N00236.000887
ALAMEDA POINT
SSIC NO. 5090.3

CLEAN

Contract No. N62474-88-D-5086

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Navy Remedial Project Managers: Gary J. Munekawa and George Kikugawa
PRC Installation Coordinator: Duane Balch
Montgomery Watson Remedial Project Manager: Kenneth Leung

NAVAL AIR STATION, ALAMEDA
ALAMEDA, CALIFORNIA

DATA SUMMARY REPORT
RI/FS PHASES 1 AND 2A

VOLUME II

APPENDICES A THROUGH D

FINAL

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FINAL DATA SUMMARY REPORT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PHASE 1 AND 2A

DATED 25 AUGUST 1993

THIS RECORD CONTAINS MULTIPLE VOLUMES
WHICH HAVE BEEN ENTERED SEPARATELY

VOLUME I OF II IS ENTERED IN THE DATABASE
AND FILED AT ADMINISTRATIVE RECORD NO.
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Appendix A

APPENDIX A

REFERENCES

Atwater, B.F., C.W. Hedel, and E.J. Helley, 1977. "Late Quaternary Depositional History, Holocene Sea-Level Changes, and Vertical Crustal Movement, Southern San Francisco Bay, California." U.S. Geological Survey (USGS) Professional Paper 1014.

California Department of Health Services (DHS), 1986. "The California Site Mitigation Decision Tree Manual," Toxic Substances Control Division.

California DHS, 1988. Notice of Remedial Action Order, Health and Safety Code Section (s) 205, 206, 25220, 25355.5 (a) (1) (B), Docket No. HSA 88/89-051, letter dated June 30, 1988.

California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) 1983. Order No. 83-35, Closure Requirements for U.S. Navy, Alameda Naval Air Station Class II, Solid Waste Disposal Site, Alameda and San Francisco Counties, File No. 2199.9080 (RAS) ej, letter dated September 28, 1983.

California RWQCB, 1986. "San Francisco Bay Basin, Region 2 Water Quality Control Plan, San Francisco Basin, California," December 1986.

California State Water Resources Control Board (SWRCB), 1988a. "Adoption of Policy Entitled Sources of Drinking Water," Resolution No. 88-63, adopted at State Water Resources Control Board Meeting, May 19, 1988.

California SWRCB, 1988b. "Technical Guidance Manual, Solid Waste Water Quality Assessment Test (SWAT), Proposals and Reports," Prepared by the Solid Waste Disposal Program, Hydrogeology Section, Land Disposal Branch, Division of Water Quality, p. 60, August 1988.

California SWRCB, 1989. "Leaking Underground Fuel Tank Field Manual." Leaking Underground Fuel Tank Task Force.

Canonie Environmental Services, Inc. (Canonie), 1988. Air Sampling Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Volume 1B. Prepared for NAVY-WESTDIV, December 16, 1988.

Canonie, 1989a. Community Relations Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 4. Prepared for NAVY-WESTDIV, February 15, 1989.

Canonie, 1989b. Project Management Plan/Schedule, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Volume 5. Prepared for NAVY-WESTDIV, March 2, 1989.

Canonie, 1989c. Data Management Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 6. Prepared for NAVY-WESTDIV, May 19, 1989.

Canonie, 1989d. Public Health and Environmental Evaluation Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 7. Prepared for NAVY-WESTDIV, June, 1989.

Canonie, 1989e. Health and Safety Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 2. Prepared for NAVY-WESTDIV, November 29, 1989.

Canonie, 1990a. Feasibility Study Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 8. Prepared for NAVY-WESTDIV, January 31, 1990.

Canonie, 1990b. Quality Assurance Project Plan (QAPP), Quality Assurance/Quality Control Plan (QA/QC), Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 3. Prepared for NAVY-WESTDIV, February 6, 1990.

Canonie, 1990c. Sampling Plan, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 1. Prepared for NAVY-WESTDIV, February 12, 1990.

Canonie, 1990d. Sampling Plan, Solid Waste Assessment Test (SWAT) Proposal Addendum, Remedial Investigation/Feasibility Study (RI/FS), Naval Air Station (NAS) Alameda, California, Vol. 1A. Prepared for NAVY-WESTDIV, February 22, 1990.

Cristi, M.B., 1973. "Short Study of Future Use of the Sanitary Dump Area," internal report by U.S. Navy staff, March 19, 1973.

Dragun, J., 1988. "The Soil Chemistry of Hazardous Materials." The Hazardous Materials Control Research Institute, Silver Spring, Maryland.

Driscoll, F.G., 1987. Groundwater and Wells, Second Edition. Johnson Division, St. Paul, Minnesota.

Ecology and Environment, Inc. (E&E), 1983. "Initial Assessment Study Naval Air Station," Alameda, California. Prepared for Navy Assessment and Control of Installation Pollutants (NACIP) and Naval Energy and Environmental Support Activity (NEESA), April 1983.

Eisenbud, Merril, 1987. Environmental Radioactivity. Academic Press, San Diego.

Environmental Research Group, Inc. (ERG), 1982. "Revised Report." Prepared for Navy PWC, September 17, 1982.

ERG, 1983. "Report #2341." Prepared for PWC, August 23, 1983.

Freeze, R.A., and John Cherry, 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York, New York, p. 320.

Hall, N. T., 1965. "Petrology of the Type Merced Group, San Francisco Peninsula, California:" M.S. thesis in Geology, University of California at Berkeley, p. 116.

Harding Lawson Associates (HLA), 1978. "Final Submittal, Sanitary Landfill Site Study, Naval Air Station, Alameda, California," report prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, March 1, 1978.

HLA, 1980a. "Draft Sanitary Landfill Closure Plan, Naval Air Station Alameda, California," report prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, May 30, 1980.

HLA, 1980b. "Basis of Design for Solid Waste, Naval Air Station Alameda, California," report prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, November 20, 1980.

HLA, 1982. "Solid Waste Disposal System, P-183, Naval Air Station Alameda, California," 10 sheets, plans and construction details, prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, February 5, 1982.

HLA, 1983. "Confirmation Study, Sanitary Landfill, Naval Air Station Alameda, California," report prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, October 19, 1983.

HLA, 1986. "As Built Drawings of West Beach Landfill, Naval Air Station Alameda, California," drawings prepared for Commanding Officer, Western Division, Naval Facilities Engineering Command, March 28, 1986.

Hickman, John, 1992. Personal communication, Radiologic Health Branch, California Department of Health Services, Sacramento, California.

Kennedy Engineers (Kennedy), 1980. Final Report Subsurface Fuel Contamination Study, Naval Air Station Alameda, California, Prepared for U.S. Navy, Contract N62474-79-C-5320, January 1980.

Leuaggi, D.A. and W. Siu, 1991. "Gaseous Toxics Monitoring in the San Francisco Bay Area: A Review and Assessment of Four Years of Data," Technical Division, Bay Area Air Quality Management District (BAAQMD), San Francisco, California, June 1991.

Miesch, A.T., 1967. Methods of Computation for Estimating Geochemical Abundance: U.S. Geological Survey Professional Paper 574-B.

National Institute for Occupational Safety and Health (NIOSH), 1984. "NIOSH Manual of Analytical Methods, Third Edition," February 1984.

NAVY-WESTDIV, 1990. Scope of Work for Phase 1 Sites at NAS Alameda, Alameda, California, Contract No. N62474-85-5620, Delivery Order No. 0009 (Canonie), prepared by Bella Dizon.

Pacific Aerial Surveys. Aerial Photo, ALA-C19L-18, November 18, 1930; Aerial Photo, AAP-2-9, February 25, 1938; Aerial Photo, AAP-2-14, February 18, 1939; Aerial Photo, AV-11-08-06, March 24, 1947; Aerial Photo, AV-28-9-33, September 6, 1949; Aerial Photo, AV-119-7-28, August 14, 1953; Aerial Photo, AV-253-06-23, May 3, 1957; Aerial Photo, AV 902-03-07, May 19, 1969; Aerial Photo, AV 1100-03-05, April 30, 1973; Aerial Photo, AV 1750-03-3, September 14, 1979; Aerial Photo, AV 2300-03-03, June 21, 1983; Aerial Photo, AV 2640-03-04, May 15, 1985; Aerial Photo, AV 3268-03-06, March 30, 1988.

PRC, 1991. Hydrogeology and Proposed Changes for Phase 5 of the RI/FS, Naval Air Station, Alameda, California, March 14, 1991.

PRC/James M. Montgomery Engineers, Inc. (PRC/JMM), 1990. NAS Alameda, Alameda, California, Work Plan, RI/FS Phases 5 and 6 Solid Waste Water Assessment Test (SWAT). Prepared for NAVY-WESTDIV, November 21, 1990.

PRC/JMM, 1991a. NAS Alameda, Alameda, California, Work Plan, RI/FS Phases 2B and 3. Prepared for NAVY-WESTDIV, February 15, 1991.

PRC/JMM, 1991b. NAS Alameda, Alameda, California, Addendum to Sampling Plan and Quality Assurance Project Plan, RI/FS Phases 5 and 6 Solid Waste Water Quality Assessment Test (SWAT). Prepared for NAVY-WESTDIV, April, 1991.

PRC/JMM, 1992a. NAS Alameda, Alameda, California, Data Summary Report RI/FS Phases 2B and 3, Final. Prepared for NAVY-WESTDIV, October 1992.

PRC/JMM, 1992b. NAS Alameda, Final Intermediate Maintenance Facility Field Investigation Report. Prepared for Navy-WESTDIV, June 1992.

PRC/JMM, 1992c. Data Summary Report, Background and Tidal Influence Studies and Additional Work at Sites 4 and 5, Draft Final. Prepared for Navy-WESTDIV, August 1992.

PRC/Montgomery Watson, 1993a. NAS Alameda, Alameda, California, Follow-on Field Sampling Plan for Follow-on Work, RI/FS Phases 2B and 3, Draft. Prepared for Navy-WESTDIV, April 2, 1993.

PRC/Montgomery Watson, 1993b. NAS Alameda, Alameda, California, Field Sampling Plan for Follow-on Work, RI/FS Phases 5 and 6 - Landfill Investigation, Draft. Prepared for Navy-WESTDIV, April 2, 1993.

PRC/Montgomery Watson, 1993c. NAS Alameda, Alameda, California, Solid Waste Water Quality Assessment Test (SWAT) Data Summary Report for RI/FS Phases 5 and 6, Final. Prepared for Navy-WESTDIV, April 30, 1993.

Radbruch, Dorothy H., 1957. "Areal and Engineering Geology of the Oakland West Quadrangle, California." Miscellaneous Geologic Investigations MAP I-239. U.S. Geological Survey (USGS).

Rogers, J.D., and Figuers, S.H., 1991. "Engineering Geologic Site Characterization of the Greater Oakland-Alameda Area, Alameda and San Francisco Counties, California," Final Report to National Science Foundation, Grant No. BCS-9003785.

Taylor, J.K., 1990. "Statistical Techniques for Data Analysis," Lewis Publishers, Chelsea, Michigan, pp. 70-73.

Trask, P.D., and J.W. Rolston, 1951. "Engineering Geology of San Francisco Bay, California," Geological Society of America Bulletin, Vol. 62, No. 9, pp. 1079-1110.

Treasher, R.C., 1963. "Geology of the Sedimentary Deposits in San Francisco Bay, California," CDMG Special Report 82, pp. 11-24.

U.S. Coast and Geodetic Survey (USCGS), 1859. Map of Entrance to the San Francisco Bay, California.

USCGS, 1937. San Francisco Bay, Candlestick Point to Angel Island.

USCGS, 1942. San Francisco Bay, Candlestick Point to Angel Island.

U.S. Environmental Protection Agency (EPA), 1984. "Characterization of Hazardous Waste Sites - A Methods Manual," Vol. II, EPA-600/4-84/075.

U.S. EPA, 1986a. "Quality Criteria for Water 1986," EPA 440/5-86-001, May 1, 1986.

U.S. EPA, 1986b. "Test Methods for Evaluating Solid Waste," Vol. 1C: Laboratory Manual, Physical/Chemical Methods.

U.S. EPA, 1986c. "Superfund Public Health Evaluation Manual (SPHEM)," October 1986.

U.S. EPA, 1988a. "Laboratory Data Validation, Functional Guidelines for Evaluating Inorganic Analyses," prepared for the Hazardous Site Evaluation Division of the EPA, July 1, 1988.

U.S. EPA, 1988b. "Laboratory Data Validation, Functional Guidelines for Evaluating Organic Analyses," prepared for the Hazardous Site Evaluation Division of the EPA, February 1, 1988.

U.S. EPA, 1988c. "Statement of Work for Inorganic Analysis, Multi-media, Multi-concentration," USEPA Contract Laboratory Program (CLP).

U.S. EPA, 1988d. "Statement of Work for Organic Analysis, Multi-media, Multi-concentration." USEPA CLP.

U.S. EPA, 1988e. "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," OSWER Directive 9335.3-01 draft, March, 1988.

U.S. EPA, 1988f. CERCLA Compliance with Other Laws Manual (Interim Final), Office of Emergency and Remedial Response, Washington, D.C., EPA/540/G89/006, August 8, 1988.

U.S. EPA, 1989. "Risk Assessment Guidance for Superfund Volume 1," Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989.

U.S. EPA, 1990a. "Test Methods for Evaluating Solid Waste," Vol. 1B: "Laboratory Manual Physical/Chemical Methods," EPA OSWER SW-846.

U.S. EPA, 1990b. "Guidance on Remedial Actions for Superfund Sites with PCB Contamination," EPA/540/G-90/007, August 1990.

U.S. EPA, 1991. "Drinking Water Standards and Health Advisory Table," Public Water Supply Section, Drinking Water and Groundwater Protection Branch, August 1991.

U.S. EPA Region 9, 1989. Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects, Quality Assurance Management Section Environmental Services Branch Office of Policy and Management, Document Control No. 9QA-03-89, September 1989.

U.S. Geological Survey (USGS), 1899. Map of San Francisco Bay.

USGS, 1989. "Water Resources Data, California, Water Year 1988, Volume 2, Pacific Slope from Arroyo Grande to Oregon State Line except Central Valley", April 1989.

Wahler Associates (Wahler), 1985. "Draft Report, Verification Step, Confirmation Study." Prepared for Western Division Naval Facilities Engineering Command, May 1985.

Wahler, 1986. "Confirmation Study (Characterization Step), Work Plan for Naval Air Station, Alameda, California," draft report prepared for Western Division Naval Facilities Engineering Command, February 1986.

Wong, Jeffrey, 1992. Personal communication, Radiologic Health Branch, California Department of Health Services, Berkeley, California.

Appendix B

APPENDIX ~~A~~ B

SHALLOW SOIL GAS INVESTIGATION
ALAMEDA NAVAL AIR STATION
ALAMEDA, CALIFORNIA

Canonie Environmental

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INTRODUCTION

A shallow soil gas investigation was performed by Tracer Research Corporation (TRC) at the Alameda Naval Air Station located in Alameda, California. The investigation was conducted from June 18 to 26, 1990 under contract to Canonie Environmental. The purpose of the investigation to determine the nature and extent of volatile organic compounds (VOCs) present in the subsurface.

During this survey, a total of 183 soil gas samples were collected and analyzed in the field. The analytical equipment was calibrated for the following compounds:

benzene
toluene
ethyl benzene
xylenes
total hydrocarbons (THC)

Xylenes are reported as the total of the three xylene isomers and total hydrocarbons are reported as gasoline range constituents consisting of C4-C9 aliphatic, alicyclic and aromatic compounds.

The compounds in this suite were chosen as target compounds based on their suspected presence in the subsurface and their amenability to soil gas detection. Soil gas samples were screened on the flame ionization detector (FID).

SHALLOW SOIL GAS INVESTIGATION - METHODOLOGY

Shallow soil gas investigation refers to a method developed by TRC for investigating underground contamination from volatile organic chemicals (VOCs) such as industrial solvents, cleaning fluids and petroleum products by looking for their vapors in the shallow soil gas. The method involves pumping a small amount of soil gas out of the ground through a hollow probe driven into the ground and analyzing the gas for the presence of volatile contaminants. The presence of VOCs in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large data base. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

Soil gas contaminant mapping helps to reduce the time and cost required to delineate underground contamination by volatile contaminants. The soil gas investigation does this by outlining the general areal extent of contamination. Conventional bore holes or observation wells are used to verify both the presence and extent of the subsurface contamination as indicated in the soil gas survey. In this manner, soil gas contaminant mapping can assist in determining the placement of monitoring wells. Thus, the likelihood

of drilling unnecessary monitoring wells is reduced. The soil gas survey is not intended to be a substitute for conventional methodology, but rather to enable conventional methods to be used efficiently.

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical field van that was equipped with one gas chromatograph and two Spectra Physics SP4270 computing integrators. In addition, the van has two built-in gasoline powered generators which provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

SAMPLING PROCEDURES

Sampling probes consisted of 7 foot lengths of 3/4 inch diameter hollow steel pipe that were fitted with detachable drive tips. Soil gas probes were advanced to 2-6 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump.

To adequately purge the volume of air within the probe, 2 to 5 liters of gas was evacuated with a vacuum pump. During the soil gas evacuation, samples were collected in a glass syringe by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the TRC analytical field van. Soil gas was subsampled (duplicate injections) in volumes ranging from 1 uL to 2 mL, depending on the VOC concentration at any particular location.

Sample probe vacuum pressures measured with a vacuum gauge ranged from 2 to 15 inches Hg. Maximum vacuum pump pressure was measured at twenty-six inches Hg.

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID), was used for the soil gas analyses. The FID was used for the analysis of benzene, toluene, ethyl benzene, xylenes and total hydrocarbons. Separation of the FID compounds was achieved on a 6' by 1/8" OD packed column with OV-101 as the stationary phase. The column was contained in a temperature controlled oven and nitrogen was used as the carrier gas.

Volatiles detected in soil gas were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day and system blanks were run at the beginning of the day to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

Detection limits for the compounds of interest are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the analytical equipment. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses.

The detection limits range down to approximately 0.04 ug/L for those compounds screened on the FID depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.04 ug/L). Detection limits obtained from GC analyses are calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility for cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (TRC's patented design) are used to connect the sample probe to the vacuum pump. The adaptor is designed to eliminate the possibility of exposing the sample stream to any part of the adaptor. Associated tubing connecting the adaptor to the vacuum pump is replaced periodically as needed during the job to insure cleanliness and good fit. At the end of the each day the adaptor is cleaned with soap and water and baked in the GC oven.
- Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.
- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Injector port septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.
- Analytical instruments were calibrated each day by analytical standards from Chem Service, Inc. Calibration checks are also run after approximately every five soil gas sampling locations.
- 2 cc subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.

- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis.
- All sampling and 2 cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.
- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A reliable gas sample can be obtained if the negative pressure reading on the vacuum pump is at least 2 inches Hg less than the maximum pump capacity.

APPENDIX A: CONDENSED DATA

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S
06-18-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.05	<0.06	<0.08	<0.06
A1-2'	<0.04	<0.05	<0.06	<0.08	<0.06
E1-3'	<0.04	<0.05	<0.06	<0.08	<0.06
F1-2'	<0.04	<0.05	<0.06	<0.08	<0.06
G1-4'	0.09	0.2	0.5	<0.08	1
I1-4'	<0.04	<0.05	<0.06	<0.08	0.1
J1-5'	3200	2600	88	300	14000
K1-5'	<0.04	<0.05	<0.06	<0.08	<0.06
K2-5'	<0.04	<0.05	<0.06	<0.08	<0.06
J2-5'	<0.04	<0.05	<0.06	<0.08	<0.06
I2-4'	<0.04	<0.05	<0.06	<0.08	<0.06
H2-5'	0.04	<0.05	<0.06	<0.08	0.2
G2-5'	0.2	<0.05	<0.06	<0.08	0.4
F2-5'	<0.04	<0.05	<0.06	<0.08	0.2
E2-4'	<0.04	<0.05	<0.06	<0.08	<0.06
D2-5'	0.09	<0.05	<0.06	<0.08	0.4
C2-4'	<0.04	<0.05	<0.06	<0.08	<0.06
A2-4'	<0.04	<0.05	<0.06	<0.08	<0.06
B2-4'	<0.04	<0.05	<0.06	<0.08	<0.06
A3-4'	<0.04	<0.05	<0.06	<0.08	<0.06
B1-4'	<0.04	<0.05	<0.06	<0.08	<0.06
C1-3'	0.3	<0.05	<0.06	<0.08	6
B3-5'	0.2	0.1	<0.06	<0.08	0.8
C3-6'	<0.04	<0.05	<0.06	<0.08	<0.06
D3-5'	0.1	<0.05	<0.06	<0.08	0.6
E3-5'	<0.04	<0.05	<0.06	<0.08	<0.06
AIR	<0.04	<0.05	<0.06	<0.08	<0.06

Analyzed by: G. Heath
Checked by: M. Caldon
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S
06/19/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	0.08	0.09	0.1	<0.07	0.2
H3-6'	0.08	<0.05	<0.06	<0.07	0.1
J3-4'	<0.04	<0.05	<0.06	<0.07	<0.05
K3-5'	<0.04	<0.05	<0.06	<0.07	<0.05
K4-5'	<0.04	<0.05	<0.06	<0.07	<0.05
J4-4'	<0.04	<0.05	<0.06	<0.07	<0.05
I5-4'	<0.04	<0.05	<0.06	<0.07	0.1
H5-5'	0.6	<0.05	<0.06	<0.07	1
H4-5'	0.2	<0.05	<0.06	<0.07	1
I5-5'	2	23	48	100	6900
J5-5'	<0.04	<0.05	<0.06	<0.07	0.4
AIR	<0.04	<0.05	<0.06	<0.07	<0.05
K5-4'	<0.04	<0.05	<0.06	<0.07	<0.05
K7-5'	<0.04	<0.05	<0.06	<0.07	<0.05
K8-5'	<0.04	<0.05	<0.06	<0.07	<0.05
A6-3'	<0.04	<0.05	<0.06	<0.07	<0.05
A7-5'	0.4	0.4	<0.06	<0.07	12
A4-3'	<0.04	<0.05	<0.06	<0.07	<0.05

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S
06/19/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.05	<0.06	<0.07	<0.05
B4-4'	<0.04	<0.05	<0.06	<0.07	<0.05
C4-4'	0.2	0.5	0.06	0.04	8
D5-4'	0.4	<0.05	<0.06	<0.07	4
E5-5'	<0.04	<0.05	<0.05	<0.06	<0.05
E4-4'	<0.04	<0.05	<0.05	<0.06	<0.05
F4-4'	<0.04	<0.05	<0.05	<0.06	<0.05
F5-5'	<0.04	<0.05	<0.05	<0.06	<0.05
F3-4'	0.06	0.07	0.8	2	93
F6-5'	<0.04	<0.05		<0.07	<0.05
H6-5'	<0.04	<0.05	<0.06	<0.07	20
AIR	<0.04	<0.05	<0.06	<0.07	<0.05

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by: _____

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S
6-20-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.05	<0.06	<0.06	<0.05
H-7-5'	<0.04	<0.05	<0.06	<0.06	0.05
G-6-5'	16	4	<0.09	<0.09	60
J-6-5'	<0.04	<0.05	<0.06	<0.06	0.1
J-7-5'	<0.04	<0.05	<0.06	<0.06	<0.05
H-8-5'	0.3	<0.05	<0.06	<0.06	0.4
G-9-3'	<0.04	<0.05	<0.06	<0.06	0.1
H-9-3'	0.2	0.09	<0.06	<0.06	1
G-10-4'	<0.04	<0.05	<0.06	<0.06	<0.05
H-11-4'	0.2	<0.05	<0.06	<0.06	0.3
G-11-5'	0.2	<0.05	<0.06	<0.06	2
H-12-5'	0.04	<0.05	<0.06	<0.06	0.3
H-13-5'	<0.04	<0.05	<0.06	<0.06	<0.05
F-13-3'	<0.04	<0.05	<0.06	<0.06	<0.05
F-14-4'	<0.04	<0.05	<0.06	<0.06	<0.05
F-15-3'	<0.04	<0.05	<0.06	<0.06	<0.05
F-7-5'	<0.04	<0.05	<0.06	<0.06	<0.05
F-8-5'	35000	58000	67	510	350000
E-8-5'	17000	36000	23	310	190000
E-9-5'	14000	35000	21	230	220000
E-10-3'	55	60	<6	<6	1300
E-12-3'	220	520	<6	<6	810
E-13-2'	0.008	0.09	0.1	0.1	0.7
F-11-3'	1	0.76	<0.06	<0.06	19
F-10-4'	0.08	0.09	<0.01	<0.1	1
F-9-4'	1	0.07	<0.06	<0.06	
D-9-3'	<0.8	<0.09	<0.1	<0.1	<0.1
AIR	<0.04	<0.05	<0.06	<0.06	2

Analyzed by: M. Caldon/Checked by: G. Heath
Proofed by

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S
06/21/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHEL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.04	<0.05	<0.06	<0.05
D11-4'	<0.4	48	<0.5	<0.6	1600
D10-3'	<0.04	<0.04	<0.05	<0.06	<0.05
C14-4'	<0.8	<0.09	<1	<1	20000
D14-2'	<0.08	0.2	<0.1	<0.1	24
C13-2'	<0.08	<0.09	<0.1	<0.1	3600
A14-2'	<0.4	<0.4	<0.5	<0.6	6900
A15-4'	<0.3	<0.4	<0.4	<0.4	6700
B15-3'	<0.04	<0.04	<0.05	<0.06	<0.05
A12-6'	<4	<4	<5	<6	54000
A13-2'	<0.08	0.7	<0.1	<0.1	980
B14-2'	<0.4	110	1	10	9000
B13-4'	0.3	0.4	0.1	<0.06	6
B10-3'	0.04	0.04	<0.05	<0.06	0.4
B12-5'	<0.04	<0.04	<0.05	<0.06	<0.05
B9-5'	22000	24000	<50	<57	248000
B6-5'	2	12	<0.05	<0.06	34
B5-5'	0.3	0.2	<0.05	<0.06	8
B11-5'	<0.04	3	<0.05	<0.06	7
B8-5'	9150	23626	<50	<57	200000
B7-5'	8900	22000	<50	<57	190000
H10-4'	<0.04	<0.04	<0.05	<0.06	<0.05
C12-3'	<0.04	<0.04	<0.05	<0.06	16
C11-4'	<0.04	<0.04	<0.05	<0.06	<0.05
D8-5'	9200	13000	<52	<60	163000
AIR	<0.04	<0.04	<0.05	<0.06	7

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S

06-22-90

CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.05	<0.06	<0.06	<0.05
D7-5'	29000	51000	56	64	660000
D6-5'	17000	30000	42	100	160000
E6-5'	8	74	0.6	0.8	170
E7-5'	37000	26000	<28	<13	460000
C5-5'	26000	47000	420	64	230000
C6-5'	36000	29000	500	22	400000
C7-5'	25000	34000	56	48	540000
C8-5'	47000	26000	<56	<64	960000
A8-4'	0.8	4	<0.1	<0.1	16
A9-5'	1	42	0.3	8	80
C10-3'	2	7	<0.06	<0.06	26
A11-2'	0.2	6	<0.1	<0.1	12
L1-4'	<0.1	0.4	<0.1	<0.2	0.8
M1-4'	0.7	4	<0.06	<0.06	10
N1-4'	190	500	35	7	2900
O1-3'	0.09	0.7	<0.1	<0.1	0.9
P1-3'	0.2	1	<0.07	<0.08	4
Q1-4'	3	0.7	0.6	<0.1	14
Q2-5'	100000	24000	9200	2700	550000
P2-5'	120000	27000	13000	3700	970000
O2-5'	57000	26000	5200	1400	920000
N2-5'	53000	46000	7400	2205	1200000
M2-5'	14	20	<0.07	<0.08	38
M3-5'	9	10	<0.09	<0.1	71
N3-5'	46000	22000	4100	980	840000
AIR	19	31	<0.06	<0.06	55

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by: _____

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S

06/25/90

CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.04	<0.06	<0.07	<0.05
L0-6'	0.2	0.2	<0.06	<0.07	6
M0-5'	0.08	0.2	<0.06	<0.07	60
N0-4'	<0.04	<0.04	<0.06	<0.07	1100
O0-3'	<0.04	<0.04	<0.06	<0.07	3
P0-2'	<0.04	<0.04	<0.06	<0.07	6
Q0-5'	<0.04	<0.04	<0.06	<0.07	1
R0-4'	<0.04	<0.04	<0.06	<0.07	2
O3-4'	7	2	<0.06	<0.07	120
P3-4'	2300	320	220	<0.07	36000
Q3-6'	0.8	2	<0.06	<0.07	10
Q4-5'	<0.04	<0.04	<0.06	<0.07	<0.05
P4-5'	15000	4100	<55	190	260000
O4-3'	9500	4200	<55	<66	200000
N4-4'	27000	15000	<55	<66	490000
M4-5'	0.4	0.2	<0.06	<0.07	4
N5-4'	0.06	<0.04	<0.06	<0.07	3
O5-5'	0.5	0.8	<0.06	<0.07	10
P5-5'	<0.04	<0.04	<0.06	<0.07	<0.05
Q5-5'	<0.04	<0.04	<0.06	<0.07	<0.05
Q5.5-5'	<0.04	<0.04	<0.06	<0.07	<0.05

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-90-312-S

06/25/90

CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
Q6-5'	<0.04	<0.04	<0.05	<0.07	19
P6-5'	0.4	0.2	<0.05	<0.07	4
O6-5'	0.2	0.2	<0.05	<0.07	2
O7-5'	0.6	0.4	<0.05	<0.07	7
P7-4'	<0.04	<0.04	<0.05	<0.07	3
Q7-5'	0.08	0.4	<0.06	<0.07	5
N6-4'	<0.04	0.06	<0.06	<0.07	2
N7-5'	<0.04	0.2	<0.06	<0.07	10
M7-3'	<0.04	<0.04	<0.06	<0.07	40
M6-5'	<0.04	0.1	<0.06	<0.07	1
AIR	<0.04	<0.04	<0.06	<0.07	<0.05

Analyzed by: M. Kaldon
Checked by: G. Heath
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-312-90-S
06/26/90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
AIR	<0.04	<0.05	<0.06	<0.07	<0.05
L-2-4'	<0.04	<0.05	<0.06	<0.07	<0.05
L-3-4'	0.08	0.2	<0.06	<0.07	0.7
L-4-4'	<0.04	<0.05	<0.06	<0.07	0.2
L-5-4'	0.04	0.05	<0.06	<0.07	0.2
L-6-3'	<0.04	<0.05	<0.06	<0.07	<0.05
L-7-3'	<0.04	<0.05	<0.06	<0.07	0.2
R-5-4'	0.6	48	0.4	4	90
R-4-4'	I	2	0.3	<0.1	2
R-3-4'	0.4	4	0.6	<0.2	6
R-2-4'	<0.1	0.4	<0.2	<0.2	0.4
R-1-4'	<0.05	0.4	<0.08	<0.08	0.4
R-7-3'	<0.06	<0.08	<0.1	<0.1	<0.08
R-8-4'	<0.05	<0.06	0.09	<0.08	0.2
Q-8-4'	0.3	0.3	0.08	<0.08	2
P-8-4'	<0.04	<0.05	<0.06	<0.07	<0.05
O-8-3'	0.05	0.08	<0.06	<0.07	0.4
N-8-3'	0.3	0.3	<0.08	<0.08	2
M-8-3'	<0.04	<0.05	<0.06	<0.07	<0.05
L-8-4'	<0.04	<0.05	<0.06	<0.07	<0.05
G-13-5'	<0.04	<0.05	<0.05	<0.06	0.2

I interference with adjacent peaks

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by:

CANONIE ENVIRONMENTAL/ALAMEDA NAVAL AIR STATION/ALAMEDA, CALIFORNIA JOB#1-312-90-S

06/26/90

CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENE ug/l	THC ug/l
G-8-5'	<0.04	<0.05	<0.05	<0.06	0.09
G-7-5'	<0.04	<0.05	<0.05	<0.06	<0.05
I-7-5'	<0.04	<0.05	<0.05	<0.06	<0.05
H-1-5'	0.08	0.6	<0.05	<0.06	1
D-1-2'	0.1	<0.05	<0.06	0.08	0.6
A-5-3'	<0.04	<0.05	<0.06	<0.07	<0.05
D-9-5'	73000	29000	1000	440	810000
AIR	<0.04	<0.05	<0.06	<0.07	<0.05

Analyzed by: M. Caldon
Checked by: G. Heath
Proofed by:

Appendix C

APPENDIX C

SOIL BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NW Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.9 Feet
DRILLER: Beylik Drilling - Alex Bashta DATE: START 5/16/90 FINISH 5/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0	5	9	14	20	GP	3			Medium dense brown sandy gravel, moist, occasional layers of gravelly sand, some concrete debris (fill). OVA readings 200 - 500 ppm between 0 and 4 feet inside borehole.	
5	2	CR	5.0	10.0				12	GP			5.5	Medium dense blackish gray sandy gravel, saturated, abundant metal and wood debris, slight odor (fill), free water encountered at 7 feet.	
10	3	CR	10.0	15.0				12	SM			11.0		
									SM				Medium dense, black to brown silty sand, saturated, fine to medium grained, oily discoloration (fill), becomes very fine to fine grained below 13 feet, occasional wood debris, no odor.	
15	4	CR	15.0	20.0				4	SM					
20	5	CR	20.0	25.0				2	SM			20.0	Loose gray silty sand, saturated, fine grained, trace of shell debris at 20 feet.	
25	6	SS	25.0	27.0	P			2	CL	39.4	>0.25	25.0	Very soft dark gray silty clay, saturated, abundant shell layers (Bay Mud). Trace of fine grained sand at 28 feet.	
	7	SS	27.0	29.0	P			24	CL		>0.25			
30	8	SS	30.0	32.0	P			24	CL	48	>0.25		abundant shells between 30 and 30.5 feet, no odor.	
	9	SS	32.0	35.0				36	CL		>0.25		abundant shells between 32 and 33 feet.	
35	10	SS	35.0	40.0				42	CL		>0.25		abundant shells below 37 feet. abundant shells from 39 to 39.3 feet.	
40	11	CR	40.0	45.0				6	SM		>0.25	40.0	Medium dense gray clayey silty sand, saturated, fine grained.	

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-1
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PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NW Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.9 Feet
DRILLER: Beylik Drilling - Alex Bashta DATE: START 5/16/90 FINISH 5/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45														
	12	CR	45.0	50.0				12	SM			45.0	Medium dense to dense gray silty sand, saturated, fine grained, abundant shells, no odor.	
												46.0		
50													Medium dense to dense light brown silty sand, saturated, fine grained, no odor (Merritt Sand).	
	13	SS	50.0	52.0	3	4	5	12	SM					
					12									
	14	SS	52.0	54.0	7	5	11	6	SM					
					19									
55	15	SS	54.0	56.0	7	11	11	6	SM					
					20									
60														
65														
	16	CR	65.0	70.0				24	SM					
70														
	17	CR	70.0	75.0				2	SM					
75														
	18	CR	75.0	80.0				16	SM					
									SM			77.0	Dense gray silty sand, saturated, no odor.	
80														
	19	A	80.0	85.0					SM					

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Soil Boring Log

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PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NW Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.9 Feet
DRILLER: Beylik Drilling - Alex Bashta DATE: START 5/16/90 FINISH 5/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
85									CL			84.0	Very stiff gray green silty clay, saturated (Observed on augers after auger removal).	
	20	A	85.0	90.0										
90												90.0	Bottom of boring at 90.0 feet.	
95														
100														
105														
110														
115														
120														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Boring was backfilled with cement/bentonite grout upon completion of drilling.
3. Ground water was encountered at 7 feet during drilling.
4. Sampler type:
   California sampler (SS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
   Dry core sampler (CR)
   O.D.: 3.0 inches
   I.D.: 2.5 inches
5. Abbreviation legend:
   A - Drill cuttings
   P - Push (Sampler advanced downward by the weight of the downhole hammer.)

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NW Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.9 Feet
DRILLER: Beylik Drilling - Alex Bashta DATE: START 5/16/90 FINISH 5/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
125														Notes: (Continued)	
														6. Boring elevations are referenced to a Navy datum point using the Mean Lower Low Water (MLLW) datum.	
														7. Moisture content (%) was obtained from geotechnical laboratory test data.	
130															
135															
140															
145															
150															
155															
160															

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NE Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.8 Feet
DRILLER: Beylik Drilling -Alex Bashta DATE: START 5/18/90 FINISH 5/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 12" / 6" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0	2 2 4	18	SM	12.5		0.20	Gravel parking area (fill)	
					4			7.7			Loose brown silty sand, dry, fine grained, no odor (fill).	
	2	SS	2.0	4.0	4 3 3	12	SM					
					4		CL			3.0		
5											Medium stiff brown silty clay, moist, no odor (fill).	
	3	CR	5.0	10.0		6	SM			5.0		
											Loose light brown to gray silty sand, saturated, fine grained (fill), color change to gray green at 7 feet.	
10												
	4	SS	10.0	12.0	P	5	CL	62		10.0		
											Soft gray silty clay, saturated (fill).	
	5	SS	12.0	14.0	P	18	CL					
							SM			13.0	Loose gray silty sand, saturated, fine grained, some shells, trace of clay (fill).	
15	6	SS	14.0	16.0	P	24	SM					
	7	CR	16.0	20.0		48	SM				becomes more sandy below 18 feet.	
20												
	8	CR	20.0	25.0		48	SM				increase in shells and less sandy below 20 feet.	
							ML			21.5	Soft to medium stiff gray clayey silt, saturated, interfingering layers of clayey sand, abundant shells below 22 feet (Bay Mud).	
25												
	9	SS	25.0	27.0	P	18	SM			25.0	Loose to medium dense gray silty sand, saturated, fine grained, some shells, heaving sands encountered at 25 feet.	
	10	SS	27.0	29.0	P	18	SM	17.9				
30	11	CR	29.0	34.0		0	SM					
35	12	CR	34.0	38.0		48	SM					
							SM			35.5	Dense orange brown silty sand, saturated, fine grained, trace of clay (Merritt Sand).	
40	13	SS	39.0	41.0	32 60 50 65	24	SM				becomes more clayey between 36 and 37 feet.	

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NE Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.8 Feet
DRILLER: Beylik Drilling -Alex Bashta DATE: START 5/18/90 FINISH 5/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	14	SS	41.0	43.0	8	21	18	18	SM	18.7				
45	15	CR	45.0	50.0				24	SM				thin zone of iron oxidation at 46 feet.	
													color change to yellow brown below 46.5 feet.	
50	16	CR	50.0	55.0				24	SM				becomes less silty and more sandy below 50 feet.	
55													heaving sands encountered between 55 and 60 feet.	
60	17	CR	60.0	65.0				12	SM				becomes silty below 60 feet color change to light brown.	
65	18	CR	65.0	70.0			8	8	SM					
70	19	CR	70.0	75.0				36	SM				Slight increase in grain size below 70 feet.	
75	20	CR	75.0	80.0				0	SM					
80		CR	80.0	85.0				36	SP	19.6		80.0		

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NE Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.8 Feet
DRILLER: Beylik Drilling -Alex Bashta DATE: START 5/18/90 FINISH 5/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	21	CR	80.0	85.0				36	SP	19.6			Dense gray sand, saturated, fine grained, trace of silt.	
85	22	CR	85.0	90.0				24	SP					
									CL			86.5	Stiff gray green silty clay, saturated.	
90	23	CR	90.0	92.0	0	3	4	24	CL				color change to brown gray below 90 feet.	
					8							92.0		
95													Bottom of boring at 92 feet.	
100													Notes:	
105													1. Boring was advanced using 8-inch-diameter hollow stem augers	
110													2. Boring was backfilled using cement bentonite grout upon completion of drilling.	
115													3. Ground water was encountered at 10 feet during drilling.	
120													4. Sampler type: California Sampler (SS) O.D. = 2.5 inches I.D. = 2.0 inches Dry core sampler (CR) O.D. = 3.0 inches I.D. = 2.5 inches	
													5. Abbreviation Legend: A- Drill cuttings P - Push (Sampler was advanced downward by the weight of the downhole hammer.)	

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. DA-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: NE Corner of 1943-1956 Disposal Area SURFACE ELEV. 110.8 Feet
DRILLER: Beylik Drilling -Alex Bashta DATE: START 5/18/90 FINISH 5/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
125														Notes: (Continued)	
														6. Boring elevations are referenced to a Navy datum point using a Mean Lower Low Water (MLLW) datum.	
														7. Moisture content (%) was obtained from geotechnical laboratory test data.	
130															
135															
140															
145															
150															
155															
160															

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northwest Corner of W. Beach Landfill SURFACE ELEV. 113.7 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/31/90 FINISH 6/1/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0				24	SM	8.4			Brown silty fine sand with gravel and riprap/concrete debris. (fill)	
	2	SS	2.0	4.0				0				2.0	OVA reading at 300 to 500 ppm in borehole.	
5													Timber and wood debris. (fill)	
	3	CR	5.0	10.0				12					OVA reading at 10 ppm at 5 feet in borehole. Mud loss at 6.0 feet Mud loss at 7.0 feet.	
10													black creosote color and odor at 10 feet.	
	4	CR	10.0	13.0				18	SM			10.0	Loose black to gray silty sand, saturated, fine to medium grained. (fill)	
	5	CR	13.0	15.0				0	SM					
15														
	6	CR	15.0	20.0				0				15.0	mud loss at 15.0 feet Timber and wood debris, some pieces of steel and wire. (fill)	
20														
	7	CR	20.0	25.0				24	CL	34.4		20.0	Soft gray silty clay and clayey sand, saturated.	
									SM			21.5	Loose gray silty sand, saturated.	
25														
	8	CR	25.0	30.0				6	SM					
30														
	9	CR	30.0	35.0				0	SM					
35														
	10	CR	35.0	40.0				48	CL	35.2		35.0	Soft gray silty clay, saturated, abundant shells between 35 and 36 feet, some fine sand. (Bay Mud)	
40													shell layer at 38.5 feet.	
	11	CR	40.0	45.0				36	CL					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northwest Corner of W. Beach Landfill SURFACE ELEV. 113.7 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/31/90 FINISH 6/1/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	11	CR	40.0	45.0				36	CL		0.25		occasional pockets of clayey silt and sand.	
45	12	CR	45.0	50.0				36	CL		0.25		abundant shells between 46 and 74 feet.	
50	13	CR	50.0	55.0				36	CL		0.25		OVA reading 100 ppm at 50 feet in borehole.	
55	14	CR	55.0	60.0				3	CL					
60	15	CR	60.0	65.0				24	CL		0.25	60.0	Stiff gray sandy clay, saturated.	
									SC			62.0	Dense gray clayey sand, saturated.	
65	16	CR	65.0	70.0				0	SC					
70	17	CR	70.0	75.0				60	CL		0.25	70.0	Stiff gray silty clay, saturated.	
												72.0	Dense gray clayey sand, saturated.	
75	18	CR	75.0	80.0				24	CL		0.25	74.0	Stiff gray sandy clay, saturated, some shell fragments.	
												75.5	Dense gray clayey silty sand, saturated, fine grained, some clay.	
80	19	CR	80.0	85.0				48	SM				thin clayey layer at 80 feet.	

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northwest Corner of W. Beach Landfill SURFACE ELEV. 113.7 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/31/90 FINISH 6/1/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	19	CR	80.0	85.0				48	SM					
85													some shells at 84 feet.	
	20	CR	85.0	90.0				60	SC			85.0	Dense gray clayey sand, saturated, some clay seams at 86 and 87 feet, trace of shell fragments.	
90														
	21	CR	90.0	95.0				48	SC				pieces of wood debris at 92 feet.	
95														
	22	CR	95.0	100.0				0	SC					
100														
	23	CR	100.0	105.0				5	SC			100.0	Dense dark gray green clayey sand, saturated, fine grained, some silt, nearly equal mixture of sand and clay.	
105														
	24	CR	105.0	110.0				5	SC				rock fragments between 105 and 110 feet.	
110													becomes more clayey below 110 feet.	
	25	CR	110.0	115.0				48	SC					
115														
	26	CR	115.0	120.0				60	SC					
120									CL			118.0	Very stiff mottled gray to gray green silty clay, saturated.	
	27	CR	120.0	125.0				36	CL					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-1
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northwest Corner of W. Beach Landfill SURFACE ELEV. 113.7 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/31/90 FINISH 6/1/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	27		120.0	125.0				36	CL		2.0			Traces of root debris and fine grained sand.	
125														Bottom of boring at 125 feet.	

Notes:

1. Boring was advanced using a mud rotary drilling rig.

2. Boring was backfilled with cement bentonite grout upon completion of drilling.

3. Sampler type:
   California Sampler (SS)
   O.D. = 2.5 inches
   I.D. = 2.0 inches
   Dry core sampler (CR)
   O.D. = 3.0 inches
   I.D. = 2.5 inches

4. Abbreviation Legend:
   A- Drill cuttings
   P - Push (Sampler was advanced downward by the weight of the downhole hammer.)

5. Boring elevations are referenced to a Navy datum point using a Mean Lower Low Water (MLLW) datum.

6. Moisture content (%) was obtained from geotechnical laboratory test data.

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southwest Corner of W. Beach Landfill SURFACE ELEV. 112.6 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/24/90 FINISH 5/29/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0	15	25	30	18	SM				Dense brown silty sand, dry, fine to medium grained OVA reading: (2 feet) 40-50 ppm, some rock fragments(fill) OVA reading (4 feet) 20-30 ppm.	
					35									
	2	SS	2.0	4.0	12	22	22	0	SM					
5												4.0		
	3	SS	5.0	7.0	3	3	4	18	SM				Dense brown silty sand, moist, fine grained. (fill)	
					4									
10														
	4	CR	10.0	15.0				6	SM				color change to gray at 13 feet, becomes saturated below 12 feet.	
15												13.0		
	5	SS	15.0	17.0	P			18	SM				Medium dense gray silty sand, saturated, some silt. (fill)	
	6	SS	17.0	19.0	P			6	SM				Switched to mud rotary drilling method because of extreme heaving sands at 20 feet.	
20														
	7	CR	20.0	25.0				12	SM			20.0	Gray fine silty sand, saturated, some shells. Mud Viscosity = 59 seconds Mud Weight = 10.2 lbs./gallon Specific Gravity = 1.215 gm/cm(3)	
25														
	8	CR	25.0	30.0				6	SM					
30														
	9	CR	30.0	35.0				24	SM			30.0	Loose to medium dense yellow brown silty sand, saturated, trace of clay. 2" shell layer at 32 feet.	
35														
	10	CR	35.0	40.0				24	SM					
40														
	11	CR	40.0	45.0				3	SM					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southwest Corner of W. Beach Landfill SURFACE ELEV. 112.6 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/24/90 FINISH 5/29/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	11	CR	40.0	45.0				3	SM				Mud Viscosity = 51 seconds Mud Weight = 10.7 lbs./gallon Specific Gravity = 1.285 gm/cm (3)	
45														
	12	CR	45.0	50.0				48	CL			45.0	Medium stiff gray silty clay, saturated.	
									SM			46.0		
50													Medium dense gray silty sand, saturated, fine grained , some thin sandy clay seams.	
	13	CR	50.0	55.0				6	SM				color change to brown gray below 50 feet.	
55														
	14	CR	55.0	60.0				60	SM				4" thick clay seam at 55 feet.	
												56.5	Dense yellow brown clayey sand, saturated, fine grained, thin layer of gray clay at top of unit, abundant iron stained laminations (Merritt Sand).	
60														
	15	CR	60.0	65.0				24	SC				color change to gray brown at 57 feet, becomes more silty.	
65														
	16	CR	65.0	70.0				60	SC				color gradually changes to orange brown at 57.5 feet.. color change to gray brown at 65 feet.	
70														
	17	CR	70.0	75.0				48	SC				becomes silty between 72 and 75 feet.	
75														
	18	CR	75.0	80.0				60	SC					
80														
	19	CR	80.0	85.0				36	SC					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southwest Corner of W. Beach Landfill SURFACE ELEV. 112.6 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/24/90 FINISH 5/29/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
80	19	CR	80.0	85.0				36	SC				traces of shells below 80 feet.	
85	20	CR	85.0	90.0				60	SC					
												88.0	Very stiff gray green sandy clay, saturated, some occasional pockets of fine grained sand.	
90	21	CR	90.0	95.0				12	CH CH	48.9				
									SM			92.0	bottom of clay unit marked by thin layer of mottled dark brown-gray green silty clay.	
95	22	CR	95.0	100.0				36	SM				Dense brown-gray silty sand, saturated, fine grained, occasional thin seams of clay.	
100												100.0	Bottom of boring at 100 feet.	
105														
110														
115														
120														

Notes:

1. Boring was advanced using a mud rotary drilling rig.
2. Boring was backfilled with cement grout upon completion of drilling.
3. Ground water was encountered at 12 feet.
4. Sampler type:
   California Sampler (SS)
   O.D. = 2.5 inches
   I.D. = 2.0 inches

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-2
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southwest Corner of W. Beach Landfill SURFACE ELEV. 112.6 feet
DRILLER: Beylik Drilling - David Jones DATE: START 5/24/90 FINISH 5/29/90

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
80														Notes: (Continued)	
														Dry core sampler (CR) O.D. = 3.0 inches I.D. = 2.5 inches	
85															
														5. Abbreviation Legend: A - Drill cuttings P- Push (Sampler was advanced was advanced downward by the weight of the downhole hammer.)	
90															
														6. Boring elevations are referenced to a Navy datum point using a Mean Lower Low Water (MLLW) datum.	
95															
														7. Moisture content (%) was obtained from geotechnical laboratory test data.	
100															
105															
110															
115															
120															

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-3
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southeast corner of W. Beach Landfill SURFACE ELEV. 112.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/22/90 FINISH 5/22/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0	3	4	6	12	SP	1.6			Medium dense yellow brown silty sand, dry, no odor, trace of clay (fill).	
					6									
	2	SS	2.0	4.0	3	4	9	24	SP					
					10								becomes more sandy.	
5														
	3	CR	5.0	10.0				24	SP					
													sandy silt seam between 5 and 6 feet, becomes moist.	
10														
	4	CR	10.0	15.0				12	SP					
													becomes loose, saturated below 10 feet.	
15														
	5	SS	15.0	17.0	2	0	0	24	SP	18.3				
					0									
	6	SS	17.0	19.0	1	4	3	24	SP	20.0				
					4								heaving sands at 20 feet.	
20														
	7	CR	20.0	25.0				0	SM					
25														
	8	CR	25.0	30.0				12	SM				heaving sands at 25 feet.	
30														
	9	CR	30.0	35.0				12	SM				thin clayey seams between 30 and 32 feet. (driller notes hard drilling between 30 and 32 feet).	
													color change to gray at 31 feet,	
35									CL			34.0	some shells.	
	10	SS	35.0	37.0	P			24	CL				Medium stiff gray silty clay, saturated,	
									SM	21.3		36.0	trace of organic debris.	
	11	SS	37.0	39.0	P			24	CL			37.0	Medium dense gray silty sand, saturated, fine grained.	
40														
	12	SS	40.0	45.0	25	35	35					40.0	Soft gray silty clay, saturated, with sand seams. (Bay Mud)	
					45									

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-3
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southeast corner of W. Beach Landfill SURFACE ELEV. 112.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/22/90 FINISH 5/22/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	12	SS	40.0	45.0	25	35	35	60	SM			40.0	Dense orange brown clayey silty sand, saturated, fine grained, trace of clay. (Merritt Sand)	
					45									
45	13	SS	45.0	47.0	12	29	30	24	SM					
					47									
	14	SS	47.0	49.0				18	SM	20.0				
50	15	CR	50.0	55.0				36	SM					
55	16	CR	55.0	60.0				12	SM-SP			55.0	Dense yellow brown silty sand, saturated, trace of clay. (Merritt Sand)	
60	17	CR	60.0	65.0				48	SC			60.0	Dense, yellow brown clayey sand, some silt. (Merritt Sand)	
													some orange mottled iron stained seams between 64 and 65 feet.	
65	18	CR	65.0	70.0				24	SC					
													becomes more silty below 66.5 feet.	
70	19	CR	70.0	75.0				24	SC					
													becomes more clayey below 70.5 feet.	
75	20	CR	75.0	80.0				12	SM			75.0	Loose to medium dense yellow brown silty sand, saturated, fine grained. (Merritt Sand)	
80	21	CR	80.0	85.0				12	SM					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-3
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southeast corner of W. Beach Landfill SURFACE ELEV. 112.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/22/90 FINISH 5/22/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	21	CR	80.0	85.0				12	SM					
85	22	CR	85.0	90.0				0	SM					
90	23	CR	90.0	95.0				24	CL			90.0	Very stiff gray silty clay, saturated.	
												92.0	Loose gray silty fine sand, saturated. Uncontrollable heaving sands below 92 feet.	
95												97.0	Bottom of boring at 97 feet.	
100														
105														
110														
115														
120														

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-3
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Southeast corner of W. Beach Landfill SURFACE ELEV. 112.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/22/90 FINISH 5/22/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
125														Notes:	
130														1. Boring was drilled with an eight-inch diameter hollow stem auger.	
135														2. Boring was backfilled with cement-bentonite grout upon completion of drilling.	
140														3. Ground water was encountered at 10 feet during drilling.	
145														4. Sampler type: Califronia Sampler (SS) O.D. = 2.5 inches I.D. = 2.0 inches Dry Core Sampler (CR) O.D. = 3.0 inches I.D = 2.5 inches	
150														5. Abbreviation Legend: A - Drill cuttings P - Push (Sampler was advanced downward by the weight of the downhole hammer.)	
155														6. Boring elevations are referenced to a Navy datum point using a Mean Lower Low Water (MLLW) datum.	
160														7. Moisture content (%) was obtained from geotechnical laboratory test data.	

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-4
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northeast corner of W. Beach Landfill SURFACE ELEV. 110.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/21/90 FINISH 5/21/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 12" / 6" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	SS	0.0	2.0	2 4 5 / 6	24	SP-SM	2.1 1.9			Medium dense yellow brown silty sand, dry, some silt, no odor (fill) (backfill material surrounding nearby storm drain).	
	2	SS	2.0	4.0	3 7 9 / 9	24	SP-SM					
5	3	CR	5.0	10.0		24	SP-SM				becomes saturated below 9 feet.	
10	4	CR	10.0	15.0		12	SP-SM					
15	5	CR	15.0	20.0		24	SP-SM					
20	6	CR	20.0	25.0		12	SP-SM					
25	7	CR	25.0	30.0		36	SP-SM				heaving sands at 25 feet, some clay seams between 25 and 28 feet.	
30	8	CR	30.0	35.0		18	SM			30.0	Medium dense gray silty sand, saturated, fine grained, some shells, some pockets of clayey silt and sandy clay.	
35	9	CR	35.0	40.0		36	SM					
40	10	CR	40.0	45.0		36	SM					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-4
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northeast corner of W. Beach Landfill SURFACE ELEV. 110.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/21/90 FINISH 5/21/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	10	CR	40.0	45.0				36	SM					
45	11	CR	45.0	50.0				24	SM					
									CL			46.0	Medium stiff gray sandy clay, saturated, some shells, abundant pockets of sand below 47 feet.	
												48.0		
50									SC					
	12	CR	50.0	55.0				24	SC				Dense gray clayey sand, saturated, fine grained, occasional shells, with occasional thin interbedded sandy clay.	
55														
	13	CR	55.0	60.0				60	SC					
60													thin silty sand zone at 59 feet.	
	14	CR	60.0	65.0				48	SC					
									CL			60.5	Medium stiff gray silty clay, saturated.	
65												64.0		
	15	CR	65.0	70.0				48	SC				Medium dense gray clayey sand, saturated, fine grained. silty clay layers at 66.5 feet.	
70									SM			69.0	Medium dense gray silty sand, saturated, some shell fragements.	
	16	CR	70.0	75.0				48	SM					
												71.0		
									SC				Medium dense gray clayey sand, saturated, fine grained, some shell fragments, some layers of silty clay.	
75	17	CR	75.0	80.0				60	SC					
80												79.0	increase in silt below 75 feet some silty sand layers.	
	18	CR	80.0	85.0				36	SP					

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-4
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northeast corner of W. Beach Landfill SURFACE ELEV. 110.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/21/90 FINISH 5/21/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	18	CR	80.0	85.0				36	SP				Medium dense gray sand, saturated.	
85													heaving sand at 85 feet drilled to 90.0 feet to sample.	
90	19	CR	90.0	95.0				24	SP					
95	20	CR	95.0	100.0				24	SP				silty clay layer between 91 and 91.5 feet.	
100	21	SS	100.0	102.0	7	14	14	2	CL			100.0	Very stiff light gray green sandy clay, saturated.	
					13					32.8				
105	22	SS	104.0	106.0	8	8	10	10	CL					
					13							106.0	Bottom of boring at 106 feet.	
110														
115														
120														

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Soil Boring Log

PROJECT No. 86-018-1701
BORING No. WB-4
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Northeast corner of W. Beach Landfill SURFACE ELEV. 110.0 feet
DRILLER: Beylik Drilling-Alex Bashta DATE: START 5/21/90 FINISH 5/21/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
125															
130															
135															
140															
145															
150															
155															
160															

Notes:

1. Boring was advanced using 8-inch diameter hollow stem augers.

2. Boring was backfilled with cement/ bentonite grout upon completion of drilling.

3. Ground water was encountered at 9 feet during drilling.

4. Sampler type:
   California sampler (SS)
   O.D. - 2.5 inches
   I.D. = 2.0 inches
   Dry core sampler (CR)
   O.D. = 3.0 inches
   I.D = 2.5 inches

5. Abbreviation legend:
   A- Drill cuttings
   P - Push (Sampler was advanced downward by the weight of the down hole hammer.)
   downward by weight of down hole hammer.)

6. Boring elevations are referenced to a Navy datum point using a Mean lower Low Water (MLLW) datum.

7. Moisture content (%) was obtained from geotechnical laboratory test data.

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November 1990 86-018-1810

NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PHASE 2A BORING LOGS AND
MONITORING WELL CONSTRUCTION DETAILS

ENCLOSURE 16

Prepared for Western Division Naval Facilities Engineering Command

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APPENDIX A

BUILDING 360
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Boring Log Legend

SAMPLE

No: (Number) Soil samples are numbered consecutively from the ground surface. Core samples are numbered consecutively from the first core run.

Type: SS= Split-Spoon (2" O.D.) ST= Shelby Tube A= Auger Cuttings
PT= Piston Tube CR= Core Run

Interval: The depth of sampling interval in feet below ground surface.

BLOW COUNT

The number of blows required to drive a 2-inch O.D. split-spoon sampler with a 140 pound hammer falling 30-inches. When appropriate, the sampler is driven 18 inches and blow counts are reported for each 6-inch interval. The sum of blow counts for the last two 6-inch intervals is designated as the standard penetration resistance (N) expressed as blows per foot.

RECOVERY IN INCHES

The length of sample recovered by the sampling device.

U.S.C.S SOIL TYPE

The Unified Soil Classification System symbol for recovered soil samples determined by visual examination or laboratory tests. Refer to ASTM D2487-69 for a detailed description of procedure and symbols. Underlined symbols denote classifications based on laboratory tests (ie: ML), all others are based on visual classification only.

PERCENT MOISTURE

Natural moisture content of sample expressed as percent of dry weight.

qu, TSF

Unconfined compressive strength in tons per square foot obtained by Hand Penetrometer. Laboratory compression test values are indicated by underlining.

CONTACT DEPTH

The contact depth between soil layers is interpreted from significant changes in recovered samples and observations during drilling. Actual changes between soil layers often occur gradationally and the contact depths shown on the boring logs should be considered as approximate.

SOIL DESCRIPTION AND REMARKS

Soil descriptions include consistency or density, color, predominant soil types, and modifying constituents.

COHESIVE SOILS			GRANULAR SOILS	
Consistency	qu (TSF)	Blows/Ft.	Density	Blows Per Foot
Very Soft	less than 0.25	0-1	Very Loose	4 or less
Soft	0.25 to 0.50	2-4	Loose	5 to 10
Medium Stiff	0.50 to 1.00	5-8	Medium Dense	11 to 30
Stiff	1.00 to 2.00	9-15	Dense	31 to 50
Very Stiff	2.00 to 4.00	15-30	Very Dense	over 50
Hard	more than 4.00	Over 30		

PARTICLE SIZE DESCRIPTION

Boulder= Larger than 12 inches.
Cobble= 3 to 12 inches.
Gravel= 0.187 to 3 inches.
Sand= 0.074 mm to 4.76 mm.
Silt and Clay= Smaller than 0.074 mm

DEFINITION OF TERMS

Trace= 5 to 12 percent by weight.
Some= 12 to 30 percent by weight.
And= Approximately equal fractions.
( )= Drillers observation.

