.65	0.4	220	Med dense, Sand to silty sand	42-46	40-60				38 - 56	40 - 60
19.5	146.4	155.4	1.29	0.7	298	Med dense, Sand to silty sand	42-46	40-60				28 - 38	30 - 40
20.0	93.6	99.0	0.52	0.5	224	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
20.5	71.9	75.7	0.37	0.5	232	Loose, Sand to silty sand	40-42	20-40				09 - 14	10 - 15
21.0	85.2	89.4	0.26	0.3	229	Med dense, Sand to silty sand	40-42	40-60				14 - 19	15 - 20
21.5	81.0	84.8	0.37	0.4	244	Loose, Sand to silty sand	40-42	20-40				14 - 19	15 - 20
22.0	133.6	139.2	0.53	0.4	236	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
22.5	141.4	146.8	0.49	0.3	240	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
23.0	103.7	107.3	0.46	0.4	249	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30
23.5	114.1	117.6	0.49	0.3	259	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30
24.0	176.0	180.8	0.51	0.3	280	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
24.5	151.9	155.5	0.75	0.5	305	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
25.0	100.7	102.7	0.77	0.6	323	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	89.1	90.6	0.36	0.4	341	Med dense, Sand to silty sand	40-42	40-60				15 - 20	15 - 20
26.0	105.7	107.1	0.41	0.3	369	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
26.5	158.3	159.9	0.67	0.4	403	Med dense, Sand to silty sand	42-46	40-60				30 - 40	30 - 40
27.0	165.1	166.3	1.22	0.7	514	Med dense, Sand to silty sand	42-46	40-60				40 - 60	40 - 60
27.5	150.4	150.9	1.49	0.9	614	Dense, Sand to silty sand	40-42	60-80				30 - 40	30 - 40
28.0	156.5	156.6	1.72	1.1	688	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
28.5	168.0	167.6	2.20	1.2	710	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
29.0	193.5	192.3	2.71	1.4	794	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
29.5	199.6	197.8	3.10	1.5	856	Dense, Sand to silty sand	40-42	60-80				40 - 61	40 - 60
30.0	222.2	219.6	3.10	1.4	874	Dense, Sand to silty sand	42-46	60-80				61 - 100	60 - 99
30.5	209.7	206.6	3.28	1.5	1083	Dense, Sand to silty sand	40-42	60-80				61 - 100	60 - 99
31.0	150.0	147.3	2.85	1.6	1112	Dense, Sand to silty sand	40-42	60-80				41 - 61	40 - 60
31.5	155.1	151.9	2.59	1.6	1147	Dense, Sand to silty sand	40-42	60-80				41 - 61	40 - 60
32.0	173.0	169.0	2.95	1.5	1332	Dense, Sand to silty sand	40-42	60-80				41 - 61	40 - 60
32.5	217.6	211.9	3.24	1.4	1414	Dense, Sand to silty sand	42-46	60-80				41 - 62	40 - 60
33.0	267.4	259.7	3.81	1.1	1379	Dense, Sand to silty sand	42-46	60-80				62 - 102	60 - 99
33.5	385.4	373.1	4.22	1.1	1474	V dense, Sand to silty sand	42-46	80-100				+ 103	+ 100
34.0	339.4	327.7	4.47	1.2	1519	V dense, Sand to silty sand	42-46	80-100				+ 104	+ 100
34.5	308.2	296.8	2.35	0.7	1530	Dense, Sand to silty sand	42-46	60-80				62 - 103	60 - 99
35.0	316.8	304.2	3.45	1.1	1598	Dense, Sand to silty sand	42-46	60-80				62 - 103	60 - 99
35.5	301.2	288.4	3.79	1.2	1622	V dense, Sand to silty sand	42-46	80-100				63 - 103	60 - 99
36.0	236.8	226.1	3.31	1.2	1717	Dense, Sand to silty sand	42-46	60-80				42 - 63	40 - 60
36.5	158.5	150.9	2.83	1.5	1343	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
37.0	175.1	166.4	2.27	1.3	1407	Dense, Sand to silty sand	40-42	60-80				42 - 63	40 - 60
37.5	124.5	118.0	2.04	1.3	1143	Dense, Sand to silty sand	40-42	60-80				32 - 42	30 - 40
38.0	105.8	100.0	2.09	1.8	1567	Dense, Silty sand to sandy silt	37-40	60-80				32 - 42	30 - 40
38.5	94.8	89.4	1.74	1.7	1408	Dense, Silty sand to sandy silt	37-40	60-80				21 - 32	20 - 30
39.0	87.8	82.6	1.61	1.7	1527	Dense, Silty sand to sandy silt	37-40	60-80				21 - 32	20 - 30
39.5	91.6	85.9	1.84	1.9	1471	Dense, Silty sand to sandy silt	37-40	60-80				21 - 32	20 - 30
40.0	104.7	97.9	1.02	1.1	1375	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
40.5	100.9	94.2	1.49	1.4	1446	Med dense, Silty sand to sandy silt	37-40	40-60				21 - 32	20 - 30
41.0	93.9	87.4	1.60	1.6	1490	Dense, Silty sand to sandy silt	37-40	60-80				21 - 32	20 - 30
41.5	102.0	94.7	1.43	1.4	1546	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 32	20 - 30
42.0	87.0	80.6	1.44	1.6	1694	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 32	20 - 30
42.5	89.2	82.4	1.57	1.6	1644	Med dense, Silty sand to sandy silt	37-40	40-60				22 - 32	20 - 30
43.0	112.0	103.3	1.66	1.5	1829	Dense, Silty sand to sandy silt	37-40	60-80				33 - 43	30 - 40
43.5	113.0	104.0	1.38	1.2	1850	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
44.0	122.8	112.7	1.36	1.0	1838	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
44.5	133.9	122.6	1.19	0.9	1830	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
45.0	106.3	97.1	0.95	0.8	1899	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
45.5	92.6	84.4	0.89	0.9	2082	Med dense, Sand to silty sand	40-42	40-60				16 - 22	15 - 20
46.0	88.3	80.3	0.86	0.9	2108	Med dense, Sand to silty sand	37-40	40-60				17 - 22	15 - 20
46.5	86.2	78.2	0.74	0.9	2037	Med dense, Sand to silty sand	40-42	40-60				17 - 22	15 - 20
47.0	88.8	80.3	0.90	1.0	2039	Med dense, Sand to silty sand	37-40	40-60				17 - 22	15 - 20
47.5	90.2	81.4	1.05	1.1	2088	Med dense, Sand to silty sand	37-40	40-60				22 - 33	20 - 30
48.0	94.4	85.0	1.17	1.2	2127	Med dense, Sand to silty sand	37-40	40-60				22 - 33	20 - 30
48.5	100.1	90.0	1.19	1.2	2056	Med dense, Sand to silty sand	37-40	40-60				22 - 33	20 - 30
49.0	96.3	86.4	0.95	1.0	2115	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
49.5	96.4	86.3	1.06	1.1	2196	Med dense, Sand to silty sand	37-40	40-60				22 - 34	20 - 30
50.0	96.1	85.9	0.87	0.9	2172	Med dense, Sand to silty sand	40-42	40-60				17 - 22	15 - 20