PIEZO.

(Piezometer) Screened interval of the piezometer installation is denoted by cross-hatching.

GENERAL NOTE

The boring logs and related information depict subsurface conditions only at the specific locations and dates indicated. Soil conditions and water levels at other locations may differ from conditions occurring at these boring locations. Also the passage of time may result in a change in the conditions at these boring locations.

SOIL TEST BORING REFUSAL

Defined as any material causing a blow count greater than 100 blows/6 inches. Such material may include bedrock, "floating" rock slabs, boulders, dense gravel seams, or cemented soils. Refusal is usually indicated in fractional notation showing number of blows as the numerator and inches of penetration as the denominator.

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW360-1
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION North side of Building 360 in front of rollup doors SURFACE ELEVATION 113.19 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/28/90 FINISH 6/28/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	8	10	12	12	SM			0.5	Medium dense, mottled reddish yellowish	
	2	CS	2.0	3.5	4	10	12	14	SP			2.7	brown, silty medium sand, moist. (Fill)	
													Medium dense, gray and tan, fine to	
5	3	CS	3.5	5.0	3	4	2	15	SP				medium sand, moist.	
	4	CS	5.0	6.5	1	2	5	13	SP				becomes loose at 3.5 feet.	x
													becomes saturated at 4.5 feet.	x
	5	CS	6.5	8.0	3	1	2	12	SP				color change to black at 5.5 feet.	x
	6	CS	8.0	9.5	2	3	2	15	SP				increase of clay to trace at 5.5 feet.	x
10													color change to dark brown at 8.0 feet.	x
	7	CS	9.5	11.0	2	2	4	15	SC			10.3	Loose, orange brown, clayey fine sand,	x
	8	CS	11.0	12.5	6	12	18	15	SC				saturated . (Merritt Sand)	x
													becomes medium dense at 11.5 feet.	x
	9	CS	12.5	14.0	4	16	16	14	SC				decrease in clay to trace at 12.3 feet.	x
15	10	CS	14.0	15.5	5	9	11	16	SC				becomes fine to medium grained at	x
												15.5	12.3 feet.	
													Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.

2. Groundwater was encountered at 4.5 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was converted to a monitoring well upon completion of drilling.

5. OVA readings:
   a) 8-10 ppm at 4.0 feet.
   b) 20-30 ppm at 5.5 feet.
   c) 0 ppm at 9.0 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW360-2
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION West side of Building 360 SURFACE ELEVATION 114.27 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/28/90 FINISH 6/28/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	5	8	12	15	SM			0.5	Loose, dark brown, silty fine sand, moist.	
	2	CS	2.0	3.5	4	5	5	15	SM				(Fill) color change to orangish brown	
													and trace of clay at 2.8 feet.	
5	3	CS	3.5	5.0	2	4	3	6	SW			3.8	Loose, orangish brown, gravelly sand,	
	4	CS	5.0	6.5	1	3	5	10	SM			5.0	moist, with trace of silt, moist. (Fill)	X
													Loose, gray, silty fine sand, saturated,	X
	5	CS	6.5	8.0	3	2	2	15	SM				with trace of gravel and clay.	X
	6	CS	8.0	9.5	3	4	5	16	SC			9.0	color change to dark brown at 5.5 feet.	X
10													gravel decreases to none at 6.5 feet.	X
	7	CS	9.5	11.0	5	10	11	16	SC				Loose, reddish brown and gray, silty fine	X
	8	CS	11.0	12.5	10	12	14	16	SC				sand, saturated, with trace of clay.	X
													increase in clay to some at 9.5 feet.	X
	9	CS	12.5	14.0	8	9	10	16	SC				density changes to Medium at 9.5 feet.	X
15	10	CS	14.0	15.5	6	13	15	16	SC				decrease in clay at 12.5 feet.	X
												15.5	very wet at 12.5 feet.	
													Bottom of Boring at 15.5 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: a) 2-5 ppm at 1.0 feet. b) 2-4 ppm at 5.0 feet.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW360-3
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION South side of Building 360 SURFACE ELEVATION 114.28 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/27/90 FINISH 6/27/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PID
													Concrete. (Fill)	
	1	CS	0.5	2.0	7	12	4	15	SM			0.5	Medium dense, dark brown, silty fine	
	2	CS	2.0	3.5	7	5	3	15	SP			1.2	sand, moist. (Fill)	
												3.0	Medium dense, light brown, fine sand,	
5	3	CS	3.5	5.0	1	2	2	15	SM				moist. (Fill)	
	4	CS	5.0	6.5	3	1	1	16	SM			5.0	Loose, grayish tan, silty fine sand,	X
													moist, with trace of clay. (Fill)	X
	5	CS	6.5	8.0	3	4	5	16	SM				some asphalt from 3.8 feet to 5.0 feet.	X
	6	CS	8.0	9.5	5	15	17	18	SM				Loose, light brown, silty fine sand,	X
10													saturated.	X
	7	CS	9.5	11.0	10	14	13	16	SM				trace of clay at 8.0 feet.	X
	8	CS	11.0	12.5	7	10	12	17	SM			11.5	Medium dense, orange brown mottled	X
													with gray, silty fine sand, saturated,	X
	9	CS	12.5	14.0	6	13	20	15	SM				trace of clay. (Merritt Sand)	X
15	10	CS	14.0	15.5	5	6	7	17	SM					X
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 5 ppm at 6.0 feet.
6. Standing water at 14.0 feet upon completion of drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW360-4
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION East side of Building 360 by picnic area SURFACE ELEVATION 113.90 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/27/90 FINISH 6/27/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	13	14	21	15	SM			0.5	Medium dense, dark brown, silty fine sand. (Fill)	
	2	CS	2.0	3.5	8	11	8	15	SM					
													becomes loose and saturated at	
5	3	CS	3.5	5.0	3	6	5	14	SM				4.5 feet, color change to black, with	
	4	CS	5.0	6.5	1	1	4	13	SM				some asphalt at 5.5 feet..	X
														X
	5	CS	6.5	8.0	2	3	3	17	SM			6.5	Loose, dark brown, silty fine sand,	X
	6	CS	8.0	9.5	3	3	2	16	SM			8.5	saturated.	X
10													Loose, reddish brown, silty fine sand,	X
	7	CS	9.5	11.0	4	7	11	16	SM				saturated, with trace of clay.	X
	8	CS	11.0	12.5	7	11	12	16	SM				(Merritt Sand)	X
														X
	9	CS	12.5	14.0	5	12	12	14	SM				color change to dark brown at	X
15	10	CS	14.0	15.5	8	10	7	14	SM				13.5 feet.	X
												15.5	Bottom of Boring at 15.5 feet	
													Notes:	
20													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 4.5 feet during drilling.	
25													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D: 2.0 inches	
30													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: No OVA readings observed during drilling.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B360-5
LOGGED BY GMM

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Northwest side of Building 360 SURFACE ELEVATION 114.7 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/26/90 FINISH 6/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6" 6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												Concrete. (Fill)	
	1	CS	0.5	2.0	14	35 30	15	SM			0.7	Dense, dark brown, fine to medium sand, moist, with trace of silt. (Fill)	
	2	CS	2.0	3.5	15	25 22	14	SM					
5	3	CS	3.5	5.0	9	7 12	14	SM				becomes dry and color changes to light brown at 3.0 feet.	
	4	CS	5.0	6.5	9	11 9	17	SM				becomes medium dense at 3.5 feet.	
	5	CS	6.5	8.0	2	1 2	18	SM-CL			7.2	becomes saturated at 5.5 feet.	
	6	CS	8.0	9.5	4	3 3	16	SM			8.0	becomes loose at 6.5 feet.	
10												Very soft, dark gray, silty clay, saturated, with some fine sand. (Bay Mud)	
	7	CS	9.5	11.0	3	4 8	17	SM-SC			10.0		
	8	CS	11.0	12.5	5	12 17	17	SC-SM				Loose reddish brown and gray, silty fine sand, saturated, with trace of clay. (Merritt Sand)	
	9	CS	12.5	14.0	8	14 18	16	SM					
15	10	CS	14.0	15.5	7	11 8	16	SM				Medium dense, orange and brown, clayey fine sand, saturated, with trace of silt. (Merritt Sand)	
	11	CS	15.5	17.0	1	2 10	16	SM			17.0	decrease in clay to some at 11.5 feet. decrease in clay to trace at 13.0 feet.	
20												Bottom of Boring at 17.0 feet.	
25													
30													
35													
40													

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B360-6
LOGGED BY GMM

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Southwest side of Building 360 SURFACE ELEVATION 114.2 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/25/90 FINISH 6/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	10	7	8	18	SM			0.7	Medium dense, brown, silty medium sand, moist. (Fill)	
	2	CS	2.0	3.5	3	7	6	12	SM				becomes loose and color changes	
5	3	CS	3.5	5.0	3	3	2	14	SM				to black at 3.5 feet.	
	4	CS	5.0	6.5	2	1	4	14	SM			5.8	Very loose, black, sandy gravel, angular, saturated. (Fill)	
	5	CS	6.5	8.0	3	3	3	16	GP-SM			6.5	Loose, black, silty medium sand, with saturated, trace of clay.	
	6	CS	8.0	9.5	5	9	11	16	SM-SC			8.0	color change to brown at 7.3 feet.	
10														
	7	CS	9.5	11.0	3	11	10	15	SC				Medium dense, reddish brown and gray, clayey fine gray sand, saturated, with trace of silt. (Merritt Sand)	
	8	CS	11.0	12.5	3	6	8	16	SC					
	9	CS	12.5	14.0	12	10	14	16	SC				clay content decreases at 10.0 feet.	
15	10	CS	14.0	15.5	10	12	15	3	SC					
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion on drilling.
5. OVA readings:
   a) 30 ppm at 4.0 feet.
6. Standing water level at 7.3 feet after drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B360-7
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION West of southwest corner of Building 360 SURFACE ELEVATION 114.0 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/26/90 FINISH 6/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	12	22	12	14	SM			0.5	Medium dense to dense, dark brown, silty sand, moist. (Fill)	
	2	CS	2.0	3.5	5	5	5	16	SM				becomes very loose at 3.5 feet.	
5	3	CS	3.5	5.0	2	1	1	10	SM				trace of clay at 3.5 feet.	
	4	CS	5.0	6.5	1	1	2	12	SM				becomes saturated at 4.5 feet.	
	5	CS	6.5	8.0	2	1	2	16	SM					
	6	CS	8.0	9.5	3	5	8	16	SM			8.0	Medium dense, reddish brown and gray, silty fine sand, saturated, with some clay. (Merritt Sand)	
10														
	7	CS	9.5	11.0	12	13	12	17	SM					
	8	CS	11.0	12.5	8	17	24	15	SM					
	9	CS	12.5	14.0	8	13	18	16	SM					
15	10	CS	14.0	15.5	5	7	13	16	SM					
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B360-8
LOGGED BY GMM

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Southeast corner of Building 360 SURFACE ELEVATION 113.9 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/26/90 FINISH 6/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	17	16	16	16	SM			0.5	Medium dense, brown and black, silty fine sand, moist. (Fill)	
	2	CS	2.0	3.5	4	4	5	15	SM				becomes loose at 2.0 feet.	
5	3	CS	3.5	5.0	4	4	4	16	SM				color change to black at 2.7 feet,	
	4	CS	5.0	6.5	2	1	1	12	SM			6.0	some asphalt.	
													Medium dense, brown, silty fine sand,	
	5	CS	6.5	8.0	2	4	10	17	CL			7.0	saturated.	
	6	CS	8.0	9.5	6	13	19	17	CL-SM			9.0	Stiff, orange brown mottled gray, sandy	
10													clay, saturated. (Merritt Sand)	
	7	CS	9.5	11.0	8	13	17	15	SM				Medium dense, orange brown, silty	
	8	CS	11.0	12.5	8	12	14	17	SM				fine sand, saturated , trace of clay,	
													decrease of clay to trace at 9.5 feet.	
	9	CS	12.5	14.0	8	11	10	16	SM					
15	10	CS	14.0	15.5	5	5	11	18	SM					
												15.5	Bottom of Boring at 15.5 feet.	

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grount upon completion of drilling.
5. OVA readings:
   a) 100 ppm at 4.5 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B360-9
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION East side of Building 360 SURFACE ELEVATION 113.8 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/26/90 FINISH 6/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 12" / 6" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
											Concrete. (Fill)	
	1	CS	0.5	2.0	15 10 8	12	SM			0.5	Medium dense, dark brown, silty fine sand, moist. (Fill)	
	2	CS	2.0	3.5	4 7 16	14	SM				color change to black at 3.0 feet.	
5	3	CS	3.5	5.0	4 5 6	14	SM				slight hydrocarbon odor at 3.0 feet.	
	4	CS	5.0	6.5	2 1 2	17	SM				becomes loose at 5.0 feet.	
											becomes saturated at 6.0 feet.	
	5	CS	6.5	8.0	2 2 3	14	SM				color change to dark brown	
	6	CS	8.0	9.5	3 6 14	17	SM			8.5	at 6.5 feet.	
10											Medium dense, reddish brown and gray,	
	7	CS	9.5	11.0	7 12 17	17	SC-SM				silty fine sand, saturated, with	
	8	CS	11.0	12.5	10 10 12	16	SM				trace of clay. (Merritt Sand)	
											color change to light brown at	
	9	CS	12.5	14.0	7 9 12	13	SC				12.0 feet.	
15	10	CS	14.0	15.5	7 12 13	16	SC				increase in clay content at 12.5 feet.	
	11	CS	15.5	17.0	3 7 15	17	SC					
										17.0	Bottom of Boring at 17.0 feet.	
20											Notes:	
											1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25											2. Groundwater was encountered at 6.0 feet during drilling.	
											3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30												
											4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35												
											5. OVA readings: No OVA readings observed during drilling.	
40												

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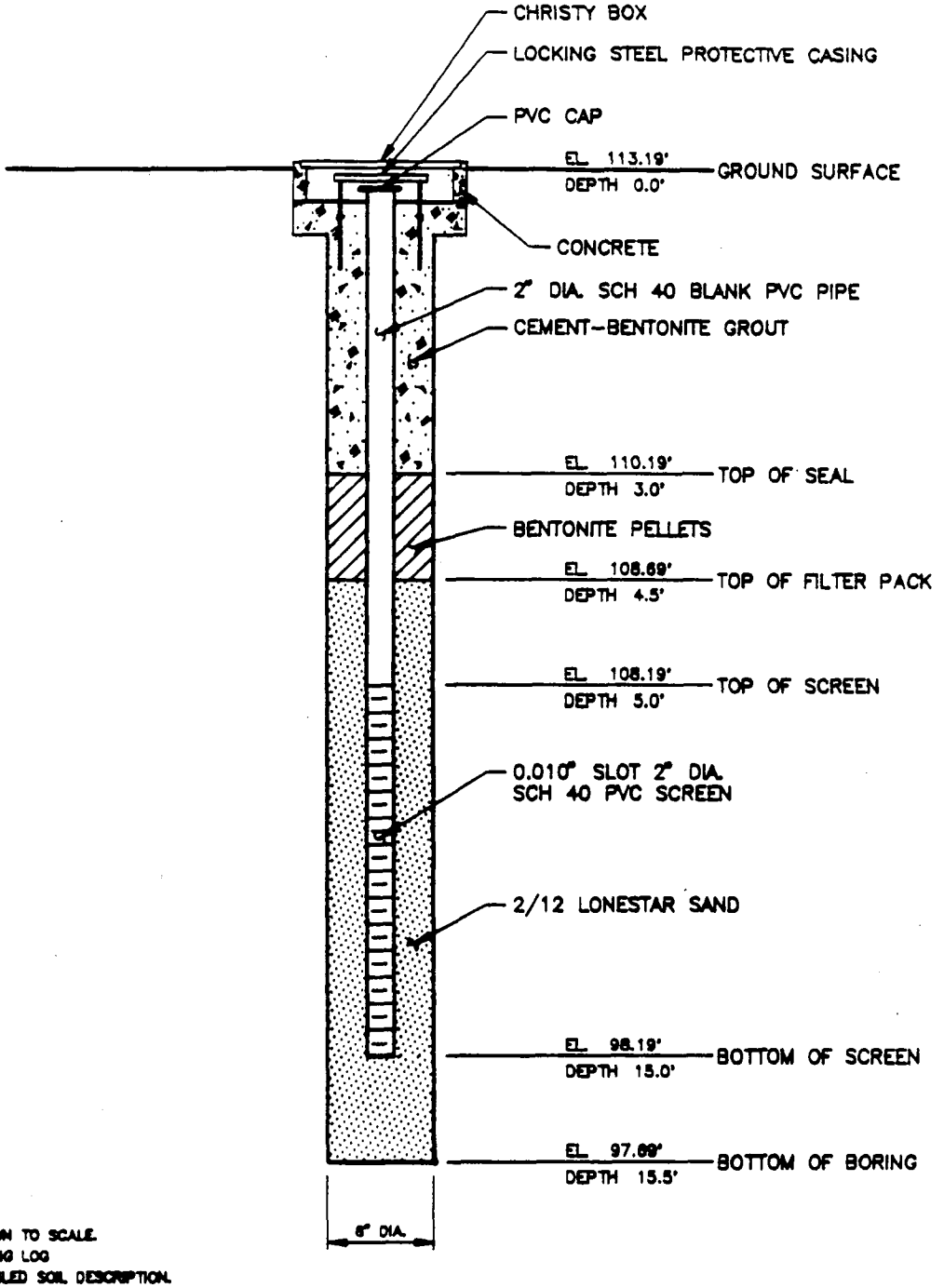
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW360-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 360, NORTHWEST CORNER DATE 6-28-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

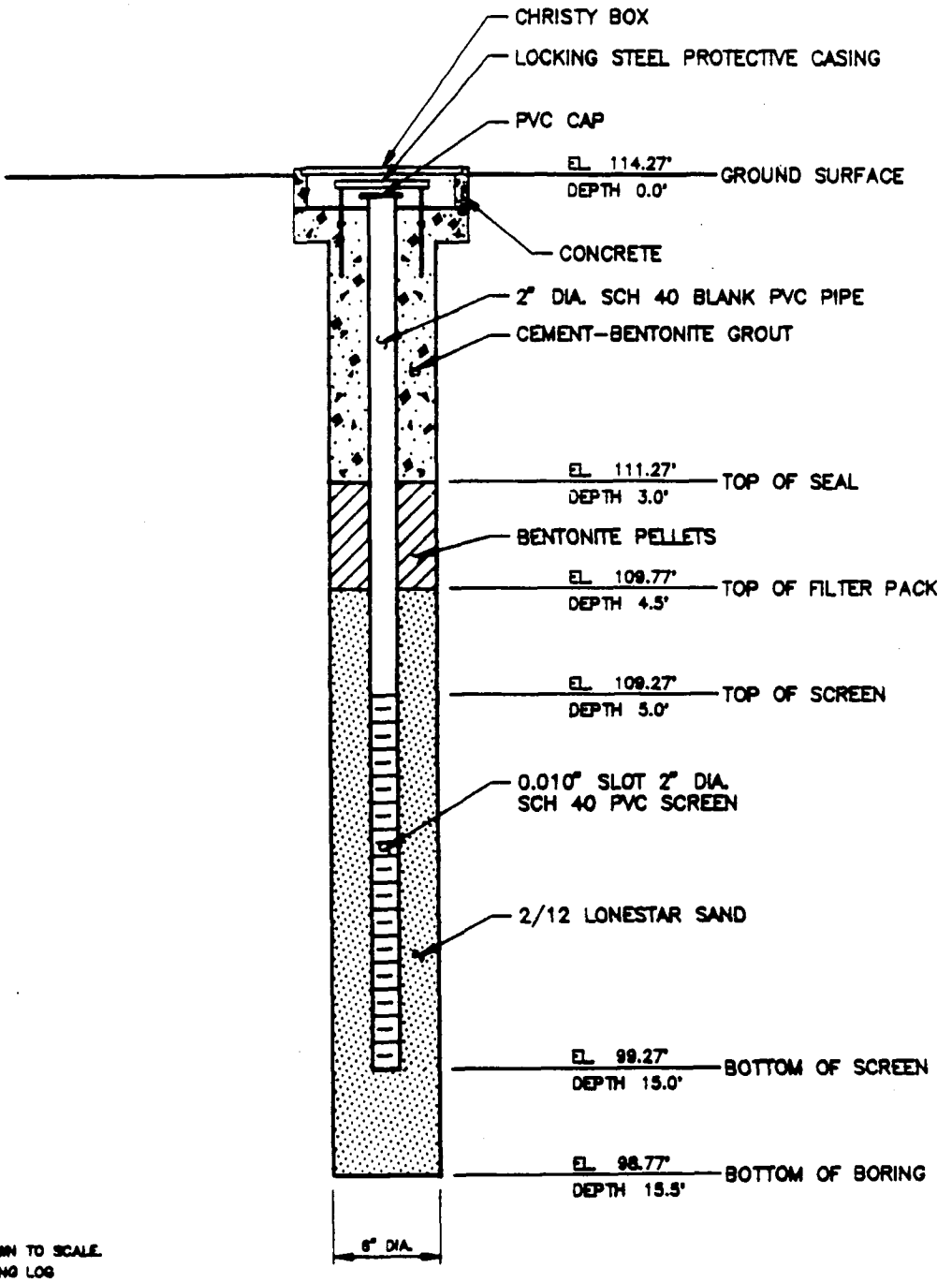
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW360-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 360, WEST SIDE DATE 6-28-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

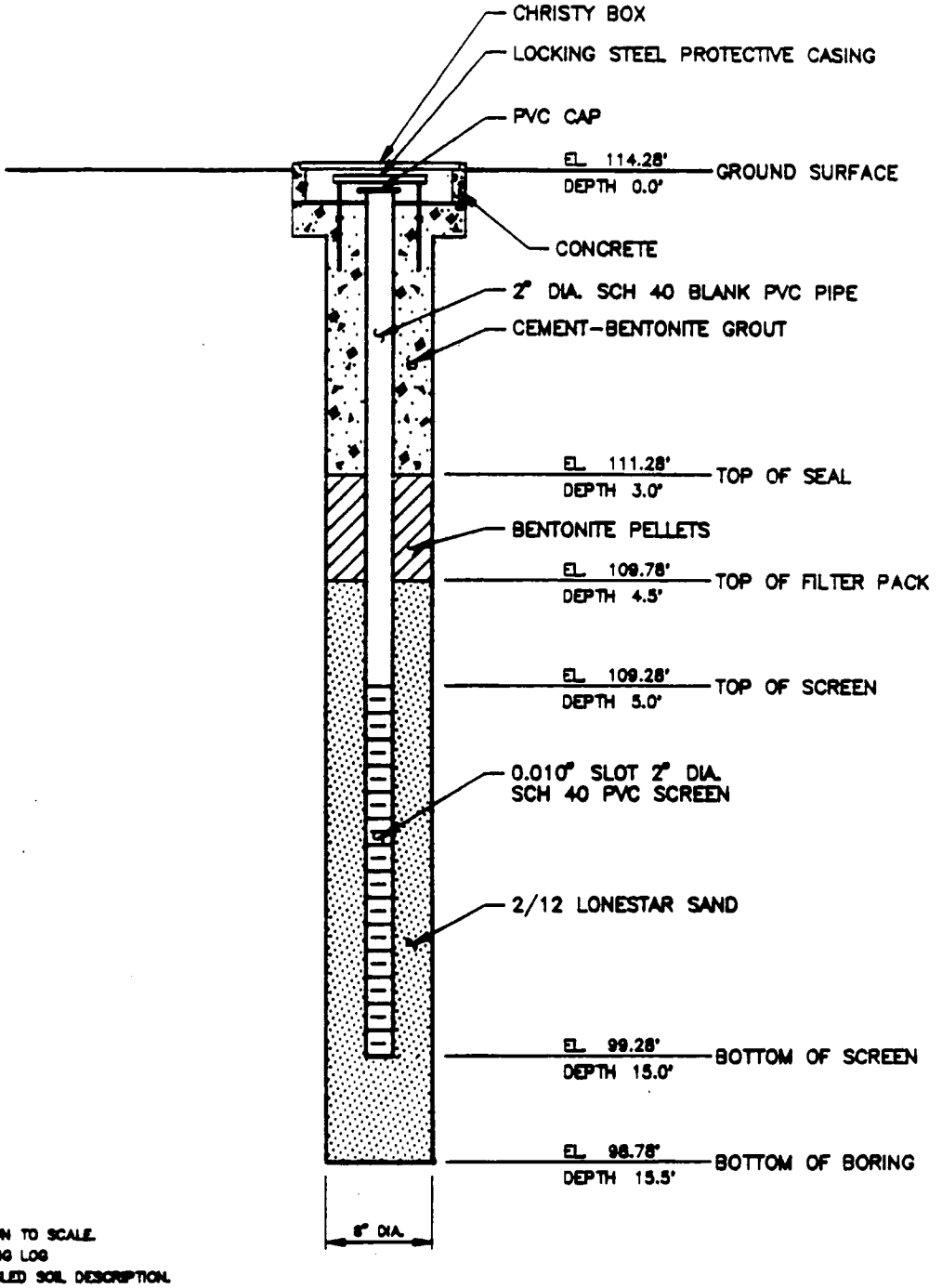
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW360-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 360, SOUTH SIDE DATE 6-27-90 BY GM



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

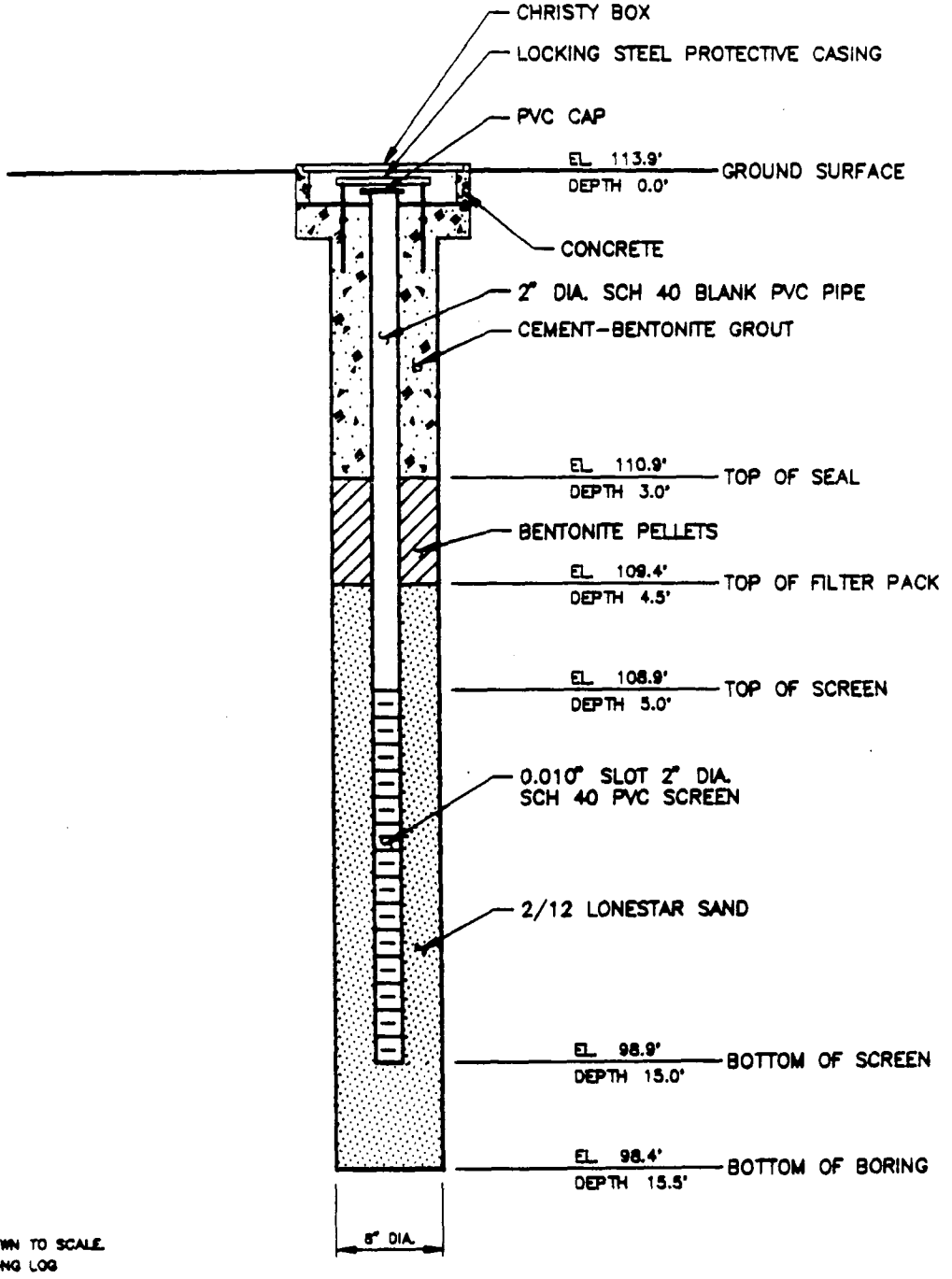
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW360-4

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 360, EAST SIDE DATE 6-27-90 BY GM



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX B

BUILDING 547
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW547-1
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION NW corner of fenced area of Building 547 at gate SURFACE ELEVATION 114.58 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/29/90 FINISH 6/29/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	12	14	11	14	SP			0.3	Asphalt. (Fill)	
													Medium dense, light brown, fine sand,	
	2	CS	1.5	3.0	6	7	7	15	SP				moist, some asphalt debris. (Fill)	
	3	CS	3.0	4.5	2	2	2	13	SP-SM			4.0	becomes loose at 1.5 feet.	
5													Loose, dark brown, silty fine sand,	
	4	CS	4.5	6.0	1	2	1	13	SM				saturated.	X
	5	CS	6.0	7.5	2	1	1	15	SM			6.0	Medium dense, brown, silty fine sand,	X
												7.3	saturated. (Merritt Sand)	X
	6	CS	7.5	9.0	3	6	12	18	SM				Loose, orange and brown mottled with	X
10	7	CS	9.0	10.5	14	15	14	17	SM				gray, silty, fine sand, saturated, with	X
													trace of clay. (Merritt Sand)	X
	8	CS	10.5	12.0	10	20	16	18	SM			10.5	becomes medium dense at 8.5 feet.	X
	9	CS	12.0	13.5	7	13	12	18	SM				layer of clayey sand at top of unit.	X
													Medium dense to dense, brown, silty	X
15	10	CS	13.5	15.0	7	13	15	18	SM				fine sand, saturated. (Merritt Sand)	X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.

2. Groundwater was encountered at 4.0 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was converted to a monitoring well upon completion of drilling.

5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW547-2
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Northeast corner of fenced area of Building 547 SURFACE ELEVATION 113.87 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/29/90 FINISH 6/29/90

DEPTH	No.	TYPE	INTERVAL FROM	INTERVAL TO	COUNT 0" 6"	COUNT 6" 12"	COUNT 12" 18"	(in)	SOIL TYPE	(%)	(TSF)	LAYER DEPTH	AND REMARKS	PIEZO
	1	CS	0.0	1.5	4	9	14	13	SM				Grass and topsoil.	
												0.5	Medium dense, dark brown, silty	
	2	CS	1.5	3.0	6	8	12	15	SM				fine sand, dry. (Fill)	
	3	CS	3.0	4.5	10	10	7	14	SM				becomes moist with odor at 2.5 feet.	
5													color change to black at 2.8 feet.	
	4	CS	4.5	6.0	2	3	2	15	SM			5.0	trace of clay at 3.5 feet.	X
	5	CS	6.0	7.5	3	5	10	18	SC			7.0	becomes loose at 4.5 feet.	X
													Medium dense, brown, silty sand,	X
	6	CS	7.5	9.0	5	10	11	16	SC				saturated.	X
10	7	CS	9.0	10.5	9	7	10	16	SC				Medium dense, orange brown mottled	X
													with gray, clayey fine sand, saturated.	X
	8	CS	10.5	12.0	9	9	13	15	SC				clay decreases to some at 9.0 feet.	X
	9	CS	12.0	13.5	9	10	11	16	SC				color change to brown at 9.0 feet..	X
													(Merritt Sand)	X
15	10	CS	13.5	15.0	6	11	13	18	SC				Heaving sands encountered at bottom	X
													of borehole.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.

2. Groundwater was encountered at 5.3 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was converted to a monitoring well upon completion of drilling.

5. OVA readings:
   a) 10 ppm at 1.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW547-3
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION South of service island in fenced area of Bldg. 547 SURFACE ELEVATION 115.61 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 7/2/90 FINISH 7/2/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	6	13	13	9	SP				Asphalt. (Fill)	
												1.0	Medium dense, gray, fine sand, dry,	
	2	CS	1.5	3.0	2	12	13	15	SP				with fuel odor. (Fill)	
	3	CS	3.0	4.5	6	5	6	14	SP				sand becomes moist at 3.5 feet.	
5													thin layer of clay at 4.0 feet.	
	4	CS	4.5	6.0	1	1	1	13	CL			5.5	Soft, dark gray, sandy clay, saturated.	X
	5	CS	6.0	7.5	1	1	1	16	CL			7.3	Sand decreases to none at 6.3 feet.	X
													Very loose, black, silty fine sand,	X
	6	CS	7.5	9.0	2	2	2	17	SM				saturated.	X
10	7	CS	9.0	10.5	3	2	2	15	SM			10.3	Loose, orange brown mottled with gray,	X
													silty, fine sand, saturated, with	X
	8	CS	10.5	12.0	2	5	7	18	SM				some clay. (Merritt Sand)	X
	9	CS	12.0	13.5	2	9	10	16	SM				becomes medium dense at 11.5 feet.	X
													clay decreases to trace at 12.8 feet.	X
15	10	CS	13.5	15.0	5	8	13	17	SM					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 30-40 ppm at 1.5 feet.
   b) 100-200 ppm in hole 3.0 feet.
   c) 50 ppm at 6.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW547-4
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Southwest corner of fenced area of Building 547 SURFACE ELEVATION 114.68 feet
DRILLER Spectrum Drilling - Garry Buss DATE: START 6/28/90 FINISH 6/28/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	9	10	13	SM				Asphalt. (Fill)	
												0.3	Medium dense, dark brown, silty fine	
	2	CS	1.5	3.0	6	8	6	15	SM				sand, dry. (Fill)	
	3	CS	3.0	4.5	1	2	2	15	SM				becomes very loose at 3.0 feet.	
5													color change to black at 3.8 feet.	
	4	CS	4.5	6.0	1	1	1	18	SM				becomes saturated at 4.5 feet.	X
	5	CS	6.0	7.5	2	2	2	15	SM					X
														X
	6	CS	7.5	9.0	1	1	1	17	SM					X
10	7	CS	9.0	10.5	3	4	4	16	SC			9.0	Loose, reddish brown and gray, clayey	X
													fine sand, saturated, with some silt.	X
	8	CS	10.5	12.0	4	7	6	17	SC				(Merritt Sand)	X
	9	CS	12.0	13.5	2	5	10	15	SC				clay decreases to trace at 12.5 feet.	X
														X
15	10	CS	13.5	15.0	10	12	15	13	SM			13.5	Medium dense, dark brown, silty	X
													fine sand, saturated.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameterhollow stem augers.

2. Groundwater was encountered at 4.5 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was converted to a monitoring well upon completion of drilling.

5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW547-5
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Southeast corner of fenced area of Building 547 SURFACE ELEVATION 114.68 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/29/90 FINISH 6/29/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	4	14	19	10	SP				Grass and Topsoil.	
												0.2	Medium dense, light brown, fine sand,	
	2	CS	1.5	3.0	21	13	17	13	SP				dry. (Fill)	
	3	CS	3.0	4.5	5	6	5	12	SP				trace of red brick fragments from	
5													1.7 feet to 2.0 feet.	
	4	CS	4.5	6.0	2	4	6	15	SM			4.5	Loose, dark brown, silty fine sand, moist,	x
	5	CS	6.0	7.5	2	6	4	16	SC			6.0	with pockets of gray clay.	x
													Loose, black, clayey fine sand, with	x
	6	CS	7.5	9.0	3	4	3	17	SC				some silt, saturated.	x
10	7	CS	9.0	10.5	3	5	3	16	SM			9.0	Loose, dark brown, silty fine sand, with	x
													trace of clay, saturated.	x
	8	CS	10.5	12.0	10	12	15	18	SM			10.5	Medium dense, orange brown mottled	x
	9	CS	12.0	13.5	2	10	20	17	SM				with gray silty fine sand, saturated with	x
													trace of clay. (Merritt Sand)	x
15	10	CS	13.5	15.0	8	11	16	16	SM					x
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B547-6
LOGGED BY RMD

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION Northeast corner of fenced area of Building 547 SURFACE ELEVATION 114.8 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 7/2/90 FINISH 7/2/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6" 12" / 6" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	7 16 12	0	SM			0.3	Asphalt. (Fill)	
											Medium dense, brown, silty fine sand,	
	2	CS	1.5	3.0	15 18 16	12	SM				moist. (Fill)	
	3	CS	3.0	4.5	3 2 4	9	SM					
5											color change to black at 4.5 feet.	
	4	CS	4.5	6.0	4 2 3	15	SM				becomes saturated at 5.5 feet.	
	5	CS	6.0	7.5	2 3 2	13	SM				color change to brown at 6.0 feet.	
	6	CS	7.5	9.0	2 8 20	16	SC			7.8	Medium dense, orange brown mottled	
10	7	CS	9.0	10.5	17 25 20	18	SC				with gray, clayey sand, saturated, with	
											trace of silt. (Merritt Sand)	
	8	CS	10.5	12.0	10 15 25	18	SC				decrease in clay to some at 11.5 feet.	
	9	CS	12.0	13.5	10 17 20	15	SC				some interlayered silty sand.	
15	10	CS	13.5	15.0	6 10 12	15	SC					
										15.0	Bottom of Boring at 15.0 feet.	
20											Notes:	
											1. Boring was advanced using 8-inch-diameter hollow stem augers.	
											2. Groundwater was encountered at 5.5 feet during drilling.	
25											3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30											4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
35											5. OVA readings: a) 1 ppm at 1.0 feet.	
40												

Canonie Environmental

PROJECT No. 86-018-1804
BORING No. B547-7
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION North of service island in fenced area of Bldg. 547. SURFACE ELEVATION 116.2 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 6/28/90 FINISH 6/28/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	19	21	12	SM			0.3	Asphalt. (Fill)	
													Dense, dark brown, silty fine sand, moist.	
	2	CS	1.5	3.0	16	23	24	14	SP			1.8	Dense, light brown, fine sand, moist.	
	3	CS	3.0	4.5	5	7	6	15	SP				strong fuel odor at 1.5 feet.	
5													becomes loose at 4.5 feet.	
	4	CS	4.5	6.0	3	3	3	16	SP				very strong fuel odor at 5.5 feet.	
	5	CS	6.0	7.5	2	4	4	12	SP				becomes saturated at 5.5 feet.	
	6	CS	7.5	9.0	2	1	2	15	SP			8.0	Very loose, dark grayish brown, fine	
10	7	CS	9.0	10.5	7	12	10	17	SP				sand, saturated, with trace of silt,	
													becomes medium dense at 9.0 feet.	
	8	CS	10.5	12.0	6	10	12	15	SM			11.0	Medium dense, brown and gray, silty	
	9	CS	12.0	13.5	8	8	8	17	SM				fine sand, saturated, with some clay	
													seams. some orange-mottled gray	
15	10	CS	13.5	15.0	6	13	13	17	SM				coloring at 11.0 feet. (Merritt Sand)	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.

2. Groundwater was encountered at 5.5 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was backfilled with cement/bentonite grout upon completion of drilling.

5. OVA readings:
   a) 30 ppm down hole at 1.5 feet.
   b) 300-700 ppm at 2.0 feet.
   c) > 1,000 ppm at 5.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B547-8
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION NE of service island in fenced area of Building 547 SURFACE ELEVATION 116.2 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 7/3/90 FINISH 7/3/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	11	17	20	10	SM			0.3	Asphalt. (Fill)	
													Dense, dark brown, silty fine sand, moist.	
	2	CS	1.5	3.0	11	18	15	14	SP			2.0	Medium dense, light gray, fine sand,	
	3	CS	3.0	4.5	6	7	6	14	SP				moist, fuel odor.	
5													becomes very loose at 4.5 feet.	
	4	CS	4.5	6.0	2	1	1	11	SP				becomes saturated at 5.5 feet.	
	5	CS	6.0	7.5	1	2	1	14	SM			6.5	Very loose, black, silty fine sand,	
													saturated.	
	6	CS	7.5	9.0	2	1	2	14	SM				strong fuel odor at 6.5 feet	
10	7	CS	9.0	10.5	2	5	10	16	SM			9.5	color change to dark gray at 7.5 feet.	
													Medium dense, orange brown mottled	
	8	CS	10.5	12.0	6	20	17	18	SM				with gray silty fine sand, saturated,	
	9	CS	12.0	13.5	4	10	20	15	SM				with some clay. (Merritt Sand)	
													clay decreases to trace at 12.0 feet.	
15	10	CS	13.5	15.0	6	13	25	11	SM					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) > 1,000 ppm at 2.0 feet.
   b) 10-20 ppm at 7.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B547-9
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION West of fenced area of Bldg. 547 by power pole SURFACE ELEVATION 114 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 7/2/90 FINISH 7/2/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	28	9	9	12	SM			0.3	Asphalt. (Fill)	
													Medium dense, dark brown, silty fine	
	2	CS	1.5	3.0	4	4	5	12	SM				sand, moist.	
	3	CS	3.0	4.5	2	2	1	13	SM				becomes loose at 1.5 feet.	
5													color change to light brown at 2.5 feet.	
	4	CS	4.5	6.0	2	1	1	14	SM				dark brown layer at 4.0 feet.	
	5	CS	6.0	7.5	2	1	4	16	SM-SC			7.0	becomes saturated at 4.5 feet.	
													Loose, dark brown mottled with gray	
	6	CS	7.5	9.0	6	10	14	16	SC-SM			8.0	and orange clayey fine sand, saturated	
10	7	CS	9.0	10.5	7	12	10	15	SM				Medium dense, reddish brown & gray,	
													silty fine sand, saturated, with	
	8	CS	10.5	12.0	6	10	9	18	SM				some clay. (Merritt Sand)	
	9	CS	12.0	13.5	4	3	4	6	SM				color change to brown gray at 13.5	
													feet.	
15	10	CS	13.5	15.0	10	10	11	17	SM				clay decreases to none at 13.5 feet.	
												15.0	Bottom of Boring at 15.0 feet.	
													Notes:	
20													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 4.5 feet during drilling.	
25													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35													5. OVA readings: No OVA readings observed during drilling.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B547-10
LOGGED BY BB

PROJECT NAME NAS Alameda - Phase 2A Site Investigations
BORING LOCATION S side of fenced area of Bldg. 547, by dual gates SURFACE ELEVATION 114.9 feet
DRILLER Spectrum Exploration - Garry Buss DATE: START 7/2/90 FINISH 7/2/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	TO	BLOW COUNT 0" 6" 6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	19 19	14	SM			0.3	Asphalt. (Fill)	
												Dense, dark brown, silty fine sand,	
	2	CS	1.5	3.0	7	8 5	12	SM				moist, some gravel from 0.3-1.5 feet.	
	3	CS	3.0	4.5	3	3 3	15	SM				becomes medium dense at 1.5 feet.	
5												becomes loose at 3.0 feet.	
	4	CS	4.5	6.0	1	2 3	15	SM				color change to black at 3.5 feet.	
	5	CS	6.0	7.5	2	4 3	18	SM				becomes saturated at 5.0 feet.	
	6	CS	7.5	9.0	2	2 3	16	SM					
10	7	CS	9.0	10.5	2	2 3	16	SM				color change to dark brown at 9.5 feet.	
	8	CS	10.5	12.0	3	7 13	17	SM			10.5	Medium dense, dark brown and gray,	
	9	CS	12.0	13.5	6	8 8	15	SM				silty fine sand, saturated, with	
												some clay.	
15	10	CS	13.5	15.0	5	13 15	17	SM				color change to reddish brown mottled	
												gray at 12.5 feet.	
											15.0	Bottom of Boring at 15.0 feet.	
												Notes:	
20													
												1. Boring was advanced using 8-inch-diameter hollow stem augers.	
												2. Groundwater was encountered at 5.0 feet during drilling.	
25													
												3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30													
												4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35													
												5. OVA readings: a) 2 ppm at 3.5 feet. b) 15-30 ppm at 6.0 feet.	
40													

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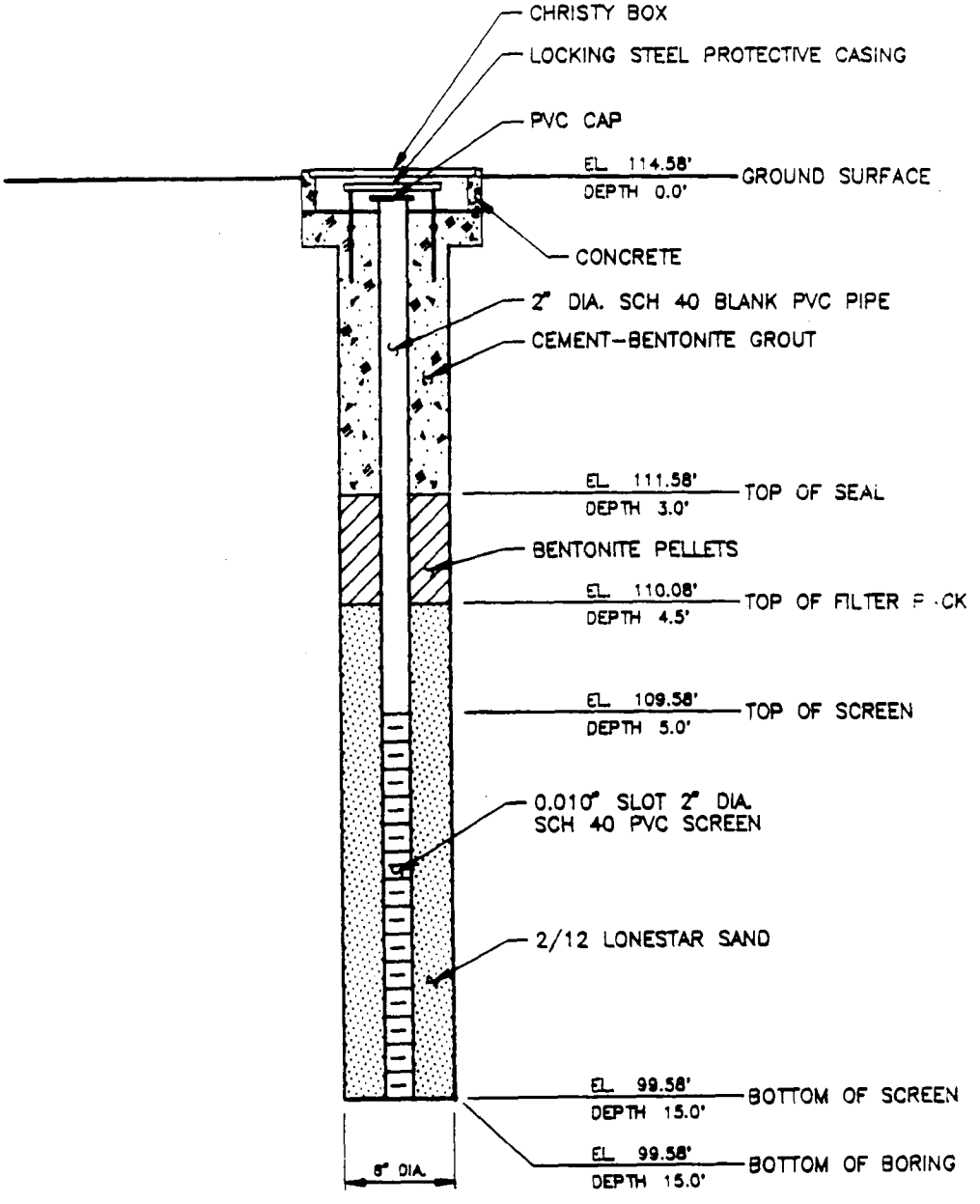
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW547-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION AREA 547, NORTHWEST CORNER AT GATE DATE 6-29-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

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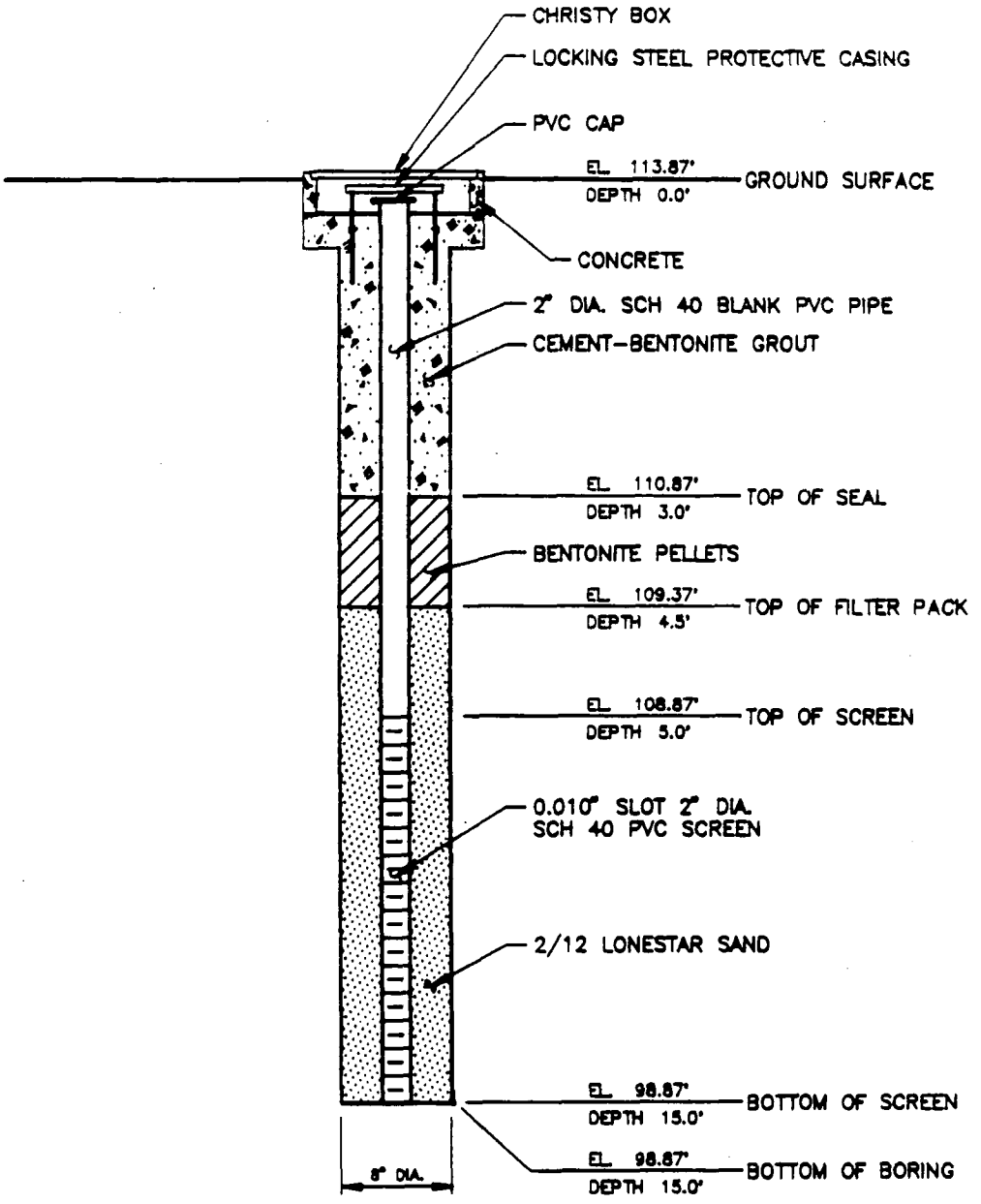
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW547-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION AREA 547, NORTHEAST CORNER DATE 6-29-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

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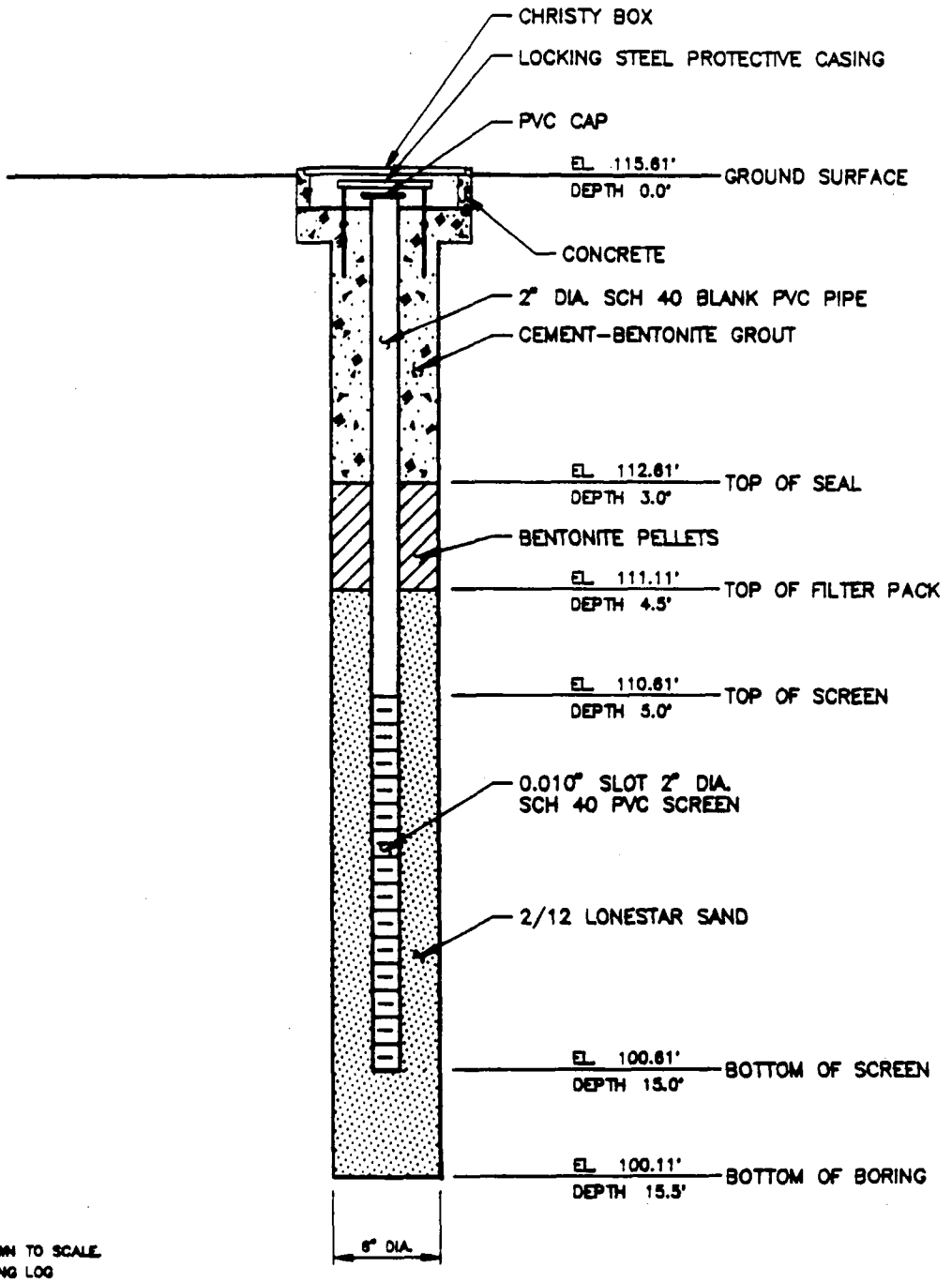
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW547-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION AREA 547, SOUTH OF GASOLINE ISLAND DATE 7-2-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

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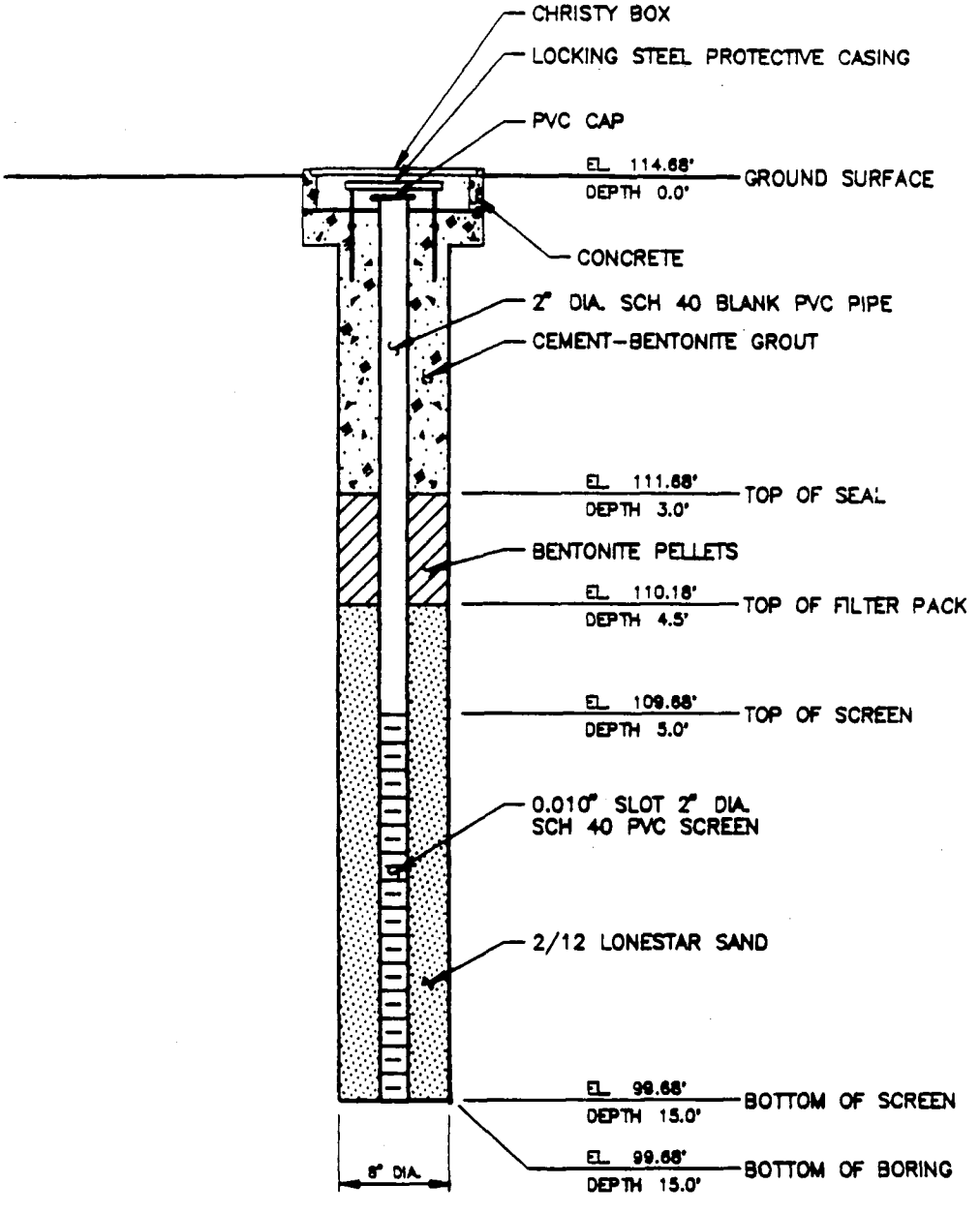
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW547-4

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION AREA 547, SOUTHWEST CORNER DATE 6-28-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