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	94.4	84.1	0.86	0.9	2197	Med dense, Sand to silty sand	40-42	40-60				17 - 22	15 - 20
51.0	92.0	81.8	0.84	0.9	2256	Med dense, Sand to silty sand	40-42	40-60				17 - 22	15 - 20
51.5	91.6	81.3	0.84	0.9	2274	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
52.0	90.7	80.3	0.86	0.9	2352	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
52.5	91.7	81.1	0.85	0.9	2388	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
53.0	101.1	89.2	0.83	0.8	2224	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
53.5	114.2	100.5	0.94	0.8	2249	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
54.0	118.7	104.2	1.07	0.9	2281	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
54.5	115.0	100.8	1.15	1.0	2366	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
55.0	102.4	89.6	1.25	1.1	2360	Med dense, Sand to silty sand	37-40	40-60				23 - 34	20 - 30
55.5	113.1	98.7	1.41	1.2	2433	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
56.0	116.1	101.2	1.46	1.3	2483	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
56.5	116.1	101.0	1.07	0.9	2427	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
57.0	122.7	106.5	1.18	1.0	2455	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
57.5	119.4	103.4	1.13	0.9	2462	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
58.0	114.4	98.9	1.05	0.9	2501	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
58.5	112.1	96.7	1.13	1.0	2552	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
59.0	121.7	104.8	1.27	1.0	2588	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
59.5	124.3	106.8	1.39	1.1	2530	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
60.0	102.3	87.7	1.20	1.1	2554	Med dense, Sand to silty sand	37-40	40-60				23 - 35	20 - 30
60.5	66.5	57.0	1.31	1.6	2610	Med dense, Silty sand to sandy silt	36-37	40-60				18 - 23	15 - 20
61.0	96.5	82.5	1.60	1.2	2593	Med dense, Sand to silty sand	37-40	40-60				23 - 35	20 - 30
61.5	149.5	127.5	1.06	0.7	2592	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
62.0	151.7	129.2	1.13	0.7	2718	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
62.5	164.2	139.5	1.63	0.9	2746	Med dense, Sand to silty sand	40-42	40-60				35 - 47	30 - 40
63.0	153.9	130.5	0.89	0.5	2293	Med dense, Sand to silty sand	40-42	40-60				24 - 35	20 - 30
63.5	171.6	145.3	1.24	0.6	2415	Med dense, Sand to silty sand	40-42	40-60				35 - 47	30 - 40
64.0	202.9	171.5	0.49	0.3	2958	Med dense, Sand to silty sand	42-46	40-60				36 - 47	30 - 40
64.5	218.2	184.1	1.36	0.5	1617	Med dense, Sand to silty sand	42-46	40-60				47 - 71	40 - 60
65.0	278.7	234.7	1.80	0.6	2434	Dense, Sand to silty sand	42-46	60-80				48 - 71	40 - 60
65.5	248.2	208.6	2.21	0.8	4159	Dense, Sand to silty sand	42-46	60-80				48 - 71	40 - 60
66.0	167.9	140.8	1.37	0.7	2702	Med dense, Sand to silty sand	40-42	40-60				36 - 48	30 - 40
66.5	143.5	120.2	1.10	0.6	2754	Med dense, Sand to silty sand	40-42	40-60				24 - 36	20 - 30
67.0	232.8	194.6	1.46	0.5	3053	Med dense, Sand to silty sand	42-46	40-60				48 - 72	40 - 60
67.5	346.0	288.7	2.08	0.5	3130	Dense, Sa gravel to gr sand	42-46	60-80				48 - 72	40 - 60
68.0	358.0	298.2	1.43	0.4	2561	Dense, Sa gravel to gr sand	+46	60-80				48 - 72	40 - 60
68.5	340.6	283.2	3.75	1.0	2306	Dense, Sand to silty sand	42-46	60-80				72 - 119	60 - 99
69.0	401.0	332.9	4.18	1.1	3663	V dense, Sand to silty sand	42-46	80-100				72 - 119	60 - 99
69.5	340.4	282.1	0.89	0.3	2227	Dense, Sa gravel to gr sand	+46	60-80				48 - 72	40 - 60
70.0	339.6	281.0	3.38	1.0	2814	Dense, Sand to silty sand	42-46	60-80				73 - 120	60 - 99
70.5	362.5	299.4	1.70	0.5	2460	Dense, Sa gravel to gr sand	+46	60-80				48 - 73	40 - 60
71.0	229.9	189.5	1.42	0.5	2828	Med dense, Sand to silty sand	42-46	40-60				49 - 73	40 - 60
71.5	195.3	160.7	1.99	0.9	2969	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
72.0	238.9	196.3	2.02	0.8	3223	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
72.5	251.9	206.6	1.22	0.5	2826	Med dense, Sand to silty sand	42-46	40-60				49 - 73	40 - 60
73.0	279.4	228.8	0.88	0.3	2764	Med dense, Sa gravel to gr sand	42-46	40-60				49 - 73	40 - 60
73.5	303.0	247.7	1.30	0.4	3208	Dense, Sa gravel to gr sand	42-46	60-80				49 - 73	40 - 60
74.0	325.3	265.4	1.60	0.5	3025	Dense, Sa gravel to gr sand	42-46	60-80				49 - 74	40 - 60
74.5	288.3	234.9	2.06	0.7	3105	Dense, Sand to silty sand	42-46	60-80				49 - 74	40 - 60
75.0	303.2	246.6	2.47	0.8	3284	Dense, Sand to silty sand	42-46	60-80				49 - 74	40 - 60

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-18-1999 TIME:10:49:11.45
SOUNDING NUMBER:cp-9910

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	372.1	302.2	2.73	0.6	3411	Dense, Sand to silty sand	42-46	60-80				49 - 74	40 - 60

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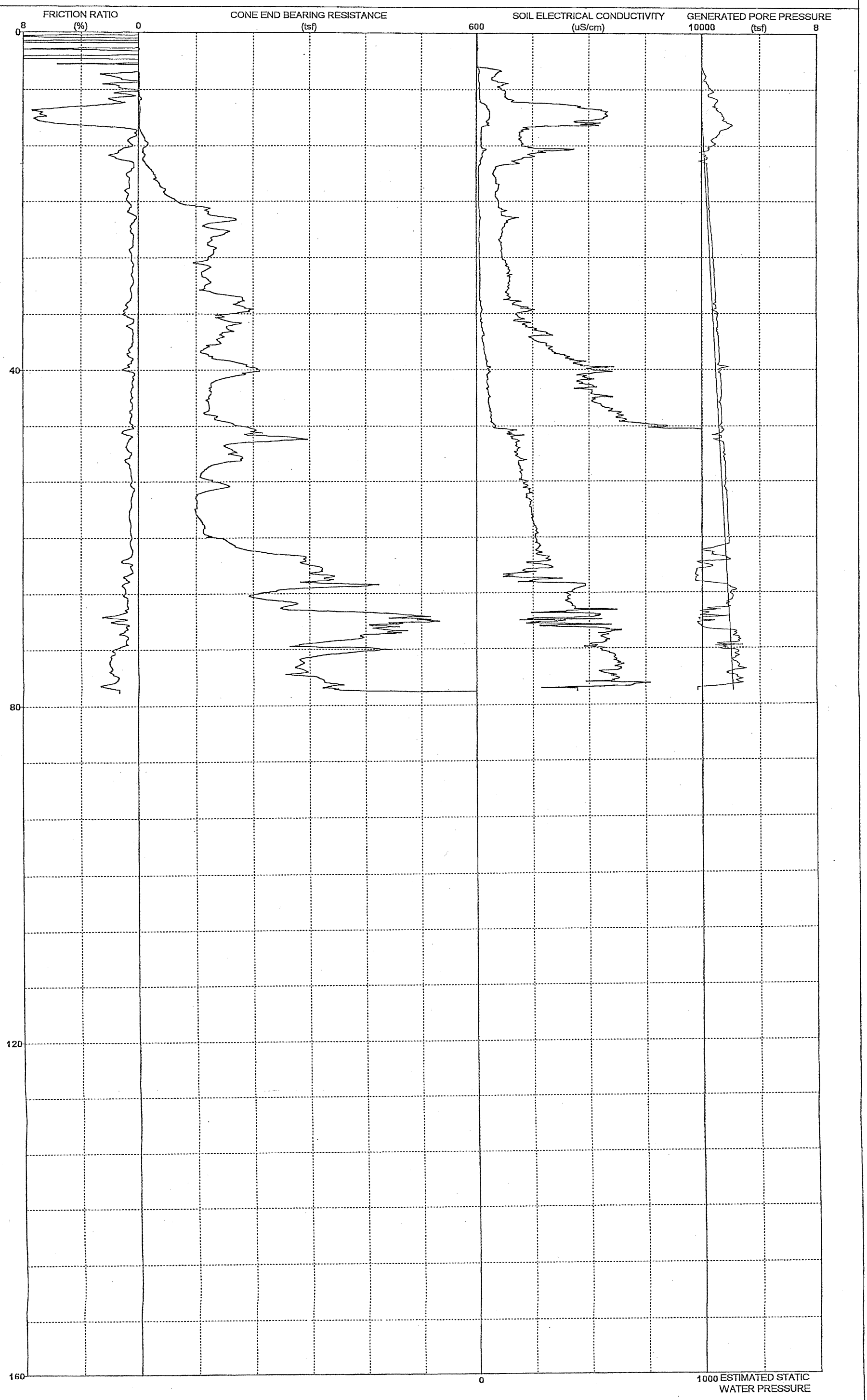
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	Prepunched To 20.70'												
1.5	Prepunched To 20.70'												
2.0	Prepunched To 20.70'												
2.5	Prepunched To 20.70'												
3.0	Prepunched To 20.70'												
3.5	Prepunched To 20.70'												
4.0	Prepunched To 20.70'												
4.5	Prepunched To 20.70'												
5.0	Prepunched To 20.70'												
5.5	Prepunched To 20.70'												
6.0	Prepunched To 20.70'												
6.5	Prepunched To 20.70'												
7.0	Prepunched To 20.70'												
7.5	Prepunched To 20.70'												
8.0	Prepunched To 20.70'												
8.5	Prepunched To 20.70'												
9.0	Prepunched To 20.70'												
9.5	Prepunched To 20.70'												
10.0	Prepunched To 20.70'												
10.5	Prepunched To 20.70'												
11.0	Prepunched To 20.70'												
11.5	Prepunched To 20.70'												
12.0	Prepunched To 20.70'												
12.5	Prepunched To 20.70'												
13.0	Prepunched To 20.70'												
13.5	Prepunched To 20.70'												