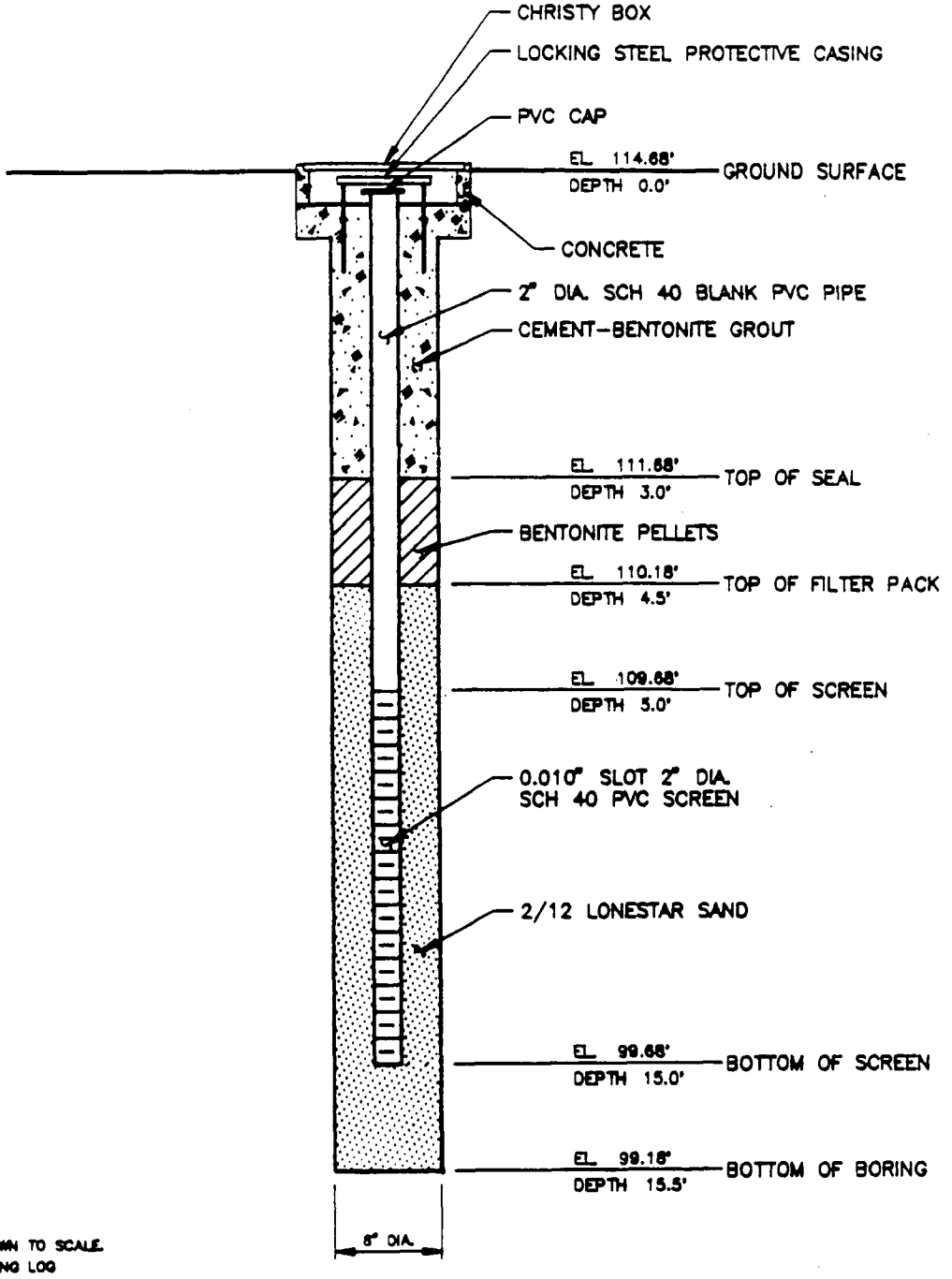
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW547-5

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION AREA 547, SOUTHEAST CORNER DATE 6-29-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX C

YARD D-13
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWD13-1
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: N side of yard D13, inside fence by N gate SURFACE ELEV. 114.57 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	20	6	16	14	SM			0.3	Asphalt. (Fill)	
													Medium dense to dense, light brown, silty	
	2	CS	1.5	3.0	10	20	13	14	SM				fine sand, dry. (Fill)	
	3	CS	3.0	4.5	1	2	3	14	SM			3.5	Very loose, dark brown, mottled, gray silty	
5													fine sand, moist, with some pockets of	
	4	CS	4.5	6.0	2	1	1	0	SM				gray clay.	X
	5	CS	6.0	7.5	1	1	2	12	SM				color changes to balck at 4.5 feet.	X
														X
	6	CS	7.5	9.0	2	1	3	15	SM-SC			8.0	Very loose, mottled gray, orange brown,	X
10	7	CS	9.0	10.5	5	10	15	18	SC				silty clayey fine sand, saturated, with	X
													some silt. (Merritt Sand)	X
	8	CS	10.5	12.0	6	13	16	16	SC				become medium dense at 9.0 feet.	X
	9	CS	12.0	13.5	11	10	6	16	SC				thin layer of sandy, clay at 9.0 feet.	X
														X
15	10	CS	13.5	15.0	6	6	10	8	SC					X
												15.0	Bottom of Boring at 15.0 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 6.5 feet during drilling.	
25													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: No OVA readings observed during drilling.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWD13-2
LOGGED BY TGB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: North end of yard D13, west of Bldg 616 SURFACE ELEV. 113.90 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/6/90 FINISH 7/6/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	14	18	16	18	GM			0.3	Dense, brown, silty gravel, moist. (Fill)	
	2	CS	2.0	3.5	15	22	20	15	GM					
5	3	CS	3.5	5.0	9	19	17	18	SM			3.5	Medium dense, brown, silty fine sand,	
	4	CS	5.0	6.5	5	10	11	18	SM				moist.	X
													becomes saturated at 5.5 feet.	X
	5	CS	6.5	8.0	8	10	6	15	SM				color changes to gray from 6.5-7.5 feet.	X
	6	CS	8.0	9.5	4	2	1	18	SM				thin layer of organic matter at 9.0 feet.	X
10														X
	7	CS	9.5	11.0	1	1	6	18	SM					X
	8	CS	11.0	12.5	8	11	10	18	SC			11.0	Medium dense, orange brown mottled	X
													with gray, clayey fine sand, saturated,	X
	9	CS	12.5	14.0	4	13	15	18	SC				with some silt.	X
15	10	CS	14.0	15.5	4	9	12	18	SC				increase in silt content below 13.0 feet.	X
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 200 ppm at 1.5 feet.
   b) 20-30 ppm at 3.0 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWD13-3
LOGGED BY TGB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: SW corner of yard D13, by west fence SURFACE ELEV. 114.36 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/6/90 FINISH 7/6/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	8	10	15	12	SM			0.5	Medium dense, light brown, silty fine	
	2	CS	2.0	3.5	5	8	6	12	SM				sand, dry. (Fill)	
5	3	CS	3.5	5.0	3	1	1	12	SM				becomes saturated at 5.0 feet.	
	4	CS	5.0	6.5	2	7	9	6	SM			6.5	Concrete rubble between 5 and 10 feet.	X
													(Fill)	X
													(driller noted resistance at 5.0 feet.	X
													boring location moved three times due	X
10													to refusal.)	X
	5	CS	10.0	11.5	5	5	5	12	CL			10.0	Medium stiff, dark gray, silty clay.	X
	6	CS	11.5	13.0	7	13	18	18	SC			11.7	Medium dense, orange brown mottled	X
													with clayey, fine sand, saturated, with	X
	7	CS	13.0	14.5	8	9	19	18	SC				some silt. (Merritt Sand)	X
15	8	CS	14.5	15.0	10	12	15	6	SC					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 2 ppm at 11.7 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWD13-4
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Yard D13 by the south gate SURFACE ELEV. 115.69 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/9/90 FINISH 7/9/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	2.0	3.5	30	21	19	17	SP			2.8	Dense, light brown, fine sand, moist. (Fill)	
5	2	CS	3.5	5.0	15	19	19	12	SP					
								0				5.0	Concrete rubble and silty sand. (Fill)	X
													augered between 5 and 8 feet.	X
								0					saturated below 6.5 feet.	X
	3	CS	8.0	9.5	40	25	35	8	GP			8.0	Dense, gray, silty sandy gravel, saturated.	X
10													(Fill)	X
	4	CS	9.5	11.0	5	30	50	17	GP					X
													augered between 11.0 and 12.5 feet.	X
														X
	5	CS	12.5	14.0	10	15	15	0	SM			12.5	Medium dense, brown, silty fine sand,	X
15	6	CS	14.0	15.5	8	10	15	18	SM				saturated.	X
												15.5	Bottom of Boring at 15.5 feet	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-5
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northwest corner of Yard D13 SURFACE ELEV. 113.9 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/3/90 FINISH 7/3/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	9	13	13	15	SM				Asphalt. (Fill)	
												1.0	Loose, brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	8	16	17	15	SM				becomes medium dense below 1.5 feet.	
	3	CS	3.0	4.5	6	8	6	16	SM					
5													becomes saturated below 4.5 feet.	
	4	CS	4.5	6.0	2	5	10	12	SM				color change to gray brown at 5.8 feet.	
	5	CS	6.0	7.5	5	3	6	12	SM					
												7.5	Loose, gray silty gravelly fine sand,	
	6	CS	7.5	9.0	5	3	6	0	SP				saturated, with concrete and brick	
10	7	CS	9.0	10.5	6	9	8	16	SM			9.0	fragments. (Fill)	
													Medium dense orange brown, clayey,	
	8	CS	10.5	12.0	8	15	16	16	SM				silty fine sand, saturated, with trace	
	9	CS	12.0	13.5	4	10	10	16	SM				of clay. (Merritt Sand)	
													some gray mottling between 11 and	
15	10	CS	13.5	15.0	6	10	11	14	SM				12.5 feet.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-6
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NE corner of Building 616 in Yard D13 SURFACE ELEV. 114.1 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/3/90 FINISH 7/3/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	15	18	15	SM			0.3	Asphalt. (Fill)	
													Medium dense, light brown, silty fine sand. moist. (Fill)	
	2	CS	1.5	3.0	8	16	13	15	SM					
	3	CS	3.0	4.5	7	12	12	15	SM					
5														
	4	CS	4.5	6.0	5	6	4	12	SM			5.0	Loose to medium dense, dark gray, silty	
	5	CS	6.0	7.5	2	5	6	18	SM			7.0	fine sand, saturated. (Fill)	
													thin layer of silty clay at 6.5 feet.	
	6	CS	7.5	9.0	3	3	5	18	SM			8.0	Medium dense dark gray, silty fine sand,	
10	7	CS	9.0	10.5	3	5	15	18	SC				saturated.	
													Loose reddish brown mottled gray,	
	8	CS	10.5	12.0	2	8	18	18	SC				clayey fine sand, saturated, with some	
	9	CS	12.0	13.5	4	10	16	16	SC				silt, (Merritt Sand)	
													becomes medium dense below 9 feet.	
15	10	CS	13.5	15.0	5	5	20	18	SC					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 10 ppm at 0.5 feet.
   b) 30 ppm at 6.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-7
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northeast corner of Yard D13 SURFACE ELEV. 114.1 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/3/90 FINISH 7/3/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	18	14	15	SM			0.3	Asphalt. (Fill)	
	2	CS	1.5	3.0	4	6	12	12	SM				Medium dense, light brown, silty fine sand. (Fill) some cobbles and wood fragments between 3 to 4.5 feet.	
5	3	CS	4.5	6.0	5	7	5	18	SM			4.5	Loose, medium dense dark brown, silty fine sand, saturated.	
	4	CS	6.0	7.5	3	5	7	12	SM			7.0	Medium dense brown, silty fine sand.	
	5	CS	7.5	9.0	3	3	4	15	SM					
10	6	CS	9.0	10.5	6	6	11	14	SM-SC			9.5	Medium dense orange brown, mottled gray, clayey fine sand, with some gray mottled abundant iron-stained laminations at top of unit. (Merritt Sand)	
	7	CS	10.5	12.0	2	2	4	15	SC					
	8	CS	12.0	13.5	5	8	10	15	SC					
15	9	CS	13.5	15.0	8	15	15	14	SC					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-8
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South of Building 616 in Yard D13 SURFACE ELEV. 114.5 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/5/90 FINISH 7/5/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	30	17	20	13	SP			0.3	Asphalt. (Fill)	
												0.8	Base rock. (Fill)	
	2	CS	1.5	3.0	7	12	13	14	SP				Medium dense, light brown, fine sand, moist. (Fill)	
	3	CS	3.0	4.5	5	4	9	12	SP				becomes saturated below 4.5 feet.	
5														
	4	CS	4.5	6.0	10	15	14	13	SM			5.0	Medium dense; grayish brown, gravelly silty sand, saturated. (Fill)	
	5	CS	6.0	7.5	7	7	3	12	SM				(driller reports very runny, some rock fragments.)	
	6	CS	7.5	9.0	3	4	12	8	SM					
10	7	CS	9.0	10.5	4	10	9	9	SM					
	8	CS	10.5	12.0	5	5	10	15	SC			10.5	Medium dense, gray, clayey fine sand, saturated.	
	9	CS	12.0	13.5	5	10	20	13	SC			11.5	black discoloration and soupy conditions at 10.5 feet, strong odor.	
15	10	CS	13.5	15.0	7	10	15	9	SC					
												15.0	some gravel and rock fragments (Fill)	
													Medium dense to to dense, orange brown, clayey sand, saturated. (Merritt Sand)	
20													some gray mottling at 14 feet.	
													Bottom of Boring at 15.0 feet.	
25														
30														
35														
40														

Notes:
1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 10 -30 ppm at 6.5 feet.
   b) 20 ppm at 9.0 feet.
   c) 100-150 ppm at 10.5 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-9
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South of SE corner of Building 616 SURFACE ELEV. 114.7 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/5/90 FINISH 7/5/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	16	20	18	13	SM				Asphalt. (Fill)	
												0.8	Medium dense to dense, brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	10	17	14	15	SM					
	3	CS	3.0	4.5	6	7	7	14	SM					
5													saturated below 4.5 feet.	
	4	CS	4.5	6.0	4	7	5	12	SM				thin layer of gray clay at 4.5 feet.	
	5	CS	6.0	7.5	15	9	17	16	SM-SP			6.5	interlayered gray clay below 5 feet.	
													Medium dense, gray, fine to medium sand, saturated, with abundant tiny round shells.	
	6	CS	7.5	9.0	4	10	12	18	SP					
10	7	CS	9.0	10.5	4	14	20	16	SP-SC			9.7		
													Dense, orange brown clayey sand, saturated. (Merritt Sand)	
	8	CS	10.5	12.0	5	12	18	16	SC				thin layer of gray silty sand at 10.5 to 11.3 feet, some shells.	
	9	CS	12.0	13.5	12	12	15	15	SC					
15	10	CS	13.5	15.0	15	21	15	18	SC					
												15.0	Bottom of Boring at 15 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-10
LOGGED BY GM

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southeast of Building 616 in Yard D13 SURFACE ELEV. 114.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/5/90 FINISH 7/5/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	12	20	15	13	SM				Asphalt. (Fill)	
												0.8	Medium dense, light brown, silty fine sand, dry. (Fill)	
	2	CS	1.5	3.0	5	4	5	12	SM				color change to dark brown at 3.0 feet.	
	3	CS	3.0	4.5	5	7	7	15	SM				saturated below 4.5 feet.	
5													color change to gray at 7.0 feet.	
	4	CS	4.5	6.0	2	4	4	14	SM					
	5	CS	6.0	7.5	2	3	2	18	SM-SC					
	6	CS	7.5	9.0	3	3	5	15	SC-SC			8.5	Medium dense, mottled gray-orange	
10	7	CS	9.0	10.5	7	9	10	18	CL			9.7	brown clayey sand, saturated. (Merritt Sand)	
	8	CS	10.5	12.0	10	14	9	18	CL-SC			11.0	Medium dense, mottled orange brown,	
	9	CS	12.0	13.5	10	12	13		SC				gray sandy clay, saturated, some layers of silty fine sand. (Merritt Sand)	
15	10	CS	13.5	15.0	9	14	16		SC				Medium dense orange brown, clayey	
												15.0	sand, saturated, some layers of silty sand. (Merritt Sand)	
													Bottom of Boring at 15.0 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25													2. Groundwater was encountered at 4.5 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30													4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
35													5. OVA readings: No OVA readings observed during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-11
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West side of Yard D13 by fence SURFACE ELEV. 114.2 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/10/90 FINISH 7/10/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	12	9	15	14	SM			0.5	Medium dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	2.0	3.5	10	13	10	15	SM					
5	3	CS	3.5	5.0	3	11	13	13	SM			4.5	Medium dense, orange dark brown to brown gray, gravelly silty sand, moist. (Fill)	
	4	CS	5.0	6.5	11	13		6	SM					
	5	CS	6.5	8.0	3	5	6	6	SM				concrete and rock debris below 6.5 feet. (auger tipped sideways due to concrete; hole was relocated; interval started at 6.5 feet.)	
	6	CS	8.0	9.5	4	25		6	SM					
10	7	CS	9.5	11.0	4	6	6	6	SM			10.0		
	8	CS	11.0	12.5	9	10	19	12	CL			11.5	color changes to gray at 8.0 feet.	
	9	CS	12.5	14.0	10	20	30	18	SC				Medium stiff dark gray, silty sandy clay, saturated.	
15	10	CS	14.0	15.5	18	16	25	18	SC			15.5	Medium, dense, orange brown clayey fine sand, saturated. (Merritt Sand) becomes dense at 14.0 feet.	
													Bottom of Boring at 15.5 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25													2. Groundwater was encountered at 6.5 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35														
													5. OVA readings: No OVA readings observed during drilling.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-12
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Center of Yard D13 SURFACE ELEV. 115.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/9/90 FINISH 7/9/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PEZO
													Asphalt. (Fill)	
	1	CS	1.0	2.5	15	29	31	15	SM			1.3	Dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	2.5	4.0	15	20	21	16	SM				becomes loose at 4.5 feet.	
5	3	CS	4.0	5.5	9	7	2	13	SM					
	4	CS	5.5	7.0	5	2	1	12	SC			6.5	Soft, gray clayey sand, saturated.	
	5	CS	7.0	8.5	2	1	1	15	SC					
	6	CS	8.5	10.0	6	16	21	17	SC			9.0	thin layer of clay at 8.5 feet.	
10													layer of black clayey sand at 8.5 to 9.0 feet, oily discoloration.	
	7	CS	10.0	11.5	3	13	21	15	SC					
	8	CS	11.5	13.0	6	13	20	13	SC				Medium dense orange brown, clayey fine sand, saturated, with trace of silt. (Merritt Sand)	
	9	CS	13.0	14.5	6	13	12	15	SC					
15	10	CS	14.5	16.0	6	12	19	18	SC					
												16.0	Bottom of Boring at 16.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.3 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-13
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: E side of Yard D13, N of concrete pad SURFACE ELEV. 114.9 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	2.0	3.5	10	5	5	15	SM			2.0	Loose, light brown, silty fine sand, moist. (Fill)	
5	2	CS	3.5	5.0	10	10		2	SM				concrete encountered at 4.5 and 6.0 feet.	
	3	CS	5.0	6.5	10	5		0	SM				saturated below 6.5 feet.	
	4	CS	6.5	8.0	2	1	3	12	SM			6.5	Very loose, brown, silty fine sand,	
	5	CS	8.0	9.5	6	7	25	18	SM			8.5	saturated, trace of clay.	
10													Medium dense, orange brown, silty fine	
	6	CS	9.5	11.0	12	20	25	14	SM				sand, saturated, with trace of clay, some	
	7	CS	11.0	12.5	10	15	12	18	SM				gray mottling. (Merritt Sand)	
													no clay below 12.5 feet.	
	8	CS	12.5	14.0	12	10	11	14	SM					
15	9	CS	14.0	15.5	10	12	14	18	SM					
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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PROJECT No. 86-018-1804
BORING No. BD13-14
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: SW corner of Yard D13 on concrete pad SURFACE ELEV. 115.2 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/9/90 FINISH 7/9/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
												1.0	Dense, dark to light brown, silty fine sand. moist. (Fill)	
	1	CS	1.5	3.0	30	32	19	15	SM					
5	2	CS	3.0	4.5	15	15	18	15	SM				concrete debris between 4.5 and 6.0 feet.	
													becomes saturated at 6.0 feet.	
	3	CS	6.0	7.5	6	5	50	0	SM				concrete encountered 6.5 to 9.0 feet.	
10														
	4	CS	9.0	10.5	8	8	3	8	GP			9.0	Medium dense brown gray, silty, sandy gravel, saturated.	
	5	CS	10.5	12.0	5	20	15	0	GP				cobbles at 10.5 feet.	
15	6	CS	13.5	15.0	22	22	15	18	SM			13.5	Dense, dark reddish brown, silty fine sand, saturated, trace of clay, some interbedded clayey sand. (Merritt Sand)	
	7	CS	15.0	16.5	16	25	25	18	SM			16.5		
													Bottom of Boring at 16.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-15
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South edge of Yard D13 by gate SURFACE ELEV. 115.5 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/10/90 FINISH 7/10/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	1.5	3.0	38	23	14	13	SM			1.5	Medium dense light brown, silty fine sand, moist. (Fill)	
	2	CS	3.0	4.5	10	6	3	13	SM				becomes loose at 3.0 feet.	
5	3	CS	4.5	5.0	6			2	SM			4.5	Concrete debris and silty sand from 4.5 to 10. 5 feet. (Fill)	
													becomes saturated at 7.0 feet.	
	5	CS	7.5	9.0	4	2	2	6					color change to black between 10.5 and 11.0 feet.	
10														
	7	CS	10.5	12.0	10	12	20	17	SM			11.0	Dense, brown, silty fine to medium sand, saturated, abundant shells.	
	8	CS	12.0	13.5	20	20	25	15	SM			12.5	some black discoloration at top of unit.	
	9	CS	13.5	15.0	13	21	21	18	SM				Dense, orange brown, silty fine sand,	
15												15.0	saturated, trace of clay. (Merritt Sand)	
													Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 7.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BD13-16
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southeast corner of Yard D13 SURFACE ELEV. 115.0 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/10/90 FINISH 7/10/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete	
	1	CS	1.0	2.5	13	21	30	14	SM			1.0	Medium dense to dense, dark to light brown, silty fine sand, moist. (Fill)	
	2	CS	2.5	4.0	9	14	9	15	SM					
5	3	CS	4.0	5.5	3	6	4	14	SM-SC			4.5	Medium dense mottled gray brown, clayey sand, moist, with pockets of clay.	
	4	CS	5.5	7.0	3	2	1	13	SC					
	5	CS	7.0	8.5	1	1	5	8	SC				some wood and organic debris encountered below 8 feet.	
	6	CS	8.5	10.0	9	11	4	15	SC					
10													thin pocket of dark gray, gravelly silty sand, with shells at 9.5 feet.	
	7	CS	10.0	11.5	8	15	14	16	SC			11.0		
	8	CS	11.5	13.0	6	13	11	15	SC				wood encountered below 8 feet.	
	9	CS	13.0	14.5	2	3	10	18	SC				Medium dense, orange brown, clayey sand, saturated, some silt. (Merritt Sand)	
15												14.5	Bottom of Boring at 14.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 50 ppm at 8.0 feet.
   b) 10-30 ppm at 9.5 feet.
   c) 10 ppm at 11.0 feet.

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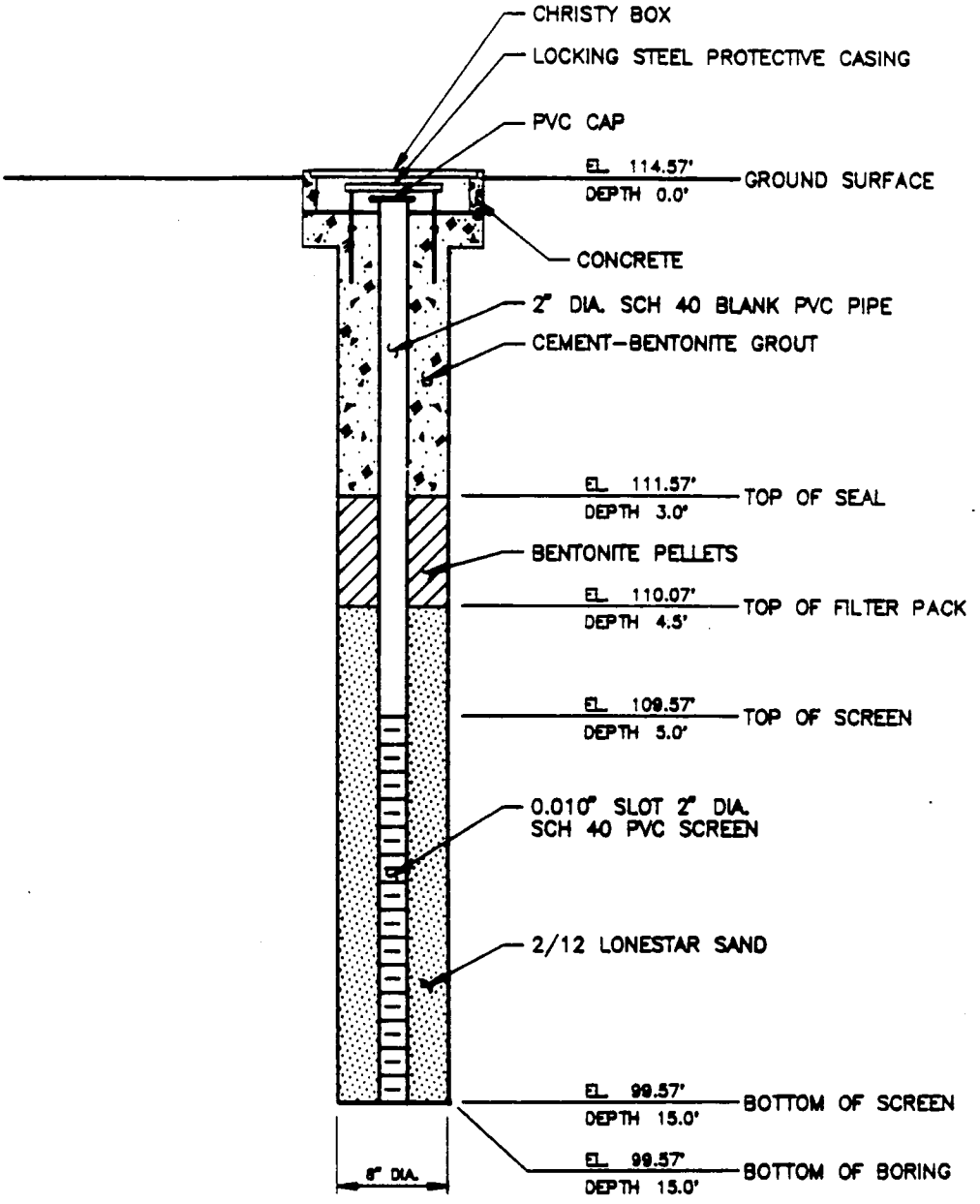
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWD13-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION YARD D13 BY NORTH GATE DATE 7-11-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

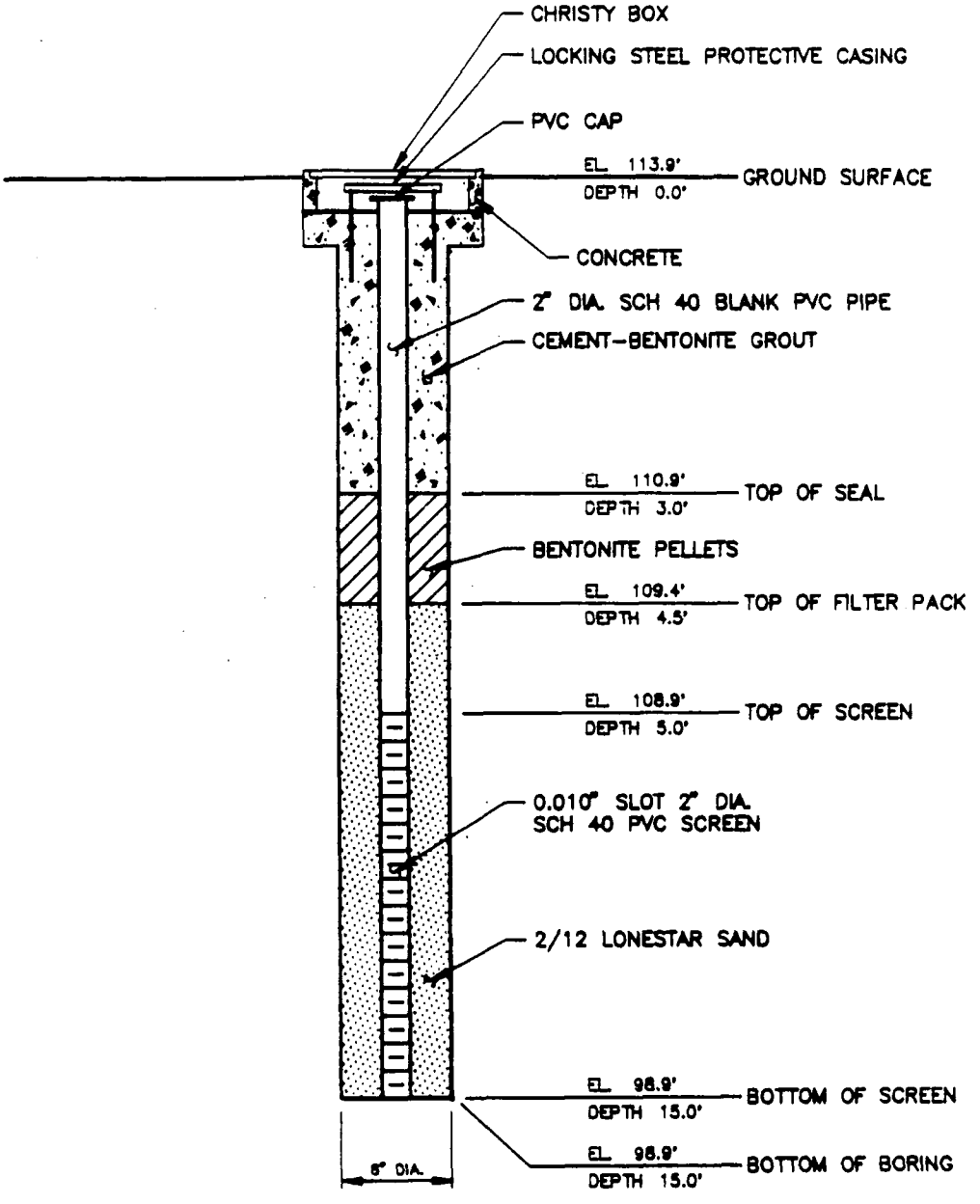
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWD13-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION YARD D13, WEST OF BUILDING 616 DATE 7-6-90 BY TGB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

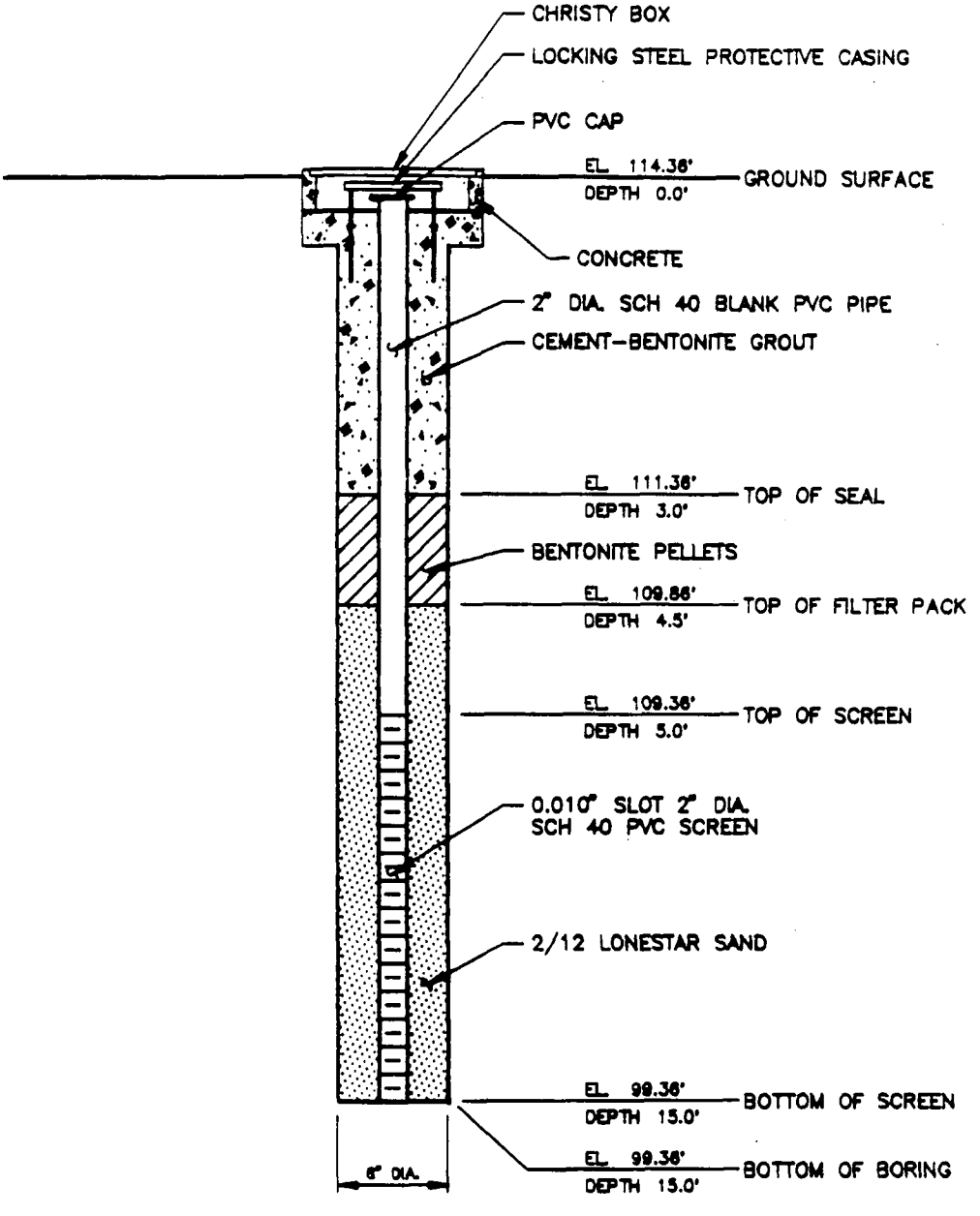
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWD13-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION YARD D13, SOUTHWEST CORNER DATE 7-6-90 BY TGB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

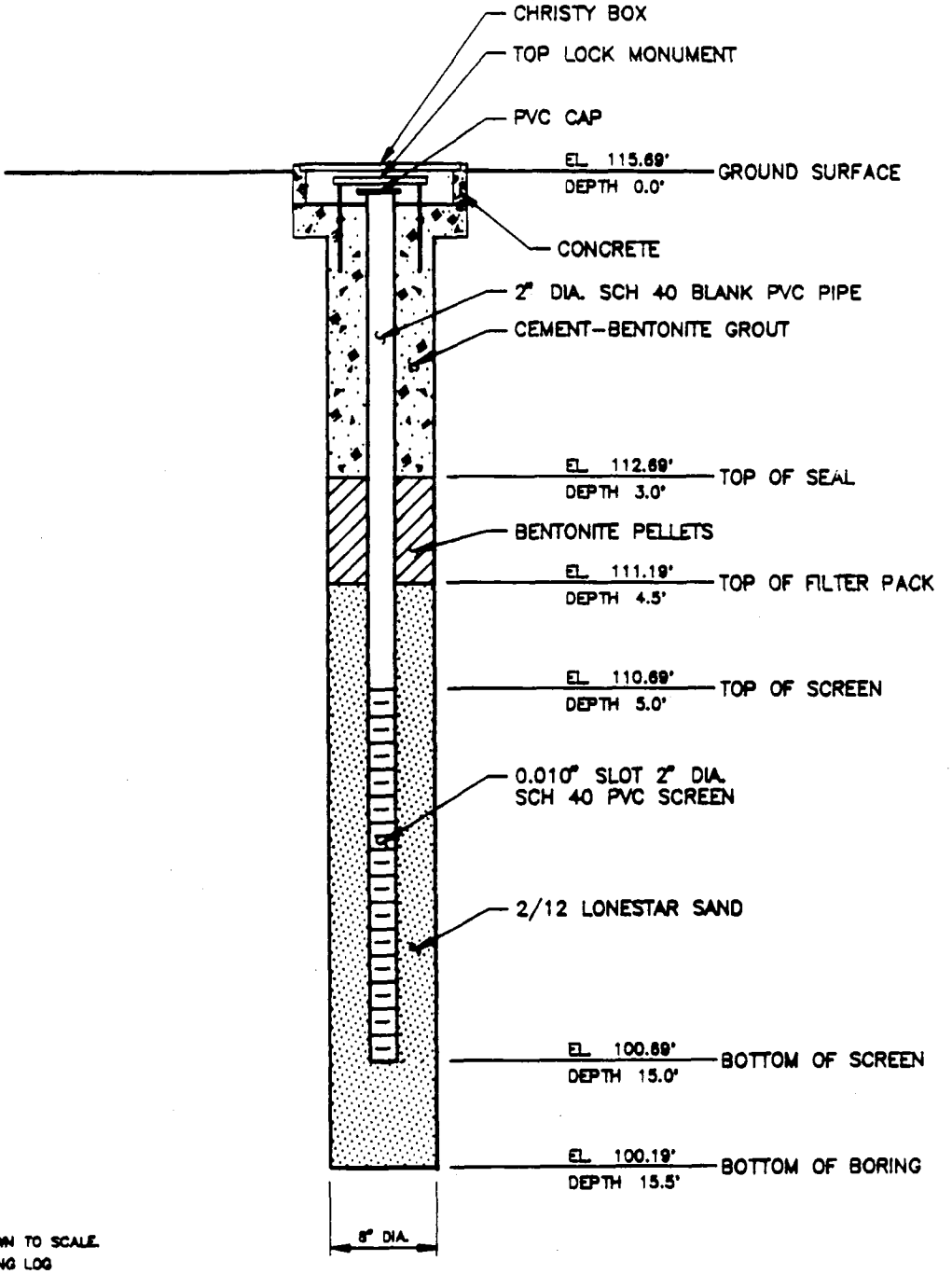
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWD13-4

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION YARD D13 BY SOUTH GATE DATE 7-9-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX D

BUILDING 410
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW410-1
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: North side of Building 410 SURFACE ELEV. 114.75 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	8	10	9	14	SM			0.3	Asphalt. (Fill)	
													Medium dense, light brown, silty fine	
	2	CS	1.5	3.0	5	5	6	17	SM				sand, moist.	
	3	CS	3.0	4.5	4	4	3	15	SM				becomes loose at 3.0 feet.	
5														
	4	CS	4.5	6.0	2	3	2	14	SM					X
	5	CS	6.0	7.5	2	2	2	14	SM				saturated below 6.0 feet.	X
													color change to gray at 6.5 feet.	X
	6	CS	7.5	9.0	2	1	3	14	SM					X
10	7	CS	9.0	10.5	3	3	2	12	SM					X
														X
	8	CS	10.5	12.0	1	1	3	12	CL			11.0	Soft, dark gray, silty clay, some fine	X
	9	CS	12.0	13.5	3	5	6	12	CL				sand, saturated. (Bay Mud)	X
													tiny round shell fragments at 12.5 feet.	X
15	10	CS	13.5	15.0	4	6	4	12	SM			13.5	Loose, dark gray, silty fine sand,	X
												15.0	saturated, trace of clay.	
													Bottom of Boring at 15.0 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 6.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: a) 10 ppm at 12.5 feet.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW410-2
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West side of Building 410 SURFACE ELEV. 115.47 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/16/90 FINISH 7/16/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt concrete (Fill)	
	1	CS	1.0	2.5	6	4	10	16	SM			1.0	Medium dense, light brown, silty fine sand, moist, with scattered shell fragments.	
	2	CS	2.5	4.0	5	5	6	14	SM					
5	3	CS	4.0	5.5	8	12	21	12	SM				becomes dense at 5.0 feet.	
	4	CS	5.5	7.0	15	20	15	15	SM				saturated below 7.0 feet.	X
													becomes medium dense at 7.0 feet.	X
	5	CS	7.0	8.5	5	10	6	16	SM					X
	6	CS	8.5	10.0	8	7	7	15	SM			8.5	Loose, brown gray, silty fine sand, saturated, some small shells.	X
10														X
	7	CS	10.0	11.5	4	4	6	15	SM					X
	8	CS	11.5	13.0	2	4	9	14	SM					X
														X
	9	CS	13.0	14.5	3	4	5	15	SM					X
15	10	CS	14.5	16.0	5	6	7	15	SC			14.5	Medium dense, dark gray, silty clayey sand, saturated.	X
												16.0		
													Bottom of Boring at 16.0 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 7.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: No OVA readings were found during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW410-3
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South side of Building 410 SURFACE ELEV. 113.98 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/12/90 FINISH 7/12/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	22	20	22	14	SM			0.5	Dense, light brown, silty fine sand, moist.	
	2	CS	2.0	3.5	11	18	19	11	SM					
5	3	CS	3.5	5.0	10	18	19	15	SM			4.0	Dense, gray, silty fine sand, moist, with shell fragments.	
	4	CS	5.0	6.5	15	14	17	13	SM				saturated below 5.5 feet.	X
	5	CS	6.5	8.0	10	14	12	16	SM				becomes medium dense at 6.5 feet.	X
	6	CS	8.0	9.5	4	6	8	16	SM				lost shell fragments at 8.0 feet.	X
10														X
	7	CS	9.5	11.0	5	5	4	15	SM				becomes loose at 9.5 feet.	X
	8	CS	11.0	12.5	1	5	10	15	SM					X
	9	CS	12.5	14.0	1	4	3	16	SM			13.8	Loose, dark gray, silty medium sand, saturated, with small white shells and pockets of clay.	X
15	10	CS	14.0	15.5	5	5	7	17	SM			15.5		X
													Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings were found during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW410-4
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of Building 410 in fenced area SURFACE ELEV. 114.64 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/12/90 FINISH 7/12/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	40	45	25	14	SM			0.5	Very dense, brown, gravelly silty sand,	
	2	CS	2.0	3.5	20	16	14	13	SM			1.5	moist. (Fill)	
													Dense, light brown, silty fine sand, moist,	
5	3	CS	3.5	5.0	7	6	10	15	SM				with shell fragments.	
	4	CS	5.0	6.5	6	6	7	14	SM				becomes medium dense at 3.5 feet.	X
														X
	5	CS	6.5	8.0	6	7	6	15	SM				saturated below 6.5 feet.	X
	6	CS	8.0	9.5	6	6	5	15	SM					X
10														X
	7	CS	9.5	11.0	5	6	8	15	SM				color change to gray at 11.0 feet.	X
	8	CS	11.0	12.5	8	3	4	15	SM				becomes loose at 11.0 feet.	X
														X
	9	CS	12.5	14.0	3	2	3	15	SC			12.8	Loose, dark gray, clayey sand,	X
15	10	CS	14.0	15.5	2	1	3	14	SC				saturated, with pockets of silty clay.	X
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 2-5 ppm at 12.5 feet.
   b) 5-10 ppm at 14.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B410-5
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northwest corner of Building 410 SURFACE ELEV. 114.9 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	25	25	20	14	SM			0.3	Asphalt. (Fill)	
													Dense, light brown, silty fine sand, moist.	
	2	CS	1.5	3.0	16	19	20	15	SM					
	3	CS	3.0	4.5	10	11	13	15	SM				becomes medium dense at 3.0 feet.	
5														
	4	CS	4.5	6.0	10	11	6	15	SM					
	5	CS	6.0	7.5	7	7	5	13	SM				saturated below 6.0 feet.	
	6	CS	7.5	9.0	5	8	9	12	SM				becomes loose at 9.0 feet.	
10	7	CS	9.0	10.5	3	1	4	14	SM				color change to brown gray and	
													increase in clay content at 9.0 feet.	
	8	CS	10.5	12.0	3	5	7	18	CL			10.5	Medium stiff, black to dark gray,	
	9	CS	12.0	13.5	3	5	8	6	SC			13.0	silty clay, saturated.	
													Loose, dark gray, clayey fine sand,	
15	10	CS	13.5	15.0	3	5	10	12	SC				saturated, some silt.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B410-6
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northeast of Building 410 SURFACE ELEV. 114.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	25	18	14	SM			0.3	Asphalt. (Fill)	
													Dense, light brown, silty fine sand, moist.	
	2	CS	1.5	3.0	15	20	13	14	SM					
	3	CS	3.0	4.5	10	10	14	15	SM					
5													becomes medium dense at 3.0 feet.	
	4	CS	4.5	6.0	8	9	11	15	SM					
	5	CS	6.0	7.5	7	9	7	15	SM				saturated below 6.0 feet.	
													becomes loose at 8.0 feet.	
	6	CS	7.5	9.0	5	4	6	13	SM					
10	7	CS	9.0	10.5	3	2	3	12	SM					
	8	CS	10.5	12.0	2	3	2	15	SM					
	9	CS	12.0	13.5	1	2	4	13	CL			12.0	Soft, black, silty clay, saturated. (Bay Mud)	
												13.5	Dense, light brown, silty fine sand, saturated.	
15	10	CS	13.5	15.0	6	16	15	6	SM					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B410-7
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of northeast corner of Building 410 SURFACE ELEV. 114.9 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/12/90 FINISH 7/12/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	41	15	20	12	SM			0.5	Dense, light brown, silty fine sand, moist,	
	2	CS	2.0	3.5	10	10	10	14	SM				some gravel. (Fill)	
													becomes medium dense at 2.0 feet.	
5	3	CS	3.5	5.0	3	6	6	12	CL			4.3	Medium stiff, brown gray, sandy clay,	
	4	CS	5.0	6.5	5	6	7	12	CL				moist, with pockets of silty sand.	
													saturated below 7.0 feet.	
	5	CS	6.5	8.0	4	7	5	12	CL				becomes loose at 8.0 feet.	
	6	CS	8.0	9.5	1	2	3	15	CL			9.0	Stiff, mottled brown dark gray, silty clay,	
10													saturated, moderate odor.	
	7	CS	9.5	11.0	1	1	4	18	CL				black oily discoloration at 9.5 feet.	
	8	CS	11.0	12.5	2	3	4	14	CL				lenses of clayey sand below 11.0 feet.	
	9	CS	12.5	14.0	4	3	4	18	SC			13.8	Medium dense, dark gray, clayey sand,	
15	10	CS	14.0	15.5	5	9	13	18	SC				saturated, with tiny round shells.	
												15.0	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 7.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B410-8
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East side of Building 410 SURFACE ELEV. 115.1 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/11/90 FINISH 7/11/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Concrete. (Fill)	
	1	CS	0.5	2.0	10	15	25	16	SM			0.5	Dense, dark brown, silty fine sand, moist.	
	2	CS	2.0	3.5	20	25	15	16	SM				trace of shell fragments at 2.5 feet.	
5	3	CS	3.5	5.0	8	5	5	15	SM				becomes medium dense at 3.5 feet.	
	4	CS	5.0	6.5	4	8	10	17	SM				thin lens of clay at 6.5 feet.	
	5	CS	6.5	8.0	25	15	16	17	SM				saturated below 7.0 feet.	
	6	CS	8.0	9.5	50			12	SM				color change to gray at 8.5 feet.	
10												9.5	Bottom of Boring at 9.5 feet.	
15													(encountered an obstruction at 9.5 feet which kicked the auger sideways. relocated 10 feet east and encountered a similar obstruction at 5.0 feet. relocated in alignment with B410-7 and B410-9; an obstruction was encountered at 5.0 feet.)	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25													2. Groundwater was encountered at 7.0 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling. In addition, abandoned boreholes were also backfilled.	
35														
													5. OVA readings: a) 2 ppm at 7.0 feet.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. B410-9
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of southeast corner of Building 410 SURFACE ELEV. 115.0 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/12/90 FINISH 7/12/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	30	15	10	12	SM			1.0	Dense, light brown, silty fine sand, moist.	
	2	CS	2.0	3.5	20	25	15	14	SM				trace of shell fragments below 2.5 feet.	
5	3	CS	3.5	5.0	15	14	9	16	SM				medium dense below 4.0 feet.	
	4	CS	5.0	6.5	7	5	8	18	SM				becomes saturated at 4.5 feet.	
	5	CS	6.5	8.0	2	3	3	15	SM				becomes loose at 6.5 feet.	
	6	CS	8.0	9.5	2	3	5	14	SM					
10														
	7	CS	9.5	11.0	2	3	4	16	SM					
	8	CS	11.0	12.5	2	1	4	13	SM				running sands below 11.0 feet.	
	9	CS	12.5	14.0	4	4	5	12	SM			12.5	Loose, gray, silty fine sand, saturated,	
15	10	CS	14.0	15.5	2	3	3	18	SM				with pockets of silty clay.	
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Canonie

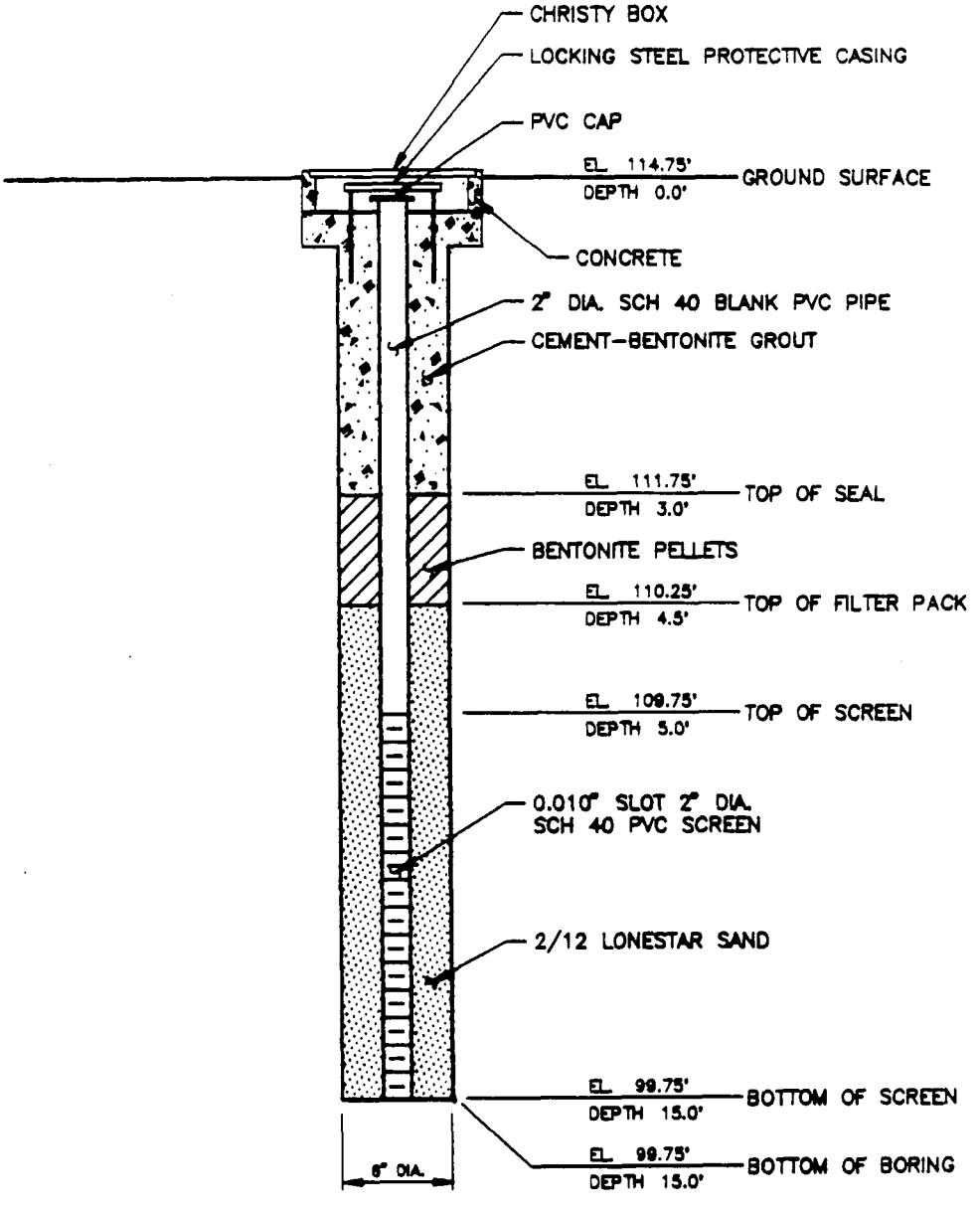
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW410-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 410, NORTH SIDE DATE 7-11-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

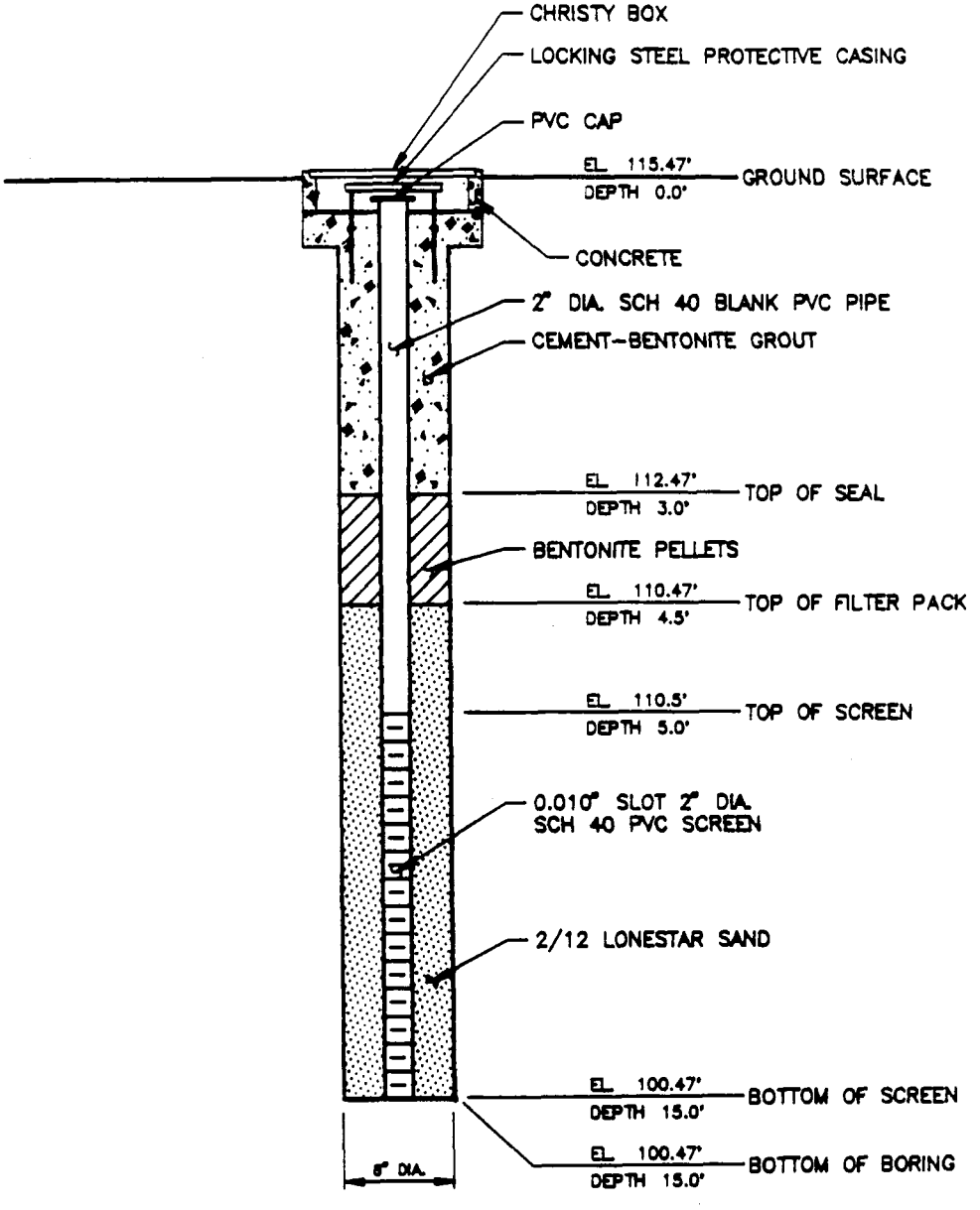
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW410-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 410, WEST SIDE DATE 7-16-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

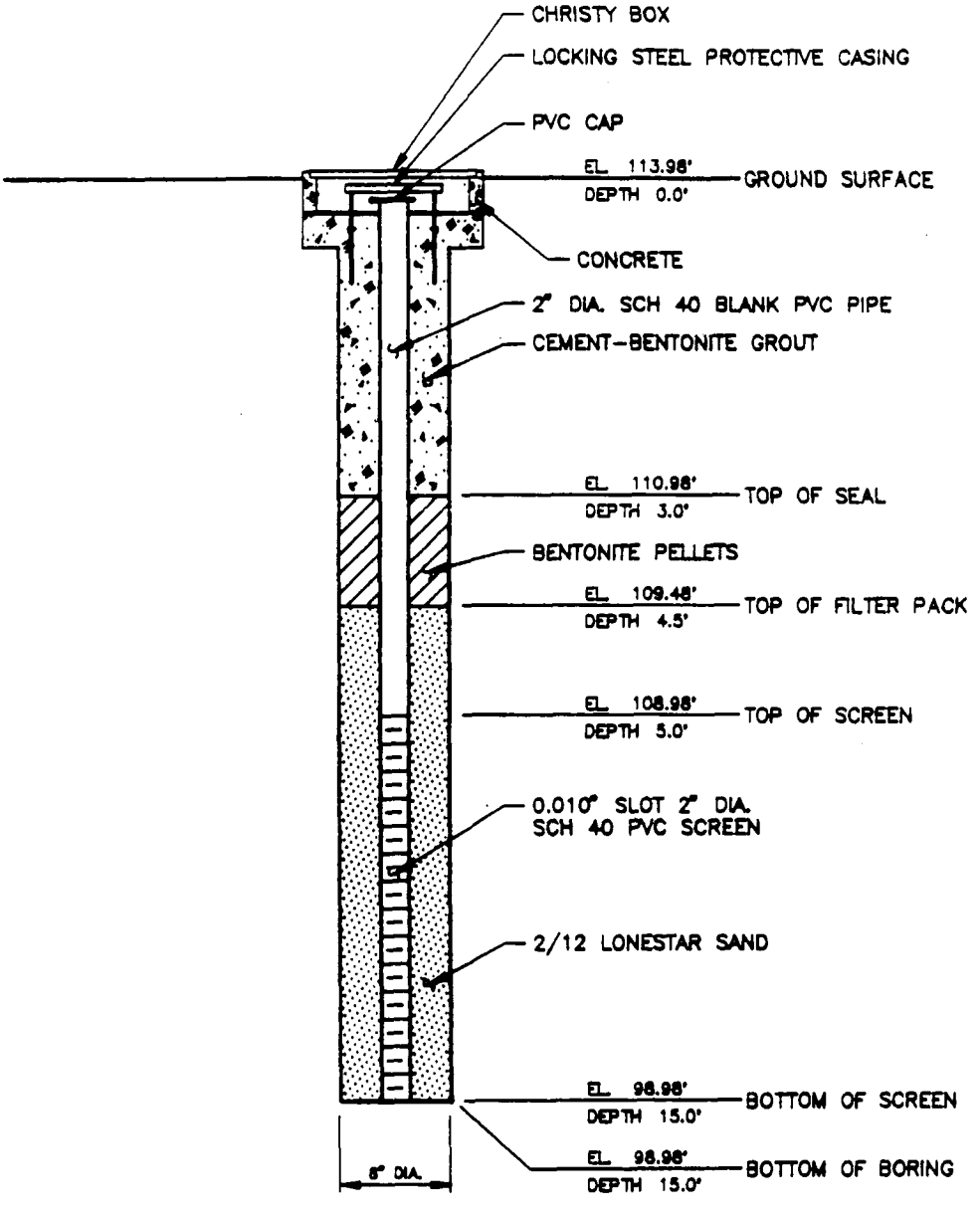
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW410-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 410, SOUTH SIDE DATE 7-12-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

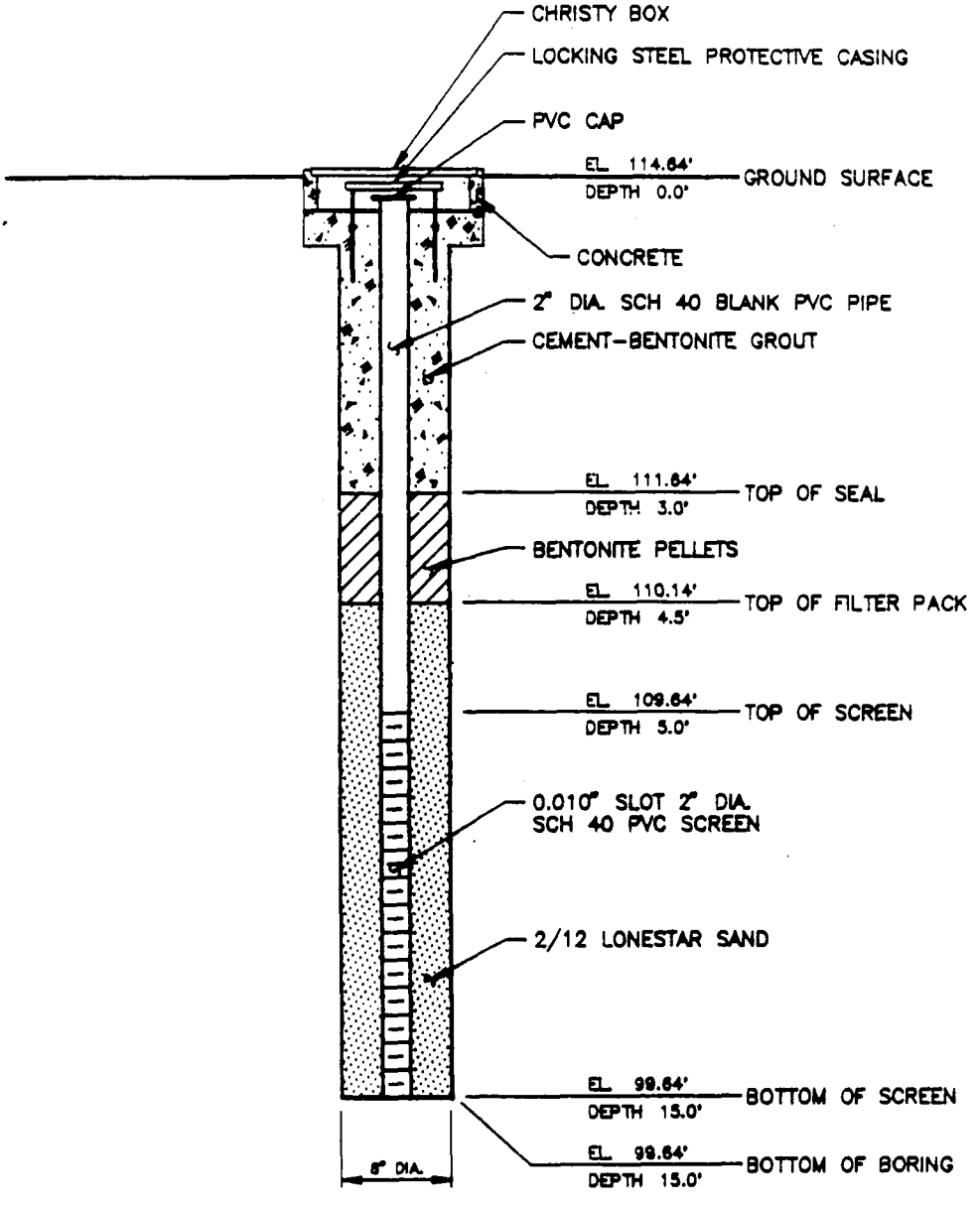
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW410-4

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION EAST OF BUILDING 410 IN FENCED AREA DATE 7-12-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX E

BUILDING 530
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW530-1
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NE corner of Building 530 in fire lane SURFACE ELEV. 114.11 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/13/90 FINISH 7/13/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	16	23	15	13	SM			0.5	Dense, mottled light and dark brown, silty	
	2	CS	2.0	3.5	11	14	16	15	SM				sand, moist, trace of gravel. (Fill)	
5	3	CS	3.5	5.0	11	15	6	15	SM			4.3	Medium dense, light brown, silty fine sand,	
	4	CS	5.0	6.5	3	2	2	14	SM				moist.	X
												6.8	thin layer of gray clay at 6.25 feet.	X
	5	CS	6.5	8.0	5	6	20	17	SP				Medium dense, black to dark brown, silty	X
	6	CS	8.0	9.5	7	3	4	15	SM				gravelly sand, saturated, oily odor.	X
10												8.3	Loose, gray, silty fine sand, saturated,	X
	7	CS	9.5	11.0	4	4	5	16	SM				black streaks, oily odor.	X
	8	CS	11.0	12.5	5	7	12	16	SM				some brick debris at 8.0 feet.	X
													becomes medium dense at 11.5 feet.	X
	9	CS	12.5	14.0	7	7	5	16	SM					X
15	10	CS	14.0	15.0	20	50	-	13	SC			14.0	Very dense, light yellow brown, clayey	X
												15.0	fine sand, saturated.	
													Bottom of Boring at 15.0 feet.	
20													Notes:	
25													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 6.5 feet during drilling.	
30													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: a) 200 ppm at 8.0 feet. Oily odor. b) 200-300 ppm at 11.0 feet. Oily odor.	
40													c) 20-30 ppm at 13.0 feet. d) 50 ppm at 15.0 feet.	