14.0	Prepunched To 20.70'												
14.5	Prepunched To 20.70'												
15.0	Prepunched To 20.70'												
15.5	Prepunched To 20.70'												
16.0	Prepunched To 20.70'												
16.5	Prepunched To 20.70'												
17.0	Prepunched To 20.70'												
17.5	Prepunched To 20.70'												
18.0	Prepunched To 20.70'												
18.5	Prepunched To 20.70'												
19.0	Prepunched To 20.70'												
19.5	Prepunched To 20.70'												
20.0	Prepunched To 20.70'												
20.5	Prepunched To 20.70'												
21.0	117.1	123.9	0.77	0.6	118	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
21.5	122.3	129.0	0.54	0.4	111	Med dense, Sand to silty sand	40-42	40-60				19 - 28	20 - 30
22.0	168.9	177.4	0.24	0.2	165	Med dense, Sa gravel to gr sand	42-46	40-60				29 - 38	30 - 40
22.5	132.5	138.6	0.68	0.4	136	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
23.0	116.5	121.5	0.77	0.6	123	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30
23.5	158.1	164.2	0.86	0.6	115	Med dense, Sand to silty sand	42-46	40-60				29 - 39	30 - 40
24.0	142.7	147.7	0.52	0.3	113	Med dense, Sand to silty sand	42-46	40-60				19 - 29	20 - 30
24.5	127.6	131.6	0.47	0.4	100	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30
25.0	120.6	123.9	0.48	0.4	110	Med dense, Sand to silty sand	40-42	40-60				19 - 29	20 - 30

Notes:

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	135.2	138.5	0.62	0.5	112	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
26.0	130.6	133.3	0.72	0.5	110	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
26.5	124.7	126.9	0.62	0.5	113	Med dense, Sand to silty sand	40-42	40-60				20 - 29	20 - 30
27.0	117.2	118.9	0.63	0.5	128	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
27.5	112.0	113.2	0.38	0.3	136	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
28.0	121.3	122.2	0.52	0.4	142	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
28.5	109.3	109.7	0.54	0.5	141	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
29.0	114.6	114.7	0.49	0.4	149	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
29.5	124.6	124.3	0.43	0.3	148	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
30.0	115.7	115.1	0.58	0.5	145	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
30.5	109.1	108.2	0.69	0.5	138	Med dense, Sand to silty sand	40-42	40-60				20 - 30	20 - 30
31.0	140.1	138.5	0.80	0.5	142	Med dense, Sand to silty sand	42-46	40-60				20 - 30	20 - 30
31.5	181.1	178.5	0.93	0.5	150	Med dense, Sand to silty sand	42-46	40-60				30 - 41	30 - 40
32.0	176.2	173.1	1.38	0.8	171	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
32.5	183.7	180.0	1.40	0.8	203	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
33.0	192.8	188.3	2.04	1.0	237	Dense, Sand to silty sand	42-46	60-80				41 - 61	40 - 60
33.5	139.8	136.2	1.45	0.9	182	Med dense, Sand to silty sand	40-42	40-60				31 - 41	30 - 40
34.0	145.6	141.4	0.49	0.3	213	Med dense, Sand to silty sand	42-46	40-60				21 - 31	20 - 30
34.5	175.5	170.0	0.82	0.5	212	Med dense, Sand to silty sand	42-46	40-60				31 - 41	30 - 40
35.0	154.9	149.6	0.87	0.5	245	Med dense, Sand to silty sand	42-46	40-60				31 - 41	30 - 40
35.5	149.4	143.9	0.57	0.4	303	Med dense, Sand to silty sand	42-46	40-60				21 - 31	20 - 30
36.0	149.0	143.1	0.59	0.4	246	Med dense, Sand to silty sand	42-46	40-60				21 - 31	20 - 30
36.5	138.5	132.7	0.51	0.4	261	Med dense, Sand to silty sand	42-46	40-60				21 - 31	20 - 30
37.0	130.3	124.5	0.59	0.4	311	Med dense, Sand to silty sand	40-42	40-60				21 - 31	20 - 30
37.5	114.1	108.8	0.82	0.7	323	Med dense, Sand to silty sand	40-42	40-60				21 - 31	20 - 30
38.0	113.4	107.8	1.01	0.8	350	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
38.5	128.7	122.0	0.77	0.5	414	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
39.0	164.0	155.1	1.00	0.5	454	Med dense, Sand to silty sand	42-46	40-60				32 - 42	30 - 40
39.5	188.3	177.5	1.22	0.7	468	Med dense, Sand to silty sand	42-46	40-60				42 - 64	40 - 60
40.0	210.2	197.7	2.26	1.1	512	Dense, Sand to silty sand	42-46	60-80				43 - 64	40 - 60
40.5	186.6	175.1	0.53	0.3	515	Med dense, Sand to silty sand	42-46	40-60				32 - 43	30 - 40
41.0	149.6	140.0	0.60	0.4	486	Med dense, Sand to silty sand	42-46	40-60				21 - 32	20 - 30
41.5	128.1	119.6	0.62	0.5	459	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
42.0	126.5	117.8	0.48	0.4	523	Med dense, Sand to silty sand	40-42	40-60				21 - 32	20 - 30
42.5	124.1	115.3	0.68	0.5	514	Med dense, Sand to silty sand	40-42	40-60				22 - 32	20 - 30
43.0	124.4	115.3	0.66	0.5	530	Med dense, Sand to silty sand	40-42	40-60				22 - 32	20 - 30
43.5	119.8	110.7	0.73	0.6	527	Med dense, Sand to silty sand	40-42	40-60				22 - 32	20 - 30
44.0	122.6	113.1	0.52	0.4	548	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
44.5	123.7	113.8	0.52	0.4	587	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
45.0	115.6	106.1	0.74	0.6	644	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
45.5	137.3	125.7	0.67	0.5	636	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
46.0	142.9	130.5	0.92	0.6	653	Med dense, Sand to silty sand	40-42	40-60				22 - 33	20 - 30
46.5	167.1	152.3	0.70	0.4	795	Med dense, Sand to silty sand	42-46	40-60				33 - 44	30 - 40
47.0	199.8	181.7	0.88	0.5	969	Med dense, Sand to silty sand	42-46	40-60				33 - 44	30 - 40
47.5	211.3	191.7	2.56	1.1	1512	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
48.0	261.9	237.0	1.16	0.4	1553	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
48.5	232.3	209.8	1.94	0.7	1877	Dense, Sand to silty sand	42-46	60-80				44 - 66	40 - 60
49.0	149.5	134.7	1.42	0.8	1744	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
49.5	162.2	145.9	1.31	0.8	1797	Med dense, Sand to silty sand	40-42	40-60				33 - 44	30 - 40
50.0	158.7	142.4	0.79	0.5	1791	Med dense, Sand to silty sand	42-46	40-60				22 - 33	20 - 30