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW530-2
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southwest corner of Building 530 SURFACE ELEV. 114.47 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/13/90 FINISH 7/13/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	13	15	14	SM			0.3	Asphalt. (Fill)	
													Medium dense, light brown, silty fine sand,	
	2	CS	1.5	3.0	9	11	15	14	SM				moist, some shells, trace of gravel.	
	3	CS	3.0	4.5	5	12	13	15	SM					
5													no shells below 5.0 feet.	
	4	CS	4.5	6.0	5	13	14	15	SM					X
	5	CS	6.0	7.5	14	9	10	17	SM				color change to gray at 6.0 feet.	X
													saturated below 6.0 feet.	X
	6	CS	7.5	9.0	9	8	10	15	SM					X
10	7	CS	9.0	10.5	5	4	3	13	SM					X
													becomes loose at 9.0 feet.	X
	8	CS	10.5	12.0	4	4	7	14	SM					X
	9	CS	12.0	13.5	2	2	4	16	SC			12.5		X
													Loose, gray to dark brown, clayey fine	X
15	10	CS	13.5	15.0	2	3	4	15	SC				sand, saturated, with some pockets	X
												15.0	of clay.	
													abundant gray clay and tiny shells at top	
													of unit.	
20													Bottom of Boring at 15.0 feet.	
													Notes:	
													1. Boring was advanced using 8-inch-	
25													diameter hollow stem augers.	
													2. Groundwater was encountered at 6.0	
													feet during drilling.	
30													3. Sampler type:	
													California Sampler (CS)	
													O.D.: 2.5 inches	
													I.D.: 2.0 inches	
35													4. Boring was converted to a monitoring	
													well upon completion of drilling.	
													5. OVA readings: No OVA readings were	
													found during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW530-3
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southwest of Building 530 by tanks SURFACE ELEV. 112.67 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/13/90 FINISH 7/13/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	30	20	20	14	SM				Asphalt. (Fill)	
												0.8	Dense, light brown to brown, silty fine	
	2	CS	1.5	3.0	30	17	20	14	SM				sand, moist, some shells. (Fill)	
	3	CS	3.0	4.5	7	14	20	14	SM					
5												4.5	Medium dense, gray, silty fine sand,	
	4	CS	4.5	6.0	7	13	15	16	SM				saturated.	X
	5	CS	6.0	7.5	7	10	14	16	SM				some scattered intervals of shells.	X
														X
	6	CS	7.5	9.0	10	8	7	15	SM				becomes very loose at 9.0 feet.	X
10	7	CS	9.0	10.5	2	1	1	10	SM					X
												10.5	Soft, gray, clay, saturated.	X
	8	CS	10.5	12.0	4	6	7	17	SM			11.0	Medium dense, gray, silty medium sand,	X
	9	CS	12.0	13.5	3	3	4	8	SM				saturated, with small white shells.	X
												12.0	Loose, gray, silty fine sand, saturated.	X
15	10	CS	13.5	15.0	5	5	5	0	SC				(soupy texture)	X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 5 ppm at 11.5 feet.
   b) 20 ppm at 12.0 feet.

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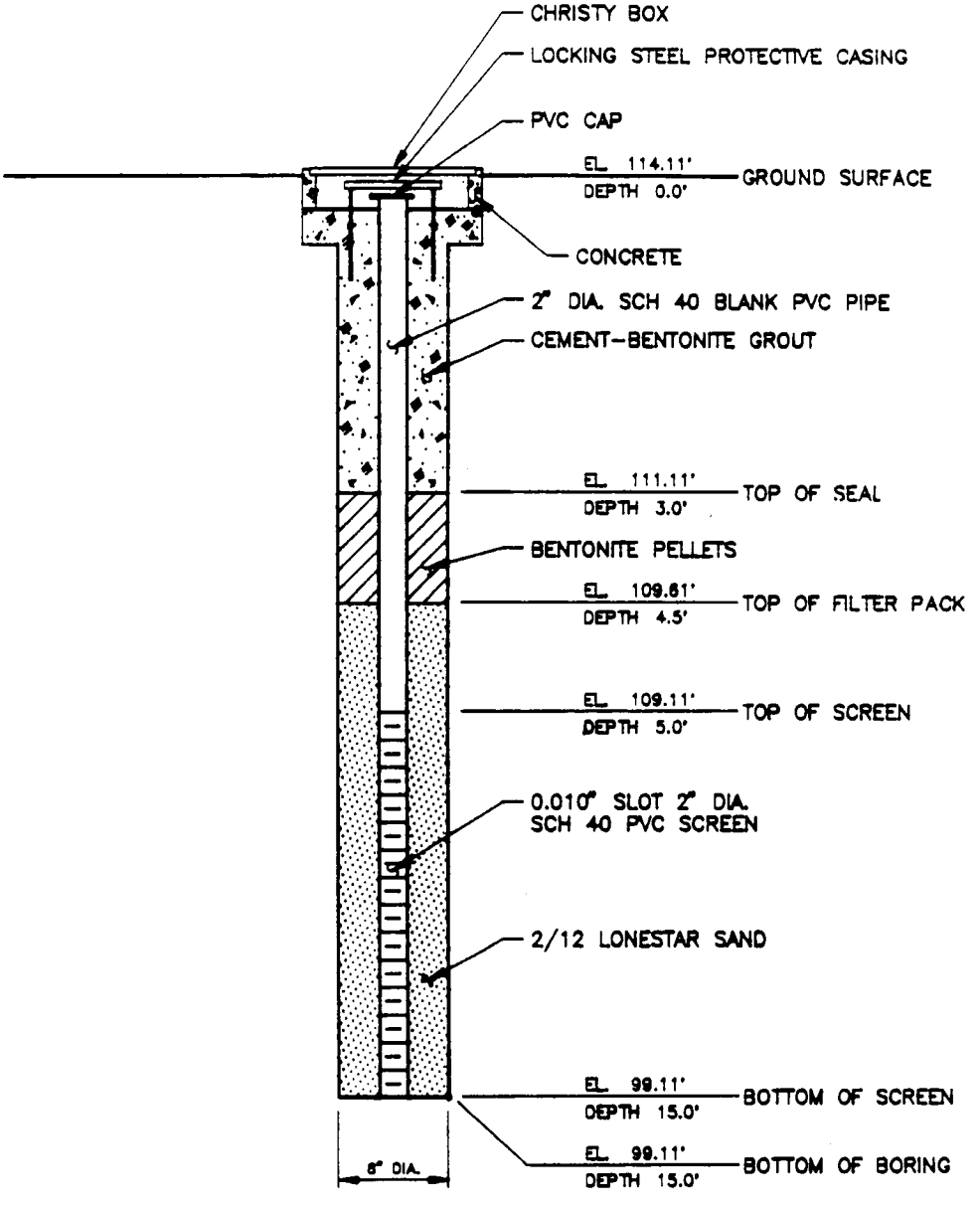
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW530-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 530, NORTHEAST CORNER DATE 7-13-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

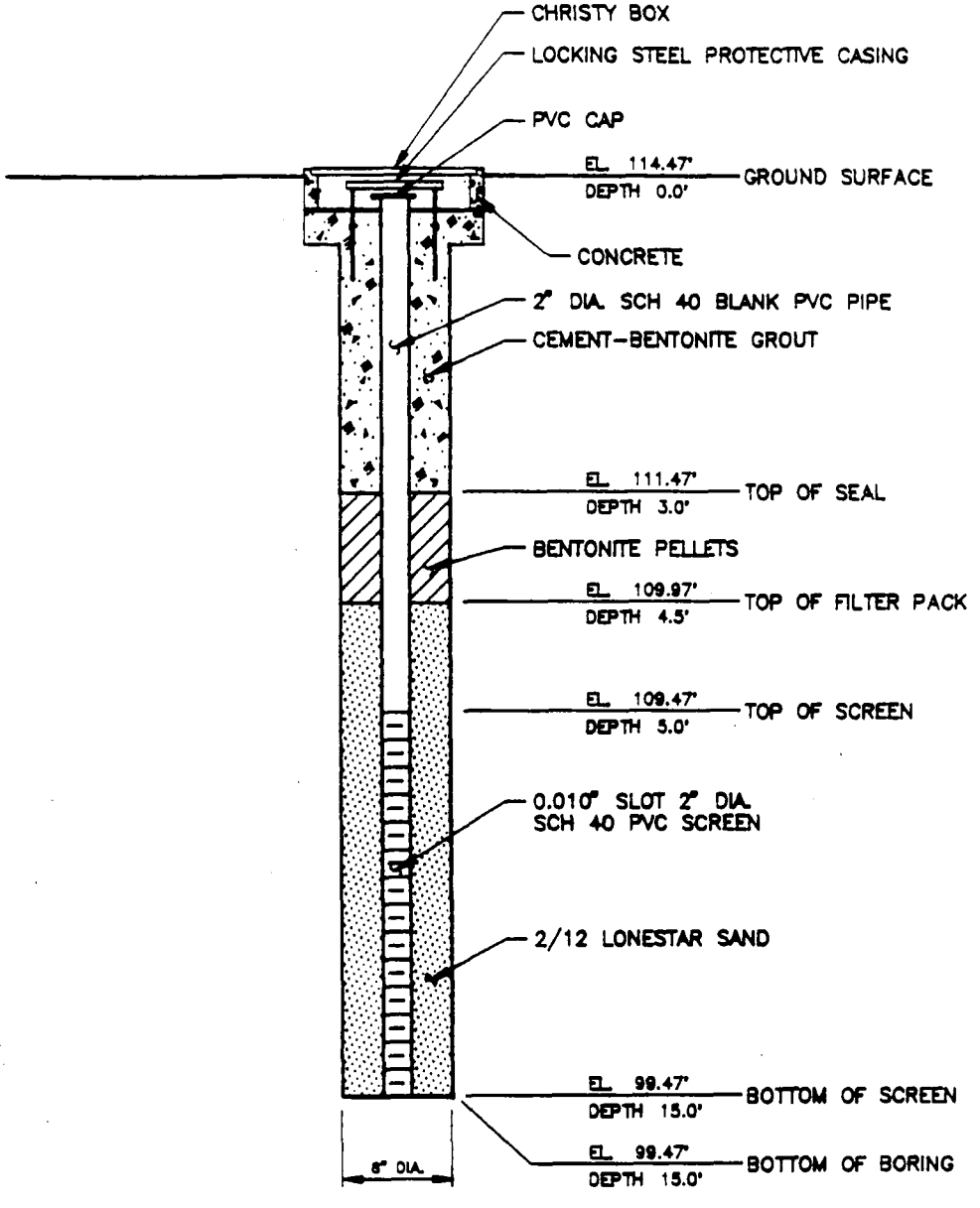
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW530-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 530, WEST SIDE, BY SW CORNER DATE 7-13-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

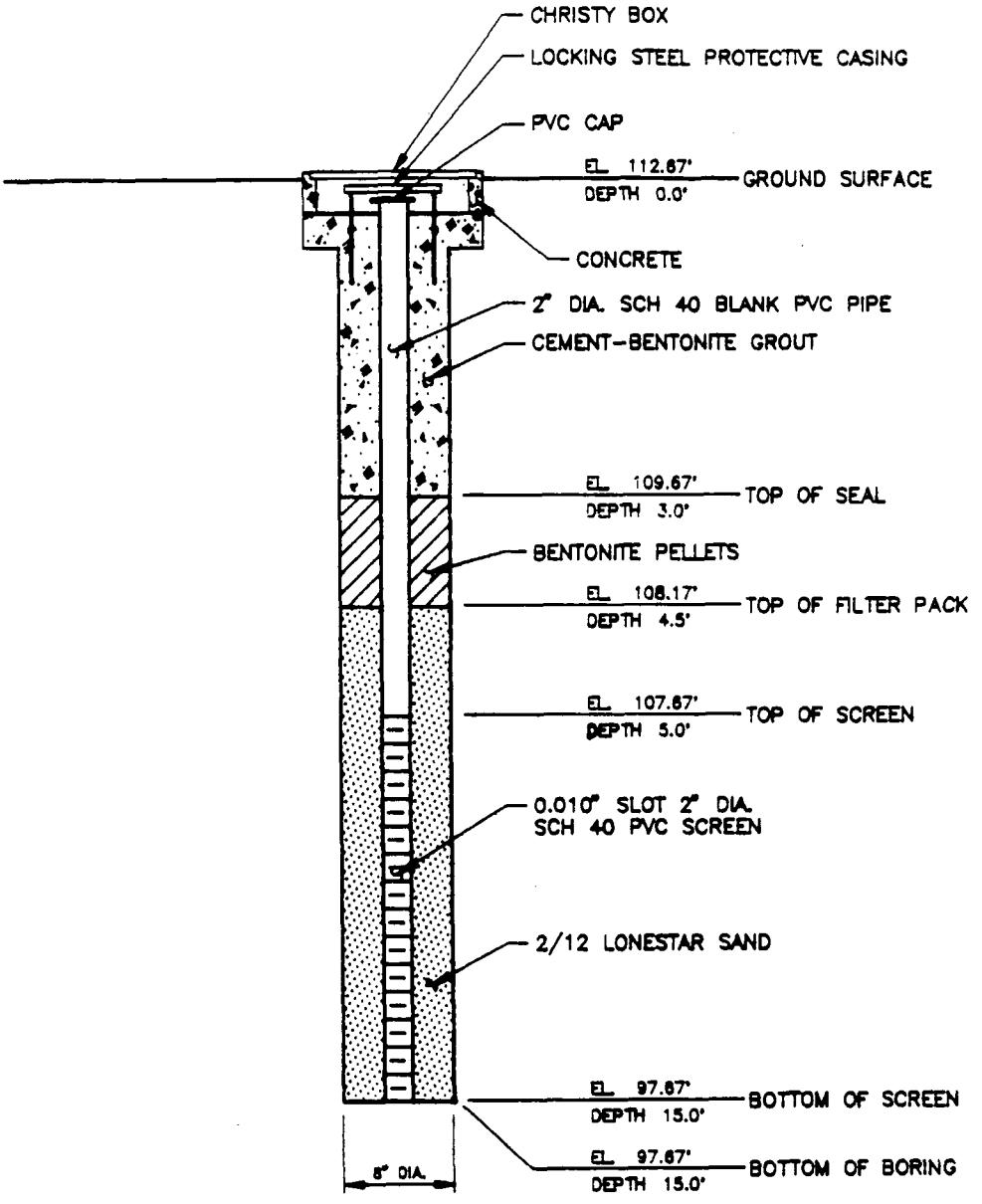
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW530-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION SOUTHWEST OF BUILDING 530 BY TANKS DATE 7-13-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX F

OIL REFINERY SITE
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWOR-1
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northeast of Building 397 SURFACE ELEV. 114.41 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/16/90 FINISH 7/16/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	5	24	16	13	SM			0.5	Dense, brown to light brown, silty fine sand, moist. (Fill)	
	2	CS	2.0	3.5	7	16	15	16	SM					
5	3	CS	3.5	5.0	8	6	4	15	SM				increased silt content below 4.0 feet.	
	4	CS	5.0	6.5	3	4	4	17	SM			5.0	Loose, brown, silty fine sand, moist.	X
													saturated below 6.3 feet.	X
	5	CS	6.5	8.0	3	2	2	16	SM					X
	6	CS	8.0	9.5	3	4	8	18	SC			8.0	Medium dense, orange brown mottled	X
10													with gray, clayey fine sand, saturated.	X
	7	CS	9.5	11.0	6	8	16	18	SC				(Merritt Sand)	X
	8	CS	11.0	12.5	2	8	10	15	SC				clay content decreases at 9.5 feet.	X
													clay content increase at 11.0 feet.	X
	9	CS	12.5	14.0	8	9	16	17	SC					X
15	10	CS	14.0	15.5	6	7	12	14	SC					X
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.3 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 2 ppm at 3.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWOR-2
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NE corner of 9th Street and Avenue L SURFACE ELEV. 114.12 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/17/90 FINISH 7/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	2	5	11	6	GM				Medium dense, brown silty gravel, dry. (Fill)	
	2	CS	1.5	3.0	15	15	24	14	GM			2.8	Dense, light brown, silty fine sand, moist, with some shells. (Fill)	
	3	CS	3.0	4.5	12	15	20	14	SM					
5														
	4	CS	4.5	6.0	6	8	12	14	SM					X
	5	CS	6.0	7.5	5	5	5	14	SM				becomes saturated below 6.0 feet.	X
													becomes medium dense at 6.0 feet.	X
	6	CS	7.5	9.0	5	7	7	14	SM				no shells below 7.5 feet.	X
10	7	CS	9.0	10.5	3	2	2	12	SM					X
														X
	8	CS	10.5	12.0	2	3	4	17	CL			11.0	Soft to medium stiff, dark gray, silty clay,	X
	9	CS	12.0	13.5	5	7	8	17	CL				trace of sand, occasional layers of	X
													sandy clay, saturated. (Bay Mud)	X
15	10	CS	13.5	15.0	6	8	12	2	CL					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWOR-3
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: E side of 11th St. bet. Avenues K and L SURFACE ELEV. 114.82 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/17/90 FINISH 7/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	20	21	26	13	SM				Dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	11	22	33	15	SM					
	3	CS	3.0	4.5	10	8	9	15	SM					
5														
	4	CS	4.5	6.0	4	2	2	6	SM			5.0	Loose black to dark gray brown, silty fine sand, moist, trace of clay.	X
	5	CS	6.0	7.5	4	5	8	12	SM				saturated below 6 feet.	X
	6	CS	7.5	9.0	6	7	4	14	SM-SC			8.0	Medium dense, mottled gray to orange brown, clayey sand, saturated, pockets of gray clay.	X
10	7	CS	9.0	10.5	10	10	18	16	SC					X
	8	CS	10.5	12.0	7	10	20	18	SC					X
	9	CS	12.0	13.5	7	10	13	14	SC					X
15	10	CS	13.5	15.0	12	14	16	8	SM			14.0	Dense, orange brown. silty sand, saturated, trace of ay. (Merritt Sand)	X
												15.0	Bottom of Boring at 15.0 feet.	
20													Notes:	
25													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 6.0 feet during drilling.	
30													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
35													4. Boring was converted to a monitoring well upon completion of drilling.	
													5. OVA readings: No OVA readings observed during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWOR-4
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Near fence on east side of storage yard SURFACE ELEV. 113.40 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/19/90 FINISH 7/19/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	22	34	13	13	GM			0.3	Red baserock. (Fill)	
	2	CS	2.0	3.5	12	14	14	15	SM			1.8	Medium dense, brown, silty fine sand, moist. (Fill)	
5	3	CS	3.5	5.0	6	8	6	14	SM				saturated below 4.5 feet.	
	4	CS	5.0	6.5	2	3	4	15	SM					X
	5	CS	6.5	8.0	6	10	13	16	SC			6.8	Medium dense, mottled gray, orange brown, clayey sand, saturated, with some silt. (Merritt Sand)	X
	6	CS	8.0	9.5	6	12	17	17	SC					X
10														X
	7	CS	9.5	11.0	8	12	16	16	SC					X
	8	CS	11.0	12.5	10	11	13	0	SM			11.0	Medium dense, orange brown, silty sand, saturated. (Merritt Sand)	X
	9	CS	12.5	14.0	5	10	15	17	SM					X
	10	CS	14.0	15.0	3	10		12	SM					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWOR-5
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southeast corner of storage yard SURFACE ELEV. 113.83 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/19/90 FINISH 7/19/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	30	25	20	13	GP			0.5	Dense, dark brown, silty sandy gravel, moist, some silt. (Fill)	
	2	CS	2.0	3.5	8	10	10	0	GP					
5	3	CS	3.5	5.0	15	20	23	0	GP				(Between 2.5 to 7.0 feet, encountered abundant hard gravel.)	
	4	CS	5.0	6.5	23			0	GP				saturated below 6.5 feet.	X
	5	CS	6.5	8.0	9	5	3	6	GP				becomes less gravelly below 7.0 feet.	X
	6	CS	8.0	9.5	3	3	9	12	GP					X
10														X
	7	CS	9.5	11.0	8	10	15	18	GP			11.0	Dense, dark orange brown, clayey silty fine sand, saturated, some clay. (Merritt Sand).	X
	8	CS	11.0	12.5	14	12	20	18	SM					X
	9	CS	12.5	14.0	9	15	20	18	SM					X
15	10	CS	14.0	15.5	8	15	25	13	SM					X
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

PROJECT No. 86-018-1804
BORING No. BOR-6
LOGGED BY TGB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: In parking lot south of Building 360 SURFACE ELEV. 114.7 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/5/90 FINISH 7/5/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	14	21	14	12	SM			1.0	Medium dense, light brown, silty fine sand, dry, no odor. (Fill)	
	2	CS	2.0	3.5	4	7	5	15	SM				dark brown, silty sand layer at 2.5 feet.	
5	3	CS	3.5	5.0	1	2	1	12	SM				becomes loose at 3.5 feet.	
	4	CS	5.0	6.5	1	1	1	18	SM				color change to brown at 3.5 feet. becomes saturated below 5.0 feet.	
	5	CS	6.5	8.0	1	1	1	15	SM				trace of clay no odor.	
	6	CS	8.0	9.5	3	4	10	18	CL			8.0	Stiff, orange brown-mottled gray, sandy clay, saturated. (Merritt Sand)	
10														
	7	CS	9.5	11.0	9	10	11	18	CL			10.5	Dense, orange-brown mottled gray, clayey sand, saturated. (Merritt Sand)	
	8	CS	11.0	12.5	5	12	12	18	SC				becomes more silty below 13 feet.	
	9	CS	12.5	14.0	5	10	13	18	SC					
15	10	CS	14.0	15.0	4	8		12	SC					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-7
LOGGED BY TGB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: In parking lot south of Building 360 SURFACE ELEV. 114.4 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/5/90 FINISH 7/5/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	9	11	8	12	SM			0.5	Medium dense, light brown, silty fine sand. dry. (Fill)	
	2	CS	2.0	3.5	4	3	2	12	SM				color change to brown at 3.0 feet.	
5	3	CS	3.5	5.0	1	1	1	12	SM				saturated below 4.5 feet.	
	4	CS	5.0	6.5	1	1	1	18	SM					
	5	CS	6.5	8.0	1	2	5	18	SM-SC			7.5	Medium dense, orange brown mottled gray, clayey fine sand, saturated. (Merritt Sand)	
	6	CS	8.0	9.5	3	4	7	18	SC-CL					
10													sandy clay layer between 9.0 and 9.5 feet.	
	7	CS	9.5	11.0	7	9	10	18	CL					
	8	CS	11.0	12.5	4	7	9	18	CL-SM			12.0	color change to brown at 11.0 feet.	
	9	CS	12.5	14.0	9	19	20	18	SM				Medium dense, orange brown, silty sand, saturated. (Merritt Sand)	
15	10	CS	14.0	15.0	4	9		12	SM			15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-8
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South of Building 397 by fence SURFACE ELEV. 114.5 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/16/90 FINISH 7/16/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	3	6	9	15	SM				Medium dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	3	7	8	15	SM					
	3	CS	3.0	4.5	5	4	6	17	SM					
5														
	4	CS	4.5	6.0	3	4	5	15	SM					
	5	CS	6.0	7.5	3	3	3	14	SM				becomes saturated at 6.0 feet.	
												6.8	Loose, gray, silty fine sand, saturated, some shells.	
	6	CS	7.5	9.0	2	2	2	15	SM					
10	7	CS	9.0	10.5	2	2	3	17	CL			9.3	Soft, dark gray, silty clay, saturated, some iron oxide stains. (Bay Mud)	
	8	CS	10.5	12.0	3	2	1	18	CL					
	9	CS	12.0	13.5	14	21	25	16	SC			12.0	Dense, mottled gray, orange brown, clayey fine sand, saturated. (Merritt Sand)	
15	10	CS	13.5	15.0	10	15	20	9	SC			15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 2-10 ppm at 10.0 feet.
   b) 20-30 ppm at 11.0 feet.
   c) 30 ppm at 13.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-9
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Off the southeast corner of Building 397 SURFACE ELEV. 114.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/13/90 FINISH 7/13/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PEZO
	1	CS	0.0	1.5	7	14	13	14	GM-SM				Medium dense, dark brown, silty gravel, dry. (Fill)	
	2	CS	1.5	3.0	8	11	13	13	SM			1.0	Medium dense, light brown, silty fine sand, moist. (Fill)	
	3	CS	3.0	4.5	5	4	5	13	SC					
5														
	4	CS	4.5	6.0	3	2	4	14	SM			4.5	Medium dense to dense, gray, clayey sand, saturated, some silt, strong odor. (Fill)	
	5	CS	6.0	7.5	4	3	4	18	SM			6.0		
	6	CS	7.5	9.0	3	3	5	15	SM			8.5	Loose to medium dense, gray, silty sand, wet, some clay, strong odor. (Fill)	
10	7	CS	9.0	10.5	4	8	15	15	SM					
	8	CS	10.5	12.0	3	11	14	15	SM				Medium dense, black, silty sand, moist, trace of clay.	
	9	CS	12.0	13.5	12	17	18	18	SM				color change to dark gray at 12.0 feet, some discoloration (iron stains),	
15	10	CS	13.5	15.0	14	15	15	18	SM				pervasive odor.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 7.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 5 ppm at 4.5 feet.
   b) 100 ppm at 5.5 feet.
   c) 100-150 ppm at 7.5 feet.
   d) 200 ppm at 9.5 feet.
   e) 300 ppm at 12.0 feet.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-10
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South of Bldg. 397, east of Bldg. 169 SURFACE ELEV. 114.7 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/12/90 FINISH 7/12/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	14	18	20	13	SM				Dense, brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	8	20	15	14	SM					
	3	CS	3.0	4.5	9	9	10	15	SM				becomes medium dense below 3.0 feet.	
5														
	4	CS	4.5	6.0	3	7	10	13	SM				becomes saturated at 5.0 feet.	
	5	CS	6.0	7.5	4	8	5	14	SM				color change to brown gray at 6.8 feet.	
	6	CS	7.5	9.0	2	1	4	14	SM			8.0	Loose, gray, silty sand, saturated, with	
10	7	CS	9.0	10.5	1	1	3	18	SM-CL			9.8	some shells.	
													Soft to medium stiff, dark gray, silty clay, saturated. (Bay Mud)	
	8	CS	10.5	12.0	1	3	6	16	CL					
	9	CS	12.0	13.5	10	7	20	18	CL-SC			12.3	iron-stained at top of unit, organic	
												13.0	matter and soil discoloration at 12.0 feet	
15	10	CS	13.5	15.0	16	21	25	15	SC				Medium dense, dark green gray, clayey	
												15.0	sand, saturated, abundant oil stains,	
													strong odor.	
													Dense, orange brown clayey sand, saturated. (Merritt Sand)	
20													Bottom of Boring at 15.0 feet.	
													Notes:	
25													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
30													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
35													4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
40													5. OVA readings: a) 10 ppm at 10.0 feet. b) 10 ppm at 12.0 feet.	

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-11
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Corner of 10th Street and Avenue L SURFACE ELEV. 114.4 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/18/90 FINISH 7/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	28	21	14	13	SM				Dense, light brown, silty sand, moist, trace of gravel. (Fill)	
	2	CS	1.5	3.0	9	11	12	13	SM					
	3	CS	3.0	4.5	3	5	4	15	SM					
5														
	4	CS	4.5	6.0	3	3	4	15	SM					
	5	CS	6.0	7.5	3	3	5	18	SM				saturated below 7.0 feet.	
	6	CS	7.5	9.0	5	2	2	15	SM				color change to gray brown at 8.0 feet.	
10	7	CS	9.0	10.5	1	1	1	15	SM-CL			10.0	some clay pockets below 9.0 feet.	
	8	CS	10.5	12.0	3	8	15	18	CL-SM				Very soft, gray silty clay, saturated. (Bay Mud)	
	9	CS	12.0	13.5	3	18	11		SM			12.5	Medium dense, dark gray to brown, silty fine sand, saturated, trace of clay, some shells.	
15	10	CS	13.5	15.0	3	2	11		SM			15.0	color change to brown at 14.0 feet.	
													Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 7.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 2 ppm at 1.5 feet.
   b) 2 ppm at 10.0 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-12
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NW corner of Bldg. 530 along Avenue L SURFACE ELEV. 114.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/18/90 FINISH 7/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	18	14	14	13	SM			0.3	Asphalt. (Fill)	
													Medium dense, light brown, silty fine sand,	
	2	CS	1.5	3.0	8	10	12	12	SM				moist. (Fill)	
	3	CS	3.0	4.5	4	8	10	13	SM					
5														
	4	CS	4.5	6.0	6	6	7	14	SM				some shells at 5.0 feet.	
	5	CS	6.0	7.5	4	5	5	15	SM				saturated below 6 feet.	
	6	CS	7.5	9.0	5	2	3	12	SM				color change to light gray at 8.0 feet.	
10	7	CS	9.0	10.5	1	2	2	13	SM-CL					
												9.5	Soft, gray, sandy silty clay, saturated,	
	8	CS	10.5	12.0	3	4	20	18	CL			10.5	some sand. (Bay Mud)	
	9	CS	12.0	13.5	13	23	14	18	SM			12.0	Stiff, dark gray to black, silty clay,	
													saturated. (Bay Mud)	
15	10	CS	13.5	15.0	3	20	25	14	SM				Dense, light orange brown, silty fine sand	
													saturated, some clay. (Merritt Sand)	
												15.0	Bottom of Boring at 15.0 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 6.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
35														
													5. OVA readings: a) 10 ppm at 1.5 feet. b) 0 ppm at 3.0 feet. c) 30-40 ppm at 10.5 feet. No odor noticed.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-13
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NE corner of 10th Street and Avenue L SURFACE ELEV. 114.7 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/3/90 FINISH 7/3/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	11	11	13	SM				Medium dense, dark brown, silty sand, dry, occasional rock fragments. (Fill)	
	2	CS	1.5	3.0	7	11	10	15	SP-SM			1.5	Medium dense, light brown, fine sand, moist. (Fill)	
	3	CS	3.0	4.5	3	8	7	15	SP-SM					
5														
	4	CS	4.5	6.0	3	6	4	15	SP-SM				becomes loose at 5.0 feet.	
	5	CS	6.0	7.5	1	2	1	15	CL			6.5	saturated below 5.5 feet.	
	6	CS	7.5	9.0	1	1	1	15	CL				Soft, dark gray, silty sandy clay, some silt, iron stains at top of unit, saturated. (Bay Mud Dredge Spoils Fill)	
10	7	CS	9.0	10.5	35			6	CL				sampler refusal at 9.5 feet.	
	8	CS	10.5	12.0	6	15	17	15	CL-SC			11.5	Medium dense, mottled gray-orange brown, clayey fine sand, saturated. (Merritt Sand)	
	9	CS	12.0	13.5	9	9	10	6	SC					
15	10	CS	13.5	15.0	8	10	8	18	SC				color change to brown at 12.5 feet.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1701
BORING No. BOR-14 (OR-1)
LOGGED BY Bill Johnston

PROJECT NAME: NAS Alameda - Phase 1 Exploratory Borings
BORING LOCATION: Near NE Corner of Ave. K and 11th St. SURFACE ELEV. 114.3 feet
DRILLER: Beylik Drilling - Alex Bashta DATE: START 5/23/90 FINISH 5/23/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	2.0	6	6	9	24	SP				Dense brown silty fine sand, moist	
					9									
	2	CS	2.0	4.0	7	8	9	18	SP					
					11							4.5	Medium stiff gray clayey silt, moist	
5	3	CS	4.0	6.0	2	2	1	12	SP					
					1				ML			6.0	Medium dense brown clayey sand, saturated, some gray to black mottling at top of unit, slight odor. (Merritt Sand)	
	4	CS	6.0	8.0	P									
								18	SC					
	5	CS	8.0	10.0	P									
10								18	SC					
	5	CS	16.0	12.0	P									
								24	CL					
	7	CS	12.0	14.0	P									
								24	CL				some interbedded sandy clay layers.	
15	8	CS	14 0	16.0	P									
								24	SC					
												16.0	Bottom of boring at 16.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Ground water was encountered at 6.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.
6. P refers to the sampler being advanced downward by the weight of the drill stem.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-15
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Storage Yard East of 11th Street SURFACE ELEV. 114.7 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/17/90 FINISH 7/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	25	25	15	12	SM				Dense, dark brown to brown, silty sand, moist, some gravel. (Fill)	
	2	CS	1.5	3.0	11	12	16	12	SM					
	3	CS	3.0	4.5	10	15	8	14	SM					
5													trace of clay below 3.0 feet.	
	4	CS	4.5	6.0	3	4	5	15	SM				color change to gray at 5.0 feet.	
	5	CS	6.0	7.5	3	3	3	15	SM				saturated below 5.0 feet.	
	6	CS	7.5	9.0	3	5	9	15	SM			8.0	Medium dense, dark gray brown, silty sand, saturated, trace of clay, strong oil petroleum odor. (Fill)	
10	7	CS	9.0	10.5	4	4	4	15	SC			10.0	color change to gray at 10.0 feet.	
	8	CS	10.5	12.0	7	9	15	18	SC				Loose to medium dense, gray, clayey sand, saturated, strong petroleum odor.	
	9	CS	12.0	13.5	13	18	20	18	SC			12.0	Very dense, mottled gray dark orange brown, clayey fine sand, saturated, some silt, strong odor and discoloration (Merritt Sand)	
15	10	CS	13.5	15.0	15	20	30	18	SC			15.0	Bottom of Boring at 15.0 feet.	
20													Notes:	
25													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
30													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
35													4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
40													5. OVA readings: a) 20 ppm at 7.5 feet. b) 100 ppm at 9.0 feet. c) 10 ppm at 12.0 feet.	

Canonie Environmental

PROJECT No. 86-018-1804
BORING No. BOR-16
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Corner of Central and Pacific Avenues SURFACE ELEV. 113.3 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/23/90 FINISH 7/23/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	12	12	16	12	ML				Medium dense, dark brown, sandy silt, dry, some roots. (Fill)	
	2	CS	1.5	3.0	7	13	8	12	ML-SM			2.5	Medium dense, black to dark brown, silty fine sand, no odor, moist. (Fill) saturated below 4.0 feet.	
	3	CS	3.0	4.5	1	1	2	15	SM					
5														
	4	CS	4.5	6.0	2	2	2	15	SM			5.0	Loose, brown, silty fine sand, saturated. (Merritt Sand)	
	5	CS	6.0	7.5	3	3	4	18	SM					
	6	CS	7.5	9.0	5	15	10	15	CL-SC			8.0	Stiff, mottled gray, orange brown, sandy clay, saturated. (Merritt Sand)	
10	7	CS	9.0	10.5	7	10	11	14	SC					
												9.0	Medium dense, mottled gray, orange brown, clayey fine sand, saturated. (Merritt Sand) with interbedded silty sand below 12.0 feet.	
	8	CS	10.5	12.0	4	7	9	18	SC					
	9	CS	12.0	13.5	5	12	13	15	SC					
15	10	CS	13.5	15.0	4	10	21	18	SC					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-17
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NE corner of 11th Street and Avenue L SURFACE ELEV. 114.8 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/17/90 FINISH 7/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	20	15	10	12	SM				Medium dense, dark brown, silty sand, dry, some gravel. (Fill)	
	2	CS	1.5	3.0	10	7	8	12	SM			2.5	Medium dense, gray brown, silty fine sand, moist.	
	3	CS	3.0	4.5	5	6	5	14	SM				black oily discoloration and strong odor	
5														
	4	CS	4.5	6.0	3	3	3	18	SM			5.0	at 5.0 feet.	
	5	CS	6.0	7.5	3	3	4	15	SM				Medium dense, mottled orange-gray, silty sand, strong odor, occasional layers	
	6	CS	7.5	9.0	6	7	10	18	SM				of clayey sand, moist. (Merritt Sand)	
10	7	CS	9.0	10.5	10	10	17	15	SM				saturated below 6.0 feet.	
													some clay of 7.5 feet.	
	8	CS	10.5	12.0	10	12	16	16	SM				trace of clay at 9.5 feet.	
	9	CS	12.0	13.5	10	15	15	16	SM				increased clay content at 10.0 feet, with gray-green discoloration and strong	
15	10	CS	13.5	15.0	10	13	15	18	SM				odor.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.

2. Groundwater was encountered at 6.0 feet during drilling.

3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches

4. Boring was backfilled with cement/bentonite grout upon completion of drilling.

5. OVA readings:
   a) 20 to 40 ppm at 2.5 feet.
   b) 80 to 100 ppm at 7.5 feet.
   c) 200 to 300 ppm at 10.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-18
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West side of Central Ave. SURFACE ELEV. 113.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/23/90 FINISH 7/23/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	17	10	12	16	SC			0.3	Asphalt. (Fill)	
	2	CS	1.5	3.0	6	5	6	16	SC				Medium dense, mottled black dark gray, clayey fine sand, moist, some silt. (Fill)	
	3	CS	3.0	4.5	2	1	1	16	SM			3.0	Very loose, gray, silty fine sand, wet. saturated below 3.5 feet.	
5	4	CS	4.5	6.0	1	1	2	14	SM			5.0	Loose, gray brown, silty fine sand, saturated, trace of gravel. (Fill)	
	5	CS	6.0	7.5	4	3	4	18	SM					
	6	CS	7.5	9.0	2	6	14	18	SC			7.5	Medium dense, mottled gray orange brown, clayey fine sand, saturated. (Merritt Sand)	
10	7	CS	9.0	10.5	11	10	11	18	SC					
	8	CS	10.5	12.0	4	15	18	18	SC					
	9	CS	12.0	13.5	16	15	12	18	SC				decreased clay content, increased silt content, becomes soupy at 13.5 feet.	
15	10	CS	13.5	15.0	6	8	11	15	SC					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 3.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 2 to 5 ppm at 1.0 feet.
   b) 2 to 4 ppm at 2.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-19
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: NW corner of 11th Street and Avenue L SURFACE ELEV. 113.9 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/18/90 FINISH 7/18/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	41	25	27	12	SM				Very dense, light brown, silty fine sand, moist, slight odor. (Fill)	
	2	CS	1.5	3.0	8	12	17	13	SM					
	3	CS	3.0	4.5	8	10	11	15	SM				color change to gray at 3.5 feet.	
5														
	4	CS	4.5	6.0	7	7	15	13	SC			5.0	Medium dense, mottled orange green, clayey fine sand, moist, strong odor. (Merritt Sand)	
	5	CS	6.0	7.5	8	12	23	14	SC			6.5		
	6	CS	7.5	9.0	17	21	25	15	SC				Dense, mottled orange gray green, clayey sand, moist.	
10	7	CS	9.0	10.5	10	15	15	15	SC					
	8	CS	10.5	12.0	10	11	15	15	SC-SM			11.0	Medium dense, gray green, silty fine sand, saturated, some clay.	
	9	CS	12.0	13.5	10	10	10	15	SM				change to trace of clay at 13.5 feet.	
15	10	CS	13.5	15.0	8	12	9	15	SM					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 11.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 50 ppm at 3.5 feet.
   b) 80 to 100 ppm at 6.0 feet.
   c) 30 ppm at 9.0 feet.
   d) 50 ppm at 10.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-20
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South of Avenue L, west of Bldg. 530 SURFACE ELEV. 114.1 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/17/90 FINISH 7/17/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	15	12	13	15	GP-SM			0.5	Medium dense, brown, silty sandy gravel, dry. (Fill)	
	2	CS	2.0	3.5	9	9	11	15	SM			1.0	Medium dense, light brown, silty fine sand, moist. (Fill)	
5	3	CS	3.5	5.0	6	8	8	15	SM				saturated below 5.0 feet.	
	4	CS	5.0	6.5	5	5	5	18	SM					
	5	CS	6.5	8.0	3	3	2	12	SM				color change to brown at 8.0 feet. (native soil approximately below 8.0 feet)	
	6	CS	8.0	9.5	4	4	4	7	SM					
10														
	7	CS	9.5	11.0	2	1	2	12	SM					
	8	CS	11.0	12.5	2	1	3	13	SM					
	9	CS	12.5	14.0	1	1	1	12	SM					
15	10	CS	14.0	15.5	2	2	1	12	SM			14.0	Loose, dark gray, silty sand, saturated, some shells.	
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 10 ppm at 15.0 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-21
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Storage yard (near NE corner of Bldg. 530) SURFACE ELEV. 113.5 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/19/90 FINISH 7/19/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	15	21	22	12	SM			0.5	Dense, light brown, silty fine sand, moist, trace of shells.	
	2	CS	2.0	3.5	11	22	18	13	SM					
5	3	CS	3.5	5.0	15	25	25	14	SM					
	4	CS	5.0	6.5	12	16	15	14	SM				saturated below 5.5 feet.	
	5	CS	6.5	8.0	7	7	17	14	SM					
	6	CS	8.0	9.5	5	6	10	15	SM					
10														
	7	CS	9.5	11.0	4	2	3	7	SM				some shells below 10.0 feet.	
	8	CS	11.0	12.5	12	14	21	15	SM			11.5	Dense, mottled gray orange brown, silty fine sand, saturated, trace of clay. (Merritt Sand)	
	9	CS	12.5	14.0	10	20	30	18	SM					
15	10	CS	14.0	15.5	15	15	15	13	SM					
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 2 ppm at 9.5 feet.
   b) 2 ppm at 13.5 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-22
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of Building 530 in parking lot SURFACE ELEV. 114.0 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/23/90 FINISH 7/23/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER	DEPTH	SOIL DESCRIPTION AND REMARKS	ENGINEER
	1	CS	0.0	1.5	4	10	11	13	SM				0.3	Asphalt. (Fill)	
														Medium dense to dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	7	22	25	17	SM						
	3	CS	3.0	4.5	10	10	12	12	SM					shells at 2.0 feet.	
5															
	4	CS	4.5	6.0	7	16	18	14	SM					saturated below 5.3 feet.	
	5	CS	6.0	7.5	12	11	12	15	SM						
	6	CS	7.5	9.0	5	5	9	16	SM				8.0	Medium dense, gray brown, silty fine sand, saturated, some shells.	
10	7	CS	9.0	10.5	4	6	5	15	SM						
	8	CS	10.5	12.0	3	1	1	16	SM-CL				11.0	Very soft, dark gray, silty clay, saturated. (Bay Mud)	
	9	CS	12.0	13.5	8	22	24	18	SM						
													12.5	Dense, light orange brown-mottled gray green, clayey silty sand, sulphur type odor, saturated. (Merritt Sand)	
15	10	CS	13.5	15.0	10	20	12	14	SM						
													15.0	Bottom of Boring at 15.0 feet.	
20															
25															
30															
35															
40															

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.3 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-23
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of Building 530 in parking lot SURFACE ELEV. 113.2 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/20/90 FINISH 7/20/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS
												0.3	Asphalt. (Fill)
	1	CS	0.5	2.0	15	20	30	15	SM				Very dense, light brown, silty fine sand.
	2	CS	2.0	3.5	10	18	16	14	SM				moist. (Fill)
													rock fragments between 2.5 and 4.0 feet
5	3	CS	3.5	5.0	7	11	18	18	SM				shells below 4.0 feet.
	4	CS	5.0	6.5	10	30	35	15	SM				saturated below 6.0 feet.
	5	CS	6.5	8.0	10	15	25	7	SM				
	6	CS	8.0	9.5	10	15	11	12	SM			9.0	Medium dense, gray silty sand, saturated.
10													
	7	CS	9.5	11.0	8	9	5	13	SM				
	8	CS	11.0	12.5	2	3	18	18	CL-SM			11.0	Medium dense, black, silty sandy clay,
												12.0	saturated. (Bay Mud)
	9	CS	12.5	14.0	5	15	10	12	SM				Medium dense, light orange brown, silty
15	10	CS	14.0	15.5	12	13	14	18	SM				fine sand, saturated.
												15.5	clayey sand layer between 12.0 and 12.5 feet.
													some clay below 13.0 feet.
													Bottom of Boring at 15.5 feet.
20													
													Notes:
													1. Boring was advanced using 8-inch-diameter hollow stem augers.
25													
													2. Groundwater was encountered at 6.0 feet during drilling.
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches
30													
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
35													
													5. OVA readings: a) 2 ppm at 9.0 feet
40													

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-24
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: W side of Central Ave. inside storage yard SURFACE ELEV. 113.8 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/19/90 FINISH 7/19/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												0.3	Asphalt. (Fill)	
	1	CS	0.5	2.0	22	15	20	8	SM				Dense, brown, silty fine sand. (Fill)	
	2	CS	2.0	3.5	8	9	12	13	SM				some granite gravel at 1.5 feet. becomes medium dense at 2.0 feet.	
5	3	CS	3.5	5.0	3	4	4	16	SM				becomes loose at 3.5 feet.	
	4	CS	5.0	6.5	3	3	3	16	SM-SC			6.0	Loose, mottled orange brown and gray, clayey fine sand, saturated, abundant iron stains. (Merritt Sand)	
	5	CS	6.5	8.0	3	4	5	14	SC					
	6	CS	8.0	9.5	14	12	14	17	SC					
10														
	7	CS	9.5	11.0	8	8	8	17	SC					
	8	CS	11.0	12.5	3	9	16	18	SC-SM			12.0	Medium dense, orange brown, silty sand, saturated, trace of clay. (Merritt Sand)	
	9	CS	12.5	14.0	3	9	16	15	SM					
15	10	CS	14.0	15.5	12	9	10	18	SM					
												15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-25
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: SE of Building 530, W of Cans C2 Area SURFACE ELEV. 114.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/20/90 FINISH 7/20/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	21	24	27	14	SM			0.3	Asphalt. (Fill)	
													Dense, yellowish light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	12	17	16	14	SM					
	3	CS	3.0	4.5	8	12	10	16	SM					
5														
	4	CS	4.5	6.0	10	20	15	18	SM			4.5	Dense, light brown, silty fine sand, moist, with seashell fragments. saturated below 5.5 feet.	
	5	CS	6.0	7.5	10	20	15	15	SM					
	6	CS	7.5	9.0	10	15	20	15	SM			8.0	Dense, gray, silty fine sand, saturated. becomes medium dense at 9.0 feet.	
10	7	CS	9.0	10.5	6	12	15	16	SM					
	8	CS	10.5	12.0	2	3	5	15	SM				becomes loose at 10.5 feet.	
	9	CS	12.0	13.5	2	3	4	15	SM					
													color change to dark gray at 13.0 feet.	
15	10	CS	13.5	15.0	3	5	6	14	SM			13.8	Loose, orange brown mottled with gray, silty fine sand, saturated. (Merritt Sand)	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-26
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: S of storage yard, N of Cans C2 Area SURFACE ELEV. 113.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/24/90 FINISH 7/24/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0"-6"	6"-12"	12"-18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt/steel grate runway	
	1	CS	0.5	2.0	14	11	11	15	SM			0.5	Medium dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	2.0	3.5	12	14	11	14	SM				lenses of clay and gravel from 2.5 to 3.5 feet.	
5	3	CS	3.5	5.0	7	14	12	16	SM					
	4	CS	5.0	6.5	5	6	8	15	SM			5.5	Loose, gray, silty fine sand, saturated.	
	5	CS	6.5	8.0	2	3	5	15	SM					
	6	CS	8.0	9.5	2	3	4	16	SM					
10														
	7	CS	9.5	11.0	2	4	3	14	SM					
	8	CS	11.0	12.5	2	1	2	18	SM-SC			12.0	Loose, dark gray, clayey sand, saturated, with pockets of silty clay.	
	9	CS	12.5	14.0	8	10	11	18	SM			12.5	Medium dense, black to dark gray, silty sand, saturated, some clay, some shells.	
15	10	CS	14.0	15.5	7	12	12	7	SM			15.5	Bottom of Boring at 15.5 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BOR-27
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northeast of Cans C2 area SURFACE ELEV. 114.3 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/20/90 FINISH 7/20/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PEN
													Asphalt. (Fill)	
	1	CS	0.5	2.0	20	25	20	14	SM			0.3	Dense, light brown, silty fine sand, dry, trace of seashell fragments. (Fill)	
	2	CS	2.0	3.5	10	12	14	14	SM				some fiberglass cloth debris at 0.5 feet.	
5	3	CS	3.5	5.0	9	9	12	15	SM				becomes medium dense at 2.0 feet.	
	4	CS	5.0	6.5	7	8	6	14	SM					
													saturated below 5.3 feet.	
	5	CS	6.5	8.0	5	7	6	16	SM			6.5	Medium dense, gray, brown, silty fine sand, saturated.	
	6	CS	8.0	9.5	4	3	6	15	SM					
10														
	7	CS	9.5	11.0	4	5	6	18	SM					
	8	CS	11.0	12.5	2	3	4	16	SM					
	9	CS	12.5	14.0	2	2	2	16	CL			12.8	Soft, dark gray, silty clay, saturated.	
15	10	CS	14.0	15.0	3	3		0	SM			13.3	(Bay Mud)	
													Loose, gray, silty sand, saturated, with trace of clay. (Soupy texture)	
												15.0	Bottom of Boring at 15.0 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25													2. Groundwater was encountered at 5.3 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35														
													5. OVA readings: No OVA readings observed during drilling.	
40														

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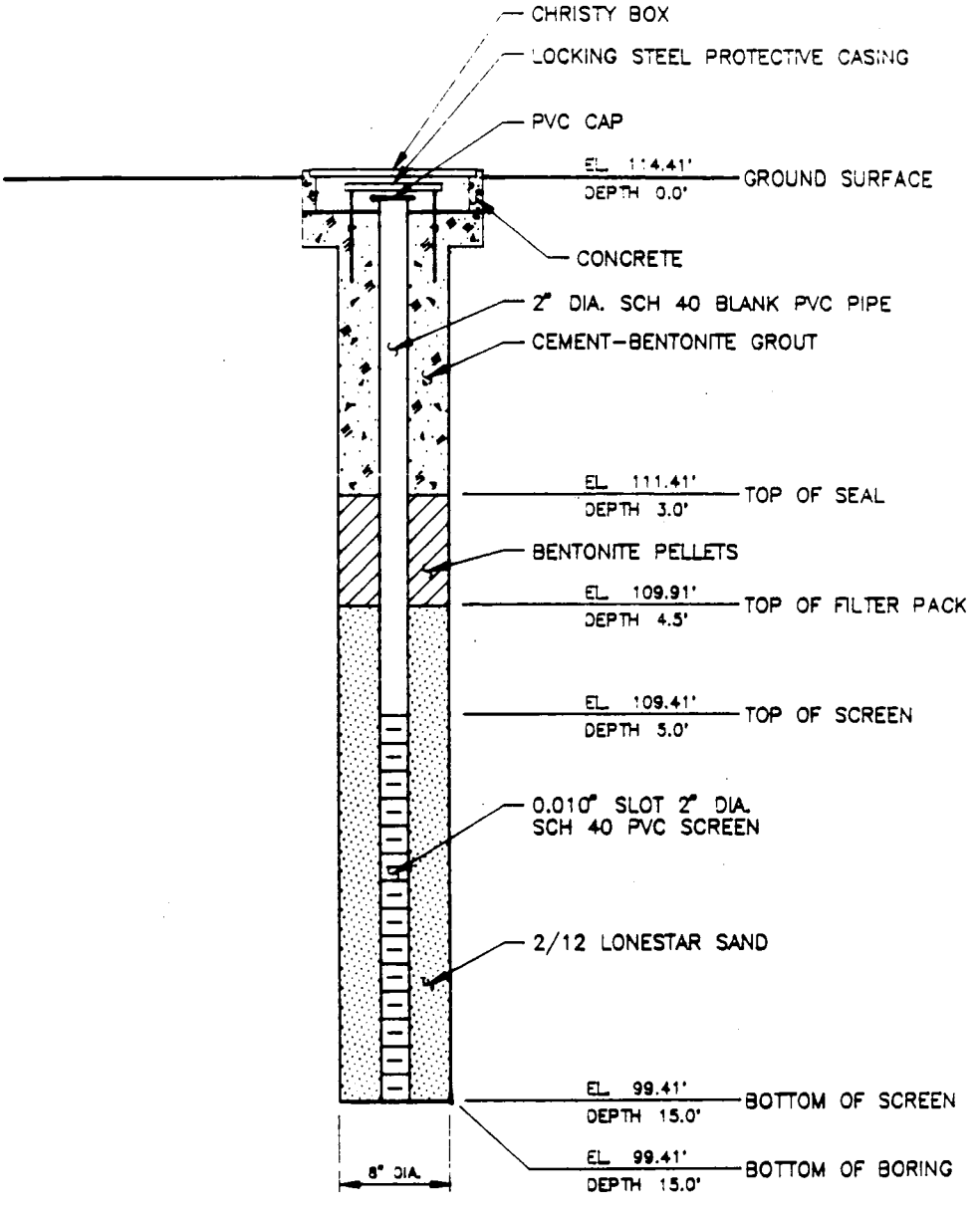
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWOR-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION BUILDING 397, NORTHEAST CORNER DATE 7-16-90 BY PMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

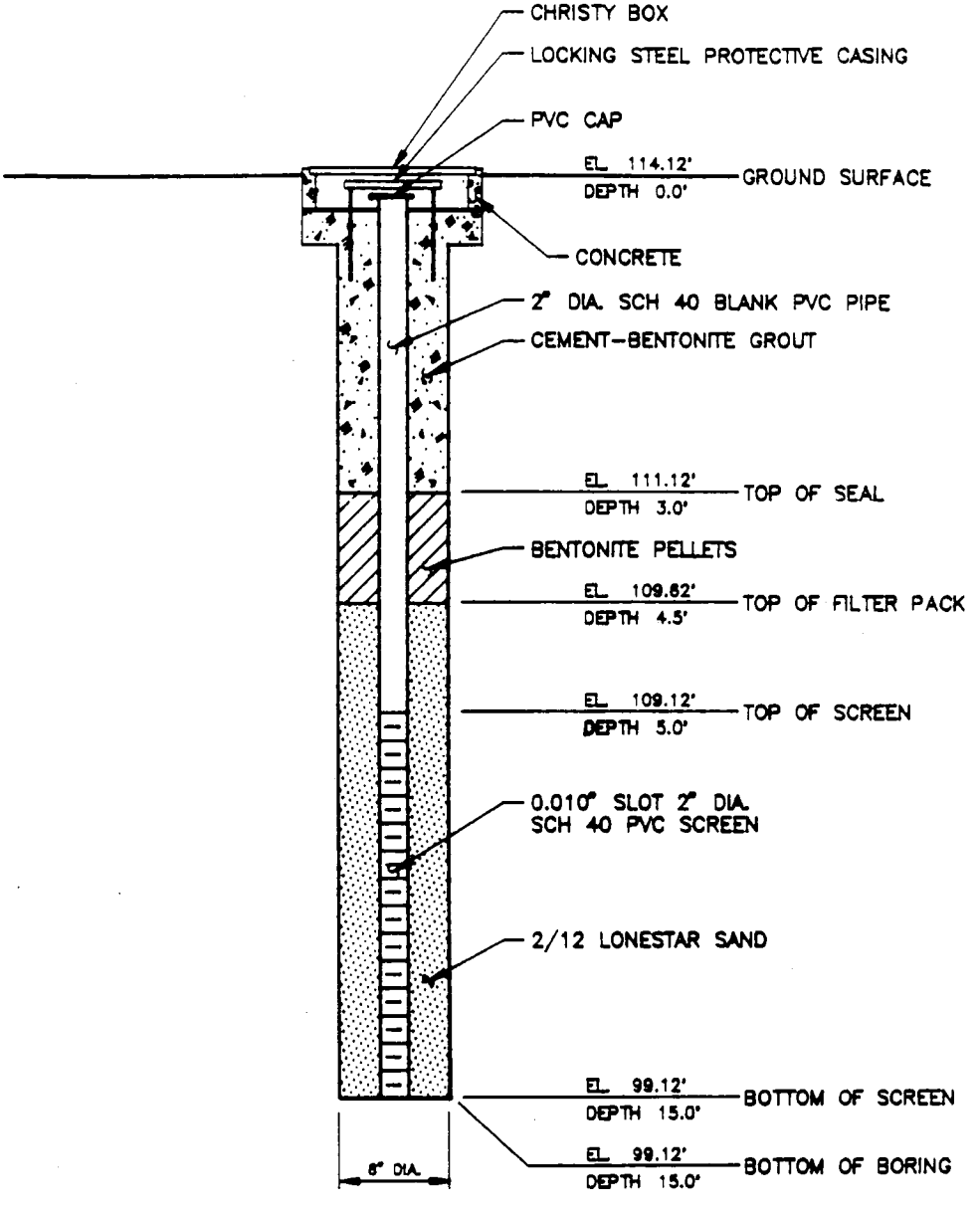
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWOR-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION NORTHEAST CORNER OF 9TH ST. AND AVE. L DATE 7-17-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