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STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
50.5	182.1	163.0	1.12	0.6	1909	Med dense, Sand to silty sand	42-46	40-60				34 - 45	30 - 40
51.0	153.7	137.3	1.57	0.9	1845	Med dense, Sand to silty sand	40-42	40-60				34 - 45	30 - 40
51.5	124.1	110.7	0.87	0.6	1920	Med dense, Sand to silty sand	40-42	40-60				22 - 34	20 - 30
52.0	114.4	101.8	0.64	0.5	2027	Med dense, Sand to silty sand	40-42	40-60				22 - 34	20 - 30
52.5	108.3	96.2	0.59	0.5	2001	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
53.0	116.5	103.2	0.65	0.5	1971	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
53.5	144.7	127.9	0.83	0.5	2111	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
54.0	152.5	134.5	0.67	0.4	2129	Med dense, Sand to silty sand	40-42	40-60				23 - 34	20 - 30
54.5	117.1	103.1	0.49	0.4	2359	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
55.0	100.5	88.3	0.49	0.5	2249	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
55.5	100.6	88.2	0.54	0.5	2376	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
56.0	101.1	88.4	0.51	0.5	2416	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
56.5	101.3	88.5	0.56	0.6	2432	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
57.0	99.5	86.7	0.66	0.7	2433	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
57.5	102.8	89.4	0.70	0.7	2509	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
58.0	108.9	94.5	0.67	0.6	2503	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
58.5	113.5	98.3	0.62	0.5	2548	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
59.0	112.6	97.3	0.66	0.6	2673	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
59.5	114.0	98.3	0.67	0.5	2734	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
60.0	138.0	118.8	0.72	0.5	2622	Med dense, Sand to silty sand	40-42	40-60				17 - 23	15 - 20
60.5	156.6	134.6	0.95	0.6	2672	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
61.0	168.3	144.4	0.96	0.5	2840	Med dense, Sand to silty sand	40-42	40-60				23 - 35	20 - 30
61.5	195.9	167.7	0.89	0.4	2633	Med dense, Sand to silty sand	42-46	40-60				35 - 47	30 - 40
62.0	256.4	219.1	1.38	0.5	2656	Dense, Sand to silty sand	42-46	40-60				35 - 47	30 - 40
62.5	290.0	247.4	2.52	0.9	3123	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
63.0	286.4	243.9	1.85	0.7	2243	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
63.5	319.3	271.4	1.82	0.6	3354	Dense, Sand to silty sand	42-46	60-80				47 - 70	40 - 60
64.0	321.8	272.9	1.26	0.4	2056	Dense, Sa gravel to gr sand	42-46	60-80				47 - 71	40 - 60
64.5	341.5	289.2	2.98	0.9	1555	Dense, Sand to silty sand	+46	60-80				47 - 71	40 - 60
65.0	340.1	287.5	2.73	0.8	3426	Dense, Sand to silty sand	42-46	60-80				71 - 117	60 - 99
65.5	365.2	308.1	3.86	1.0	4250	Dense, Sand to silty sand	42-46	60-80				71 - 117	60 - 99
66.0	297.9	250.9	3.60	1.0	4625	Dense, Sand to silty sand	42-46	60-80				71 - 117	60 - 99
66.5	224.0	188.3	2.22	0.9	4258	Dense, Sand to silty sand	42-46	60-80				47 - 71	40 - 60
67.0	194.4	163.1	1.96	0.9	4129	Dense, Sand to silty sand	42-46	60-80				48 - 71	40 - 60
67.5	240.8	201.7	1.96	0.8	4066	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
68.0	271.1	226.7	2.12	0.8	4246	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
68.5	254.8	212.7	3.03	0.9	4384	Dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
69.0	433.3	361.0	5.66	1.2	2726	V dense, Sand to silty sand	42-46	60-80				48 - 72	40 - 60
69.5	476.0	395.9	11.25	2.0	5274	V dense, Sa gravel to si gr sand	42-46	80-100				+ 120	+ 100
70.0	532.5	442.1	9.01	1.9	3948	V dense, Sa gravel to si gr sand	40-42	+100				+ 120	+ 100
70.5	419.7	347.9	3.88	0.8	5185	Dense, Sand to silty sand	42-46	+100				+ 120	+ 100
71.0	440.1	364.1	4.17	0.9	5843	V dense, Sand to silty sand	42-46	60-80				72 - 119	60 - 99
71.5	435.5	359.8	5.61	1.2	5539	V dense, Sand to silty sand	42-46	80-100				73 - 120	60 - 99
72.0	394.2	325.1	2.80	0.7	5623	Dense, Sand to silty sand	42-46	80-100				+ 121	+ 100
72.5	323.1	266.0	3.06	0.8	5775	Dense, Sand to silty sand	42-46	60-80				73 - 120	60 - 99
73.0	283.8	233.2	4.96	1.3	5329	Dense, Sand to silty sand	42-46	60-80				49 - 73	40 - 60
73.5	418.7	343.5	7.21	1.8	5570	V dense, Sa gravel to si gr sand	42-46	60-80				73 - 120	60 - 99
74.0	328.6	269.1	6.81	1.8	6073	V dense, Sa gravel to si gr sand	42-46	+100				+ 122	+ 100
74.5	284.6	232.7	5.87	1.9	6171	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 122	+ 100
75.0	289.3	236.1	5.71	2.0	6329	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 122	+ 100
							40-42	80-100				+ 123	+ 100

Notes:

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS
PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050
R2DATE: 5-12-1999 TIME:07:46:56.12
SOUNDING NUMBER:cp-9911

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
75.5	276.3	225.2	5.28	1.8	6227	V dense, Sand to silty sand	40-42	80-100				74 - 121	60 - 99
76.0	296.6	241.3	5.97	2.0	5572	V dense, Gr si sand to cl gr sand	40-42	80-100				+ 123	+ 100
76.5	294.7	239.4	4.61	1.5	6217	V dense, Sand to silty sand	42-46	80-100				74 - 122	60 - 99
77.0	325.1	263.6	5.02	1.5	6232	V dense, Sand to silty sand	42-46	80-100				74 - 122	60 - 99
77.5	356.4	288.5	8.76	2.5	7472	V dense, Gr si sand to cl gr sand	37-40	+100				+ 124	+ 100
78.0	349.3	282.3	5.71	1.4	3148	V dense, Sand to silty sand	42-46	80-100				+ 124	+ 100