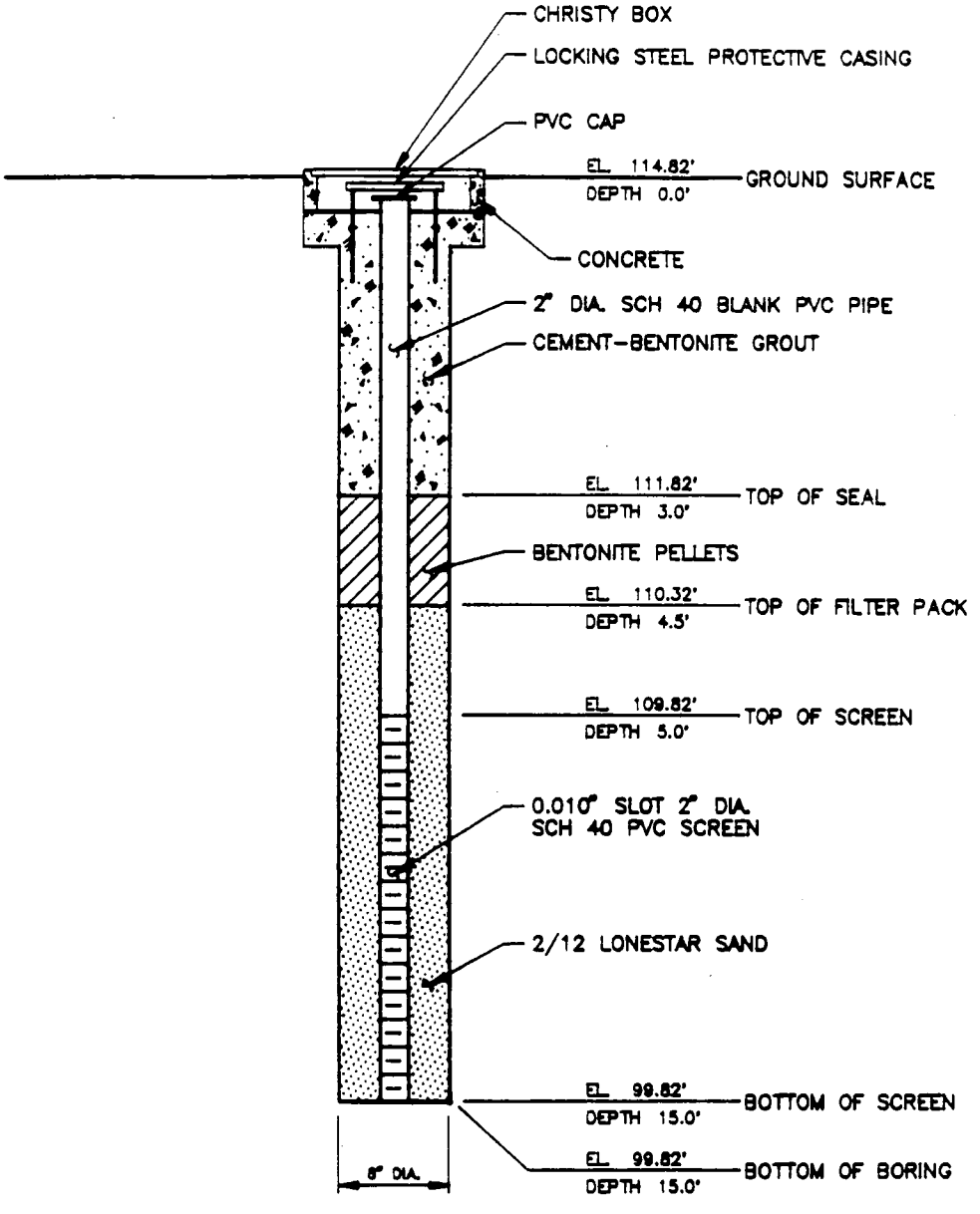
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWOR-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION EAST OF 11TH STREET BETWEEN AVENUES K & L DATE 7-17-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

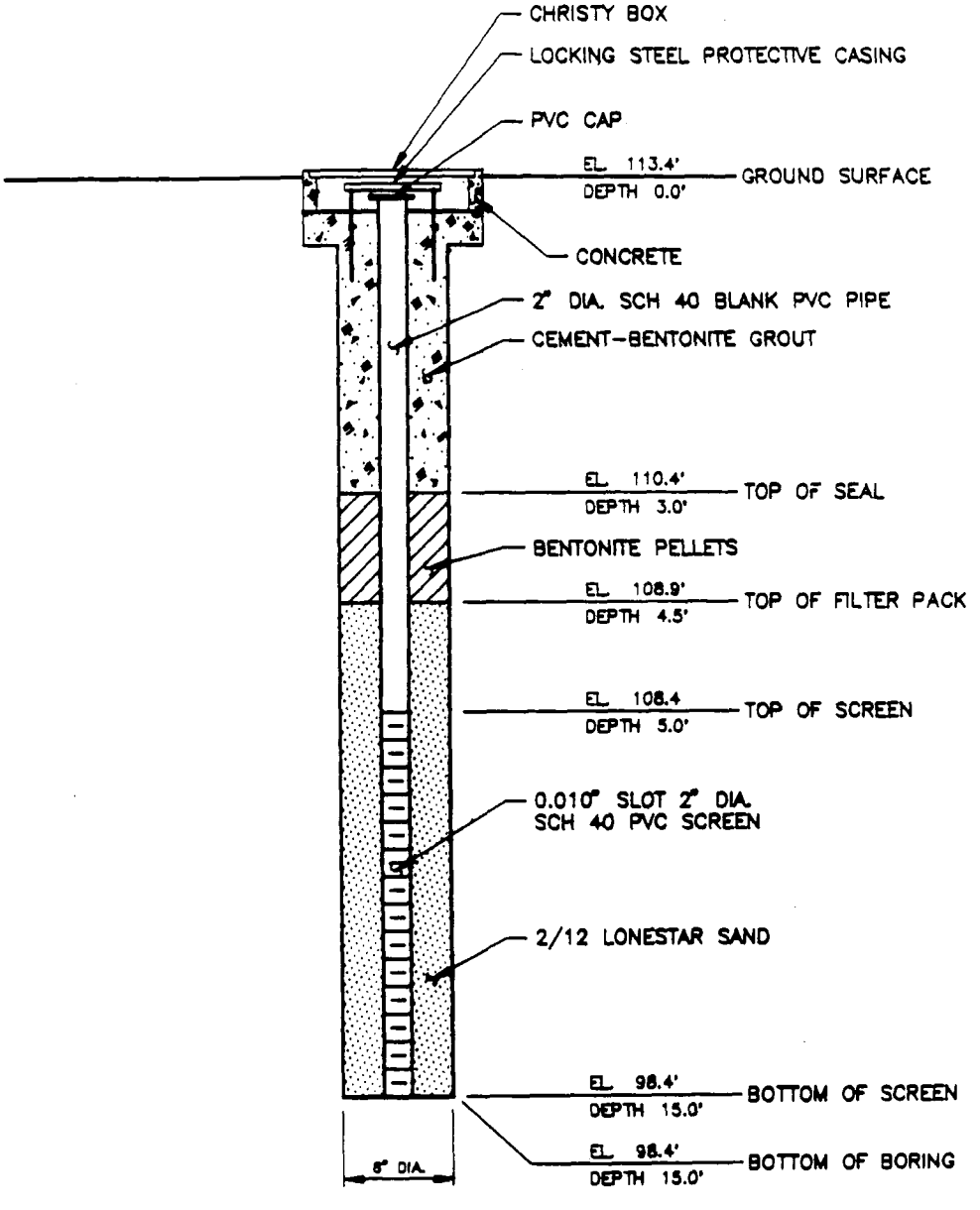
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWOR-4

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION STORAGE AREA, BY EAST FENCE DATE 7-19-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

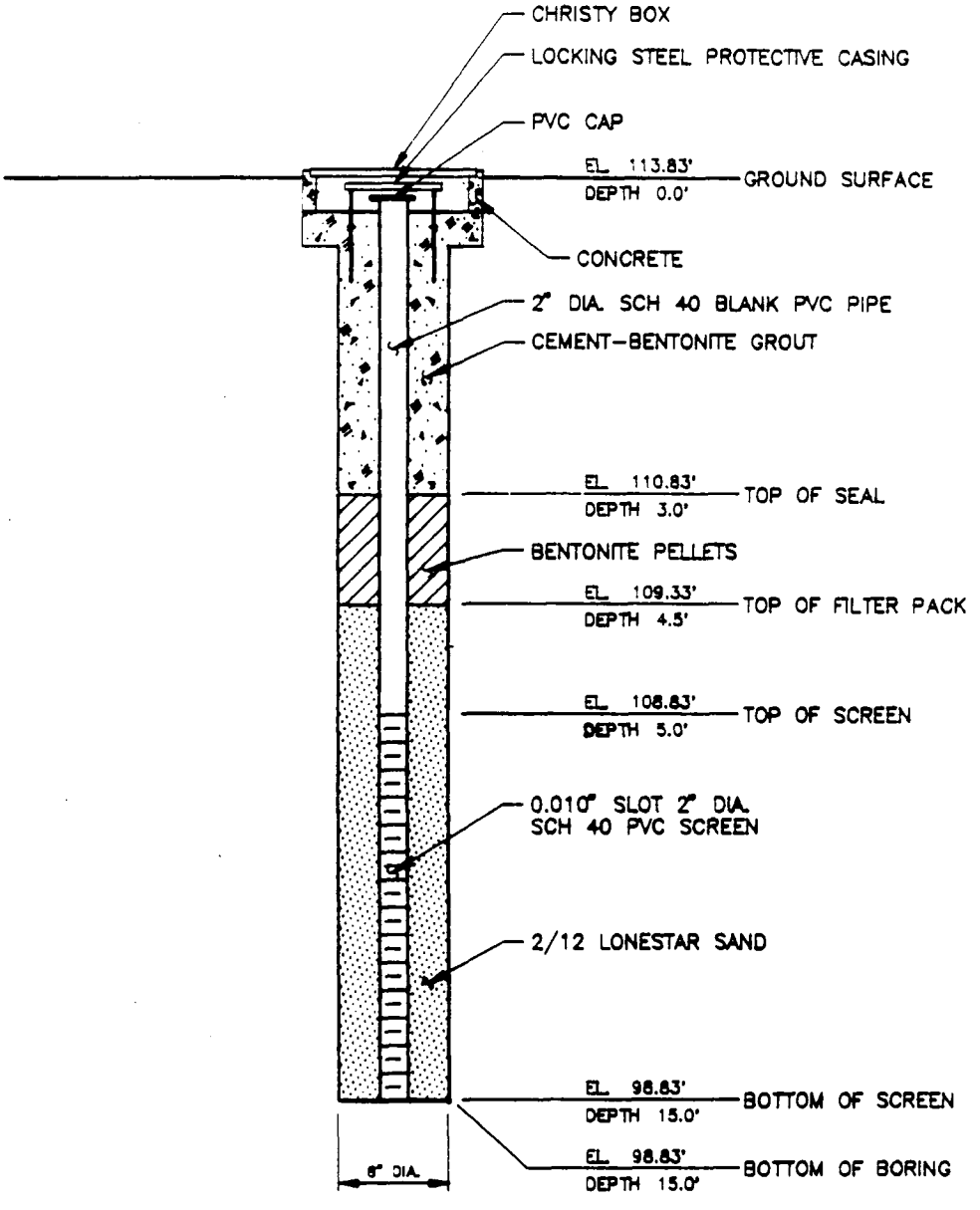
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWOR-5

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION STORAGE AREA, SOUTHEAST CORNER BY FENCE DATE 7-19-90 BY BB



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX G

CANS C-2 AREA
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWC2-1
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: North side of Cans C-2 by gate SURFACE ELEV. 113.41 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/25/90 FINISH 7/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	18	23	15	SM			0.3	Steel grate runway.	
													Dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	12	16	12	16	SM					
	3	CS	3.0	4.5	6	9	7	14	SM					
5													saturated below 4.5 feet.	
	4	CS	4.5	6.0	1	4	5	15	SM			5.5	Medium dense, gray brown, silty fine sand,	X
	5	CS	6.0	7.5	3	4	6	16	SM				saturated, some shells at 6.5 feet.	X
														X
	6	CS	7.5	9.0	3	7	8	15	SM					X
10	7	CS	9.0	10.5	5	4	4	16	SM				becomes loose at 9.0 feet.	X
												10.8	Loose, black to dark gray, silty fine sand,	X
	8	CS	10.5	12.0	3	4	5	18	SM				saturated, with white shells, abundant	X
	9	CS	12.0	13.5	4	6	8	7	SM				silt.	X
													becomes medium dense at 12.5 feet.	X
15	10	CS	13.5	15.0	3	5	8	0	SM					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.5 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings:
   a) 5 ppm at 10.0 feet.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWC2-2
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West of Cans C-2 outside fence line SURFACE ELEV. 114.79 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/24/90 FINISH 7/24/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	24	24	30	14	SM			0.5	Very dense, light brown, silty fine sand,	
	2	CS	2.0	3.5	12	26	23	15	SM				moist. (Fill)	
													pockets of clay and gravel from 0.5 to	
5	3	CS	3.5	5.0	5	11	12	14	SM				1.5 feet.	
	4	CS	5.0	6.5	3	8	7	14	SM				becomes medium dense at 3.5 feet.	X
													becomes saturated at 5.5 feet.	X
	5	CS	6.5	8.0	9	7	7	18	SM				color change to gray at 7.5 feet.	X
	6	CS	8.0	9.5	5	3	5	14	SM				becomes loose at 8.0 feet.	X
10												9.5	Very loose to loose, grayish brown, silty	X
	7	CS	9.5	11.0	1	1	1	15	SM				fine sand, saturated, with shell fragments	X
	8	CS	11.0	12.5	2	5	3	14	SM				increase in silt content below 10.0 feet.	X
													Loose, black to dark gray, silty fine sand,	X
	9	CS	12.5	14.0	1	2	2	15	SM			13.8	saturated, with shells.	X
15	10	CS	14.0	15.5	4	6	4	15	SM			14.3	Loose, greenish gray, silty fine sand,	X
													saturated, with few shells.	
												15.5		
													Bottom of Boring at 15.5 feet.	
20													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25													2. Groundwater was encountered at 5.5 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: a) 2-5 ppm at 14.5 feet.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MWC2-3
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South boundary of Cans C-2 area SURFACE ELEV. 112.43 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/25/90 FINISH 7/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	20	45	5	8	SM			0.5	Dense, orangish brown, silty fine sand,	
	2	CS	2.0	3.0	4	10		0	SM-GP			2.0	with some gravel, moist. (Fill)	
												3.0	Cobbles. (Fill)	
5	3	CS	3.0	4.5	4	6	8	14	SM				Medium dense, light brown, silty fine sand.	
	4	CS	4.5	6.0	1	1	1	15	SM				moist, with shells.	X
												5.0	Loose, gray, silty fine sand, saturated,	X
	5	CS	6.0	7.5	1	2	2	16	SM				with shells.	X
	6	CS	7.5	9.0	2	2	2	13	SM					X
10													no shells noted below 9.0 feet.	X
	7	CS	9.0	10.5	3	5	5	12	SM					X
	8	CS	10.5	12.0	4	7	8	9	SM			10.5	Medium dense, dark gray, silty fine sand,	X
													saturated, trace of clay.	X
	9	CS	12.0	13.5	4	8	8	8	SM				running sands noted during sampling.	X
15	10	CS	13.5	15.0	4	8	9	0	SM					X
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was converted to a monitoring well upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-4
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Northwest corner of Cans C-2 area SURFACE ELEV. 113.8 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/24/90 FINISH 7/24/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PEZO
	1	CS	0.0	1.5	15	21	12	15	SM			0.3	Steel grate runway.	
													Dense, light brown, silty fine sand, moist. (Fill)	
	2	CS	1.5	3.0	11	23	14	16	SM					
	3	CS	3.0	4.5	6	9	8	16	SM				becomes medium dense at 3.0 feet.	
5													concrete at 5.0 feet.	
	4	CS	4.5	6.0	11	9	7	15	SM			5.0	Medium dense, light brownish gray, silty fine sand, saturated, with shells.	
	5	CS	6.0	7.5	6	7	5	15	SM					
	6	CS	7.5	9.0	3	5	5	16	SM					
10	7	CS	9.0	10.5	3	15	25	15	SM				becomes dense at 9.5 feet.	
													becomes loose at 10.5 feet.	
	8	CS	10.5	12.0	3	4	5	16	SM				Soft to medium stiff, dark gray, clayey silt,	
	9	CS	12.0	13.5	3	4	6	17	ML			12.0	saturated, with some organic matter, trace of shell fragments and thin	
15	10	CS	13.5	15.0	8	4	7	9	ML				lenses of clayey fine sand. (Bay Mud)	
												15.0		
													Bottom of Boring at 15.0 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35														
													5. OVA readings: No OVA readings observed during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-5
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West yard in Cans C-2 area SURFACE ELEV. 114.2 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/24/90 FINISH 7/24/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	10	16	7	15	SM			0.3	Steel grate runway.	
													Medium dense, light brown, silty fine sand,	
	2	CS	1.5	3.0	7	25	22	16	SM-SC			2.0	moist. (Fill)	
	3	CS	3.0	4.5	25	18	17	15	GP-SM			3.3	Dense, light brown, clayey fine sand,	
5												3.8	moist. (Fill)	
	4	CS	4.5	6.0	5	7	9	13	SM				Dense, brown, sandy gravel, moist. (Fill)	
	5	CS	6.0	7.5	5	5	5	16	SM				Medium dense, light brown, silty fine sand,	
													moist. (Fill)	
	6	CS	7.5	9.0	2	5	5	14	SM			8.0	saturated below 5.0 feet.	
10	7	CS	9.0	10.5	2	3	3	15	SM				color change to gray brown at 6.0 feet.	
													Loose to medium dense, gray brown,	
	8	CS	10.5	12.0	10	16	18	16	SM				silty fine sand, saturated, with shells.	
	9	CS	12.0	13.5	3	5	5	17	SM				becomes dense at 11.0 feet with slight	
													color change and fewer shells.	
15	10	CS	13.5	15.0	4	4	6	15	SM				becomes medium dense at 12.0 feet.	
												15.0	thin lens of silty clay (Bay Mud) at 13.0	
													feet.	
													color change to dark gray at 13.5 feet.	
20													Bottom of Boring at 15.0 feet.	
													Notes:	
25													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
30													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
35													4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
40													5. OVA readings: No OVA readings observed during drilling.	

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-6
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: North portion of Cans C-2 area SURFACE ELEV. 114.5 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/25/90 FINISH 7/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	BLOW COUNT 6" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	25	25	14	13	SM			0.3	Asphalt and steel grate runway. (Fill)	
													Dense, light brown, silty fine sand, moist.	
	2	CS	1.5	3.0	4	8	15	14	SM-CH			2.0	(Fill)	
	3	CS	3.0	4.5	10	17	15	15	SC			2.5	becomes medium dense at 1.5 feet.	
5												3.5	Stiff, light brown, silty clay, moist. (Fill)	
	4	CS	4.5	6.0	8	14	12	15	SM				Medium dense, light brown silty fine sand,	
	5	CS	6.0	7.5	3	7	7	15	SM			6.0	moist. (Fill)	
													Dense, orange brown, silty fine sand,	
	6	CS	7.5	9.0	7	8	10	15	SM				moist, with shells.	
10	7	CS	9.0	10.5	5	5	4	15	SM				Medium dense, gray brown, silty fine sand,	
													saturated, with trace of shells.	
	8	CS	10.5	12.0	3	3	4	15	SM			11.0	increase in silt content below 8.0 feet.	
	9	CS	12.0	13.5	5	5	9	18	SM				Loose to medium dense, gray brown, silty	
													fine sand, saturated, some pockets of	
15	10	CS	13.5	15.0	4	6	7	9	SM				lean clay.	
												15.0		
													Bottom of Boring at 15.0 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 5.0 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was backfilled with cement/bentonite grout upon completion of drilling.	
35														
													5. OVA readings: No OVA readings observed during drilling.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-7
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southside corner of Cans C-2 area SURFACE ELEV. 114.3 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/24/90 FINISH 7/24/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6" 12"	6" 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	25	26	15	SM		0.3	Steel grate runway.	
												Dense, light brown, silty fine sand, dry.	
	2	CS	1.5	3.0	12	10	9	15	SM			(Fill)	
	3	CS	3.0	4.5	6	10	12	16	SM			becomes medium dense at 1.5 feet.	
5												saturated below 4.8 feet.	
	4	CS	4.5	6.0	2	8	8	14	SM				
	5	CS	6.0	7.5	6	4	6	15	SM		6.3		
												Loose, grayish brown, silty fine sand,	
	6	CS	7.5	9.0	3	4	2	15	SM			saturated.	
10	7	CS	9.0	10.5	4	4	4	15	SM			thin lens of clay at 9.5 feet.	
											10.0	Loose, greenish gray, silty fine sand,	
	8	CS	10.5	12.0	3	3	2	14	SM			saturated, with clay lenses.	
	9	CS	12.0	13.5	2	4	4	10	SM			color change to dark gray to black at	
												11.0 feet, some pockets of clayey sand,	
15	10	CS	13.5	15.0	5	5	6	16	SM			some shells below 12.5 feet.	
											15.0	Bottom of Boring at 15.0 feet.	
												Notes:	
20												1. Boring was advanced using 8-inch-diameter hollow stem augers.	
												2. Groundwater was encountered at 4.8 feet during drilling.	
25												3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30												4. Boring was backfilled with cement/ bentonite grout upon completion of drilling.	
35												5. OVA readings: No OVA readings observed during drilling.	
40													

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-8
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: Southwest corner of Cans C-2 area SURFACE ELEV. 113.6 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/25/90 FINISH 7/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	6" 12" 12"	12" 18" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	15	20	25	17	SM			0.3	Steel grate runway.	
													Dense, light brown, silty fine sand, moist.	
	2	CS	1.5	3.0	6	20	16	15	SM				(Fill)	
	3	CS	3.0	4.5	5	10	11	15	SM				becomes medium dense at 3.0 feet.	
5													saturated below 4.8 feet.	
	4	CS	4.5	6.0	5	8	7	16	SM				color change to gray brown at 4.8 feet.	
	5	CS	6.0	7.5	4	10	17	14	SM				becomes loose at 7.5 feet.	
													increase in silt content below 8.0 feet.	
	6	CS	7.5	9.0	2	2	2	13	SM					
10	7	CS	9.0	10.5	5	7	9	15	SM			9.0	Medium dense, brown mottled gray, silty fine sand, saturated, with trace of clay, small shell fragments.	
	8	CS	10.5	12.0	2	2	2	15	SM					
	9	CS	12.0	13.5	2	7	7	18	SM			12.0	becomes loose at 10.5 feet.	
													Medium dense, dark gray, silty fine sand, saturated, trace of clay, some shells.	
15	10	CS	13.5	15.0	5	8	8	17	SM					
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 4.8 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings: No OVA readings observed during drilling.

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. BC2-9
LOGGED BY BB

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: In lot in SW corner of Cans C-2 area SURFACE ELEV. 113.0 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/25/90 FINISH 7/25/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	14	25	32	15	SM			0.3	Steel grate runway.	
													Very dense, light brown, silty fine sand,	
	2	CS	1.5	3.0	15	19	20	15	SM				moist. (Fill)	
	3	CS	3.0	4.5	7	6	7	16	SM				becomes dense at 2.0 feet.	
5													becomes medium dense at 3.0 feet.	
	4	CS	4.5	6.0	10	12	12	16	SM			5.0	Medium dense, brown gray, silty fine	
	5	CS	6.0	7.5	9	9	10	15	SM				sand, saturated, abundant silt.	
	6	CS	7.5	9.0	9	5	3	13	SM				becomes loose at 8.0 feet.	
10	7	CS	9.0	10.5	5	5	5	12	SM					
	8	CS	10.5	12.0	8	3	4	12	SM			11.0	Medium dense, dark gray, silty sand,	
	9	CS	12.0	13.5	2	3	5	14	SM				saturated, some thin pockets of clayey	
													sand, shells, and wood fragments.	
15	10	CS	13.5	15.0	6	8	9	8	SM				becomes medium dense at 13.5 feet.	
												15.0	Bottom of Boring at 15.0 feet.	
20														
25														
30														
35														
40														

Notes:

1. Boring was advanced using 8-inch-diameter hollow stem augers.
2. Groundwater was encountered at 5.0 feet during drilling.
3. Sampler type:
   California Sampler (CS)
   O.D.: 2.5 inches
   I.D.: 2.0 inches
4. Boring was backfilled with cement/bentonite grout upon completion of drilling.
5. OVA readings:
   a) 2-5 ppm at 11.5 feet.
   b) 10 ppm at 13.5 feet.

Canonie Environmental

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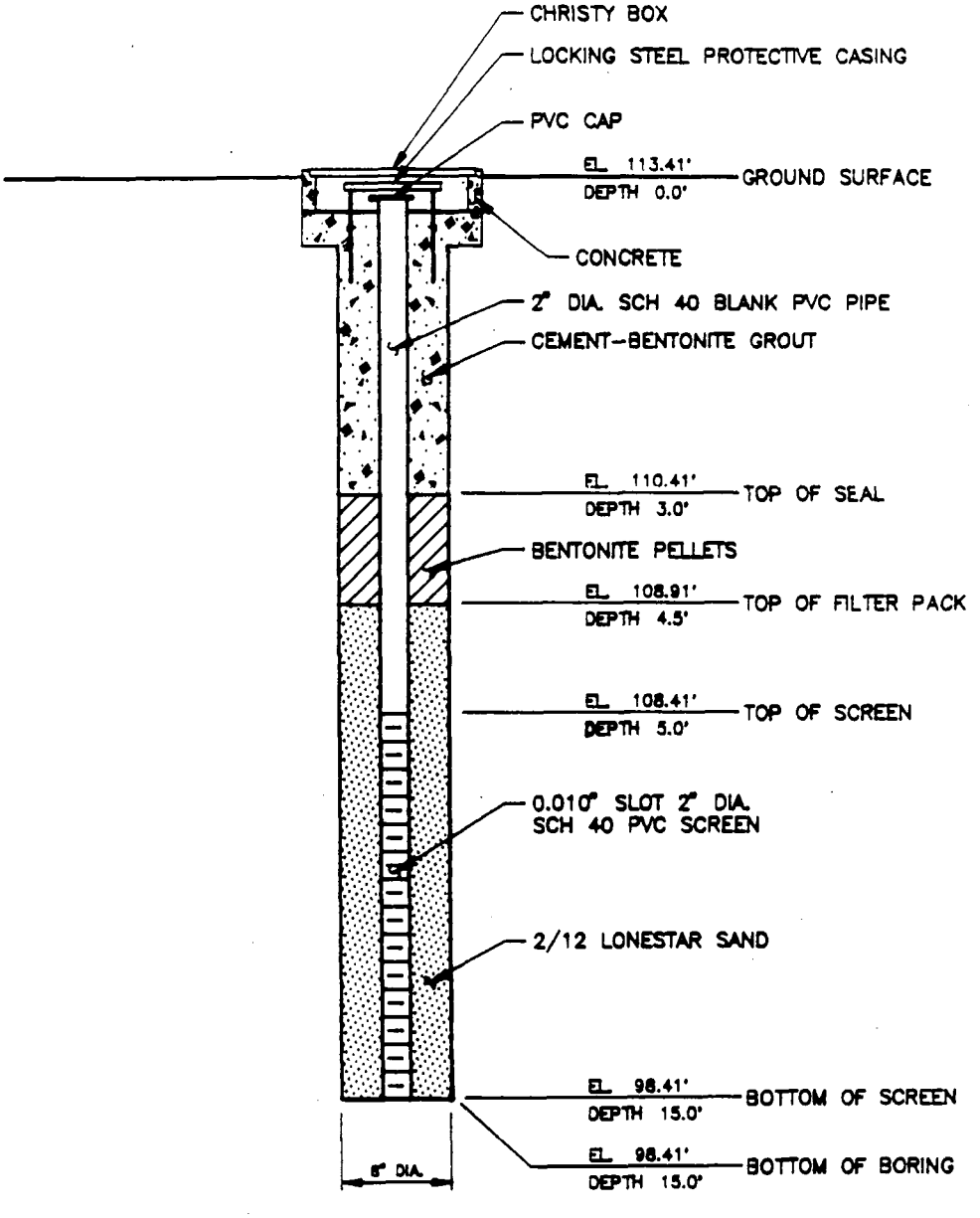
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWC2-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION CANS C2, NORTH SIDE, BY GATE DATE 7-25-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

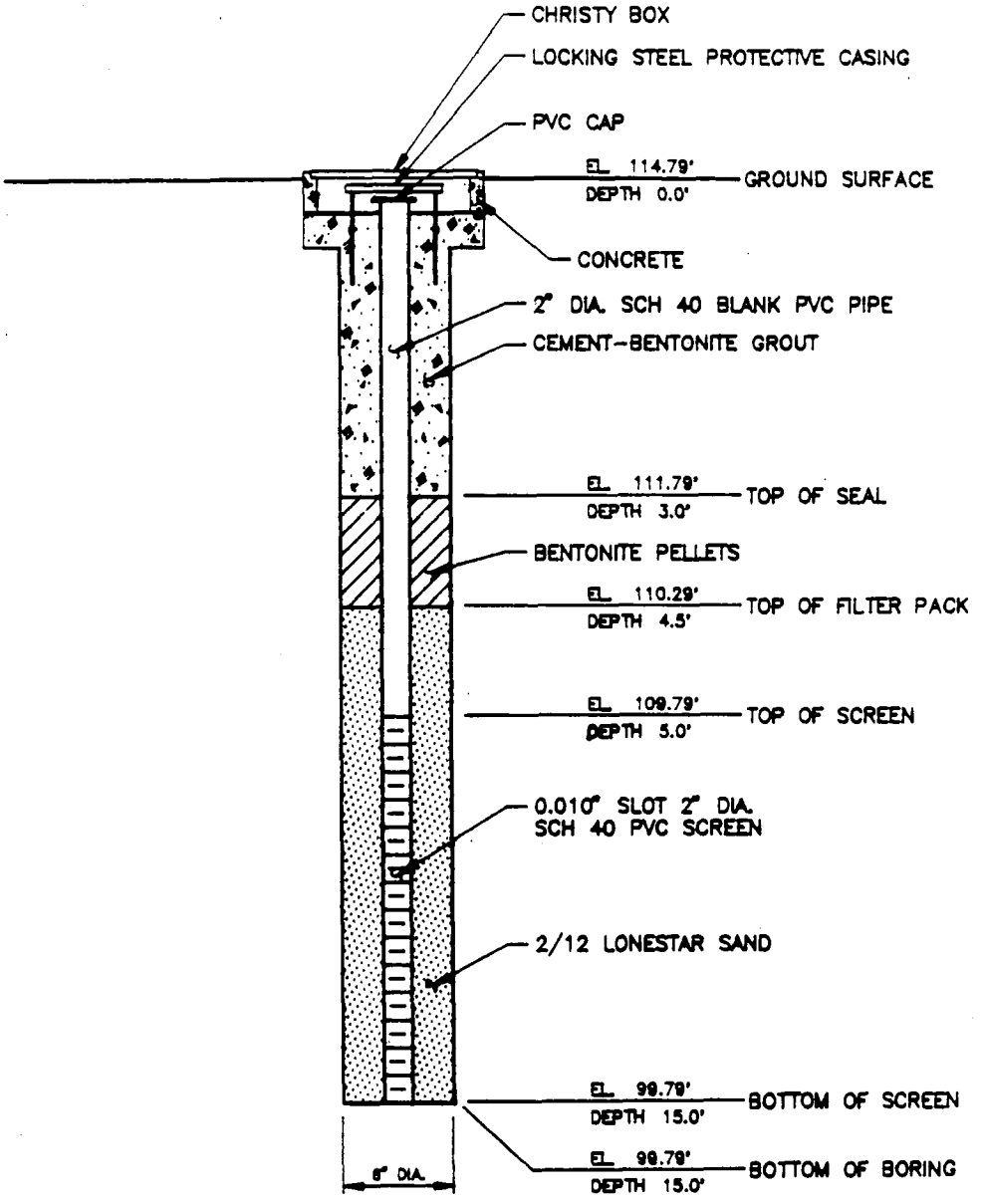
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWC2-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION CANS C-2, WEST SIDE, OUTSIDE FENCE DATE 7-24-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

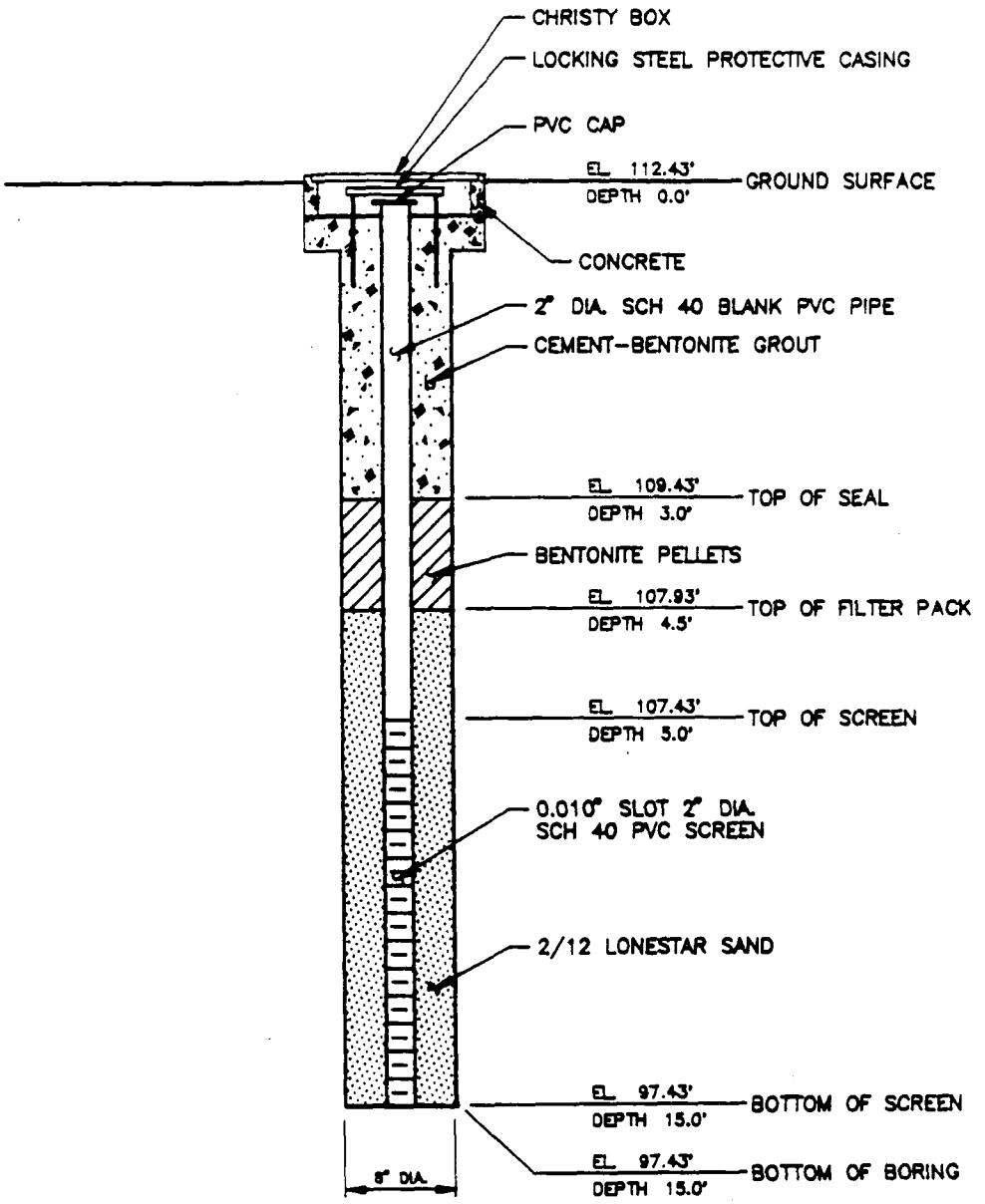
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MWC2-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION CANS C-2, SOUTH SIDE, OUTSIDE FENCE DATE 7-25-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

APPENDIX H

AREA 97
BORING LOGS AND MONITORING WELL
CONSTRUCTION DETAILS

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW97-1
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: West of McDonald's Restaurant SURFACE ELEV. 113.61 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/26/90 FINISH 7/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													Asphalt. (Fill)	
	1	CS	0.5	2.0	30	30	20	10	SM			0.5	Dense, light brown, silty fine sand, moist with shells. (Fill)	
	2	CS	2.0	3.5	9	20	12	13	SM				becomes medium dense at 2.0 feet.	
5	3	CS	3.5	5.0	8	3	2	10	SM-CL			4.5	Soft, greenish gray, silty clay, moist.	
	4	CS	5.0	6.5	8	3	2	18	SM			5.5	Loose, black, silty medium sand, saturated, with white shells and lenses of black clay.	X
	5	CS	6.5	8.0	1	1	2	16	CL			6.5		X
	6	CS	8.0	9.5	1	1	4	18	CL			8.0	Soft, gray to black, sandy clay, saturated, with shells.	X
10														X
	7	CS	9.5	11.0	1	1	5	18	CL				Soft to medium stiff, dark gray, silty clay, saturated. (Bay Mud)	X
	8	CS	11.0	12.5	2	4	6	17	SC			11.5	some organic plant matter at 10.5 feet.	X
	9	CS	12.5	14.0	5	10	18	18	SC				Loose, dark gray to brown, silty clayey fine sand, saturated, with shells.	X
15	10	CS	14.0	15.5	12	8	11	16	SC					X
												15.5	becomes medium dense and more silty at 13.0 feet.	
													Bottom of Boring at 15.5 feet.	
20														
													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25														
													2. Groundwater was encountered at 5.5 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35														
													5. OVA readings: a) 50 ppm at 6.0 feet. b) 25 ppm at 7.0 feet c) 30 ppm at 8.5 feet. d) 30 ppm at 10.5 feet.	
40														

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Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW97-2
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: East of Credit Union Building SURFACE ELEV. 112.68 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/26/90 FINISH 7/26/90

DEPTH	SAMPLE No.	TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6"	6" 12"	12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	14	14	9	9	SM			0.3	Asphalt. (Fill)	
													Medium dense, light brown, silty fine sand.	
	2	CS	1.5	3.0	4	3	2	13	SM-CL			2.5	moist. (Fill)	
	3	CS	3.0	4.5	2	1	2	18	CL				Medium stiff, gray, silty clay, moist, with	
5													interbedded silty sand. (Fill)	
	4	CS	4.5	6.0	1	1	1	18	CL					X
	5	CS	6.0	7.5	1	1	2	18	CL			6.3	Soft, dark reddish brown, sandy clay,	X
													sulfur type odor, moist. (Fill)	X
	6	CS	7.5	9.0	1	2	3	18	CL-SM			8.5	Loose, black to dark brown, silty medium	X
10	7	CS	9.0	10.5	3	2	2	18	SM				sand, moist, with white shells. (Fill)	X
													saturated below 9.3 feet.	X
	8	CS	10.5	12.0	3	2	8	16	SM				color change to gray at 11.5 feet.	X
	9	CS	12.0	13.5	10	13	15	18	SC			12.0	Medium dense, orange brown mottled	X
													with gray, clayey fine sand, saturated,	X
15	10	CS	13.5	15.0	15	15	10	17	SC				abundant iron oxide stains.	X
												15.0	(Merritt Sand)	
													Bottom of Boring at 15.0 feet.	
													Notes:	
20														
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
													2. Groundwater was encountered at 9.3 feet during drilling.	
25														
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35													5. OVA readings: a) 10 ppm at 10.0 feet. b) 10 ppm at 11.5 feet. c) 5 ppm at 13.0 feet.	
40														

Canonie Environmental

Soil Boring Log

PROJECT No. 86-018-1804
BORING No. MW97-3
LOGGED BY RMD

PROJECT NAME: NAS Alameda - Phase 2A Site Investigations
BORING LOCATION: South side of island adjacent to east gate SURFACE ELEV. 113.90 feet
DRILLER: Spectrum Exploration - Garry Buss DATE: START 7/26/90 FINISH 7/26/90

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0" 6" 6"	BLOW COUNT 6" 12" 12"	BLOW COUNT 12" 18"	REC (in)	USCS SOIL TYPE	WC (%)	qu (TSF)	LAYER DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	1	CS	0.0	1.5	9	16	11	12	SM				Grass and Topsoil.	
												0.5	Medium dense, light brown, silty fine	
	2	CS	1.5	3.0	15	12	10	16	SM				sand, moist. (Fill)	
	3	CS	3.0	4.5	3	6	5	16	SM					
5													saturated below 4.5 feet.	
	4	CS	4.5	6.0	3	6	8	16	SM					X
	5	CS	6.0	7.5	2	2	5	18	SM				Loose, gray, silty fine sand, saturated.	X
												6.5	Very soft, gray, silty clay, saturated.	X
	6	CS	7.5	9.0	1	1	1	16	SM-CL			8.5	(Bay Mud)	X
10	7	CS	9.0	10.5	1	2	3	15	SM			9.0	Loose, dark gray, silty fine sand,	X
												10.0	saturated, with small white shells.	X
	8	CS	10.5	12.0	3	4	8	18	SC			10.5	Loose, light brown, silty fine sand,	X
	9	CS	12.0	13.5	14	20	25	18	SC				saturated.	X
													Medium dense, orange brown mottled	X
15	10	CS	13.5	15.0	15	23	30	16	SC				gray, clayey fine sand, saturated,	X
												15.0	some silt. (Merritt Sand)	
													becomes dense at 12.5 feet.	
													Bottom of Boring at 15.0 feet.	
20														
													Notes:	
													1. Boring was advanced using 8-inch-diameter hollow stem augers.	
25														
													2. Groundwater was encountered at 4.5 feet during drilling.	
													3. Sampler type: California Sampler (CS) O.D.: 2.5 inches I.D.: 2.0 inches	
30														
													4. Boring was converted to a monitoring well upon completion of drilling.	
35														
													5. OVA readings: a) 10 ppm at 7.0 feet. b) 30 ppm at 8.0 feet. c) 10 ppm at 10.0 feet.	
40														

Canonie Environmental

Canonie

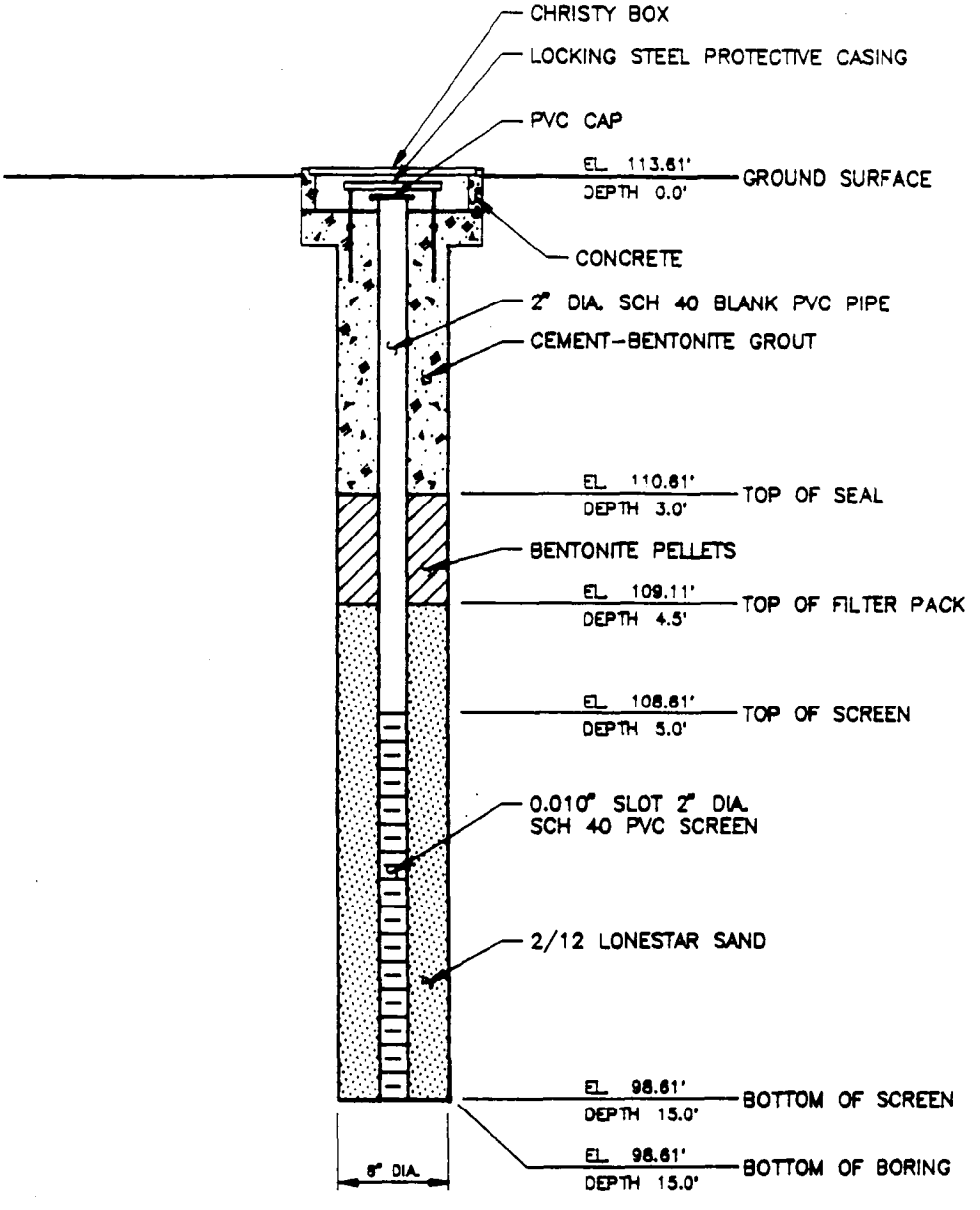
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW97-1

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION McDONALDS, NORTHWEST CORNER DATE 7-26-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

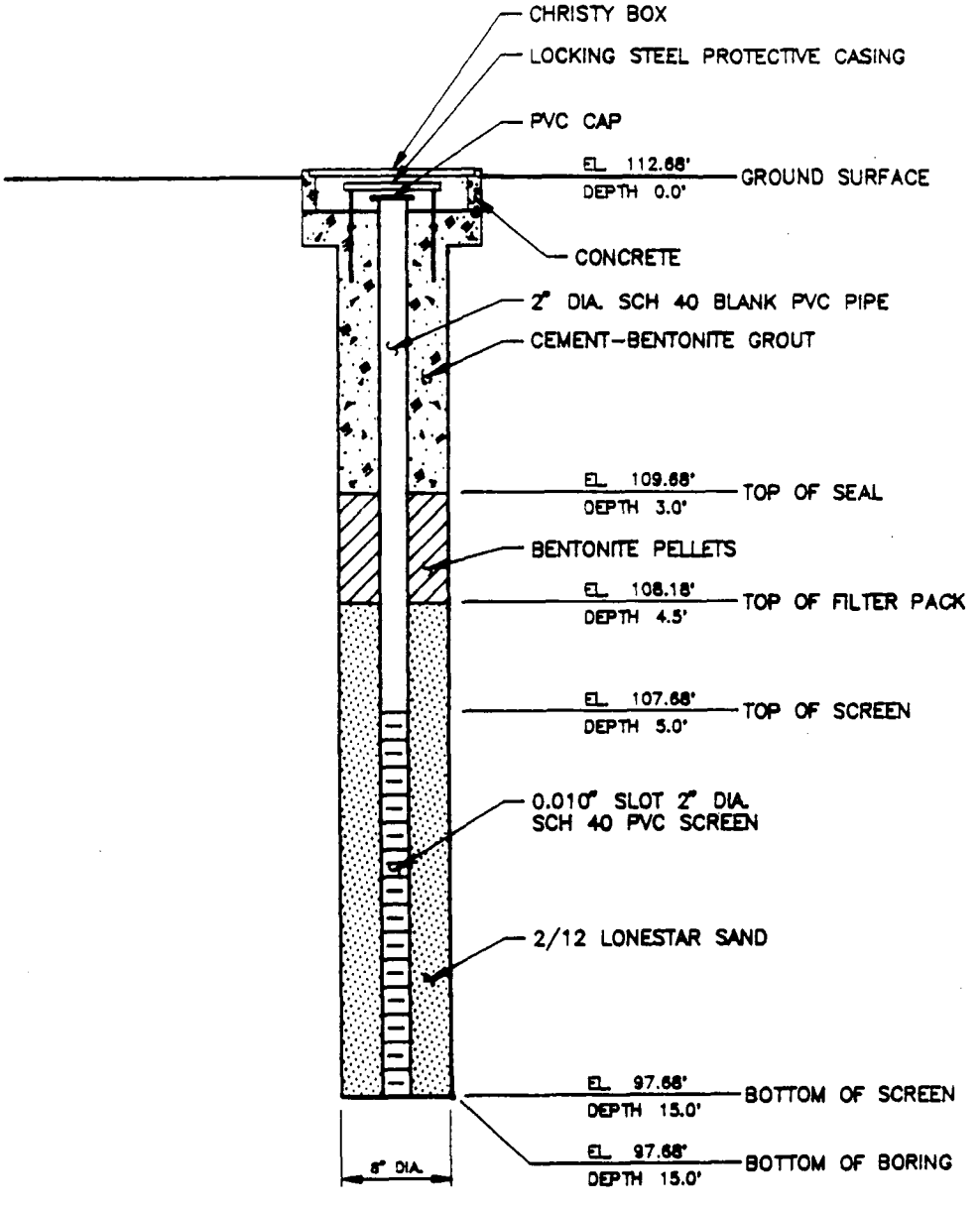
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW97-2

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION CREDIT UNION, SOUTHEAST CORNER DATE 7-26-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Canonie

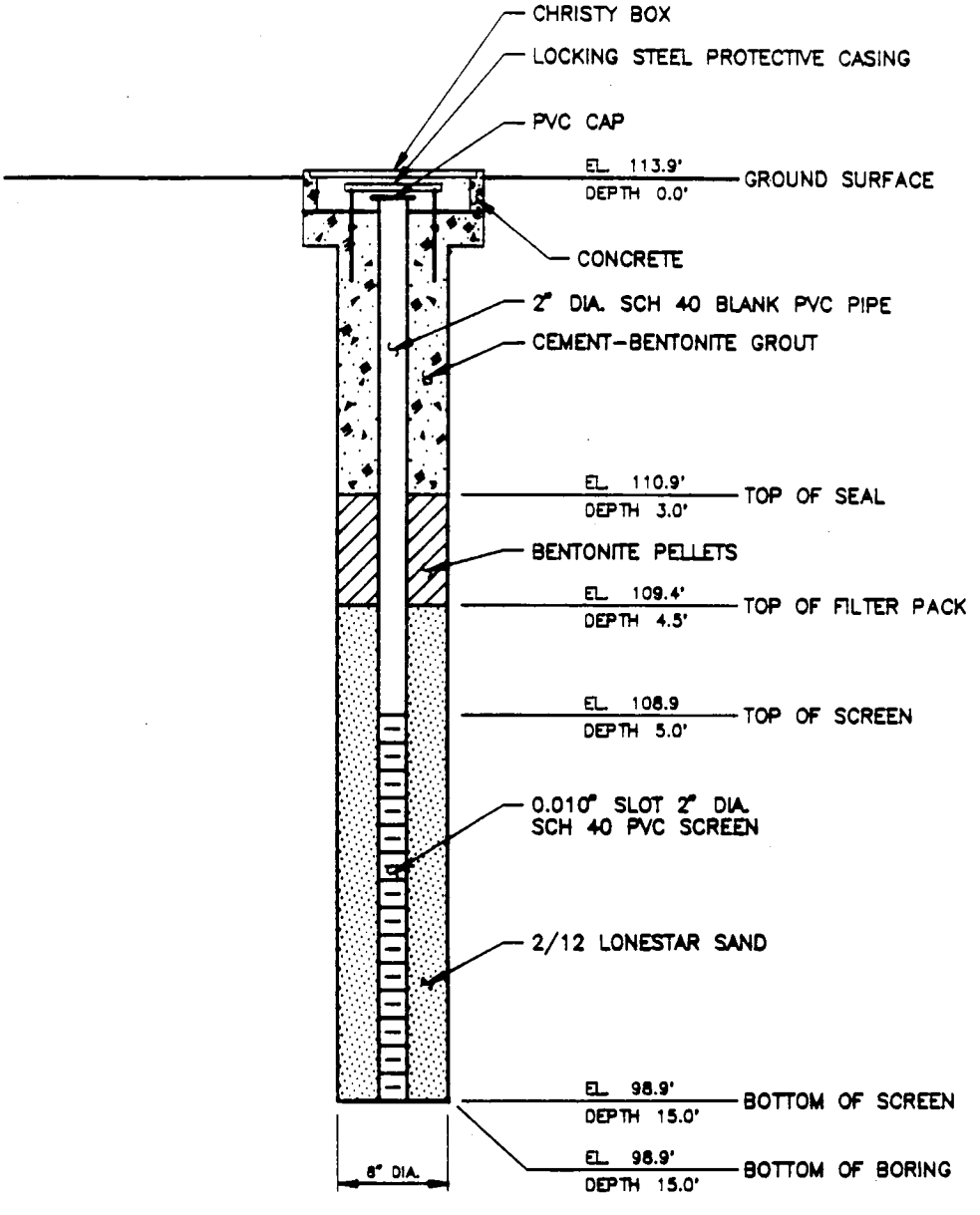
Monitoring Well Detail

PROJECT No. 86-018-1804

WELL No. MW97-3

PROJECT NAME NAS ALAMEDA-PHASE 2A SITE INVESTIGATION

WELL LOCATION SOUTHWEST OF AIRPLANE ON DISPLAY DATE 7-26-90 BY RMD



NOTES:

1. NOT DRAWN TO SCALE.
2. SEE BORING LOG FOR DETAILED SOIL DESCRIPTION.

Appendix D

APPENDIX D

GEOTECHNICAL LABORATORY SOIL TEST DATA

CTL Cooper Testing Laboratory
Independent Geotechnical Lab
1951 Colony, Unit X • Mountain View, CA 94043

David R. Coop
(415) 968-94
Fax (415) 968-42

LETTER OF TRANSMITTAL

TO: Tim Bodkin
Canonie Environmental Services
1825 S. Grant St., Suite 260
San Mateo, CA 94402

DATE: 6 Aug 90

PROJECT: 86.86-018 U.S. Navy

CTL#: 034-10

ENCLOSED: Laboratory soil test data.

REMARKS:

BY: David R. Cooper

David R. Cooper

Cooper Testing Laboratory
Independent Geotechnical Lab
1951 Colony, Unit X • Mountain View, CA 94043

(415) 968-947
Fax (415) 968-422

LETTER OF TRANSMITTAL

TO: Tim Bodkin
Canonie Environmental
1825 S. Grant Street, Suite 260
San Mateo, CA 94402

DATE: 14 June 90

PROJECT: Alameda NAS

CTL#: 034-1

ENCLOSED: Sieve test data.

REMARKS:

BY: David R. Cooper

David R. Cooper

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

JOB NO. [illegible] SHEET ___ OF ___

CLIENT [illegible]

LOCATION [illegible] LAS

DATE SAMPLED _____ DATE TESTED 7/17/90 BY: DC CHECKED BY _____

BORING NUMBER	DA-1R	DA-1	DA-2R	DA-2	WB-1	WB-1	WB-1	WB-3R	WB-3	WB-3
DEPTH (FEET)	0-0.5'	26.5-27.0'	0.0-0.5'	10.0-10.5'	0-0.5'	20.5-21.0'	36.5-37.0	0.0-0.5	16.5-17.0	17.5-18.0
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	BROWN SILTY SAND W/GRV (SM)	BAYMUD W/SHELLS	BROWN FINE SAND W/SILT (SP/SM)	BAYMUD TO (SC) BM TESTED	GREENISH BROWN SILTY FINE SAND (SM) W/GRAVEL	MIX OF BAYMUD & SAND	GRAY SANDY CLAY	BROWN SILTY FINE SAND (SM)	BROWN FINE SAND (SP)	BROWN FINE SAND (SP)
NUMBER OF RINGS	D	6	2	2	6	5	3	5.63	3	3
WT. IN GM. RINGS & SOIL	I	689.6	212.2	211.7	684.6	604.0		619.6	362.4	364.4
WT. IN GM. RINGS	S	181.9	55.0	55.7	184.2	163.4		187.5	80	80
WT. IN GM. OF SOIL	T	507.7	157.2	156.0	500.4	440.6	264.8	432.1	282.4	284.4
RING FACTOR	U	1.302/6	1.302/2	1.302/2	1.302/6	1.302/5	1.302/3	1.302/5.63	1.302/3	1.302/3
WET DENSITY pcf	R B	110.2	102.3	101.6	108.6	114.7	114.9	99.9	122.6	123.4
DRYING DISH NUMBER	E	40	142	A-14	44	122	70	78	A-15	19
WT. IN GM. MOIST SOIL & DISH	D	70.4	143.8	50.2	172.3	122.4	111.5	120.6	137.8	109.4
WT. IN GM. DRY SOIL & DISH		56.2	130.1	38.7	160.4	96.4	87.6	119.0	119.7	94.6
WT. IN GM. MOISTURE		14.2	13.7	11.5	11.9	26.0	23.9	1.6	18.1	14.8
WT. IN GM. DISH		20.2	20.7	20.7	19.4	20.8	19.6	13.4	20.6	20.7
WT. IN GM. DRY SOIL		36.0	109.4	18.0	141.0	75.6	68.0	99.6	99.1	73.9
MOISTURE CONTENT %		39.4	12.5	63.9	8.4	34.4	35.2	1.6	18.3	20.0
DRY DENSITY pcf		79.0	90.9	62.0	100.1	85.4	85.0	98.3	103.6	102.8

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

JOB NO. 234-10 SHEET ___ OF ___

CLIENT [illegible] 86-018-1806

LOCATION ALAMEDA NAS

DATE SAMPLED _____ DATE TESTED 7/24/90 BY: DC CHECKED BY _____

BORING NUMBER	WB-4	WB-4	WB-3	OR-1						
DEPTH (FEET)	0-0.5	1.5-2.0	37.0-37.5	1.5-2.0						
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	BROWN FINE SAND (SP)	BROWN FINE SAND (SP)	GRAY SILTY FINE TO MED. SAND (SM)	BROWN FINE TO MED SAND (SP)						
NUMBER OF RINGS	5.69	5.50	3	3						
WT. IN GM. — RINGS & SOIL	583.8	564.0	386.2	424.6						
WT. IN GM. — RINGS	194.8	176.0	79.7	190.6						
WT. IN GM. — OF SOIL	389.0	388.0	306.5	234.0						
RING FACTOR	1.302/5.69	1.302/5.50	1.302/3	1.302/3						
WET DENSITY pcf	89.0	91.9	133.0	101.6						
DRYING DISH NUMBER	A-10	122	35	129						
WT. IN GM. — MOIST SOIL & DISH	166.4	154.4	238.2	160.8						
WT. IN GM. — DRY SOIL & DISH	163.4	151.9	203.3	150.9						
WT. IN GM. — MOISTURE	3.0	02.5	34.9	9.9						
WT. IN GM. — DISH	21.5	20.8	20.8	20.7						
WT. IN GM. — DRY SOIL	141.9	131.1	182.5	130.2						
MOISTURE CONTENT %	2.1	1.9	19.1	7.6						
DRY DENSITY pcf	87.2	90.1	111.7	94.4						

COOPER TESTING LABORATORY

JOB NO. SANDNIE 1986-018-1806

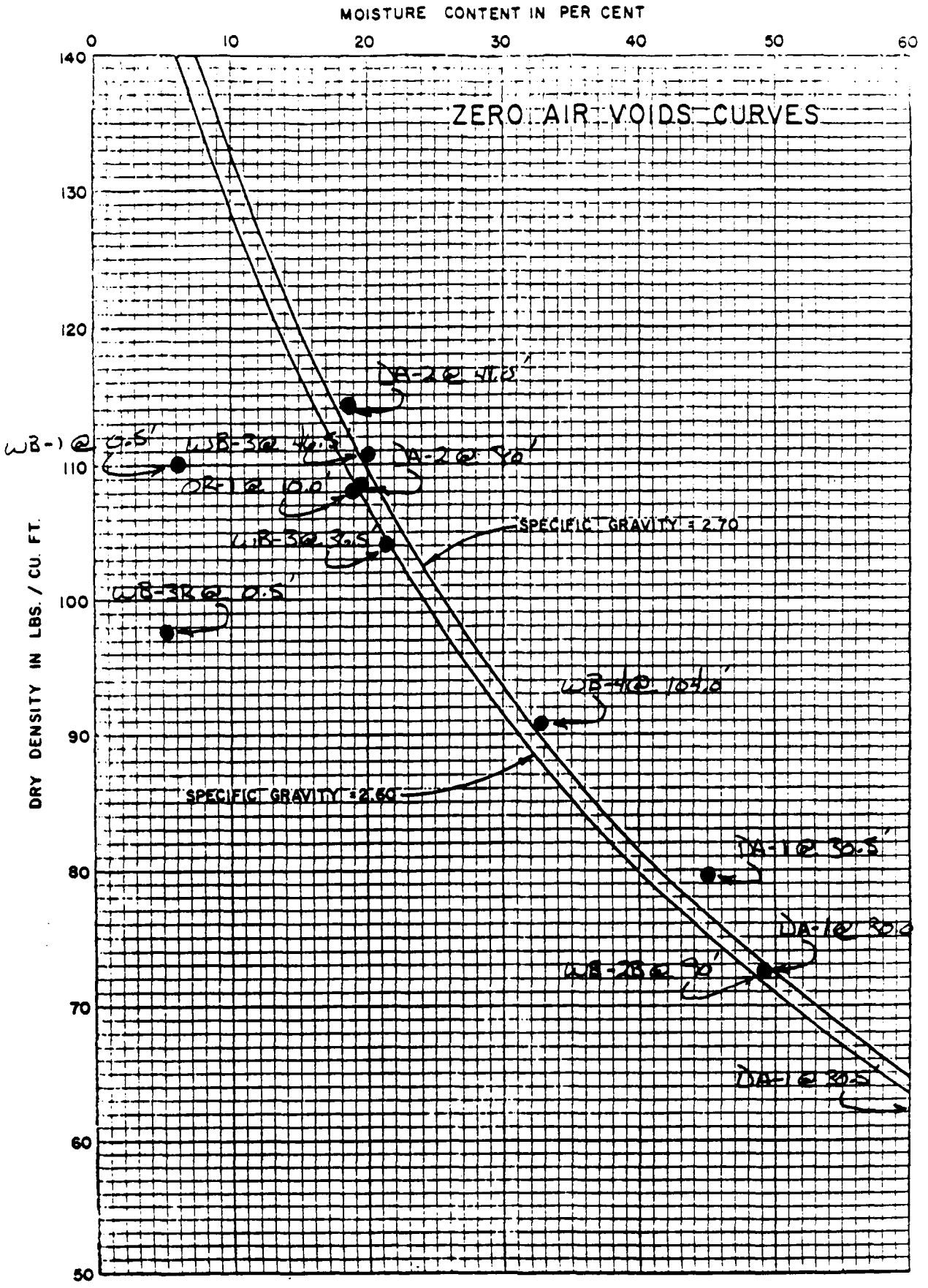
SUBJECT: MOISTURE-DENSITY DATA

SHEET ____ OF ____

REVISIONS:

BY ____ DATE ____ TO EO ____

BY ____ DATE ____ TO EO ____



BY D... DATE 8/3/90

CHECKED BY ____

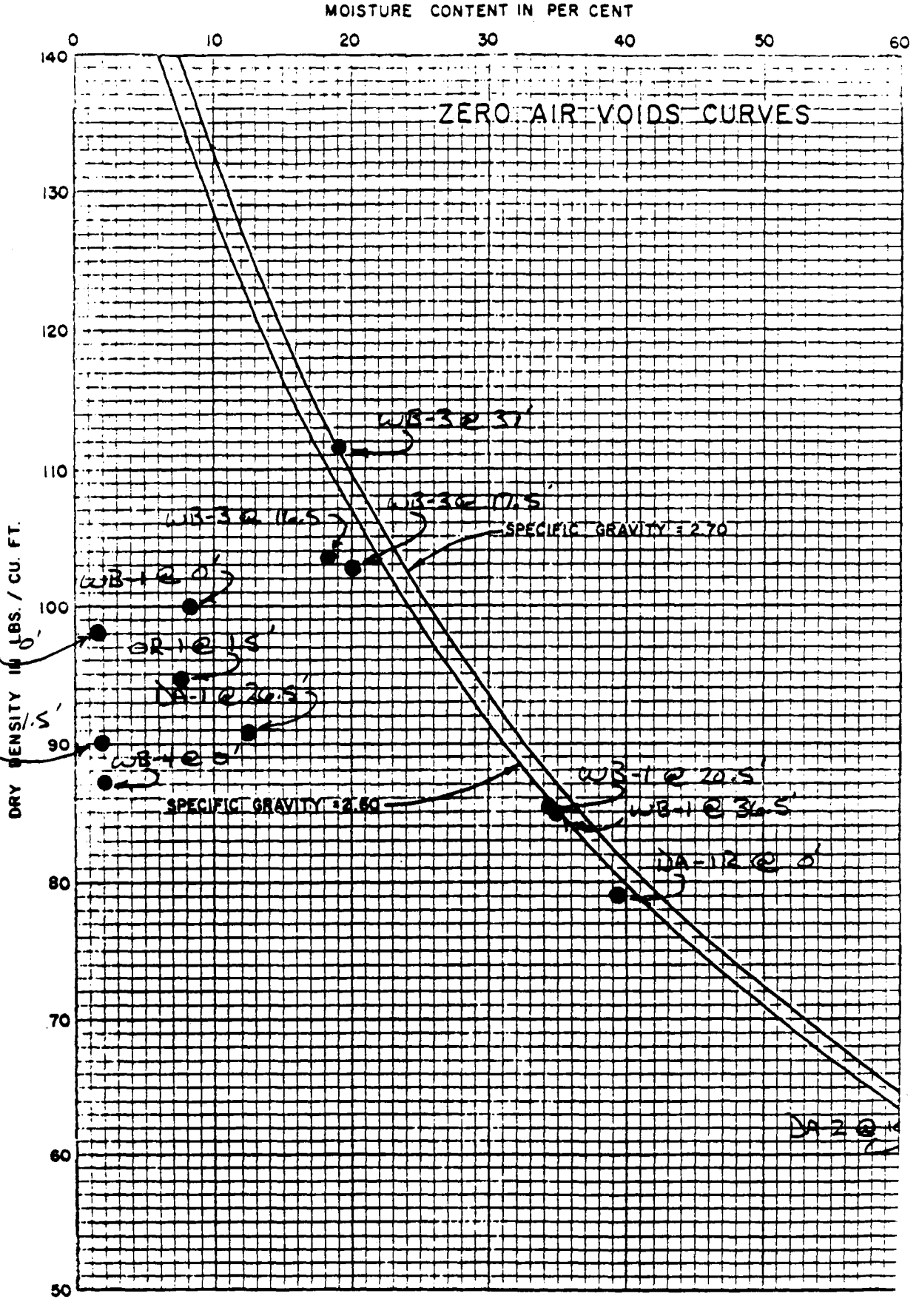
COPY TO EO ____

COOPER TESTING LABORATORY

JOB NO. CANONIE / 86-018-406

SUBJECT: MOISTURE-DENSITY DATA

SHEET ___ OF ___



REVISIONS:
BY ___ DATE ___ TO EO ___
BY ___ DATE ___ TO EO ___

BY ___ DATE 8/3/90
CHECKED BY ___
COPY TO EO ___

COOPER TESTING LABORATORY

JOB NO. _____

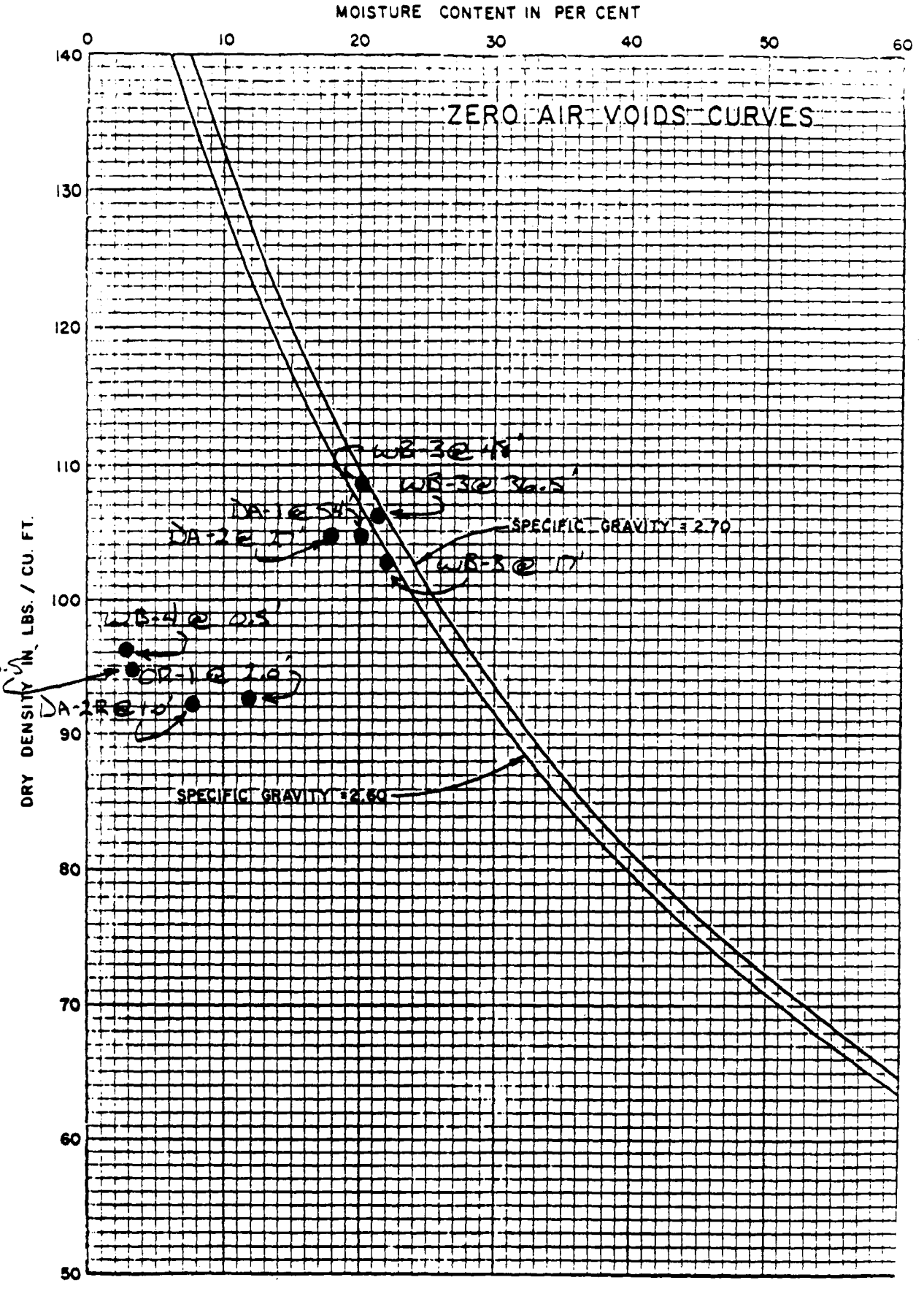
SUBJECT: MOISTURE-DENSITY DATA _____

_____ SHEET ____ OF _____

REVISIONS:

BY _____ DATE _____ TO EO _____

BY _____ DATE _____ TO EO _____



BY PC DATE 8/3/90

CHECKED BY _____

COPY TO EO _____

COOPER TESTING LABORATORY

Project: CANONIE 86-018-17 Location: ALAMEDA NAS Job No. 034-10

Soil Classification: SHELLS w/ BAYMUD Boring No. DA-1

SAMPLE DISTURBED Sample No.

Test Started By: DC 7/20/90 Test Completed By: HC 7/30/90 Depth (ft) 30.0 - 30.5

Data Computed By: / / Data Plotted By: / / Checked By: / /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☑ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.8461
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.48
Weight of Ring(s) + Wet Soil – gm	112.2	105.6
Weight of Rings Only – gm	29.0	29.0
Weight of Wet Soil – gm	83.2	76.6
Wet Density – pcf	108.3	117.9
Weight of Wet Soil + Dish (Ring) – gm	83.2	121.5
Weight of Dry Soil + Dish (Ring) – gm	55.7	100.6
Weight of Lost Moisture – gm	27.5	20.9
Weight of Dish (Ring) – gm (C24 / 15.9)		44.9
Weight of Dry Soil – gm		55.7
Moisture as % of Dry Weight – %	49.3	37.5
Dry Density – pcf	72.5	85.7

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity ☐ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final

REMARKS:

EQUIPMENT: Consolidometer

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\quad)}{(\quad)\ (4.43)\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = \frac{1}{H_c H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\quad) / (\quad) =$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
		.0000		

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

COOPER TESTING LABORATORY

Project: CANONIE 86-08-1806 Location: ALAMEDA NAS Job No. 034-10

Soil Classification: GRAY CLAYEY SAND TO CLEAN SAND (SC) TESTED Boring No. WB-3

Sample No.

Test Started By: DC 7/11 Test Completed By: / / Depth (ft) 36.5 - 37.0

Data Computed By: / / Data Plotted By: / / Checked By: / /

SAMPLE TYPE

☑ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

DATA REQUIREMENT

$\gamma_{dmx.}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.9480
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.78
Weight of Ring(s) + Wet Soil – gm	121.1	120.2
Weight of Rings Only – gm	23.8	23.8
Weight of Wet Soil – gm	97.3	96.4
Wet Density – pcf	126.7	132.4
Weight of Wet Soil + Dish (Ring) – gm	97.3	140.7
Weight of Dry Soil + Dish (Ring) – gm	80.1	124.5
Weight of Lost Moisture – gm	17.2	16.2
Weight of Dish (Ring) – gm (A-5)		44.4
Weight of Dry Soil – gm ring 20.6 28.8		80.1
Moisture as % of Dry Weight – %	21.4	20.2
Dry Density – pcf	104.4	110.1

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity ☐ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final

REMARKS:

EQUIPMENT: Consolidometer S

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\quad)}{(\quad)\ \cancel{(1.93)}\ 2.93\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\quad) / (\quad) =$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
		.0000		

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

COOPER TESTING LABORATORY

Project: 86-018-1806 Location: _____ Job No. 034-10

Soil Classification: BAY MUD W/SHELLS THROUGHOUT SAMPLE DISTURBED Boring No. B-1

Sample No. _____

Test Started By: DC 7/10/92 Test Completed By: _____ / / Depth (ft) 30.5-31.0

Data Computed By: _____ / / Data Plotted By: _____ / / Checked By: _____ / /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to _____) ☐ Remolded to _____ ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = _____ pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify) _____

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle: _____

– Take time vs. deformation reading at: _____

☐ SPECIAL:

Instruction and notes: _____

By: _____ / / _____

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.8450
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.47
Weight of Ring(s) + Wet Soil – gm	112.9	106.1
Weight of Rings Only – gm	23.8	23.8
Weight of Wet Soil – gm	89.1	82.3
Wet Density – pcf	116.0	126.8
Weight of Wet Soil + Dish (Ring) – gm	89.1	125.8
Weight of Dry Soil + Dish (Ring) – gm	61.4	104.8
Weight of Lost Moisture – gm	27.7	21.0
Weight of Dish (Ring) – gm (70)		43.4
Weight of Dry Soil – gm 19.6		61.4
Moisture as % of Dry Weight – %	45.1	34.2
Dry Density – pcf	79.8	94.5

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity _____ ☐ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final

REMARKS: _____

EQUIPMENT: Consolidometer 4

Load Factor: 1 CGR = _____ psf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\quad)}{(\quad)\ \frac{(4.43)}{293}\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\quad) / (\quad) =$ _____

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
		.0000		

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO 034-10 NAME CANONIE 86-018-1806 LOCATION ALAMEDA NAS

TESTED BY DC DATE 7/30/90 CHECKED BY

Dish Number	C-2	C-31	C-8	
Boring Number	WB-1	WB-3	OR-1	
Depth of Sample in Feet	36.5-37.0	16.5-17.0	1.5-2.0	
Field Classification of Soil				
Lab Classification of Soil	GRAY SANDY CLAY	BROWN FINE SAND (SP)	BROWN FINE TO MEDIUM SAND (SP) W/SHELLS	
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100% -#4	100% -#4	100% -#4	
Pycnometer Number	3	3	3	
Wt. of Pycnometer + Soil + Water ..... Wb	321.9	333.1	322.8	
Test Temperature in °C, Tx	24	24	24	
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.69	291.69	291.69	
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	48.60	66.51	50.47	
Temp. Correction Factor ..... K (from chart below)	.9991	.9991	.9991	
K. Wo	48.56	66.45	50.42	
Wo + Wa — Wb	18.35	25.04	19.31	
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.65	2.65	2.61	

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-10 NAME CANONIE / 76-018-15006 LOCATION

TESTED BY DC DATE 7/10/90 CHECKED BY

Dish Number	C-28	C-2	C-2	C-31
Boring Number	DA-1R	W3-3	DA-2	W3-3
Depth of Sample in Feet	0.5-1.0	36.5-37.0	41.0-41.5	46.5-47.0
Field Classification of Soil	w/SOME ORGANIC MATTER			
Lab Classification of Soil	BROWN SILTY FINE SAND (SM)	GRAY MED. TO FINE SAND (SP)	BROWN SILTY MED. TO FINE SAND (SP/SM)	BROWN FINE TO MED SAND w/ SILT (SP/SM)
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	-#4	100% -#4	100% -#4	100% -#4
Pycnometer Number	4	4	3	3
Wt. of Pycnometer + Soil + Water ..... Wb	329.3	327.8	319.0	326.4
Test Temperature in °C, Tx	24	25	24	24
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	294.34	294.3	291.69	291.60
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	56.86	53.06	43.65	55.29
Temp. Correction Factor ..... K (from chart below)	.9991	.9989	.9991	.9991
K. Wo	56.81	53.00	43.61	55.24
Wo + Wa — Wb	21.9	19.56	16.3	20.53
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.59	2.71	2.68	2.69

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-10 NAME CANONIE 86-015-15016 LOCATION ALAMEDA NAS

TESTED BY DC DATE 7/18/90 CHECKED BY

Dish Number	C-2	C-31	C-31	C-2
Boring Number	OR-1	OR-1	WB-2	WB-4
Depth of Sample in Feet	2.0-2.5	10-10.5	90.0-90.5	104.0-104
Field Classification of Soil				
Lab Classification of Soil	GREENISH BROWN FINE SAND (SP)	GREENISH GRAY SILTY SAND (SM)	GRAY SILTY CLAY (CH)	GRAY SILT CLAY (CH)
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100% -#4	100% -#4	100% -#4	100% -#4
Pycnometer Number	3	3	3	3
Wt. of Pycnometer + Soil + Water ..... Wb	322.9	325.0	323.2	319.0
Test Temperature in °C, Tx	24	23	24	24
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.69	291.74	291.69	291.69
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	49.79	53.41	50.55	44.56
Temp. Correction Factor ..... K (from chart below)	.9991	.9993	.9991	.9991
K. Wo	49.75	53.37	50.50	44.52
Wo + Wa — Wb	18.54	20.11	18.99	17.2
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.68	2.65	2.66	2.59

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

Job 03-10 CANONIE (86-018-171)

Date Tested 7/30/90 By PIT Boring No. DA-1 Sample No. _____ Depth _____

Description of Soil BROWN SILTY SAND w/ GRVL. (SURFACE FILL MATL.) / BROKEN GLASS

Initial Gradation: +¾ 8.5 %, #4 >33% Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐ —No.4 ☐ .65 .33 5 . 32

☒ MODIFIED AASHO 10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

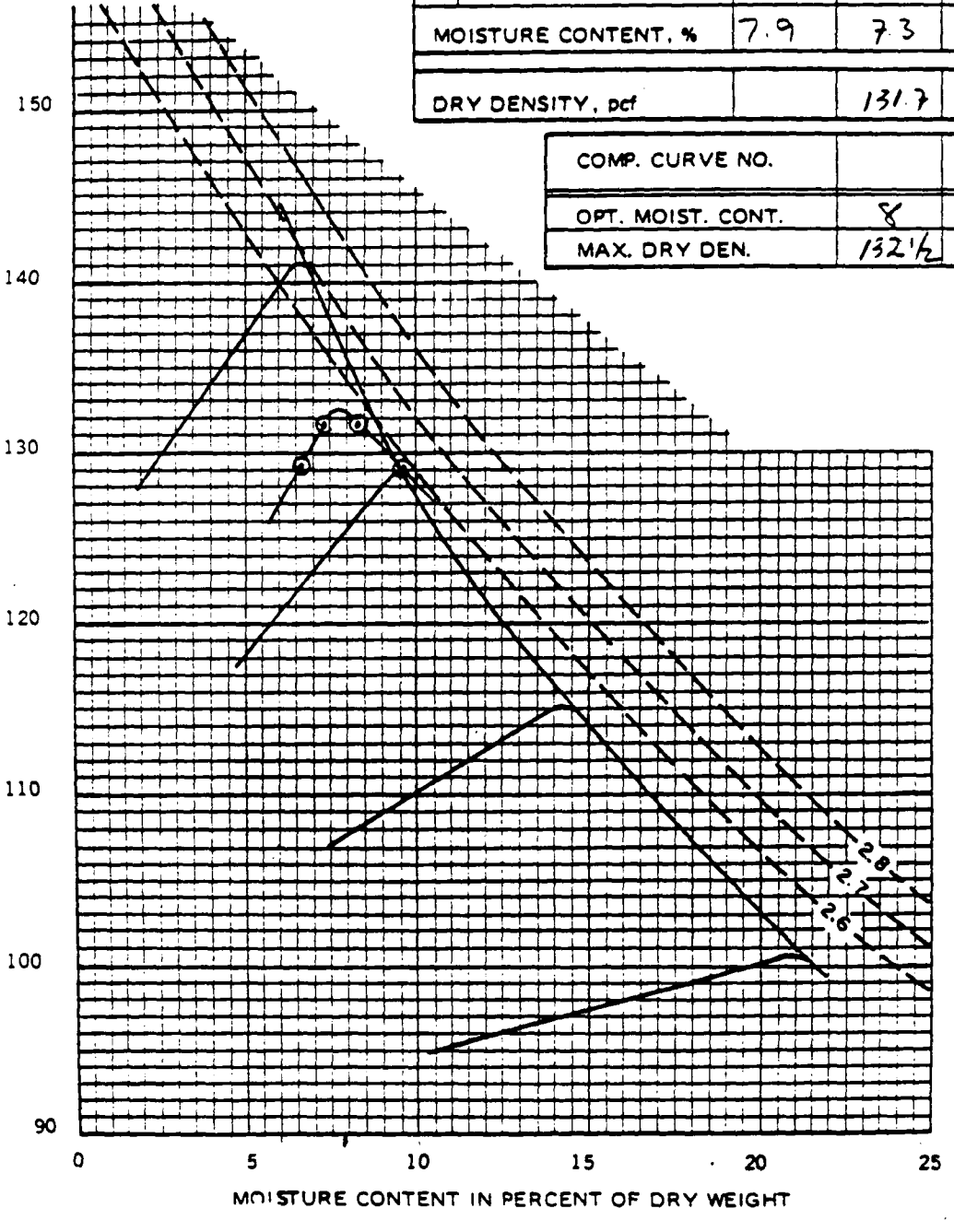
☒ 6" MOLD 1/13 cu ft

☐ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil		6.84	16.93	16.85		.57
	Mold		6.24	6.24	6.24		6.2
	Moist Soil		10.60	10.69	10.61		10.32
Factor (1/Vol. of Soil, cu ft)			13.33	13.33	13.33		
WET DENSITY, pcf		INITIAL	141.30	142.5	141.4		137.07
wt. in gms.	Moist Soil and Dish	276.7	666.0	862.9	873.6		797.3
	Dry Soil and Dish	257.4	624.7	801.2	801.5		751.2
	Moisture	19.3	41.3	61.7	72.1		46.1
	Dish	M) 12.1	B) 54.2	E) 53.4	H) 53.4		E 52.8
	Dry Soil	245.3	570.5	747.8	748.1		695.4
MOISTURE CONTENT, %		7.9	7.3	8.3	9.6		6.6
DRY DENSITY, pcf			131.7	131.6	129.0		129.2

COMP. CURVE NO.					
OPT. MOIST. CONT.	8				
MAX. DRY DEN.	132½				

SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.



COMPACTION TEST DATA SHEET

Job [illegible] CANONE (86-018-17)

Date Tested 7/20/90 By PJ Boring No. _____ Sample No. CA-2 Depth 0 - 2'

Description of Soil LT. GREENISH BROWN FINE SAND W/ SHELLS & GRAVEL & SILT (SP/SM)

Initial Gradation: +¾ .24 %, RETAINED #4 (6.5%) Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐

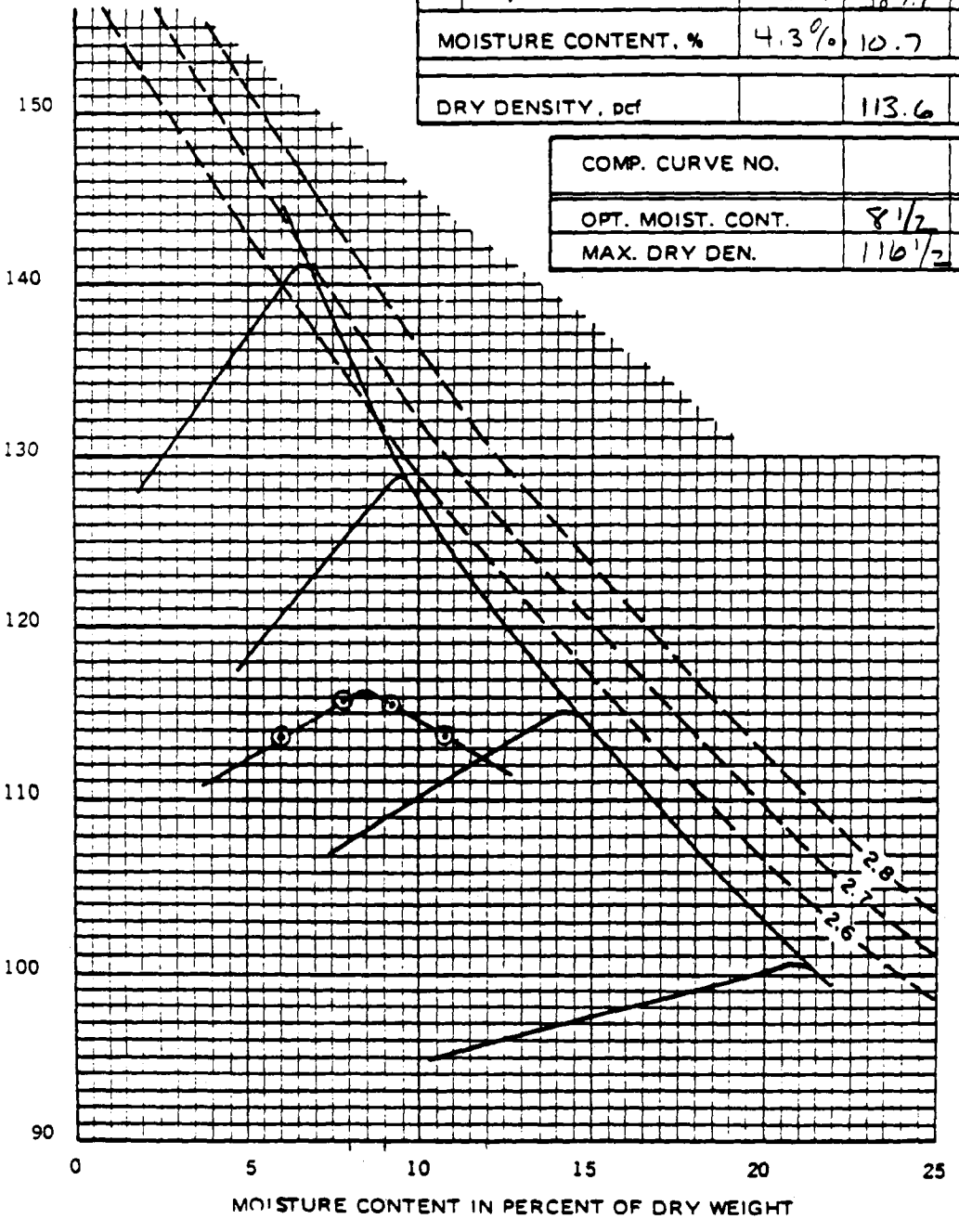
☑ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

			- T No.4	☐ 19.0	2%	+5.2	
wt. in lbs	Mold and Moist Soil		8.69	8.56	8.51	8.70	
	Mold		4.50	4.50	4.50	4.50	
	Moist Soil		4.19	4.06	4.01	4.20	
Factor (1/Vol. of Soil, cu ft)			30	30	30	30	
WET DENSITY, pcf		INITIAL	125.7	124.8	120.3	126	
wt. in gms.	Moist Soil and Dish	259.3	705.2	878.6	851.0	724.5	
	Dry Soil and Dish	249.0	642.0	824.0	809.5	668.0	
	Moisture	10.3	63.2	54.6	41.5	56.5	
	Dish	M 12.1	D 52.9	J 122.0	L 122.2	H 53.4	
	Dry Soil	236.9	589.1	702.0	687.3	614.6	
MOISTURE CONTENT, %		4.3%	10.7	7.8	6.0	9.2	
DRY DENSITY, pcf			113.6	115.8	113.5	115.4	

COMP. CURVE NO.				
OPT. MOIST. CONT.	8 1/2			
MAX. DRY DEN.	116 1/2			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Job [illegible] LAMONT LAS ALAMEDA [illegible]

Date Tested 8/1/90 By PH Boring No. WB 1 Sample No. _____ Depth [illegible]

Description of Soil BROWN FINE SILTY SAND W/GRV

Initial Gradation: +¾ 7.6 %, #4 32.0 Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐

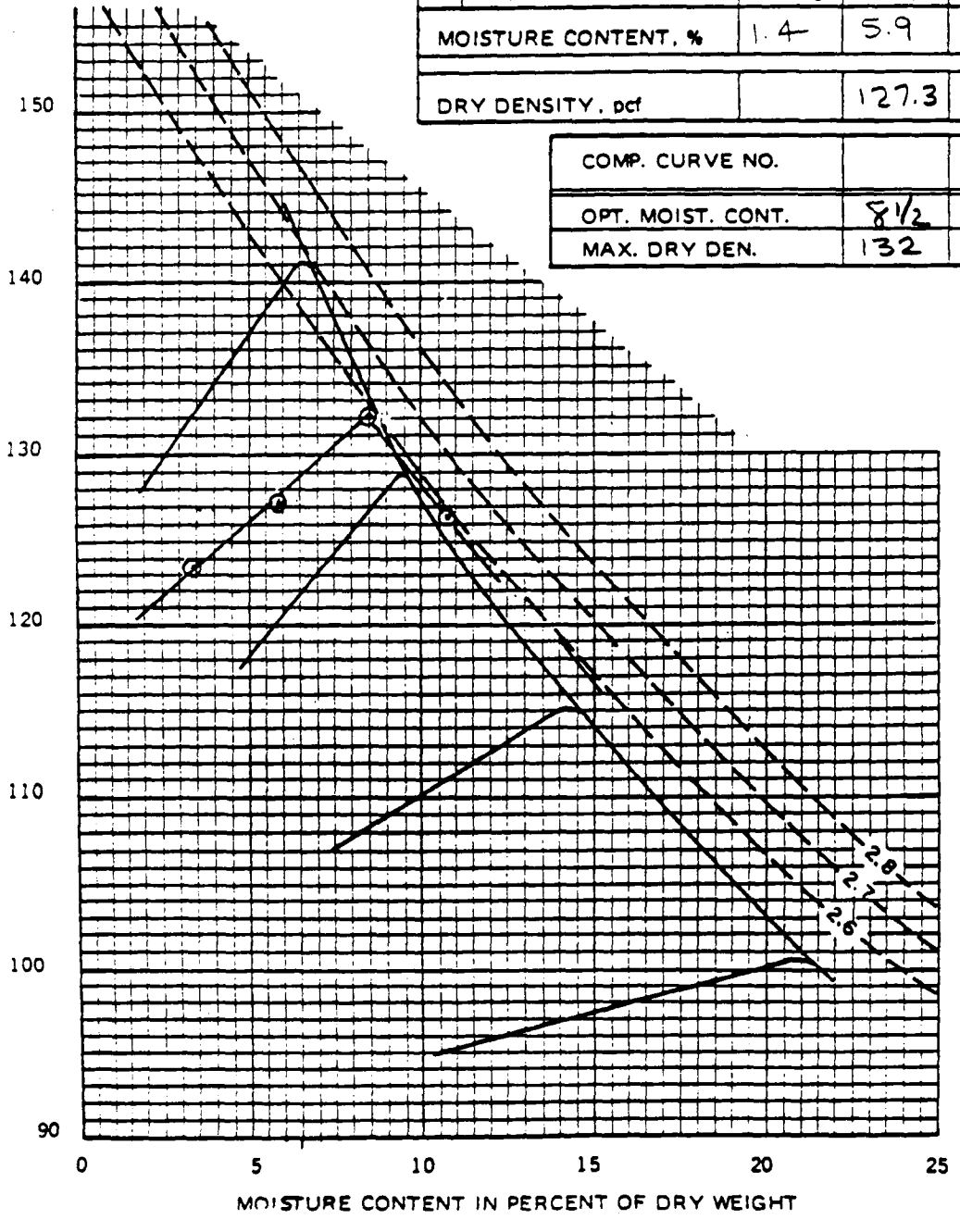
☒ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☒ 6" MOLD 1/13 cu ft

☐ 4" MOLD 1/30 cu ft

			+5 No.4	0%	+75	+2.5
wt. in lbs	Mold and Moist Soil		16.35	16.75	17.00	5.81
	Mold		6.24	6.24	6.24	6.24
	Moist Soil		10.11	10.51	10.76	9.57
Factor (1/Vol. of Soil, cu ft)			13.33	13.33	13.33	13.33
WET DENSITY, pcf		INITIAL	134.8	140.1	143.4	127.6
wt. in gms.	Moist Soil and Dish	187.8	1333.0	220.9	896.0	333.9
	Dry Soil and Dish	185.4	1265.2	1114.7	829.7	1299.3
	Moisture	2.4	67.8	106.2	66.3	39.6
	Dish	R) 12.1	D) 122.0	K) 120.2	F) 52.5	L) 122.2
	Dry Soil	173.3	1143.2	994.5	777.2	1172.1
MOISTURE CONTENT, %		1.4	5.9	10.7	8.5	3.4
DRY DENSITY, pcf			127.3	126.5	132.2	123.4

COMP. CURVE NO.				
OPT. MOIST. CONT.	8½			
MAX. DRY DEN.	132			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Job 434-10 CARNONIE (86-618-17)

Date Tested _____ By _____ Boring No. WB-2 Sample No. _____ Depth 0.0 - 2.0'

Description of Soil BROWN FINE SILTY SAND

Initial Gradation: #4 6% %.

Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐ —No.4 ☐

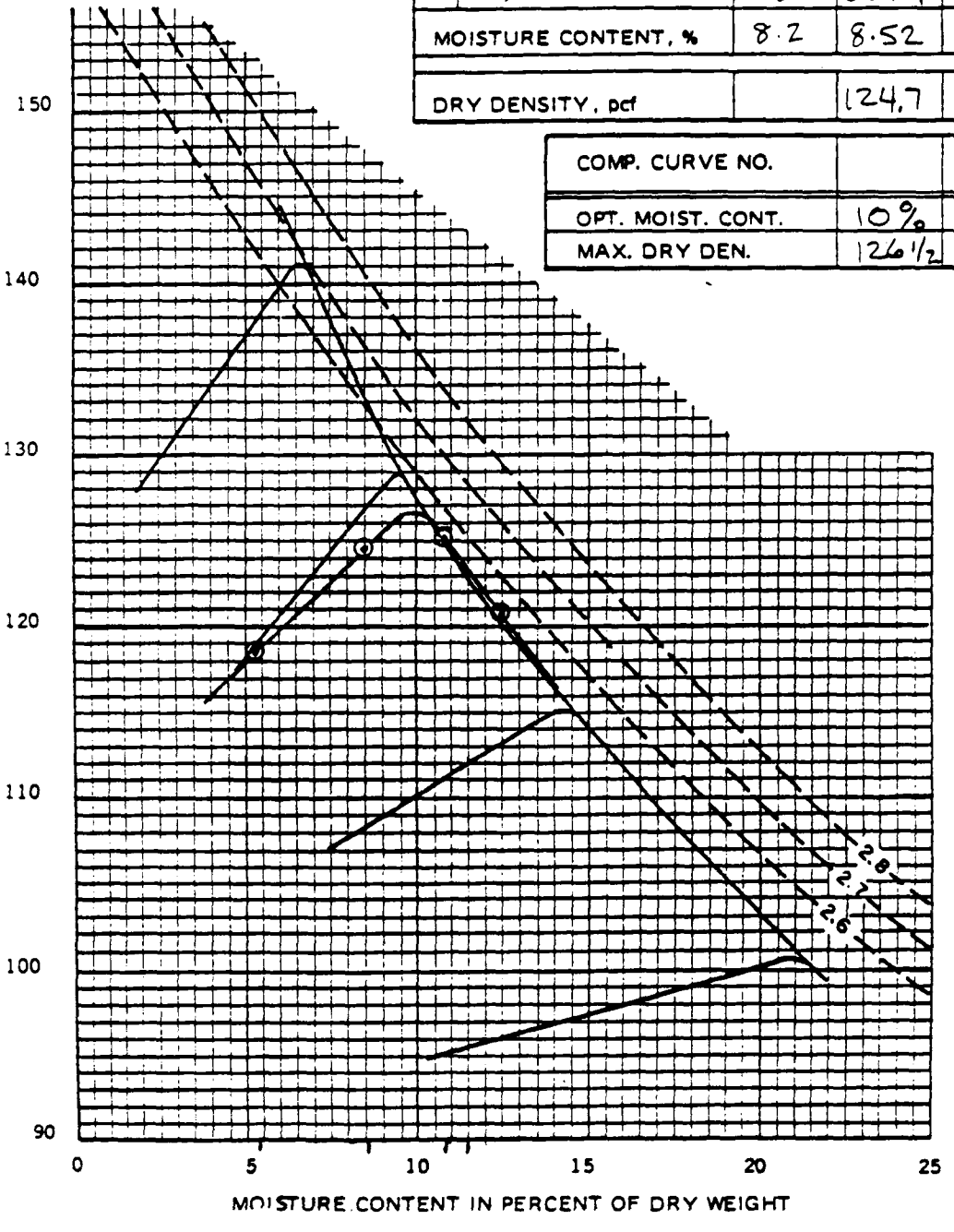
☐ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil		9.01	9.09	8.67	9.03	9.12
	Mold		4.50	4.50	4.50	4.50	4.50
	Moist Soil		4.51	4.59	4.17	4.53	4.62
Factor (1/Vol. of Soil, cu ft)			30	30	30	30	30
WET DENSITY, pcf			135.3	137.7	125.1	135.9	138.6
wt. in gms.	Moist Soil and Dish	183.8	693.0	831.1	792.5	753.4	763.2
	Dry Soil and Dish	170.8	642.7	751.2	755.5	676.7	700.6
	Moisture	13.0	50.3	79.9	37.0	77.7	62.6
	Dish	H) 12.1	I) 52.8	B) 54.2	H) 53.4	E) 53.4	J) 122.0
	Dry Soil	158.7	589.9	697.0	702.1	622.3	578.6
MOISTURE CONTENT, %		8.2	8.52	11.5	5.3	12.5	10.8
DRY DENSITY, pcf			124.7	123.5	118.8	120.8	125.1

COMP. CURVE NO.				
OPT. MOIST. CONT.	10%			
MAX. DRY DEN.	126 1/2			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Job 23-10 CANONIE 96-018-17) COMPACTION TEST DATA SHEET

Date Tested 7/20/90 By PH Boring No. _____ Sample No. WB-3 Depth 0.0' - 2.0'

Description of Soil BROWN FINE SAND WITH SOME GRAVEL (SP)

Initial Gradation : +¾ _____ %, Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐

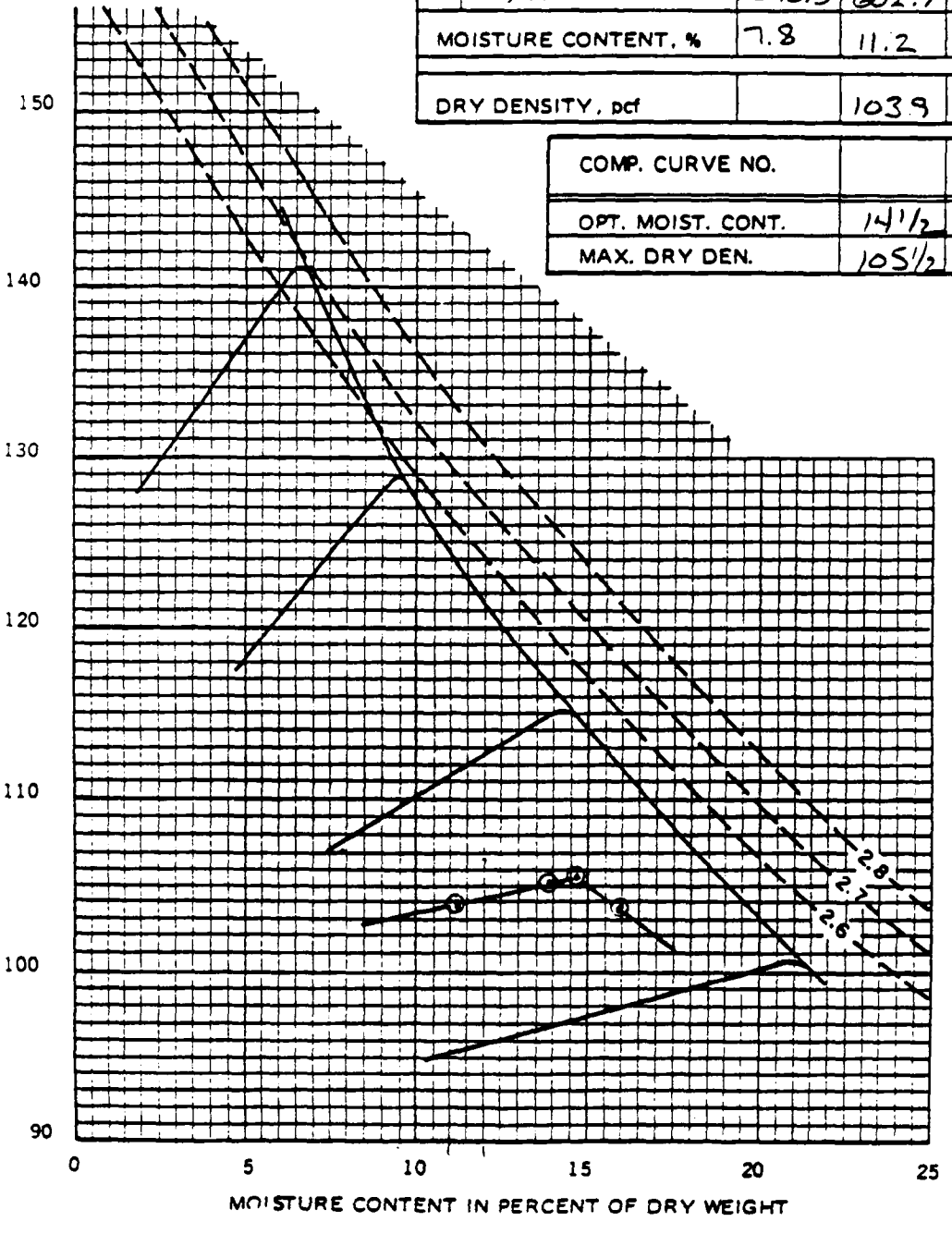
☑ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

			☐ No.4	2.5	4.5	+3.2
wt. in lbs	Mold and Moist Soil		8.35	8.49	8.50	8.54
	Mold		4.50	4.50	4.50	4.50
	Moist Soil		3.85	3.99	4.00	4.04
Factor (1/Vol. of Soil, cu ft)			30	30	30	30
WET DENSITY, pcf		INITIAL	115.5	119.7	120	121.2
wt. in gms.	Moist Soil and Dish	324.8	709.9	650.7	1069.6	812.0
	Dry Soil and Dish	302.3	642.5	577.9	939.8	715.5
	Moisture	22.5	67.4	72.8	129.8	96.5
	Dish	(M) 12.1	(M) 39.8	(C) 51.5	(K) 120.2	(F) 52.8
	Dry Soil	290.3	602.7	526.4	819.6	662.7
MOISTURE CONTENT, %		7.8	11.2	13.8	15.8	14.6
DRY DENSITY, pcf			103.9	105.2	103.6	105.8

COMP. CURVE NO.				
OPT. MOIST. CONT.	14½			
MAX. DRY DEN.	105½			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Job [illegible]

Date Tested 7/19/90 By PH Boring No. _____ Sample No. [illegible]B-4 Depth [illegible] – 2.0

Description of Soil BROWN FINE SAND (SP)

Initial Gradation : +¾ _____ %. Portion Tested: All ☑, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐

+ 3% No.4 ☐ 0%, +9.5%

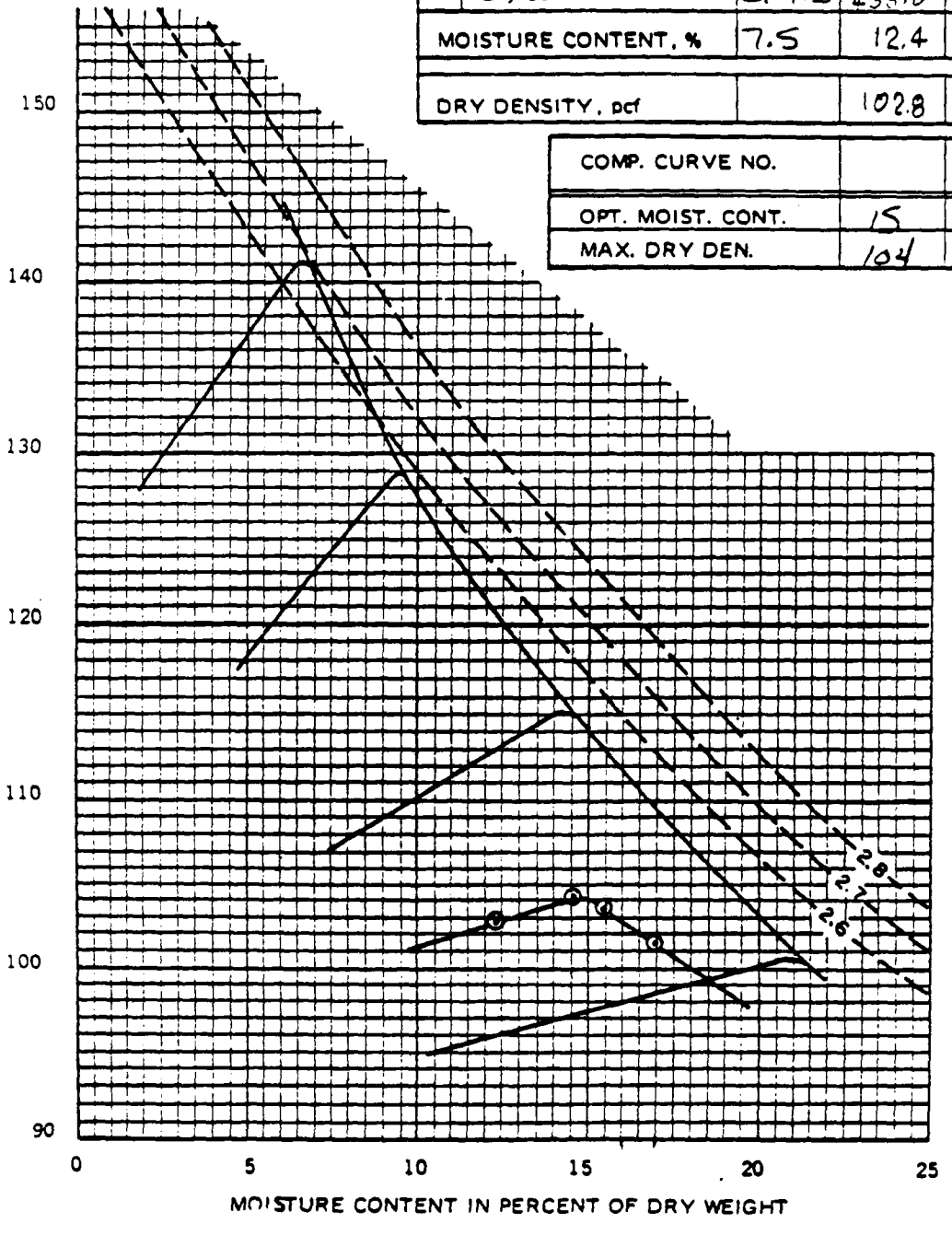
☑ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil		8.35	8.48	8.46	8.48	
	Mold		4.50	4.50	4.50	4.50	
	Moist Soil		3.85	3.98	3.96	3.98	
Factor (1/Vol. of Soil, cu ft)			30	30	30	30	
WET DENSITY, pcf		BASE	115.5	119.4	118.8	119.4	
wt. in gms.	Moist Soil and Dish	242.7	500.8	592.4	565.5	538.2	
	Dry Soil and Dish	226.6	446.7	518.2	492.1	467.7	
	Moisture	16.1	54.0	74.2	73.4	70.5	
	Dish	1) 12.1	3) 11.8	2) 10.4	4) 10.4	5) 10.3	
	Dry Soil	214.5	435.0	507.8	431.7	457.4	
MOISTURE CONTENT, %		7.5	12.4	14.6	17.0	15.4	
DRY DENSITY, pcf			102.8	104.2	101.5	103.5	

COMP. CURVE NO.				
OPT. MOIST. CONT.	15			
MAX. DRY DEN.	104			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Job [illegible] CANONIE NAS ALAMEDA [illegible]

Date Tested 8/1/90 By DH Boring No. _____ Sample No. _____ Depth [illegible]

Description of Soil BROWN SILTY SAND W/ CRUSHED ASPHALT + CONCRETE + SHELLS

Initial Gradation : +¾ _____ %. Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐

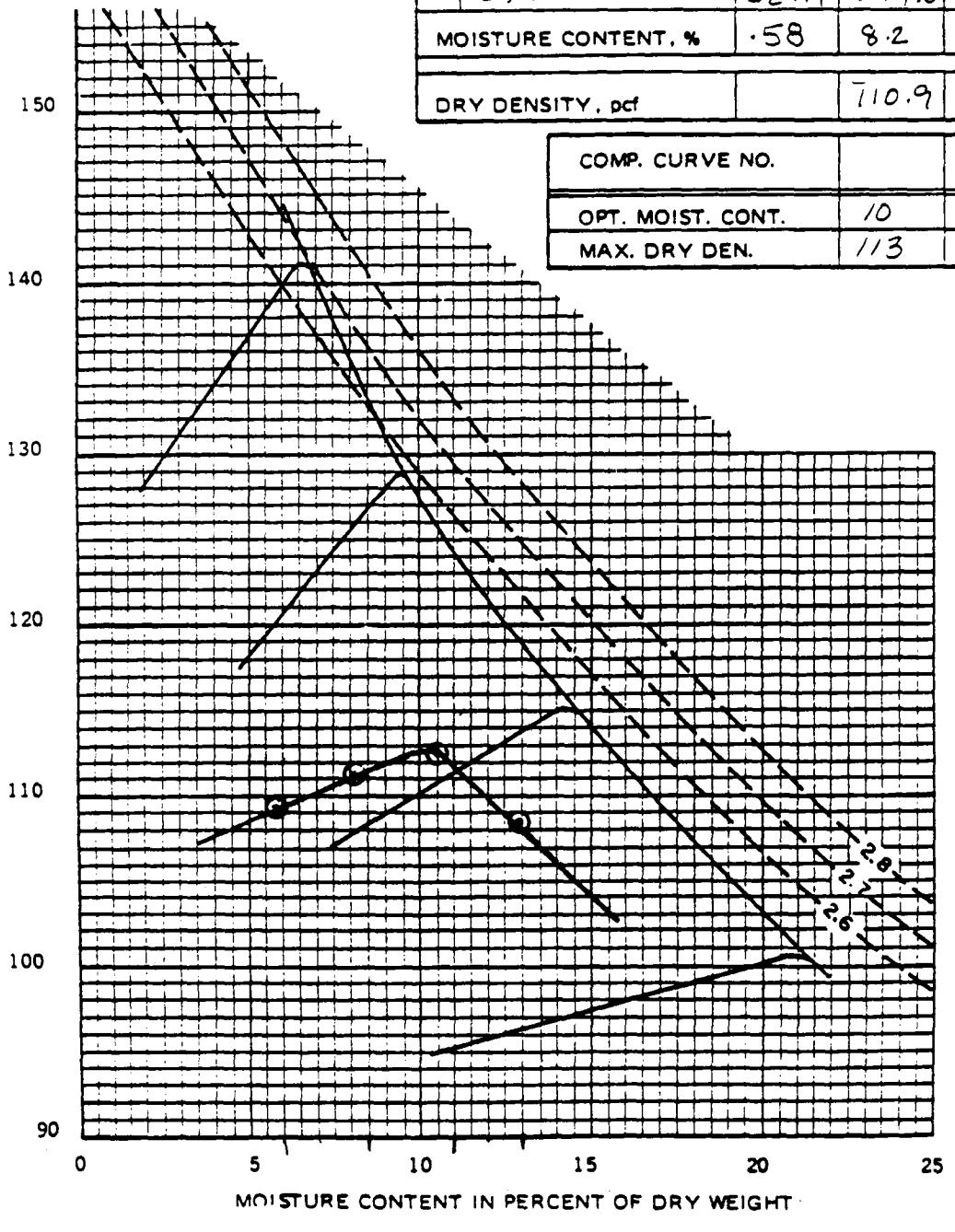
☒ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☒ 4" MOLD 1/30 cu ft

			+¾	No.4 ☐ +5½	+10½	+[illegible]	
wt. in lbs	Mold and Moist Soil		8.50	8.35	8.64	8.58	
	Mold		4.50	4.50	4.50	4.50	
	Moist Soil		4.0	3.85	4.14	4.08	
Factor (1/Vol. of Soil, cu ft)			30	30	30	30	
WET DENSITY, pcf		INITIAL	120.0	115.5	124.2	122.4	
wt. in gms.	Moist Soil and Dish	240.8	755.8	636.5	638.4	953.9	
	Dry Soil and Dish	239.5	702.4	604.8	582.7	850.7	
	Moisture	1.3	53.4	31.7	55.7	103.2	
	Dish	B) 12.1	E) 53.4	B) 54.2	F) 52.8	H) 53.4	
	Dry Soil	227.4	649.0	550.6	529.9	797.3	
MOISTURE CONTENT, %		.58	8.2	5.8	10.5	12.9	
DRY DENSITY, pcf			110.9	109.2	112.4	108.4	

COMP. CURVE NO.				
OPT. MOIST. CONT.	10			
MAX. DRY DEN.	113			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 3.5 %
Initial Dry Density 104.6 pcf.
Perm. at 20°C 1×10^{-5} cm/sec

Job 034-10 (CANONIE 186-08-806) Boring No. DA-1R Sample No. ____ Depth 0.5-1.0'

Date Sampled ____ By ____ : Test Started 7/10/80 By DC : Computed by ____

Description of Soil BROWN SILTY FINE SAND (SM) DRY & LOOSE Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
816	132	7/10	1553	—	SATURATING							
-040			1023	0	2.0			10		—		
776	129		1050	.45	7.1	5.1	4.85		1.6×10^{-5}	25	.89	1.4×10^{-5}
			1128	1.08	17.1	15.1	14.35		2.0×10^{-5}	25	.89	1.7×10^{-5}
			1218	1.92	26.3	24.3	23.09		1.8×10^{-5}	25	.89	1.6×10^{-5}
			1423	4.0	41.0	39.0	37.05		1.4×10^{-5}	26	.87	1.2×10^{-5}
			1612	5.82	50.2	48.2	45.79		1.2×10^{-5}	26	.87	1.0×10^{-5}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
110.7	Wt. of 1 rings + soil	119.3
27.5	Wt. of ____ rings	27.5
83.2	Wt. of soil	91.8
1.302	Ring Factor	1.302
108.3	WET DENSITY, PCF	119.5
	Wt. of soil + dish No. 145	112.2
	Dry wt. of soil + dish	100.8
	Net loss of moisture	11.4
	Wt. of dish	20.7
	Wt. of dry soil	80.1
3.5	MOISTURE CONTENT, %	14.2
104.6	DRY DENSITY, PCF	

d = 1.93

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-3}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content	20.0 %
Initial Dry Density	104.7 pcf.
Perm. at 20°C	2×10^{-6} cm/sec

Job 034-10 (CALDONIE 86-018-1806) Boring No. DA-1 Sample No. _____ Depth 54.0 - 54.5

Date Sampled _____ By _____ : Test Started 7/10/90 By DC : Computed by _____

Description of Soil BROWN SILTY MED. TO FINE SAND (SM/SP) SATURATED Checked by _____

☐ UNDISTURBED, d = ~~2.375"~~ 1.87", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
885	071	7/10	1659	-	SATURATING							
-040			806	0	6.0	0		36		-		
845	069		905	.98	14.0	8.0	7.6		3.4×10^{-6}	25	.89	3.0×10^{-6}
			1024	2.30	22.3	16.3	15.49		2.9×10^{-6}	25	.89	2.6×10^{-6}
			1128	3.37	28.2	22.2	21.09		2.7×10^{-6}	25	.89	2.4×10^{-6}
			1217	4.18	32.4	26.4	25.08		2.6×10^{-6}	25	.89	2.3×10^{-6}
			1424	6.30	43.0	37.0	35.15		2.4×10^{-6}	26	.87	2.1×10^{-6}
			1613	8.12	52.2	46.2	43.89		2.4×10^{-6}	26	.87	2.1×10^{-6}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
145.5	Wt. of 1 rings + soil	144.7
55.1	Wt. of _____ rings	55.1
90.4	Wt. of soil	89.6
1.389	Ring Factor	1.389
125.6	WET DENSITY, PCF	124.5
	Wt. of soil + dish No. 59	105.3
	Dry wt. of soil + dish	94.2
	Net loss of moisture	14.1
	Wt. of dish	19.6
	Wt. of dry soil	74.6
20.0	MOISTURE CONTENT, %	18.9
104.7	DRY DENSITY, PCF	

d = 1.87

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 7.7 %
Initial Dry Density 92.2 pcf.
Perm. at 20°C 6 x 10^-4 cm/sec

Job 034-10 (CANONIE 86-018-1806) Boring No. DA-2R Sample No. ____ Depth 1.0-1.5

Date Sampled ____ By ____ : Test Started 7/11/80 By DC : Computed by ____

Description of Soil GREENISH BROWN SILTY SAND (SM) Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 6 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
914	108	7/11	1452	–	SATURATING							
900			1547	0	3.0	0		2		–		
854	106		1554	.12	15.6	12.6	11.97		7.3×10^{-4}	26	.87	6.4×10^{-4}
			1612	.42	44.2	41.2	39.14		6.9×10^{-4}	26	.87	6.0×10^{-4}
			1630	.72	71.6	68.6	65.17		6.7×10^{-4}	26	.87	5.8×10^{-4}
		7/12	1158	0	3.0	0				–		
			1205	.12	21.6	18.6	17.67		1.1×10^{-3}	26	.87	9.4×10^{-4}
			1225	.45	68.0	65.0	61.75		1.0×10^{-3}	26	.87	8.8×10^{-4}
			1251	0	1.8	0				–		
			1340	.82	88.0	86.2	81.89		7.3×10^{-4}	27	.85	6.2×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
104.7	Wt. of 1 rings + soil	114.8
28.4	Wt. of ____ rings	28.4
76.3	Wt. of soil	86.4
1.302	Ring Factor	1.302
99.3	WET DENSITY, PCF	112.5
	Wt. of soil + dish No. 62	105.5
	Dry wt. of soil + dish	99.0
	Net loss of moisture	15.5
	Wt. of dish	19.4
	Wt. of dry soil	79.6
7.7	MOISTURE CONTENT, %	22.0
92.2	DRY DENSITY, PCF	

d = 1.93

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 17.9 %
Initial Dry Density 114.4 pct.
Perm. at 20°C 3×10^{-5} cm/sec