Notes:

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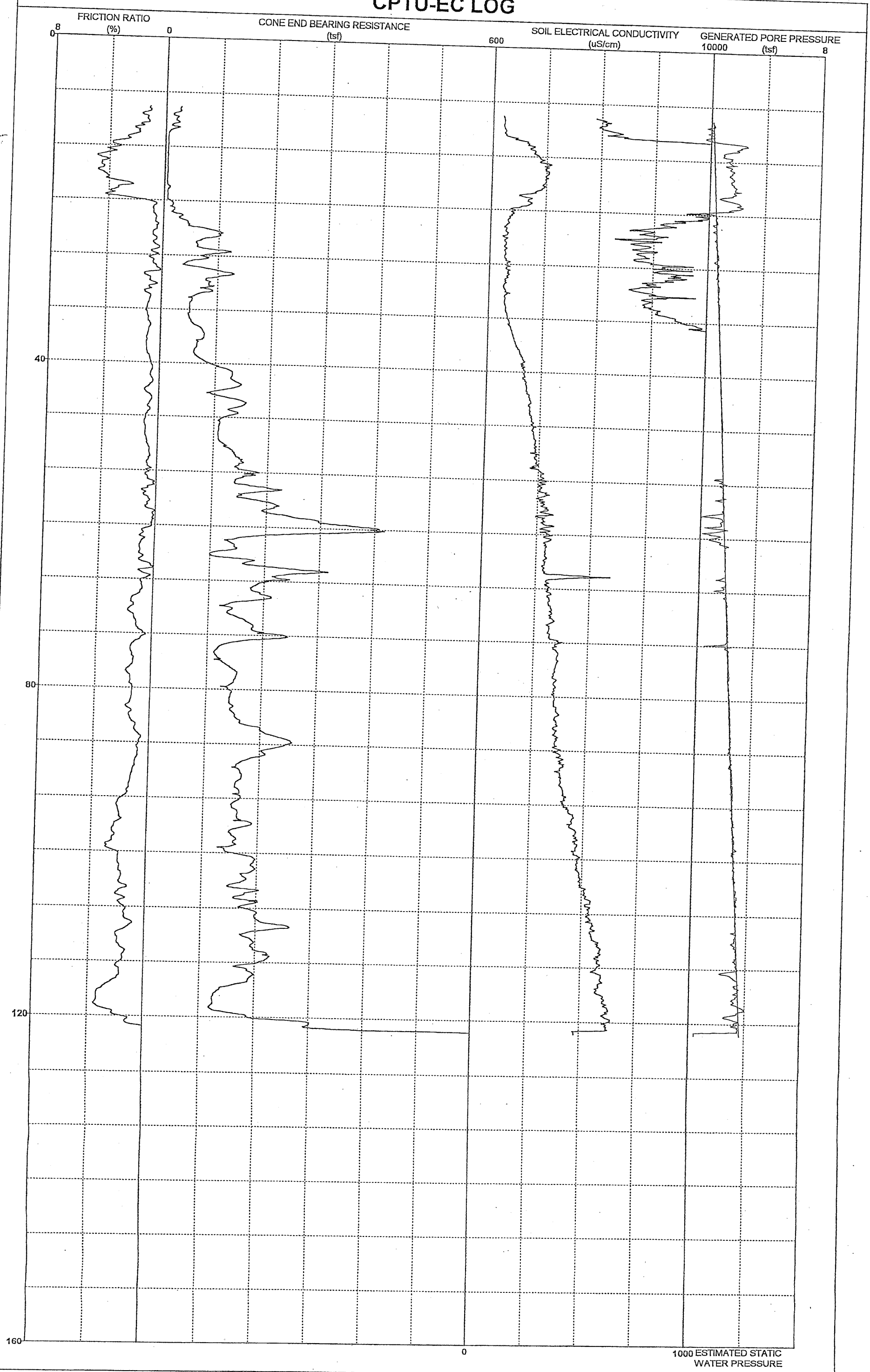
CPTU-EC LOG



PROJECT NAME:Stratford Army Engine Plant
PROJECT NUMBER:99-120-050

STRATIGRAPHICS

R2DATE: 5-10-1999 TIME:13:53:20.59
SOUNDING NUMBER:CP-9912