Job 034-10 (CANONIE 36-018-1906) Boring No. DA-2 Sample No. ____ Depth 27-27.5

Date Sampled ____ By ____ : Test Started 7/12/90 By DC : Computed by ____

Description of Soil GRAY MED TO FINE SAND (SP/SM) w/SOME SHELLS, DENSE Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.90", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .99 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
815	123	7/12	1132	–	SATURATING							
0240			1236	0	34.6	0		13		–		
775	122		1413	1.78	95.4	60.8	57.76		3.8×10^{-5}	27	.86	3.2×10^{-5}
			1426	0	3.2	0				–		
			1524	.97	35.5	32.3	30.69		3.7×10^{-5}	28	.83	3.1×10^{-5}
			1605	1.65	59.8	56.6	53.77		3.8×10^{-5}	28	.83	3.2×10^{-5}
			1629	2.05	73.8	70.6	67.07		3.8×10^{-5}	28	.83	3.2×10^{-5}
			1704	2.63	93.4	90.2	85.69		3.8×10^{-5}	28	.83	3.2×10^{-5}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-3} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
135.1	Wt. of 1 rings + soil	134.7
34.6	Wt. of ____ rings	34.6
100.5	Wt. of soil	100.1
1.342	Ring Factor	1.342
134.9	WET DENSITY, PCF	134.3
	Wt. of soil + dish No. 53	119.2
	Dry wt. of soil + dish	104.4
	Net loss of moisture	14.8
	Wt. of dish	19.7
	Wt. of dry soil	84.7
17.9	MOISTURE CONTENT, %	17.5
114.4	DRY DENSITY, PCF	

d = 1.90"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 18.7 %
Initial Dry Density 114.3 pcf.
Perm. at 20°C 2×10^{-7} cm/sec

Job 034-10 (CANONILE 86-018-1906) Boring No. DA-2 Sample No. ____ Depth 41 - 41.5

Date Sampled ____ By ____ : Test Started 7/12/90 By DC : Computed by ____

Description of Soil BROWN SILTY F. TO MED. SAND (SP/SM) DENSE Checked by ____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Gual Before Corr.	Defl. Gual After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
500	088	7/12	1155	—	SATURATING							
040			1243	0	16.6	0		36		—		
860	084		1425	1.70	26.5	9.9	9.41		2.3×10^{-6}	27	.85	1.9×10^{-6}
			1524	2.68	30.8	14.2	13.49		2.1×10^{-6}	28	.83	1.7×10^{-6}
			1606	3.38	33.4	16.80	15.96		1.9×10^{-6}	28	.83	1.6×10^{-6}
			1704	4.35	36.4	19.80	18.81		1.8×10^{-6}	28	.83	1.5×10^{-6}
		7/13	803	19.33	70.6	54.0	51.30		1.1×10^{-6}	25	.89	9.6×10^{-7}
			1546	27.05	79.8	63.2	60.04		9.1×10^{-7}	27	.85	7.7×10^{-7}
			1648	0	2.4	0				—		
		7/14	823	15.58	19.0	16.6	15.77		4.1×10^{-7}	24	.91	3.8×10^{-7}

OVER

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
135.7	Wt. of 1 rings + soil	135.4
34.6	Wt. of ____ rings	34.6
101.1	Wt. of soil	100.8
1.342	Ring Factor	1.342
135.7	WET DENSITY, PCF	135.3
	Wt. of soil + dish No. 62	119.6
	Dry wt. of soil + dish	104.1
	Net loss of moisture	15.5
	Wt. of dish	19.4
	Wt. of dry soil	84.7
18.7	MOISTURE CONTENT, %	18.3
114.3	DRY DENSITY, PCF	

d = 1.90

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 19.6 %
Initial Dry Density 108.6 pcf.
Perm. at 20°C 1×10^{-3} cm/sec

Job 034-10 (CANONIE 86-OR-806) Boring No. DA-2 Sample No. ____ Depth 80-80.5

Date Sampled ____ By ____ : Test Started 7/16/90 By DC : Computed by ____

Description of Soil GREENISH BROWN FINE TO MED. SAND (SP) Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
845	109	7/16	1012	SATURATING								
-060			1042	0	3.6	0		2		—		
785	107		1056	.23	30.2	26.6	25.27		8.1×10^{-4}	24	.91	7.4×10^{-4}
			1125	.48	87.4	57.2	54.34		8.3×10^{-4}	24	.91	7.6×10^{-4}
			1309	0	5.8	0				—		
			1324	.25	38.6	32.8	31.16		9.2×10^{-4}	25	.89	8.2×10^{-4}
			1341	.53	78.8	73.0	69.35		9.6×10^{-4}	25	.89	8.6×10^{-4}
			1358	0	2.4	0				—		
			1414	.27	46.2	43.80	41.61		1.1×10^{-3}	25	.89	1.0×10^{-3}
			1429	.52	88.6	86.20	81.89		1.2×10^{-3}	25	.89	1.0×10^{-3}

OVER

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
124.6	Wt. of 1 rings + soil	125.1
24.9	Wt. of ____ rings	24.9
99.7	Wt. of soil	100.2
1.302	Ring Factor	1.302
129.8	WET DENSITY, PCF	130.5
	Wt. of soil + dish No. 02	120.0
	Dry wt. of soil + dish	103.3
	Net loss of moisture	16.7
	Wt. of dish	20.5
	Wt. of dry soil	82.8
19.6	MOISTURE CONTENT, %	20.2
108.6	DRY DENSITY, PCF	

d = 1.93

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 6.2 %
Initial Dry Density 110.2 pcf
Perm. at 20°C 6×10^{-4} cm/sec

Job 034-10 (CANONIE 96-OR-1906) Boring No. WB-1 Sample No. _____ Depth 0.5 - 1.0'

Date Sampled _____ By _____ : Test Started 7/13/90 By DC : Computed by _____

Description of Soil BROWN SANDY GRAVEL w/SILT Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = ~~1"~~ 2" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sarch Dial Before Corr.	Deff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
817	075	7/13	1642	-	SATURATING							
-240		7/16	919	0	1.4	0		1				
777	074		943	.40	10.7	9.3	8.84		6.5×10^{-4}	24	.91	5.9×10^{-4}
			1013	.90	21.8	20.40	19.38		6.3×10^{-4}	24	.91	5.8×10^{-4}
			1057	1.63	37.4	36.0	34.20		6.2×10^{-4}	24	.91	5.6×10^{-4}
			1126	2.12	46.6	45.2	42.94		6.0×10^{-4}	24	.91	5.4×10^{-4}
			1241	3.37	68.4	67.0	63.65		5.6×10^{-4}	24	.91	5.1×10^{-4}
			1330	6.18	85.1	83.7	79.52		3.8×10^{-4}	24	.91	3.5×10^{-4}
			1401	0	3.6	0				—		
			1429	.80	35.8	32.2	30.59		1.1×10^{-3}	25	.88	1.0×10^{-3}

OVER →

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"
$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"
$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
233.7	Wt. of 2 rings + soil	246.9
54.0	Wt. of ____ rings	54.0
179.7	Wt. of soil	192.9
1.302/2	Ring Factor	1.302/2
117.0	WET DENSITY, PCF	125.6
	Wt. of soil + dish No. 153	268.3
	Dry wt. of soil + dish	245.2
	Net loss of moisture	23.1
	Wt. of dish	89.7
	Wt. of dry soil	165.5
6.2	MOISTURE CONTENT, %	14.0
110.2	DRY DENSITY, PCF	

d = 1.93" ℓ = 2"

$$K = 2.94 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 5.3 %
Initial Dry Density 97.8 pcf.
Perm. at 20°C 7 × 10⁻⁴ cm/sec

Job 034-10 (CANOVILE 86-018-1806) Boring No. WB-32 Sample No. _____ Depth 2.5 – 1.0'

Date Sampled _____ By _____ : Test Started 7/16/90 By DC : Computed by _____

Description of Soil BROWN FINE SAND (SP) DRY, LOOSE Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 4 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
757	086	7/16	1329	SATURATING								
-030			1343	0	0.4	0		1		–		
727	084		1351	.13	7.3	6.9	6.56		7.4×10^{-4}	24	.91	6.8×10^{-4}
			1415	.53	36.0	35.6	33.82		9.4×10^{-4}	24	.91	8.5×10^{-4}
			1430	.78	56.2	55.8	53.01		1.0×10^{-3}	24	.91	9.1×10^{-4}
			1512	0	30	0				–		
			1533	.35	30.0	27.0	25.65		1.1×10^{-3}	24	.91	9.8×10^{-4}
			1549	.62	48.6	45.6	43.32		1.0×10^{-3}	24	.91	9.3×10^{-4}
			1559	.78	59.6	56.6	53.77		1.0×10^{-3}	24	.91	9.2×10^{-4}
			1629	1.28	90.6	87.6	83.22		9.6×10^{-4}	24	.91	8.7×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
106.1	Wt. of 1 rings + soil	178.0
27.0	Wt. of _____ rings	27.0
79.1	Wt. of soil	91.0
1.302	Ring Factor	1.302
103.0	WET DENSITY, PCF	118.5
	Wt. of soil + dish No. 75	112.3
	Dry wt. of soil + dish	96.5
	Net loss of moisture	15.8
	Wt. of dish	21.8
	Wt. of dry soil	74.7
5.3	MOISTURE CONTENT, %	21.2
97.8	DRY DENSITY, PCF	

d = 1.93

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-1}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 22.0 %
Initial Dry Density 102.8 pcf
Perm. at 20°C 8×10^{-4} cm/sec

Job 034-10 (CANONITE 86-018-1806) Boring No. WB-3 Sample No. ____ Depth 17.0-17.5

Date Sampled ____ By ____ : Test Started 7/16/90 By DC : Computed by ____

Description of Soil BROWN FINE TO MEDIUM SAND (SP) Checked by ____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐ SATURATED

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 6 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch. Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
860	095	7/16	1418	SATURATING								
-030			1540	0	0.8	0		3		—		
830	092		1550	.17	13.7	12.9	12.26		3.5×10^{-4}	24	.91	3.2×10^{-4}
			1601	.35	32.8	32.0	30.40		4.3×10^{-4}	24	.91	3.9×10^{-4}
			1630	.83	38.8	38.0	36.10		2.1×10^{-4}	24	.91	1.9×10^{-4}
		7/17	848	0	3.6	0				—		
			855	.12	25.6	22.0	20.90		8.5×10^{-4}	23	.93	7.9×10^{-4}
			912	.40	77.8	74.2	70.49		8.6×10^{-4}	23	.93	8.0×10^{-4}
			1234	0	2.0	0				—		
			1246	.20	44.5	42.5	40.38		9.9×10^{-4}	24	.91	9.0×10^{-4}

OVER →

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
124.9	Wt. of 1 rings + soil	124.3
28.6	Wt. of ____ rings	28.6
96.3	Wt. of soil	95.7
1.302	Ring Factor	1.302
125.4	WET DENSITY, PCF	124.6
	Wt. of soil + dish No. 122	116.1
	Dry wt. of soil + dish	99.4
	Net loss of moisture	16.7
	Wt. of dish	20.8
	Wt. of dry soil	78.6
22.0	MOISTURE CONTENT, %	21.3
102.8	DRY DENSITY, PCF	

d = 1.93"

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-3}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 21.3 %
Initial Dry Density 106.2 pcf
Perm. at 20°C 2×10^{-4} cm/sec

Job 234-10 (CANONIE 86-058-5806) Boring No. WP-3 Sample No. _____ Depth 36.5 - 37.0

Date Sampled _____ By _____ : Test Started _____ By _____ : Computed by _____

Description of Soil GRAY CLAYEY SAND TO CLEAN SAND (SP) TESTED Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 7 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sarch Dial Before Corr.	Dial Readings in .001 inch: Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
764	096	7/11	1139	–	SATURATING							
-150			1154	0	34.5	0		3		–		
614	095		1217	.38	48.0	13.5	12.83		1.7×10^{-4}	25	.89	1.5×10^{-4}
			1248	.90	72.0	37.5	35.63		1.9×10^{-4}	26	.87	1.7×10^{-4}
			1423	0	1.6	0				–		
			1445	.37	14.0	12.4	11.78		1.6×10^{-4}	26	.87	1.4×10^{-4}
			1538	1.25	47.8	46.2	43.89		1.7×10^{-4}	26	.87	1.5×10^{-4}
			1612	1.82	69.8	68.2	64.79		1.7×10^{-4}	26	.87	1.5×10^{-4}
			1631	2.13	83.2	81.6	77.52		1.8×10^{-4}	26	.87	1.6×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
128.0	Wt. of 1 rings + soil	127.5
29.0	Wt. of _____ rings	29.0
99.6	Wt. of soil	98.5
1.302	Ring Factor	1.302
128.9	WET DENSITY, PCF	128.2
	Wt. of soil + dish No. 23	118.5
	Dry wt. of soil + dish	101.6
	Net loss of moisture	16.9
	Wt. of dish	20.0
	Wt. of dry soil	81.6
21.3	MOISTURE CONTENT, %	20.7
106.2	DRY DENSITY, PCF	

d = 1.93

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 20.0 %
Initial Dry Density 110.3 pcf.
Perm. at 20°C 3×10^{-7} cm/sec

Job 234-10 (CANONIE 86-018-180x) Boring No. WB-3 Sample No. _____ Depth 6.5-7.7'

Date Sampled _____ By _____ : Test Started 7/18/90 By DG : Computed by _____

Description of Soil BROWN SILTY SAND (SM) DENSE Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Gauge Before Corr.	Dial Readings in .001 inch: Diff. Gauge After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
518	103	7/18	1430	SATURATING								
-100		7/19	818	0	48.8	0				–		
418	102		1243	4.42	48.6	4.80	4.56	36	4.2×10^{-7}	24	.91	3.8×10^{-7}
			1658	8.67	52.8	9.0	8.55		4.2×10^{-7}	26	.89	3.7×10^{-7}
		7/20	816	23.97	65.6	21.8	20.71		3.6×10^{-7}	23	.93	3.4×10^{-7}
			1711	32.88	72.2	28.4	26.98		3.5×10^{-7}	27	.85	2.9×10^{-7}
		7/21	1032	50.23	83.9	40.10	38.10		3.2×10^{-7}	24	.91	2.9×10^{-7}
		7/22	1103	74.75	98.6	55.10	52.35		3.0×10^{-7}	22	.95	2.8×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
133.6	Wt. of 1 rings + soil	132.6
34.6	Wt. of _____ rings	34.6
99.0	Wt. of soil	98.0
1.342	Ring Factor	1.342
132.9	WET DENSITY, PCF	131.5
	Wt. of soil + dish No. 126	118.1
	Dry wt. of soil + dish	102.7
	Net loss of moisture	15.4
	Wt. of dish	20.7
	Wt. of dry soil	82.0
20.0	MOISTURE CONTENT, %	18.8
110.7	DRY DENSITY, PCF	

d = 1.90"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{0}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-66)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 20.2 %
Initial Dry Density 108.7 pcf.
Perm. at 20°C 3×10^{-4} cm/sec

Job 031-10 (SANONE 86-08-1806) Boring No. WB-3 Sample No. ____ Depth 45.0 - 45.5

Date Sampled ____ By ____ : Test Started 7/18/80 By DC : Computed by ____

Description of Soil GREENISH BROWN FINE TO MED SAND (SP) Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 5 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
		7/18	1600	SATURATING								
		7/19	828	0	3.0	0		2		—		
			838	.17	11.2	8.2	7.79		3.4×10^{-4}	23	.93	3.1×10^{-4}
			857	.48	25.8	22.8	21.66		3.3×10^{-4}	23	.93	3.1×10^{-4}
			927	.98	46.4	43.4	41.23		3.1×10^{-4}	23	.93	2.9×10^{-4}
			948	1.33	60.2	57.2	54.34		3.0×10^{-4}	23	.93	2.8×10^{-4}
			1000	1.53	68.2	65.2	61.94		3.0×10^{-4}	23	.93	2.8×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
125.2	Wt. of 1 rings + soil	124.9
24.9	Wt. of ____ rings	24.9
100.3	Wt. of soil	100.0
1.302	Ring Factor	1.302
130.6	WET DENSITY, PCF	130.2
	Wt. of soil + dish No. 74	119.8
	Dry wt. of soil + dish	103.3
	Net loss of moisture	16.5
	Wt. of dish	19.9
	Wt. of dry soil	83.4
20.2	MOISTURE CONTENT, %	19.8
108.7	DRY DENSITY, PCF	

d = 1.93

$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-3}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 2.9 %
Initial Dry Density 96.2 pcf.
Perm. at 20°C 1×10^{-3} cm/sec

Job 034-10 (CANONIE 86-018-186) Boring No. WB-4 Sample No. _____ Depth 0.5-1.0'

Date Sampled _____ By _____ : Test Started 7/18/90 By DC : Computed by _____

Description of Soil BROWN FINE SAND W/SILT (SP/SM) DRY, LOOSE Checked by _____

☐ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☑ REMOLDED, ~~d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)~~

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
684	065	7/18	504	SATURATING								
-100			826	0	4.6	0		2		–		
584	064		836	.17	32.4	27.8	26.41		1.1×10^{-3}	23	.93	1.1×10^{-3}
			845	.32	56.0	51.4	48.83		1.1×10^{-3}	23	.93	1.0×10^{-3}
			855	.48	80.2	75.6	71.82		1.1×10^{-3}	23	.93	1.0×10^{-3}
			928	0	2.2	0				–		
			946	.30	43.8	41.6	39.52		9.7×10^{-4}	23	.93	9.0×10^{-4}
			958	.50	71.4	69.2	65.74		9.7×10^{-4}	23	.93	9.0×10^{-4}
			1304	0	3.8	0						
			1335	.52	81.4	77.6	73.72		1.0×10^{-3}	24	.91	9.5×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
123.5	Wt. of _____ rings + soil	117.5
27.5	Wt. of _____ rings	27.5
76.0	Wt. of soil	90.0
1.302	Ring Factor	1.302
99.0	WET DENSITY, PCF	117.2
	Wt. of soil + dish No. A-10	111.4
	Dry wt. of soil + dish	95.3
	Net loss of moisture	16.1
	Wt. of dish	21.5
	Wt. of dry soil	73.8
2.9	MOISTURE CONTENT, %	21.8
96.2	DRY DENSITY, PCF	

d = 1.93"

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 18.9 %
Initial Dry Density 108.0 pcf.
Perm. at 20°C 2×10^{-7} cm/sec

Job 034-10 (CANOVIE 86-08-F006) Boring No. OR-1 Sample No. _____ Depth 20-20.5

Date Sampled _____ By _____ : Test Started 7/19/90 By DC : Computed by _____

Description of Soil GREENISH GRAY SILTY FINE SAND (SM) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐ SATURATED, DENSE

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch. Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
785	079	7/19	1438	SATURATING								
100		7/20	817	0	28.4	0		36		—		
685	073		1711	8.9	36.7	8.3	7.9		3.6×10^{-7}	27	.85	3.1×10^{-7}
		7/21	1033	26.27	50.0	21.6	20.52		3.2×10^{-7}	24	.91	2.9×10^{-7}
		7/22	1104	50.78	66.0	37.6	35.72		2.9×10^{-7}	23	.93	2.7×10^{-7}
		7/23	819	72.03	78.2	49.8	47.31		2.7×10^{-7}	23	.93	2.5×10^{-7}
			1727	81.17	83.4	55.0	52.25		2.6×10^{-7}	25	.89	2.3×10^{-7}
		7/24	1025	98.13	92.4	64.0	60.80		2.5×10^{-7}	24	.91	2.3×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
125.9	Wt. of 1 rings + soil	124.4
27.3	Wt. of _____ rings	27.3
98.6	Wt. of soil	97.1
1.302	Ring Factor	1.302
128.4	WET DENSITY, PCF	126.4
	Wt. of soil + dish No. 68	116.4
	Dry wt. of soil + dish	102.9
	Net loss of moisture	14.1
	Wt. of dish	19.8
	Wt. of dry soil	82.5
18.9	MOISTURE CONTENT, %	17.1
108.0	DRY DENSITY, PCF	

d = 1.93

$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 11.9 %
Initial Dry Density 92.6 pcf.
Perm. at 20°C 1×10^{-3} cm./sec

Job 034-10 (CANDALE 86-018-1806) Boring No. OR-1 Sample No. _____ Depth 2.0-2.5'

Date Sampled _____ By _____ : Test Started 7/18/90 By DC : Computed by

Description of Soil GREENISH BROWN FINE TO MED. SAND (SP) Checked by

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Surch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
836	068	7/18	1547	SATURATING								
-060			928	0	8.2	0		2		—		
776	067		837	.15	34.2	26.0	24.70		1.2×10^{-3}	23	.93	1.1×10^{-3}
			846	.30	59.0	50.8	48.26		1.2×10^{-3}	23	.93	1.1×10^{-3}
			856	.47	86.6	78.4	74.48		1.2×10^{-3}	23	.93	1.1×10^{-3}
			935	0	5.4	0				—		
			947	.20	45.0	39.6	37.62		1.4×10^{-3}	23	.93	1.3×10^{-3}
			959	.40	85.2	79.80	75.81		1.4×10^{-3}	23	.93	1.3×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"
$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"
$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
108.0	Wt. of 1 rings + soil	114.7
28.4	Wt. of _____ rings	28.4
79.6	Wt. of soil	86.3
1.302	Ring Factor	1.302
103.6	WET DENSITY, PCF	112.4
	Wt. of soil + dish No. 44	105.4
	Dry wt. of soil + dish	90.3
	Net loss of moisture	15.1
	Wt. of dish	19.4
	Wt. of dry soil	70.9
11.9	MOISTURE CONTENT, %	21.3
92.6	DRY DENSITY, PCF	

d = 1.93"
$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-5}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-10 CANANDAIGUA 86-018-1906

BORING NO.: DA-1 SAMPLE NO.: ____ DEPTH (FT): 30.5-31.0 SAMPLED BY: ____ /

LABORATORY CLASSIFICATION: BAYMUD W/SHELLS THROUGHOUT SAMPLE

TESTED BY: DC 7/12/90 COMPUTED BY: ____ / / CHECKED BY: ____ /

TYPE OF SAMPLE: ☑ Undisturbed ____

☐ Remolded ____

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	2.0	1.88
Sample Diameter (In.)	1.93	1.84
Sample Area (In.^{2})	2.93	2.66
Sample Volume (In.^{3})	5.86	5.00
VOID RATIO		
Volume of Sample - V_t (CC)	96.03	81.92
Volume of Solid - V_s (CC)	35.52	35.52
Volume of Void - V_v (CC)	60.51	46.40
Void Ratio - e	1.704	1.306
Degree of Saturation - S (%)	97.2	99.4

Specific Gravity (ASSUMED) 2.7

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		162.7
Dry Weight + Tare, gm		116.6
Weight of Water, gm		46.1
Weight of Tare, gm #129		20.7
Weight of Dry Soil, gm		95.9
Moisture Content, %	61.3	48.1
Total Wet Weight, gm	154.7	142.0
Total Dry Weight, gm	95.9	95.9
Weight of Water, gm	58.8	46.1
Wet Density, pcf	100.5	108.1
Dry Density, pcf	62.3	73.0

Cell# 1

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
[illegible]	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-10 CANONICE 86-018-1806

BORING NO.: WB-23 SAMPLE NO.: _____ DEPTH (FT): 90-90.5 SAMPLED BY: _____ /

LABORATORY CLASSIFICATION: GRAY SILTY CLAY (CH)

TESTED BY: DC 7/23/90 COMPUTED BY: _____ / / CHECKED BY: _____ /

TYPE OF SAMPLE: ☑ Undisturbed ☐ Remolded

SAMPLE SOMEWHAT DESICCATED

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.02	1.03
Sample Diameter (In.)	1.87	1.88
Sample Area (In.^{2})	2.75	2.78
Sample Volume (In.^{3})	2.81	2.86
VOID RATIO		
Volume of Sample - V_t (CC)	45.97	46.85
Volume of Solid - V_s (CC)	20.15	20.15
Volume of Void - V_v (CC)	25.82	26.70
Void Ratio - e	1.281	1.325
Degree of Saturation - S (%)	100	100

Specific Gravity 2.66

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		100.7
Dry Weight + Tare, gm		73.5
Weight of Water, gm		27.2
Weight of Tare, gm # 55		19.9
Weight of Dry Soil, gm		53.6
Moisture Content, %	48.9	50.8
Total Wet Weight, gm	79.8	80.9
Total Dry Weight, gm	53.6	53.6
Weight of Water, gm	26.2	27.3
Wet Density, pcf	108.1	107.7
Dry Density, pcf	72.6	71.4

Cell# 1

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-10 CANONIE 86-019-1806
BORING NO.: WB-4 SAMPLE NO.: _____ DEPTH (FT): 104.0-104.5 SAMPLED BY: _____ /
LABORATORY CLASSIFICATION: GRAY SILTY CLAY (CH)

TESTED BY: DC 7/23/90 COMPUTED BY: _____ / / CHECKED BY: _____ /

TYPE OF SAMPLE: ☑ Undisturbed ☐ Remolded SAMPLE SOMEWHAT DESICCATED

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.00	1.02
Sample Diameter (In.)	1.89	1.91
Sample Area (In.^{2})	2.81	2.87
Sample Volume (In.^{3})	2.81	2.92
VOID RATIO		
Volume of Sample - V_t (CC)	46.05	47.88
Volume of Solid - V_s (CC)	25.87	25.87
Volume of Void - V_v (CC)	20.18	22.02
Void Ratio - e	.780	.851
Degree of Saturation - S (%)	100	100

Specific Gravity 2.59

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		109.9
Dry Weight + Tare, gm		86.3
Weight of Water, gm		23.6
Weight of Tare, gm #44		19.4
Weight of Dry Soil, gm		66.9
Moisture Content, %	32.8	35.3
Total Wet Weight, gm	89.0	90.7
Total Dry Weight, gm	67.0	67.0
Weight of Water, gm	22.0	23.7
Wet Density, pcf	120.6	118.2
Dry Density, pcf	90.8	87.4

Cell# 2

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT _____ PLASTICITY INDEX _____

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 031-10 (CALVOLIE 86-018-FRX.) BORING NO. B-3 SAMPLE NO. _____ DEPTH 37.0-37.5

DATE TESTED 7/24/90 BY DC COMPUTED BY _____ CHECKED BY _____

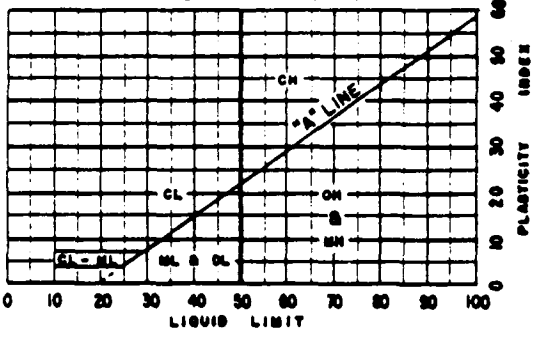
DESCRIPTION OF SOIL GRAY SILTY FINE TO MEDIUM SAND

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER								
WT. IN GMS.	MOIST SOIL & DISH							
	DRY SOIL & DISH							
	MOISTURE	NON			PLASTIC			
	DISH							
	DRY SOIL							
MOISTURE CONTENT, %								

This line is 1/8" thick

NUMBER OF BLOWS

PLASTICITY CHART

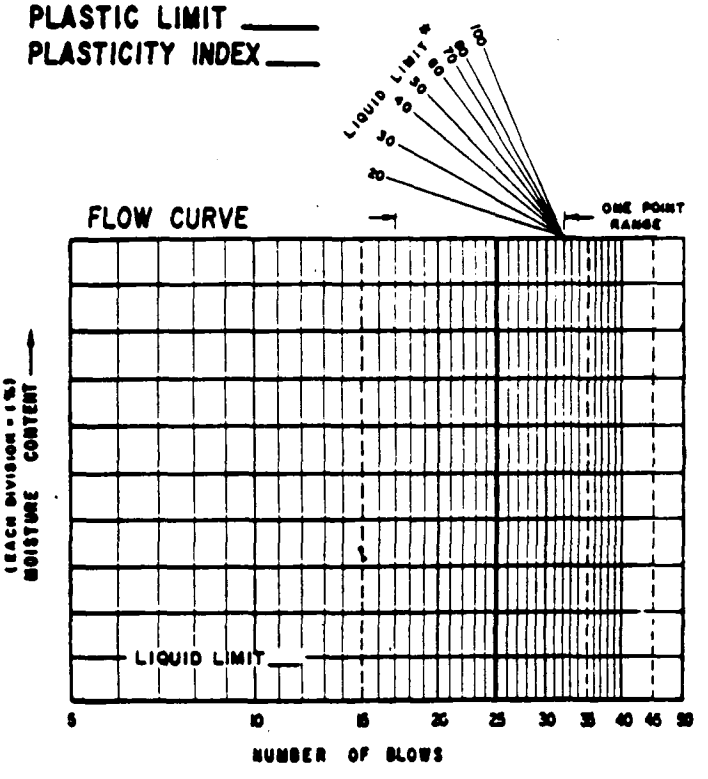


LIQUID LIMIT _____

PLASTIC LIMIT _____

PLASTICITY INDEX _____

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 312-66.

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT _____ PLASTICITY INDEX _____

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 224-10 (CALVERT SG-OIR-RAW) BORING NO OR-1 SAMPLE NO. _____ DEPTH 6.5-7.0

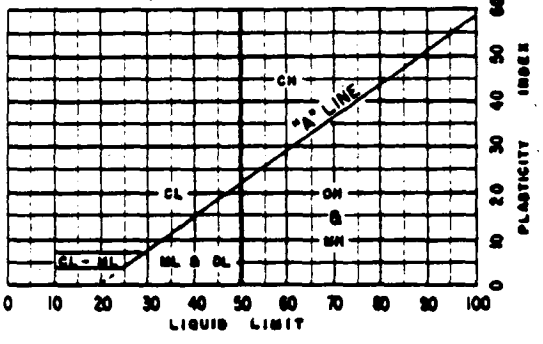
DATE TESTED 7/11/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GREENISH GRAY SILTY FINE SAND

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER								
WT. IN GMS.	MOIST SOIL & DISH							
	DRY SOIL & DISH							
	MOISTURE							
	DISH	NON			PLASTIC			
	DRY SOIL							
MOISTURE CONTENT, %								
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART

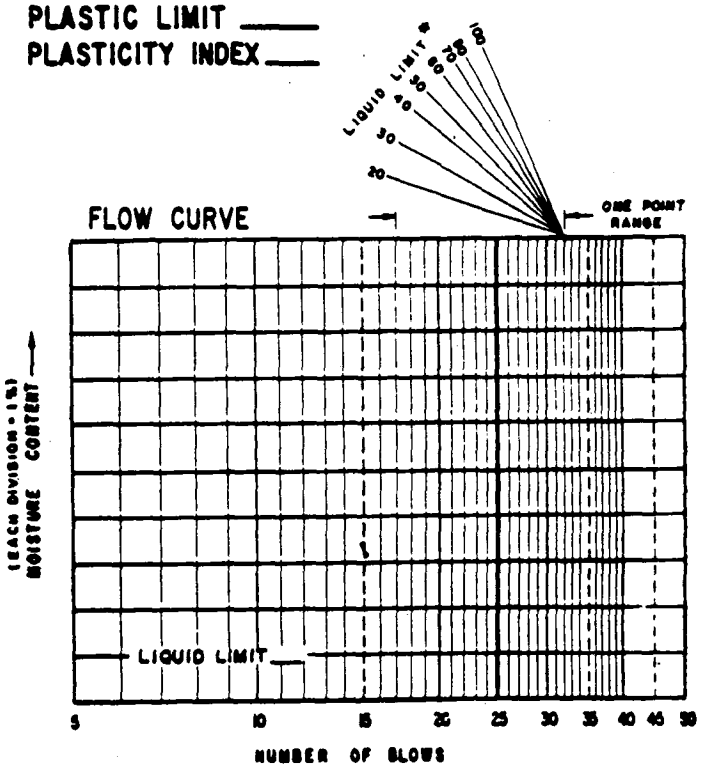


LIQUID LIMIT _____

PLASTIC LIMIT _____

PLASTICITY INDEX _____

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 26 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U. S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 312-66

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT _____ PLASTICITY INDEX _____

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 534-10 (Candlite 86-014-R01) BORING NO. WB-3 SAMPLE NO. _____ DEPTH 21.5-27.0

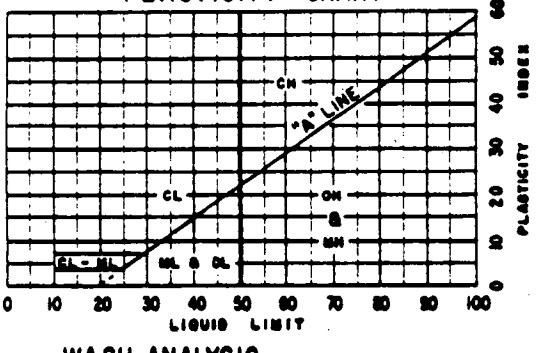
DATE TESTED 7/11/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY CLEAN MEDIUM TO FINE SAND

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER								
WT. IN GMS.	MOIST SOIL & DISH							
	DRY SOIL & DISH							
	MOISTURE		NON		PLASTIC			
	DISH							
	DRY SOIL							
MOISTURE CONTENT, %								
					NUMBER OF BLOWS			

This line is 1/8" thick

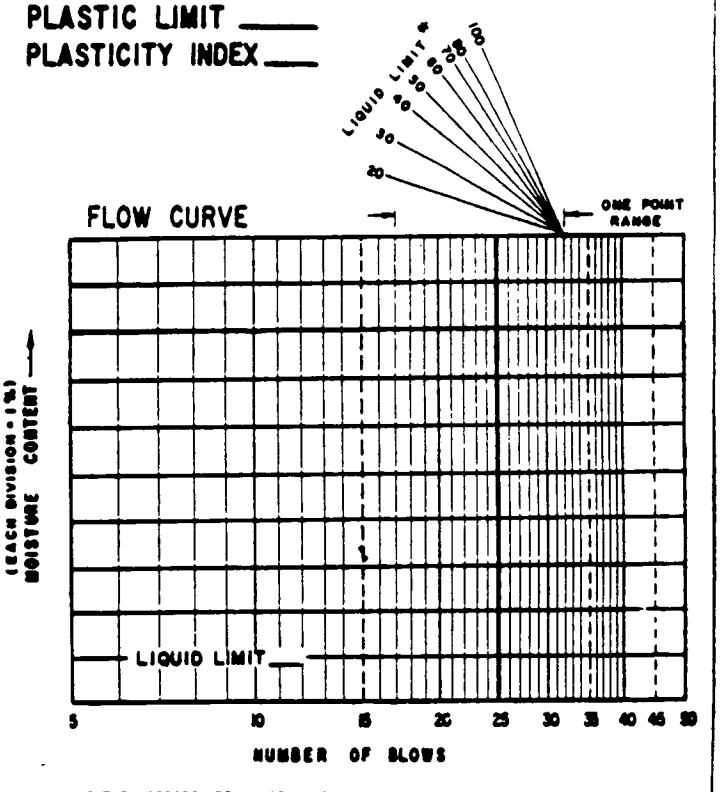
PLASTICITY CHART



LIQUID LIMIT _____

PLASTIC LIMIT _____

PLASTICITY INDEX _____



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-6

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 44 PLASTICITY INDEX 23

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CL)

JOB 034-10 (CANONIE 86-018-1906) BORING NO. A-2 SAMPLE NO. _____ DEPTH 10.0 - 10.5'

DATE TESTED 7/20/90 BY _____ COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL BAYMUD TO CLAYEY SAND (CHANGE)

DM TESTED

Dish 4

Pan G

PLASTIC LIMIT

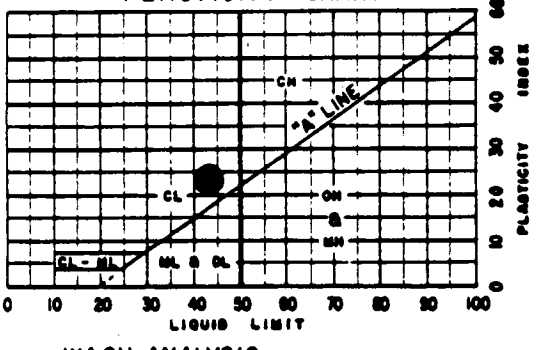
DISH NUMBER	B-5	B-7	B-51
WT. IN GMS. MOIST SOIL & DISH	14.34	13.54	14.25
DRY SOIL & DISH	12.60	11.98	12.53
MOISTURE	1.74	1.56	1.72
DISH	4.48	4.42	4.48
DRY SOIL	8.12	7.56	8.05
MOISTURE CONTENT, %	21.4	20.6	21.4

LIQUID LIMIT

	A-1	A-4	A-12	A-23
MOIST SOIL & DISH	23.69	23.34	22.40	22.49
DRY SOIL & DISH	20.03	19.62	19.04	19.90
MOISTURE	3.66	3.72	3.36	3.59
DISH	11.50	11.15	11.73	11.22
DRY SOIL	8.53	8.47	7.31	7.68
MOISTURE CONTENT, %	42.9	43.9	46.0	46.7
NUMBER OF BLOWS	30	23	17	14

This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 43.8

PLASTIC LIMIT 21.1

PLASTICITY INDEX 22.7

WASH ANALYSIS (# 200 SIEVE)

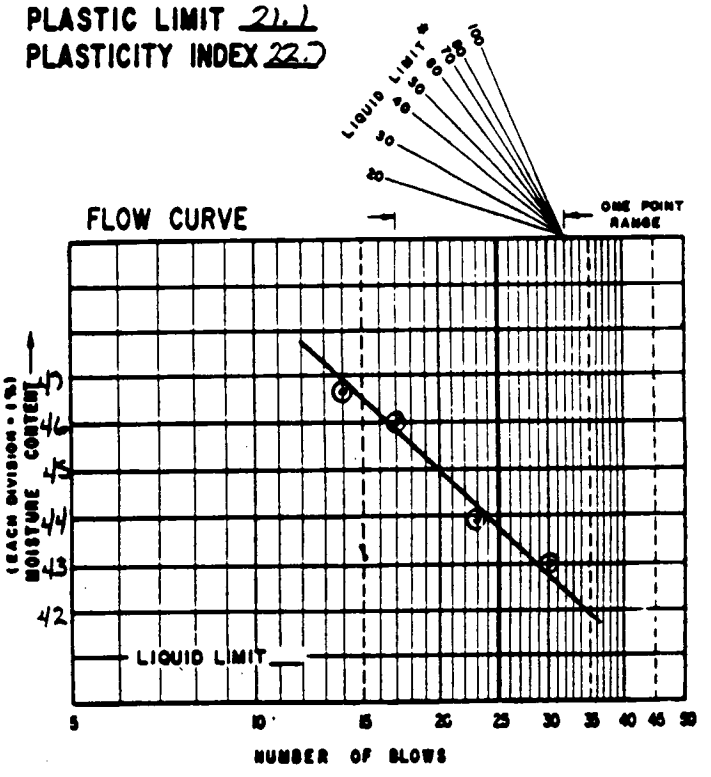
	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 312-66.

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 41 PLASTICITY INDEX 20

% GRAVEL ____ SAND ____ FINES ____ CLASSIFICATION (CL)

JOB 231-10 (CALMATE 816-018-15-6) BORING NO. DA-1 SAMPLE NO. ____ DEPTH 26.5-27.0

DATE TESTED 7/8/82 BY DC COMPUTED BY ____ CHECKED BY ____

DESCRIPTION OF SOIL BAYMUD w/ SHELLS

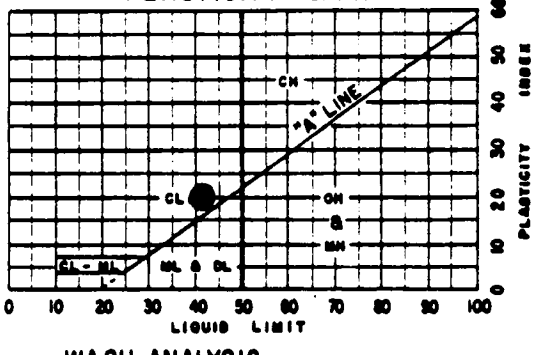
Dish 10

PAN F

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		B-4	B-6	B-16	A	C	J	H
WT. IN GMS	MOIST SOIL & DISH	16.81	12.41	15.21	18.76	21.40	19.80	15.99
	DRY SOIL & DISH	14.62	11.07	13.36	16.06	18.38	16.65	12.95
	MOISTURE	2.19	1.34	1.85	2.7	3.02	3.15	3.04
	DISH	4.43	4.40	4.30	9.1	11.00	9.31	6.20
	DRY SOIL	10.19	6.67	9.06	6.96	7.38	7.34	6.75
MOISTURE CONTENT, %		21.5	20.1	20.4	38.8	40.9	42.9	45.0
					36	28	17	13
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 41.0

PLASTIC LIMIT 20.7

PLASTICITY INDEX 20.3

WASH ANALYSIS (# 200 SIEVE)

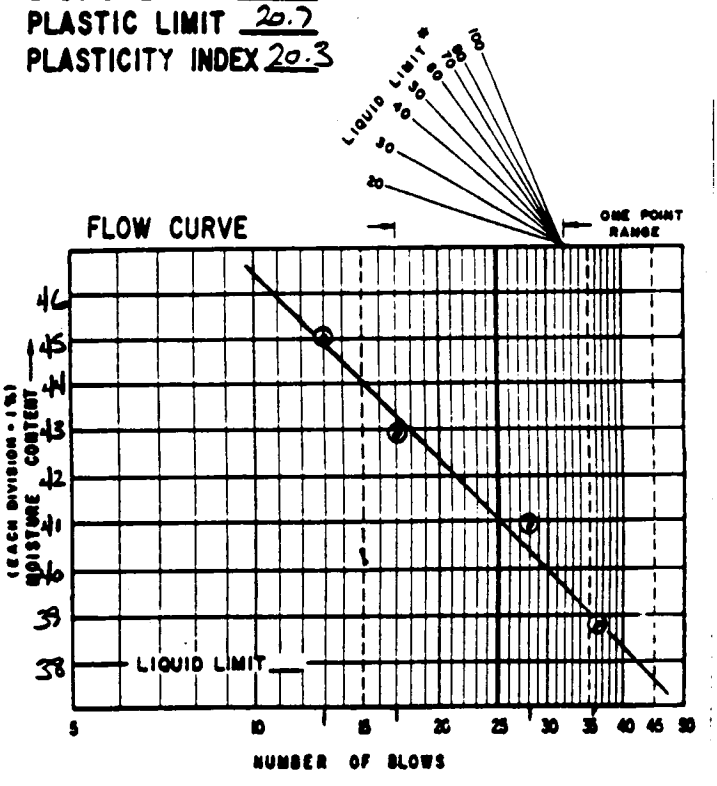
	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. ____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL ____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

FLOW CURVE



USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

DRAWN BY ____ DATE ____

CHECKED BY ____ DATE ____

JOB NUMBER ____ NAME ____

LOCATION ____

LAB 3(2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 33 PLASTICITY INDEX 15

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CL)

JOB 234-10 (CANONIE 86-OR-1506) BORING NO. B-1 SAMPLE NO. _____ DEPTH 36.5 - 37.0

DATE TESTED 7/24/90 BY _____ COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY SANDY CLAY

Dish 2
Pan 4

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		B-12	B-15	B-17	F	I	G	E
WT. IN GMS.	MOIST SOIL & DISH	14.26	15.61	13.60	19.88	17.08	22.07	22.14
	DRY SOIL & DISH	12.74	13.85	12.17	17.34	14.56	19.16	19.07
	MOISTURE	1.52	1.76	1.43	2.54	2.52	2.91	3.07
	DISH	4.42	4.35	4.34	9.34	7.25	10.56	10.62
	DRY SOIL	8.32	9.5	7.83	8.0	7.31	8.60	8.45
MOISTURE CONTENT, %		18.3	18.5	18.3	31.8	34.5	33.8	36.3
					34	15	19	10
					NUMBER OF BLOWS			

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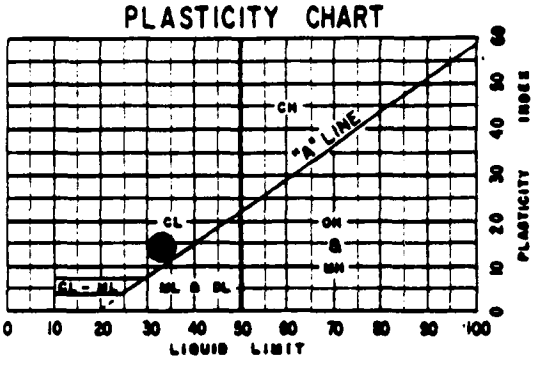
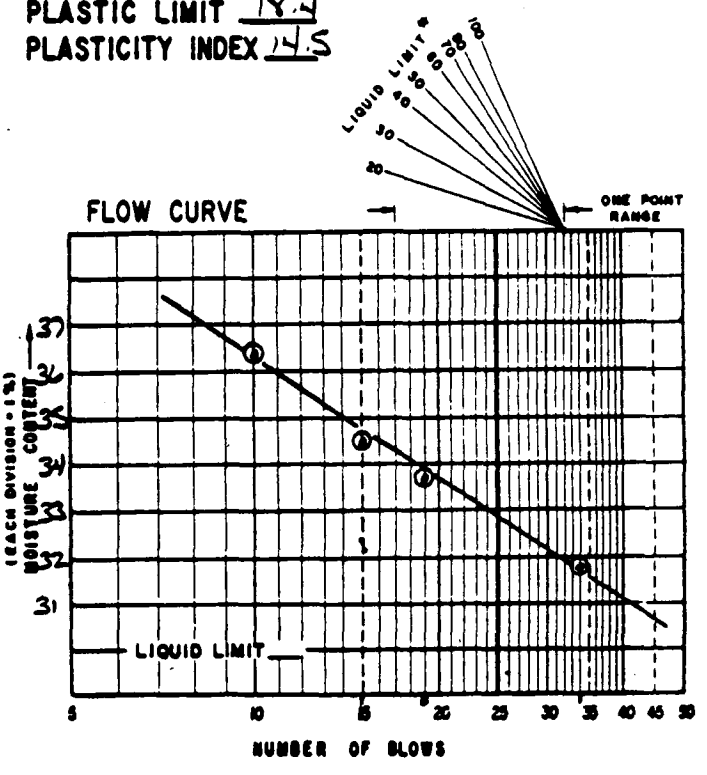
PLASTICITY CHART



LIQUID LIMIT 32.9
PLASTIC LIMIT 18.4
PLASTICITY INDEX 14.5

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 34 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U. S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 43 PLASTICITY INDEX 23

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION FINES (CL)

JOB 034-10 (CANONILE 86-OR-17) BORING NO. DA-1 SAMPLE NO. _____ DEPTH 30-30.5

DATE TESTED 7/20/89 BY _____ COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL SHELLS W/ BAYMUD

Dish 1
PAN B-1

PLASTIC LIMIT

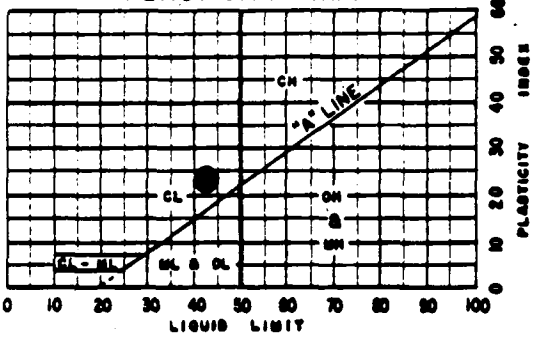
DISH NUMBER	B-9	B-13	B-18
WT. IN GMS. MOIST SOIL & DISH	10.38	10.58	10.31
DRY SOIL & DISH	9.46	9.53	9.32
MOISTURE	0.92	1.05	0.99
DISH	4.32	4.42	4.38
DRY SOIL	5.14	5.11	4.94
MOISTURE CONTENT, %	17.9	20.6	20.0

LIQUID LIMIT

	B	D	K	L
MOIST SOIL & DISH	18.72	20.43	16.40	19.05
DRY SOIL & DISH	15.87	17.09	13.26	15.79
MOISTURE	2.85	3.34	3.14	3.26
DISH	9.28	9.48	6.43	9.01
DRY SOIL	6.59	7.61	6.83	6.78
MOISTURE CONTENT, %	43.3	43.9	46.0	48.1
NUMBER OF BLOWS	30	20	15	11

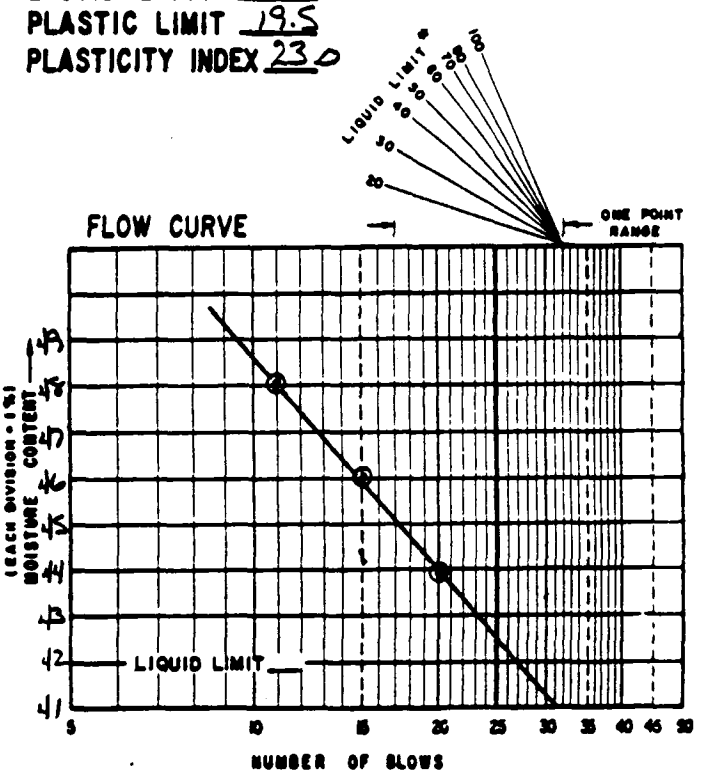
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 42.5
PLASTIC LIMIT 19.5
PLASTICITY INDEX 23.0

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-86)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 69 PLASTICITY INDEX 49

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 034-10 (CANONIE 86-018-R&D) BORING NO. B-4 SAMPLE NO. _____ DEPTH 104.0 - 104.5

DATE TESTED 2/23/90 BY _____ COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY SILTY CLAY

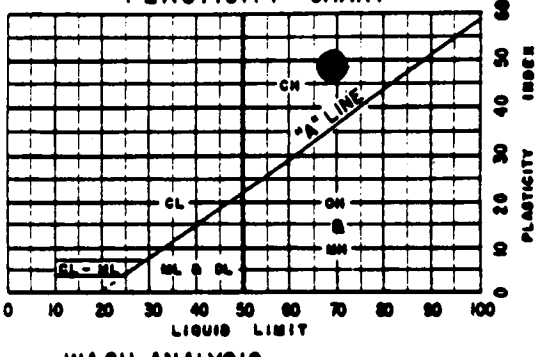
Dish 3

Pan K

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		B-1	B-2	B-11	A-7	A-8	A-22	A-24
WT. IN GMS	MOIST SOIL & DISH	10.84	13.06	12.24	22.74	21.60	21.48	21.37
	DRY SOIL & DISH	9.77	11.55	10.97	18.19	17.34	17.32	17.32
	MOISTURE	1.07	1.51	1.27	4.55	4.26	4.16	4.05
	DISH	4.47	4.37	4.49	11.46	11.22	11.41	11.61
	DRY SOIL	5.3	7.18	6.48	6.73	6.12	5.91	5.71
MOISTURE CONTENT, %		20.2	21.0	19.6	67.6	69.6	70.4	70.9
					45	20	15	15
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART

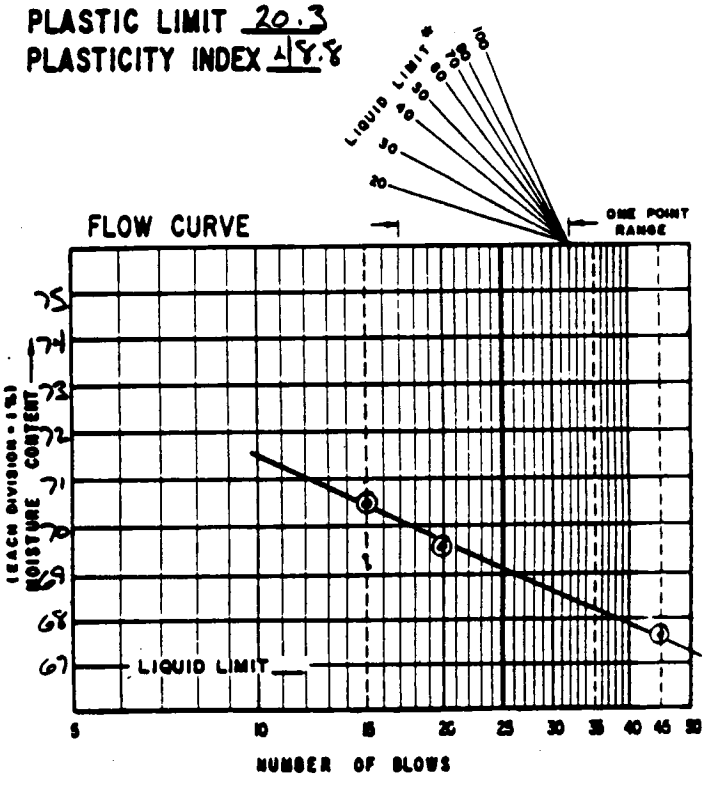


LIQUID LIMIT 69.1

PLASTIC LIMIT 20.3

PLASTICITY INDEX 48.8

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

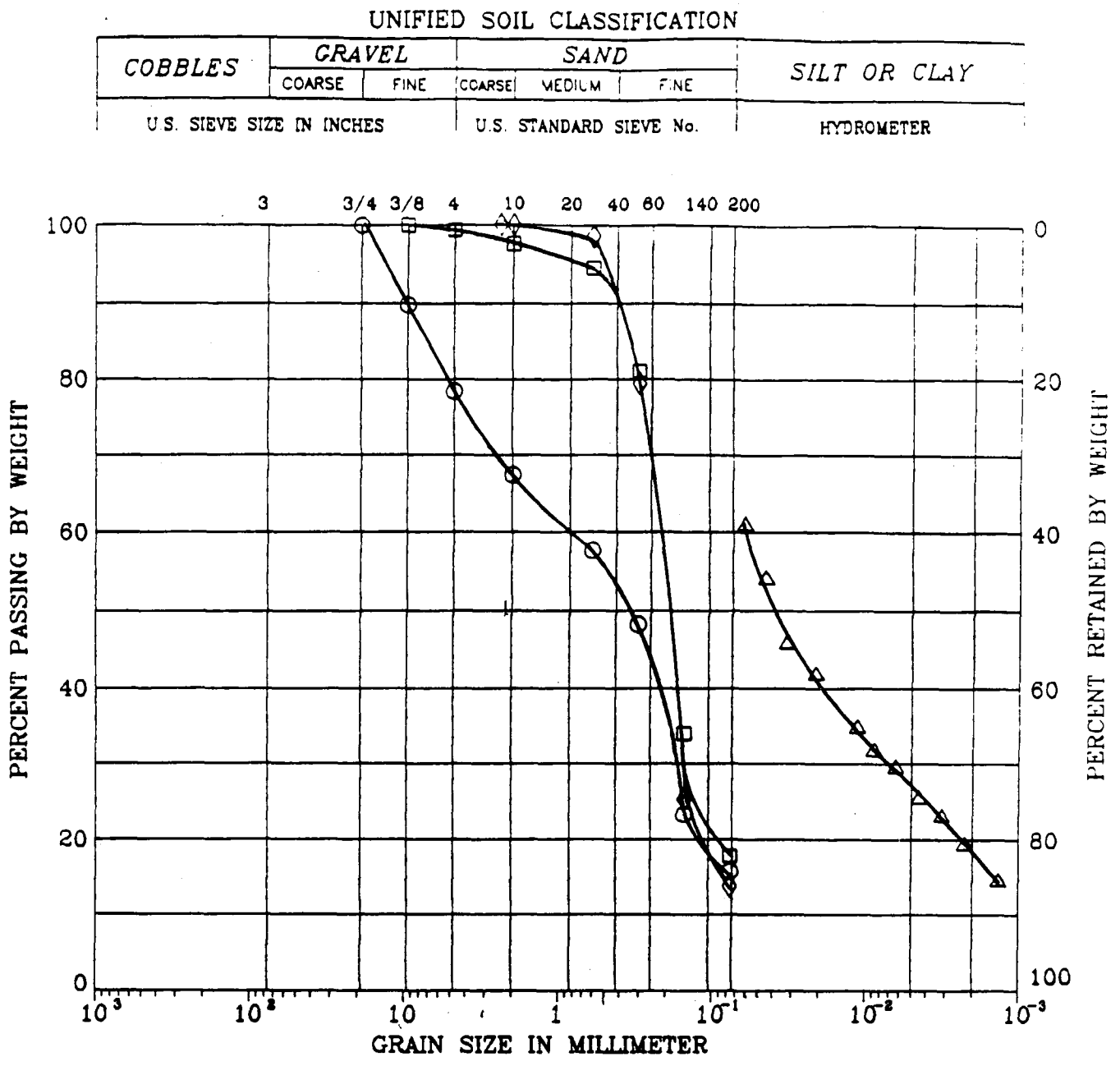
DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

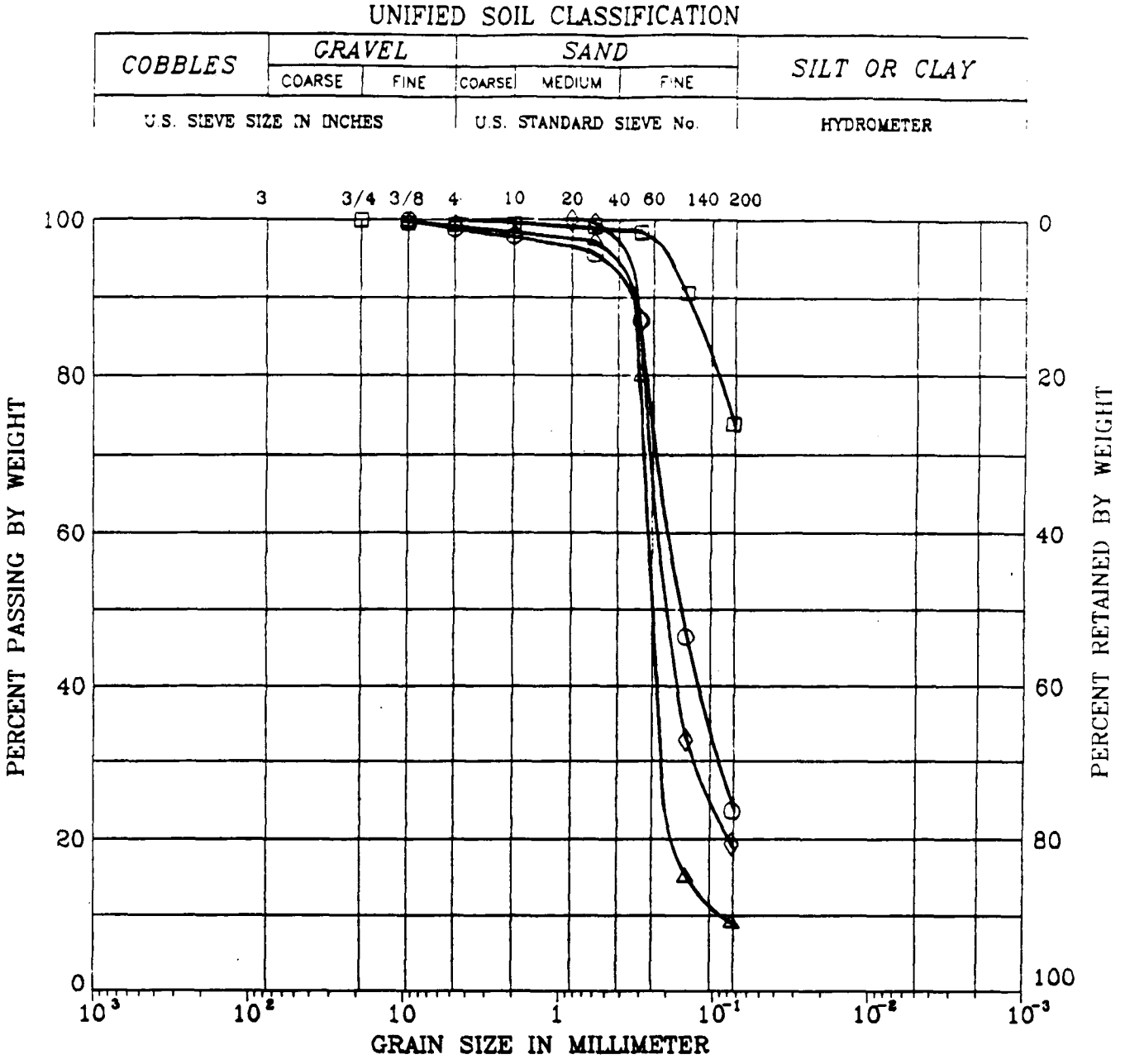
LAB 3 (2-66)



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	DA-1R	0-0.5			Brown silty sand w/gravel (SM)
□	DA-1R	.5-1.0			Brown silty fine sand (SM)
△	DA-1	26.5-27	41	20	Gray sandy clay w/shells (CL)
◇	DA-1	54-54.5			Brown silty fine to medium sand (SM)

Remark :

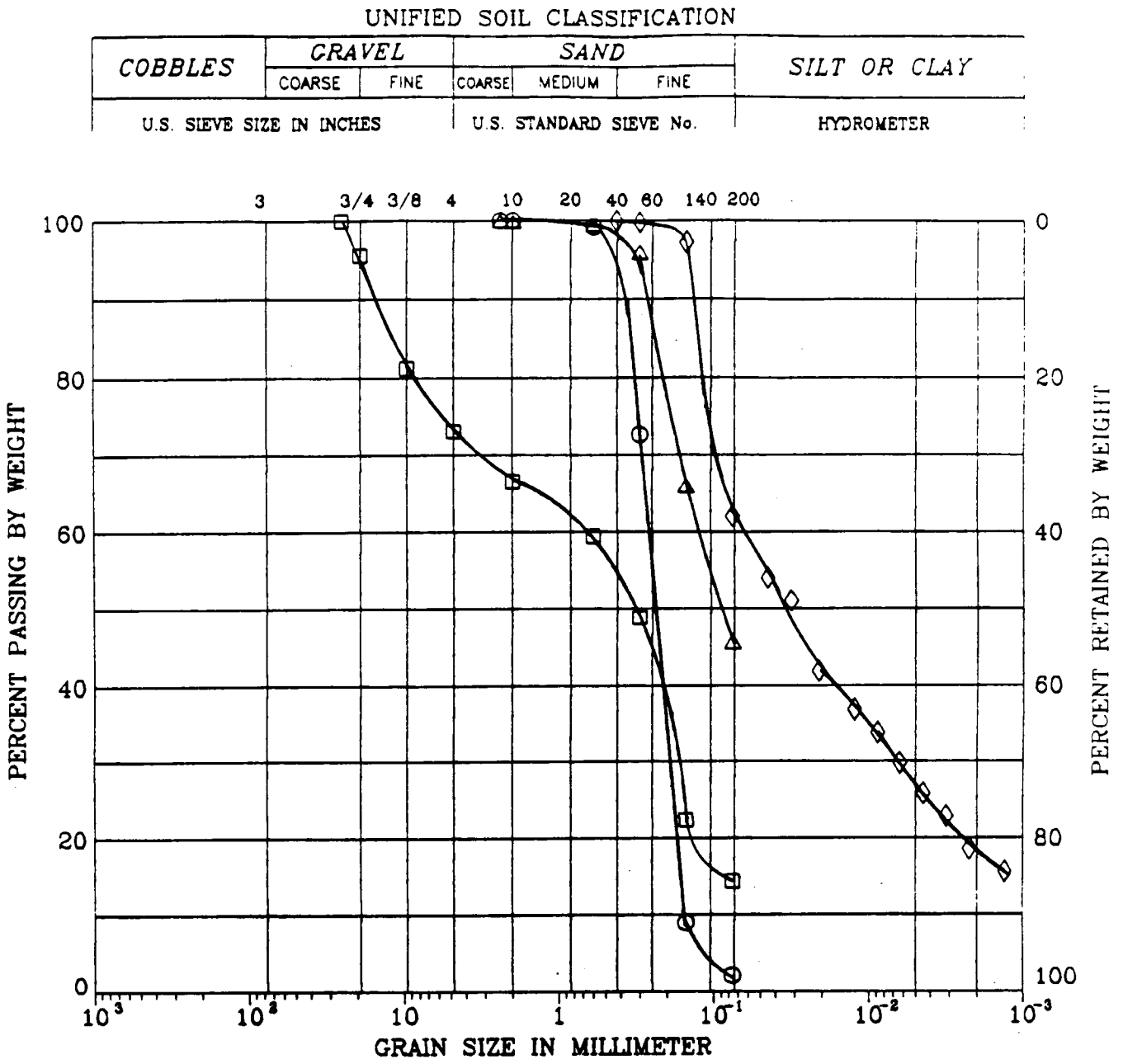
Project No.034-10	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.1



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	DA-2R	0-0.5			Brown silty fine sand (SM)
□	DA-2	10-10.5	44	23	Gray sandy clay (CL)
△	DA-2	27-27.5			Gray sand w/silt (SP)
◇	DA-2	41-41.5			Brown silty sand (SM)

Remark :

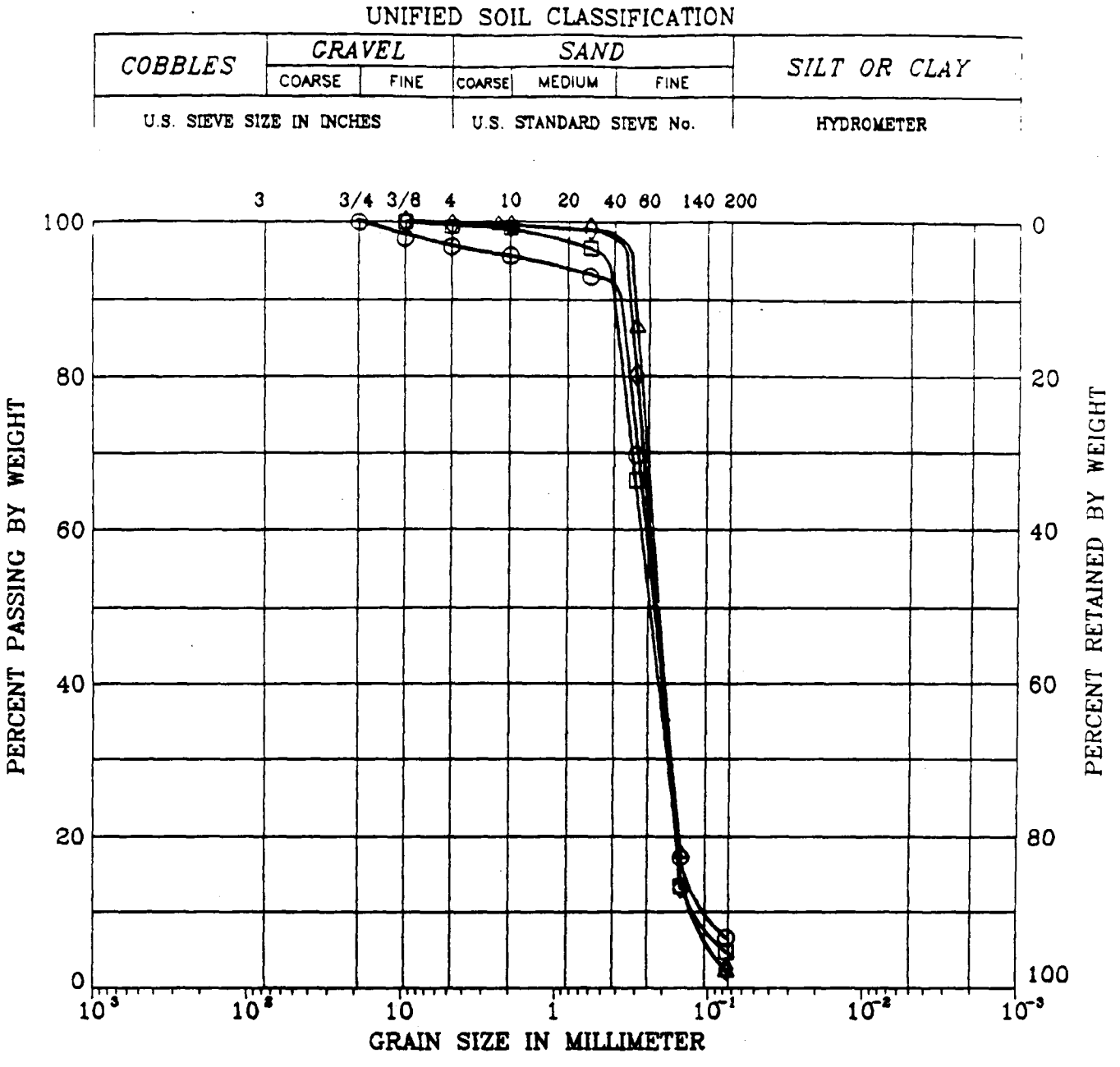
Project No.034-10	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.2



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	DA-2	80-80.5			Greenish brown fine sand (SP)
□	WB-1	0-0.5			Greenish brown silty sand w/gravel (SM)
△	WB-1	20.5-21			Gray clayey sand (SC)
◇	WB-1	36.5-37	33	15	Gray sandy clay (CL)

Remark :

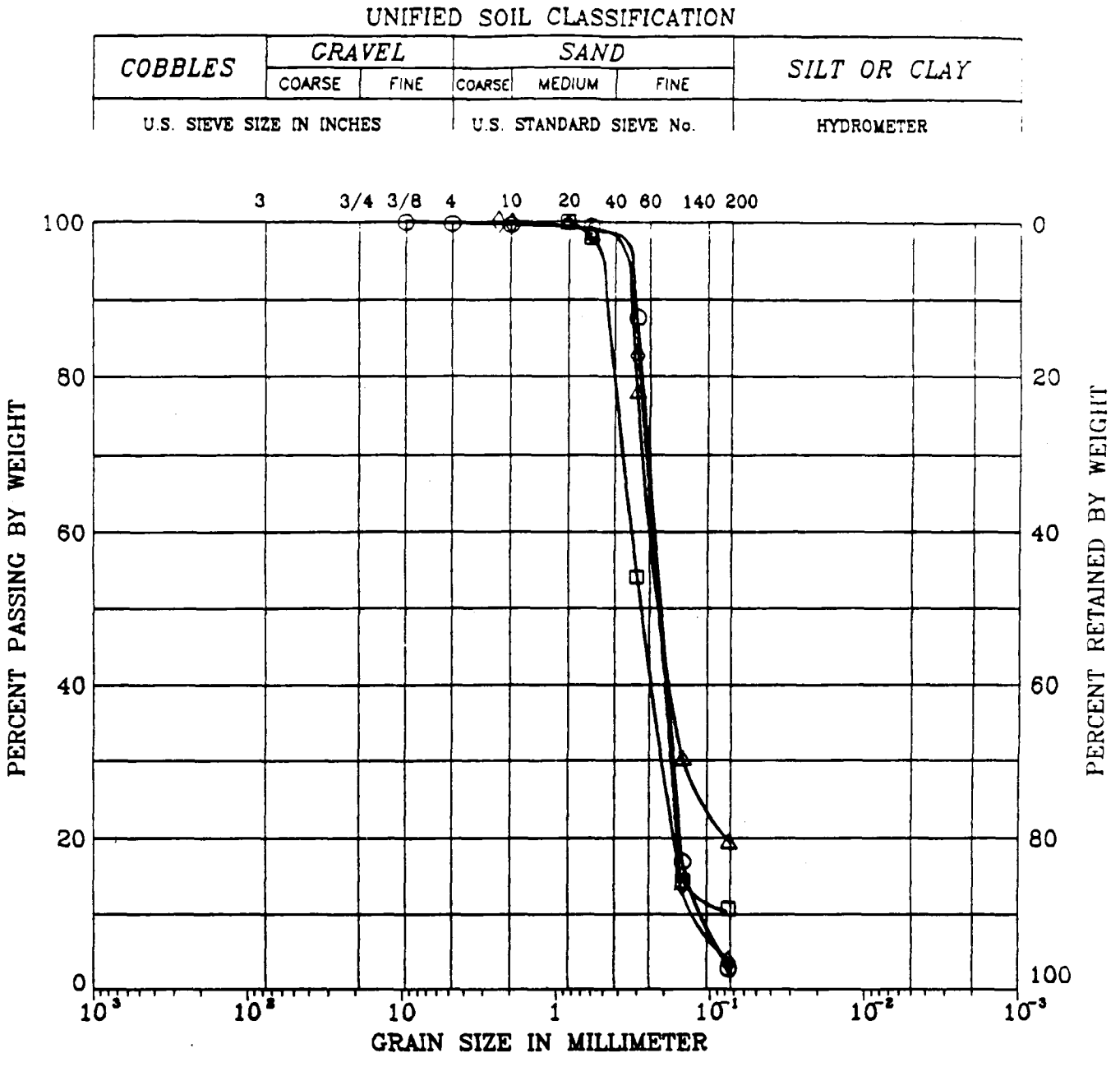
Project No.034-10b	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.3



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	WB-3R	0-0.5			Brown silty sand (SP/SM)
□	WB-3R	.5-1.0			Brown fine sand w/ some silt (SP)
△	WB-3	16.5-17			Brown fine sand w/some silt (SP)
◊	WB-3	17-17.5			Brown fine sand w/some silt (SP)

Remark :

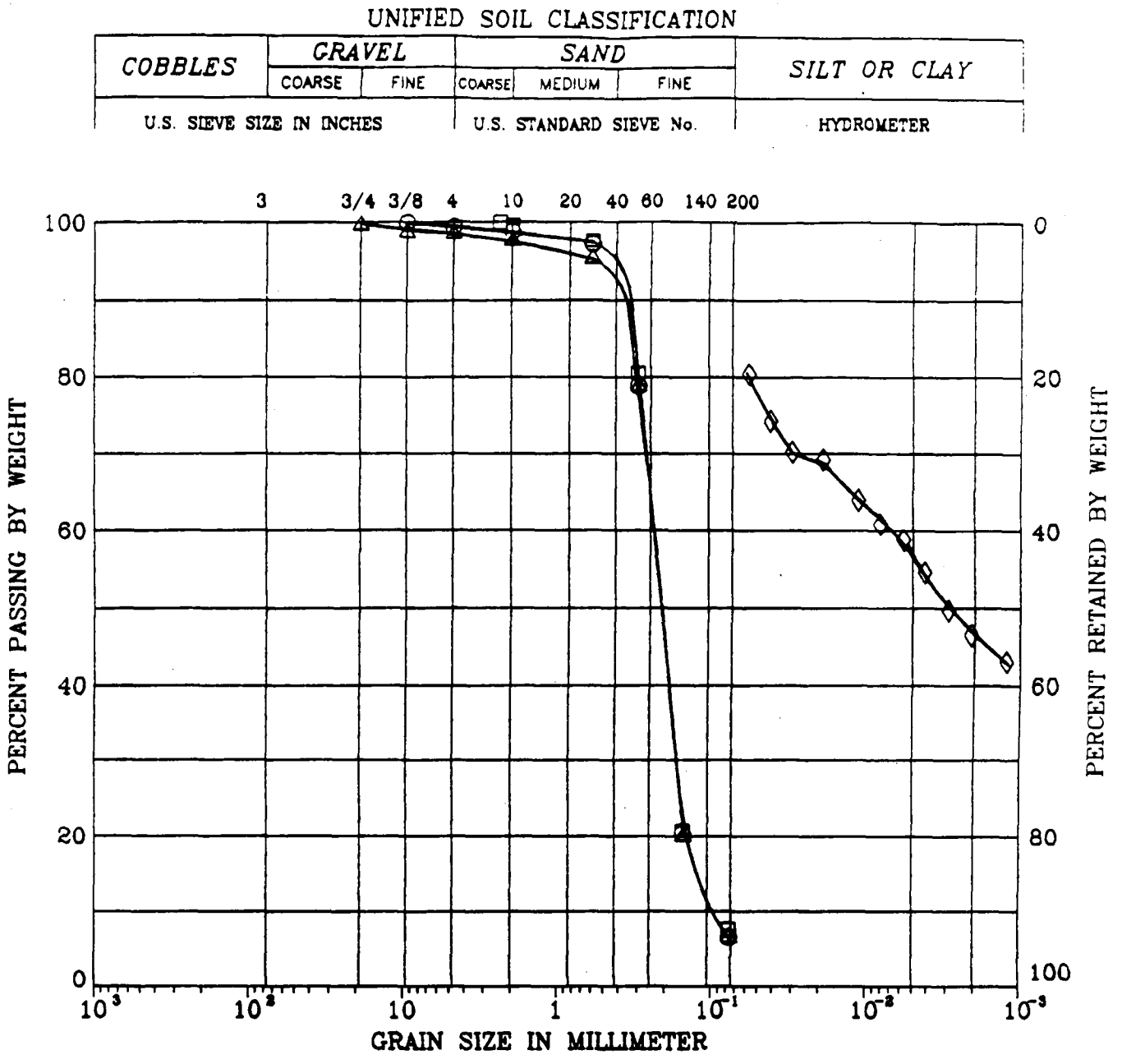
Project No.034-10c	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.4



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	Wb-3	17.5-18			Brown fine sand w/some silt (SP)
□	WB-3	36.5-37			Gray fine to medium silty sand (SW)
△	WB-3	46.5-47			Brown silty sand (SM)
◇	WB-3	48-48.5			Greenish brown fine sand w/some silt (SP)

Remark :

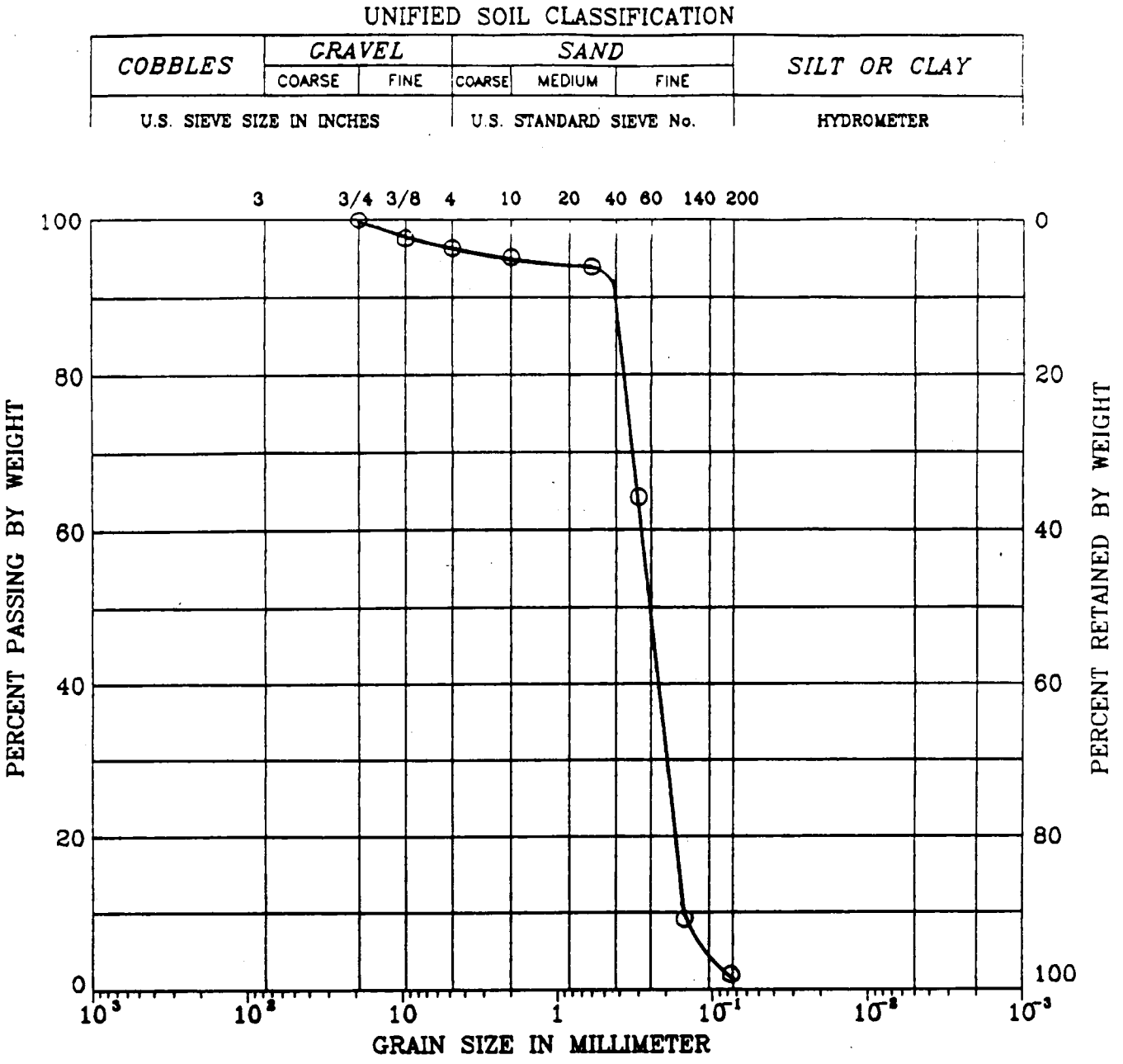
Project No.034-10d	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.5



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	WB-4	0-0.5			Brown fine sand w/some silt (SP)
□	WB-4	.5-1.0			Brown silty fine sand w/organics (SP/SM)
△	WB-4	1.5-2.0			Brown silty sand w/some fine gravel (SP/SM)
◇	WB-4	104	69	49	Mottled green & gray sandy clay (CH)

Remark :

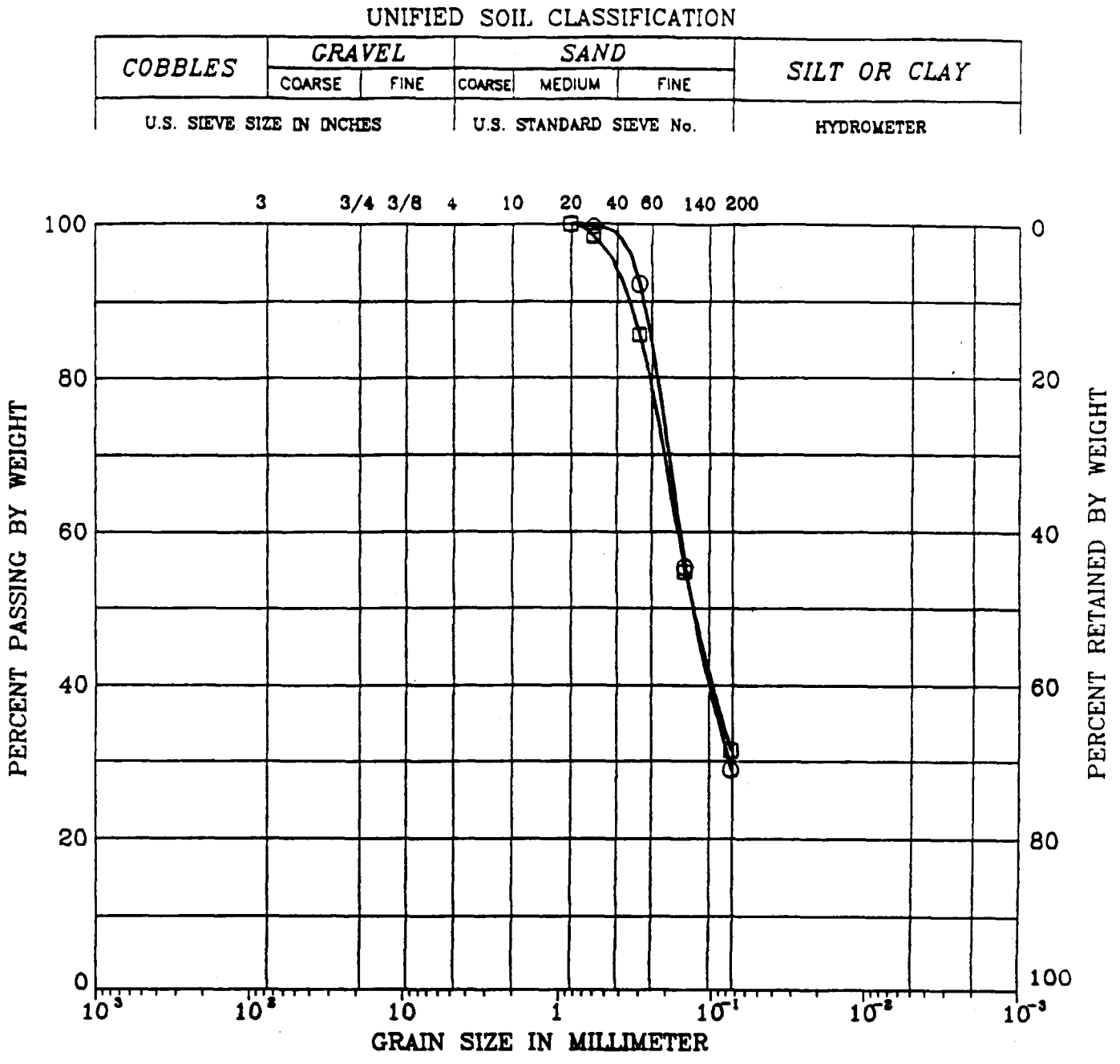
Project No.034-10e	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.6



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	OR-1	1.5-2.0			Brown fine to medium sand w/some silt (SP)

Remark :

Project No.034-10f	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.7



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	OR-1	12.5			Grayish brown silty fine sand (SM)
□	OR-1	13.5			Redish brown silty fine sand (SM)

Remark :

Project No.034-10	Canonie/Alameda NAS
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.1

November 1990 86-018-1810

PHASE 2A GEOTECHNICAL TEST RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
NAVAL AIR STATION ALAMEDA
ALAMEDA, CALIFORNIA

ENCLOSURE 14

Prepared for Western Division Naval Facilities Engineering Command

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CanonieEnvironmental

LIST OF FIGURES

FIGURE NUMBER	DRAWING NUMBER	TITLE
1	86-018-E87	Phase 2A Monitoring Well and Soil Boring Locations

LIST OF APPENDICES

APPENDIX	TITLE
A	Moisture Content/Dry Density Results
B	Sieve Analyses Results
C	Permeability Results
D	Atterburg Limits Results
E	Specific Gravity Results
F	Consolidation Results
G	Modified Proctor Compaction Results

FIGURE 1
PHASE 2A MONITORING WELL AND SOIL BORING LOCATIONS
APPENDIX D

FINAL DATA SUMMARY REPORT RI/FS
PHASE 1 AND 2A, VOLUME II

THE ABOVE IDENTIFIED FIGURE
IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY SOUTHWEST DIVISION TO LOCATE THIS FIGURE. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
SOUTHWEST
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

APPENDIX A

MOISTURE CONTENT/DRY DENSITY RESULTS

COOPER TEST LABORATORY

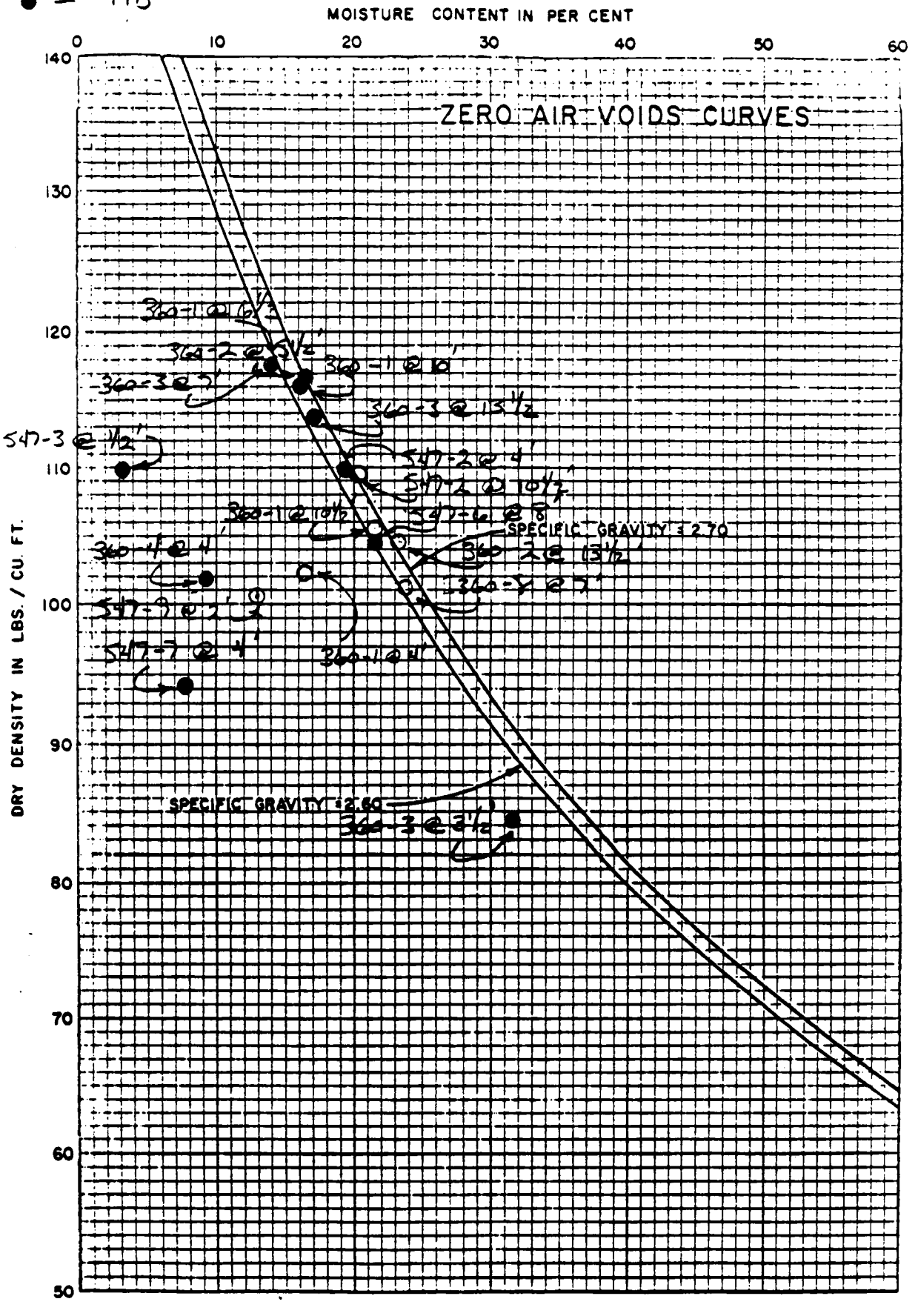
JOB NO. [illegible] / ALAMEDA NAS

SUBJECT: MOISTURE-DENSITY DATA

SHEET ____ OF ____

○ — PERMEABILITY

● — MD



REVISIONS:

BY ____ DATE ____ TO EO ____

BY ____ DATE ____ TO EO ____

BY ____ DATE ____

CHECKED BY ____

COPY TO EO ____

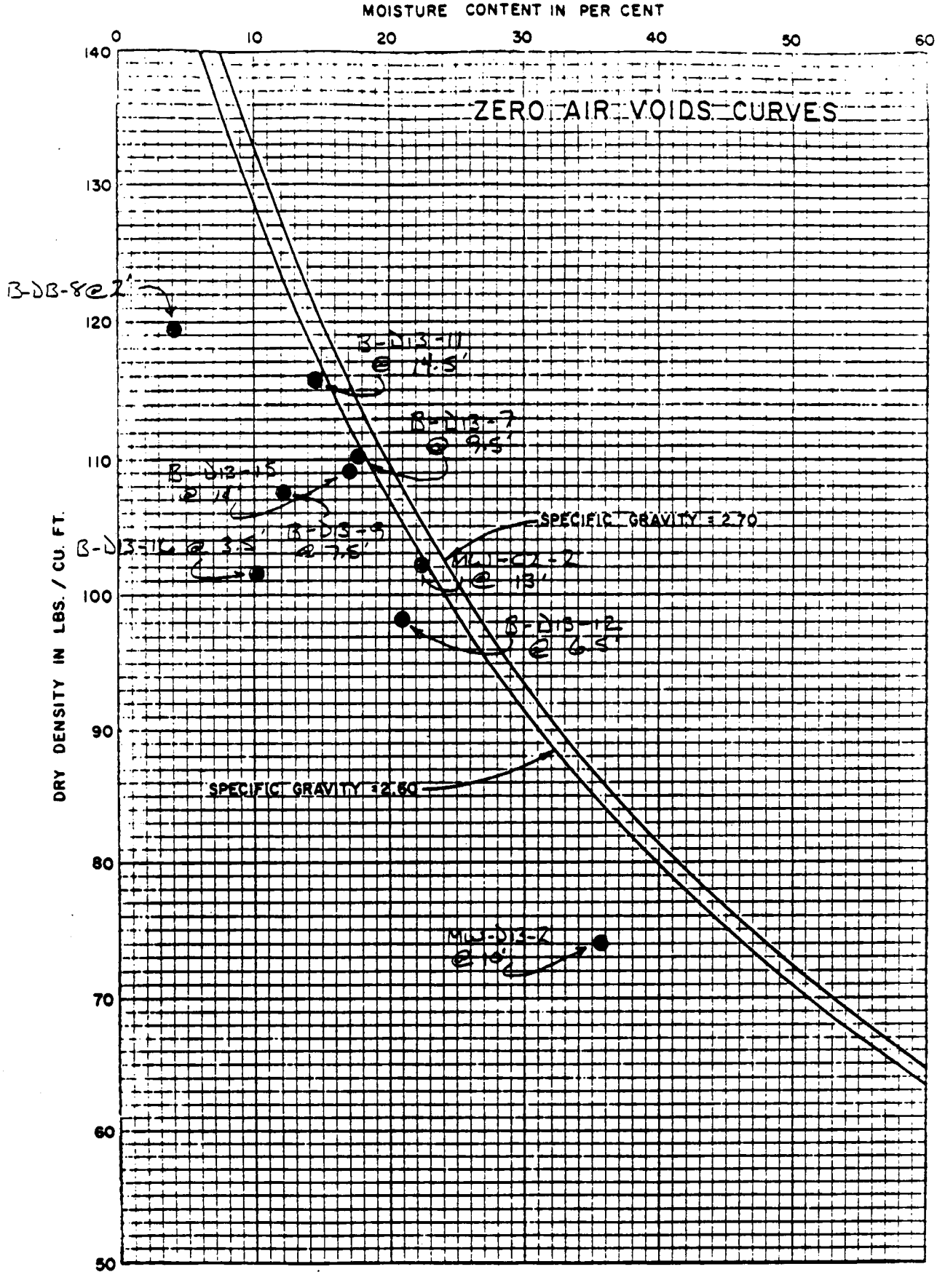
COOPER TESTING LABORATORY

JOB NO. [illegible]

SUBJECT: MOISTURE-DENSITY DATA

SHEET ____ OF ____

REVISIONS:
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____



BY [illegible] DATE 10/17/80

CHECKED BY ____

COPY TO EO ____

COOPER TESTING LABORATORY

● — MD

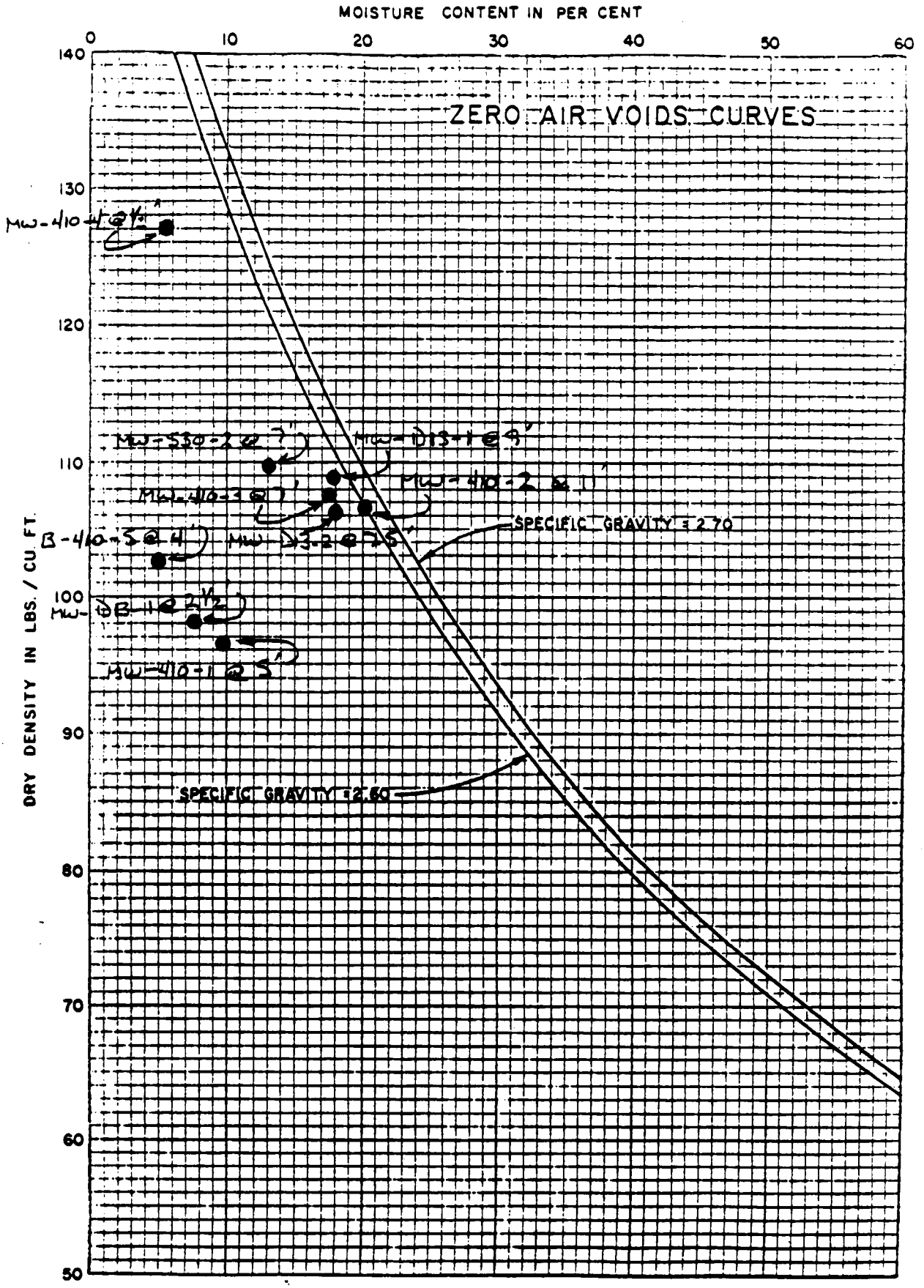
SUBJECT: MOISTURE-DENSITY DATA

SHEET ____ OF ____

REVISIONS:

BY ____ DATE ____ TO EO ____

BY ____ DATE ____ TO EO ____



BY DK DATE 10/5/80

CHECKED BY ____

COPY TO EO ____

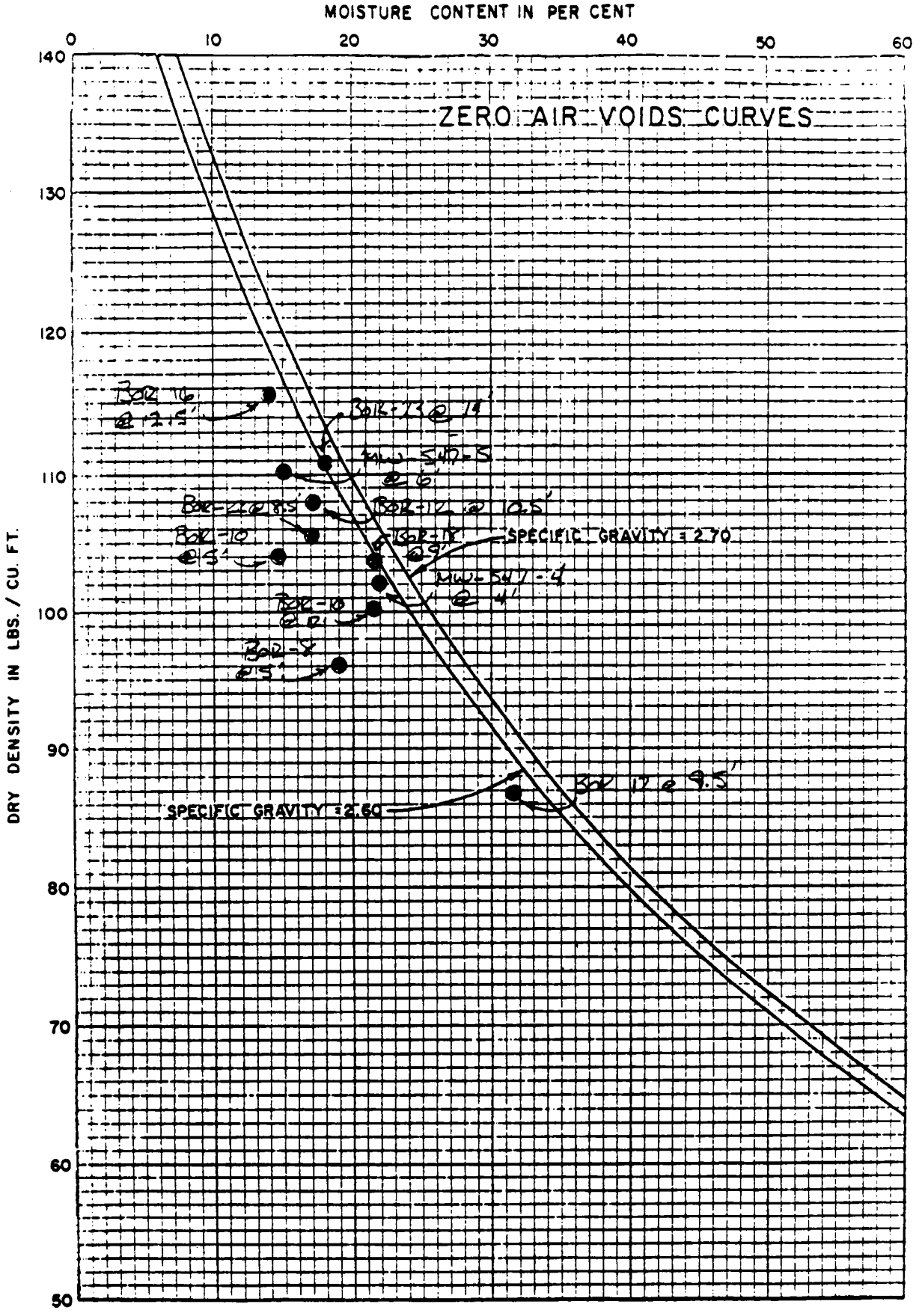
SUBJECT: MOISTURE-DENSITY DATA _____

_____ SHEET ____ OF _____

REVISIONS:

BY _____ DATE _____ TO EO _____

BY _____ DATE _____ TO EO _____



BY DC DATE 10/17/92

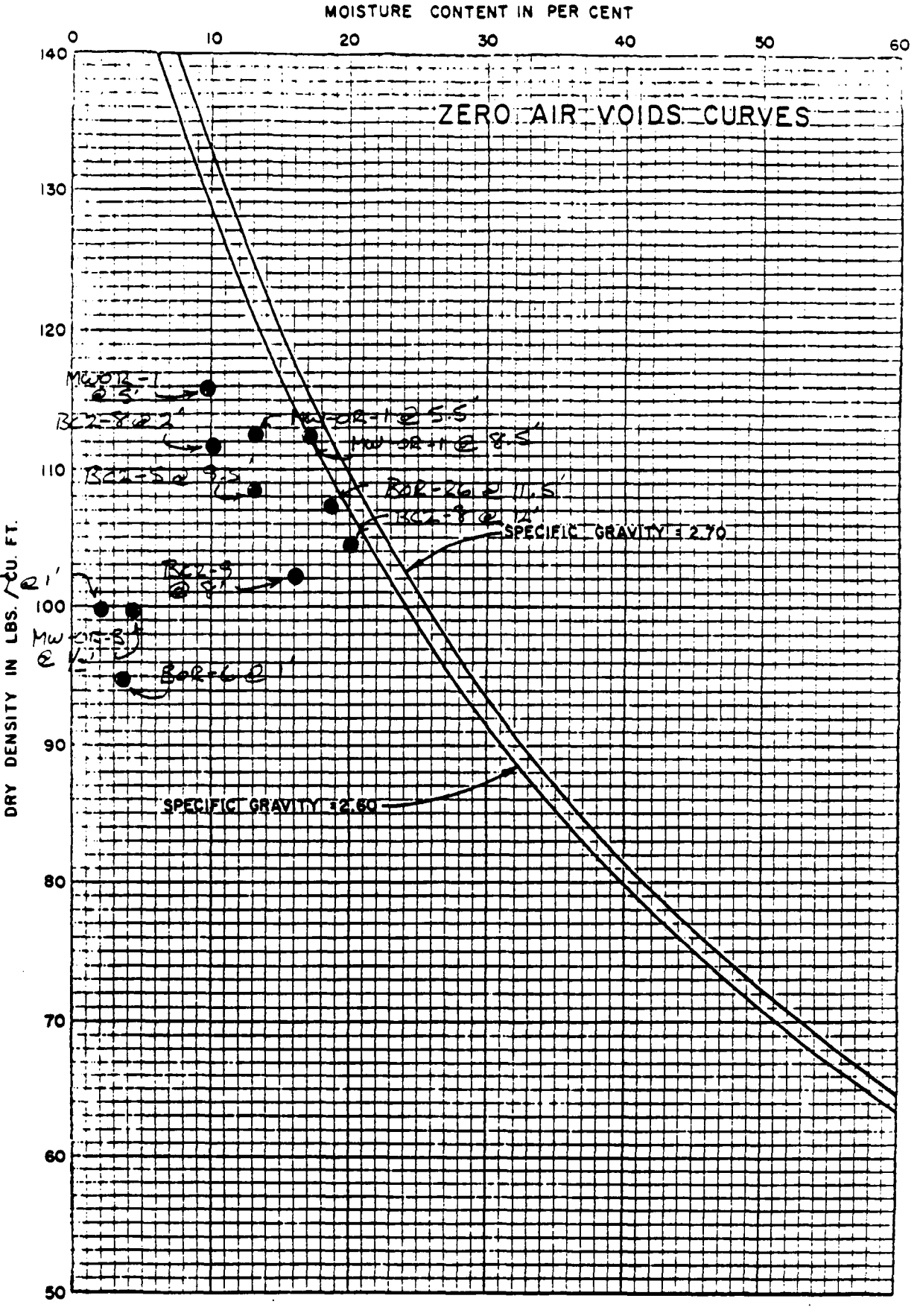
CHECKED BY _____

COPY TO EO _____

COOPER TESTING LABORATORY

SUBJECT: MOISTURE-DENSITY DATA

SHEET ____ OF ____



REVISIONS:

BY ____ DATE ____ TO EO ____

BY ____ DATE ____ TO EO ____

BY DC DATE 10/29/90

CHECKED BY ____

COPY TO EO ____

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

JOB NO. _____ SHEET ___ OF ___

CLIENT GANONLIE

LOCATION ALAMEDA NAS

DATE SAMPLED _____ DATE TESTED 9/5/90 BY: DC CHECKED BY _____

BORING NUMBER	MW 360-1	MW 360-2	MW 360-3	MW 360-3	MW 360-3	MW 360-4	MW 547-2	MW 547-3	B 547-6	B 547-7
DEPTH (FEET)	10	5½	7	13½	3½	4	4	½	8	4
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	BROWN SILTY FINE SAND (SM) SATURATED	GRAY GREEN SILT/ FINE SAND (SM)	BROWN FINE SAND W/SOME SILT (SP)	BROWN FINE SAND W/SILT (SP/SM)	D. BROWN SILTY SAND TO BAY MUD CHANGE	BROWN FINE SAND (SP)	D. BROWN FINE SAND W/SILT (SP/SM)	BROWN SILTY SAND W/SAND-STONE	BROWN SILTY FINE SAND (SM)	GREEN BROWN FINE SAND (SP)
NUMBER OF RINGS	1	5	5	5	6	6	6	5	5	5
WT. IN GM. RINGS & SOIL	135.3	697.9	676.3	675.8	677.2	669.7	767.5	601.5	666.7	550.8
WT. IN GM. RINGS	34.7	175.2	162.1	163.7	181.2	171.7	162.6	178.5	179.2	160.7
WT. IN GM. OF SOIL	100.6	522.7	514.2	512.1	496.0	498.0	604.9	423.0	487.5	390.1
RING FACTOR	1.342/1	1.302/5	1.302/5	1.302/5	1.342/6	1.342/6	1.302/6	1.342/5	1.302/5	1.302/5
WET DENSITY pcf	135.0	136.1	133.9	133.4	110.9	111.4	131.3	113.5	126.9	101.6
DRYING DISH NUMBER	68	55	133	14	65	14	109	29	133	14
WT. IN GM. MOIST SOIL & DISH	142.1	149.2	145.3	149.3	107.6	150.1	117.7	143.4	142.4	157.9
WT. IN GM. DRY SOIL & DISH	125.1	130.8	129.9	130.5	86.6	139.1	101.9	139.5	120.8	148.0
WT. IN GM. MOISTURE	17.0	18.4	15.4	18.8	21.0	11.0	15.8	3.9	21.6	9.9
WT. IN GM. DISH	19.8	19.9	20.6	21.1	19.7	21.1	20.4	20.6	20.6	21.1
WT. IN GM. DRY SOIL	105.3	110.9	109.3	109.4	66.9	118.0	81.5	118.9	100.2	126.9
MOISTURE CONTENT %	16.1	16.6	14.1	17.2	31.4	9.3	19.4	3.3	21.6	7.8
DRY DENSITY pcf	116.2	116.7	117.4	113.8	84.4	101.9	109.9	109.9	104.4	94.2

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

CLIENT [illegible]

LOCATION [illegible] 76-015-1906

DATE SAMPLED _____ DATE TESTED 10/3/90 BY: DC CHECKED BY _____

BORING NUMBER	MW 530-2	MW 410-1	MW 410-2	MW 410-3	MW 410-4	B 410-5	MW 97-2	MW D13-1	MW D13-1	MW D13-2
DEPTH (FEET)	7'	5	11	7	1/2	4	6.5	25	9	7.5
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	Brown Fine Sand (SP)	Brown Fine Sand (SP)	Greenish Brown Fine Sand (SP)	Brown Fine Sand (SP)	Brown fine sandy gravel (GP)	Brown fine sand	Peat-like organic clay	Tan fine poorly graded	Tan fine clay mot gray & red/brn	Gray-tan fine sand poorly graded
NUMBER OF RINGS	6	6	2	2	3	5	5	5	5.5	5
WT. IN GM. RINGS & SOIL	749.8	668.1	250.1	246.8	390.9	579.8	472.8	585.5	704.2	667.3
WT. IN GM. RINGS	178.8	179.9	53.2	53.1	81.6	178.2	179.6	178.8	161.8	180.5
WT. IN GM. OF SOIL	571.0	488.2	196.9	193.7	309.3	401.6	293.2	406.7	542.4	486.8
RING FACTOR	1.302/6	1.302/6	1.302/2	1.302/2	1.302/3	1.342/5	1.342/5	1.302/5	1.302/5.5	1.302/5
WET DENSITY pcf	123.9	105.9	128.2	126.1	134.2	107.8	78.7	105.9	128.4	126.8
DRYING DISH NUMBER	23	132	15	129	122	32	1	8	102	143
WT. IN GM. MOIST SOIL & DISH	144.8	152.4	172.6	146.9	180.3	132	103	167.5	161.4	207.0
WT. IN GM. DRY SOIL & DISH	130.5	140.6	151.4	128.2	171.8	126.6	48.1	156.8	140.0	178.4
WT. IN GM. MOISTURE	14.3	11.8	26.2	18.7	8.5	5.4	54.9	10.7	21.4	28.6
WT. IN GM. DISH	20.0	19.8	20.7	20.7	20.8	20.3	20.1	20.2	20.5	20.8
WT. IN GM. DRY SOIL	110.5	120.8	130.7	107.5	151.0	106.3	28.0	136.6	119.5	157.6
MOISTURE CONTENT %	12.9	9.8	20.0	17.4	5.6	5.1	196.1	7.8	17.9	18.1
DRY DENSITY pcf	109.7	96.5	106.8	107.4	127.1	102.6	26.6	98.2	108.9	107.3

DATE SAMPLED 7- -90 DATE TESTED 10-11-90 BY: _____ CHECKED BY _____

BORING NUMBER		MWD 13-2	BD 13-7	BD 13-8	BD 13-9	BD 13-11	BD 13-15	BD 13-12	BD 13-16	MWC 2-2
DEPTH		10.0'	9.5	2.0	7.5	14.5	14.0	6.5	3.5	13.0
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION		Gray-tan si fi sand / Black clay	BROWN SILTY FINE SAND (SM)	BROWN FINE SAND (SP)	BROWN FINE TO MEDIUM SAND (SP)	BROWN SILTY FINE SAND (SM)	BROWN FINE SAND w/SILT (SP/SM)	BROWN SILTY SAND (SM)	BROWN FINE SAND (SP)	GREENISH BROWN FINE SAND w/SILT (SP/SM)
NUMBER OF ~~RINGS~~ INCHES		5.5	5	6	5	5.81	5.81	4.88	5.75	5.13
WT. IN GM. RINGS & SOIL		604.7	676.3	658.0	643.4	774.5	751.2		673.0	
WT. IN GM. RINGS		180.3	177.9	180.2	179.7	182.2	181.6		179.0	
WT. IN GM. OF SOIL		424.4	498.4	477.8	463.7	592.3	569.6	445.1	494.0	492.6
RING FACTOR		1.302/5.5	1.302/5	1.302/5	1.302/5	1.302/5.81	1.302/5.81	1.302/4.88	1.302/5.75	1.302/5.13
WET DENSITY pcf		100.5	129.8	124.4	120.7	132.7	127.6	118.8	111.9	125.0
DRYING DISH NUMBER		23	A-4	153	4	72	83	119	50	A-4
WT. IN GM. MOIST SOIL & DISH		157.5	139.6	138.9	163.0	166.1	150.1	125.2	170.9	125.4
WT. IN GM. DRY SOIL & DISH		121.4	121.8	134.2	147.5	147.4	131.3	107.2	157.1	106.4
WT. IN GM. MOISTURE		36.1	17.8	4.7	15.5	18.7	18.8	18.0	13.8	19.0
WT. IN GM. DISH		20.0	21.4	19.7	21.1	19.3	20.6	20.6	20.5	21.4
WT. IN GM. DRY SOIL		101.4	100.4	114.5	126.4	128.1	110.7	86.6	136.6	85.0
MOISTURE CONTENT %		35.6	17.7	4.1	12.3	14.6	17.0	20.8	10.1	22.4
DRY DENSITY pcf		74.1	110.2	119.5	107.6	115.8	109.1	98.3	101.6	102.2

MOISTURE - DENSITY DATA SHEET

COOPER TESTING LABORATORY

CLIENT CANONIE

LOCATION 86-018-1606

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

CLIENT CANONIE

LOCATION Bb-018-1806

DATE SAMPLED 7- -90 DATE TESTED 10-11-90 BY: _____ CHECKED BY _____

BORING NUMBER	BC2-5	BC2-8	BC2-8	BC2-9	MWOR-1	MWOR-1	MWOR-1	MWOR-3	BOR6	BOR7
DEPTH	9.5	2.0	12.0	8.0	5.0	5.5	8.5	0.5	1.0	1.0
FIELD CLASSIFICATION									sample loose	
LABORATORY CLASSIFICATION	GREENISH BROWN FINE SAND (SP)	Lt tan si fi sand poorly graded	GRAY&GREEN SILT AND SAND DEPOSITS	Lt tan si fi sand poorly graded	Grey silty sand	Brown silty sand	Orange sandy clay	Greenish brown Fine sand	Greenish silty sand and dark brown silty clay	Greenish brown silty sand
NUMBER OF RINGS	2	6	2	5.5	5	5	5	5	3	5
WT. IN GM. RINGS & SOIL	245.9	746.8		661.9	650.7	667.6	685.3	578.8	330.7	569.8
WT. IN GM. RINGS	57.3	178.0		161.5	162.7	178.7	179.0	179.4	104.6	178.0
WT. IN GM. OF SOIL	188.6	568.8	192.6	500.4	488.0	488.9	506.3	399.4	226.1	391.8
RING FACTOR	1.302/2	1.302/6	1.302/2	1.302/5.5	1.302/5	1.302/5	1.302/5	1.302/5	1.302/3	1.302/5
WET DENSITY pcf	122.8	123.4	125.4	118.5	127.1	127.3	131.8	104.0	98.1	102.0
DRYING DISH NUMBER	B-1	C	D	H	114	119	142	11	3	153
WT. IN GM. MOIST SOIL & DISH	232.5	242.4	245.0	244.4	139.7	128.6	99.5	117.6	128.8	101.2
WT. IN GM. DRY SOIL & DISH	210.7	224.7	213.0	218.1	129.2	116.9	88.0	113.6	125.1	99.4
WT. IN GM. MOISTURE	21.8	17.7	32.0	26.3	10.5	12.7	11.5	4.0	3.7	1.8
WT. IN GM. DISH	43.7	53.5	52.9	53.4	20.6	20.6	20.7	19.9	20.7	19.7
WT. IN GM. DRY SOIL	167.0	171.2	160.1	164.7	108.6	95.3	67.3	93.7	104.4	79.7
MOISTURE CONTENT %	13.1	10.3	20.0	16.0	9.7	13.3	17.1	4.3	3.5	2.3
DRY DENSITY pcf	108.6	111.9	104.5	102.1	115.9	112.4	112.6	99.7	94.8	99.7

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

JOB NO. 0[illegible] SHEET 4 OF 4

CLIENT CANONIE

LOCATION 86-018-1806

DATE SAMPLED 7- -90 DATE TESTED 10-11-90 BY: _____ CHECKED BY _____

BORING NUMBER	BOR 8	BOR 10	BOR 10	BOR 12	BOR 12	BOR 16	BOR 18	BOR 22	BOR 23	BOR 26
DEPTH	5.0	5.0	12.0	9.5	10.5	12.5	9.0	8.5	14.0	11.5
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	Light brown silty fine sand	Greenish brown silty fine sand	Dark grey silty clay	Grey silty clay	Greenish brown silty clay	Light brown silty fine sand	Brown silty fine sand	Greenish brown silty fine sand clay	Greenish brown silty fine sand	Greenish brown silty fine sand
NUMBER OF RINGS	2	5	4.5	5	3	5	5	5	5	5
WT. IN GM. RINGS & SOIL	245.2	635.6	600.7	602.6	389.4	685.6	662.6	653.1	679.5	668.2
WT. IN GM. RINGS	69.7	178.0	179.4	163.5	98.4	179.3	177.7	178.8	177.3	179.2
WT. IN GM. OF SOIL	175.5	457.6	421.3	439.1	291.0	506.3	484.9	474.3	502.2	489.0
RING FACTOR	1.302/2	1.302/5	1.302/4.5	1.302/5	1.302/3	1.302/5	1.302/5	1.302/5	1.302/5	1.302/5
WET DENSITY pcf	114.3	119.2	121.9	114.3	126.3	131.8	126.3	123.5	130.8	127.3
DRYING DISH NUMBER	123	105	138	A10	69	68	133	8	124	38
WT. IN GM. MOIST SOIL & DISH	136.7	121.3	116.7	133.9	159.4	132.4	130.6	146.8	149.7	130.8
WT. IN GM. DRY SOIL & DISH	118.2	108.5	99.7	107.0	139.1	118.5	111.0	128.3	130.0	113.6
WT. IN GM. MOISTURE	18.5	12.8	17.0	26.9	20.3	13.9	19.6	18.5	19.7	17.2
WT. IN GM. DISH	20.7	20.6	20.6	21.5	20.2	19.8	20.6	20.2	20.5	21.4
WT. IN GM. DRY SOIL	97.5	87.9	79.1	85.5	118.9	98.7	90.4	108.1	107.5	92.2
MOISTURE CONTENT %	18.9	14.6	21.5	31.5	17.1	14.1	21.7	17.1	18.0	18.7
DRY DENSITY pcf	96.1	104.0	100.3	86.9	107.9	115.5	103.8	105.5	110.9	107.3

COOPER TESTING LABORATORY

MOISTURE - DENSITY DATA SHEET

CLIENT LANDUSE SG-018-1806

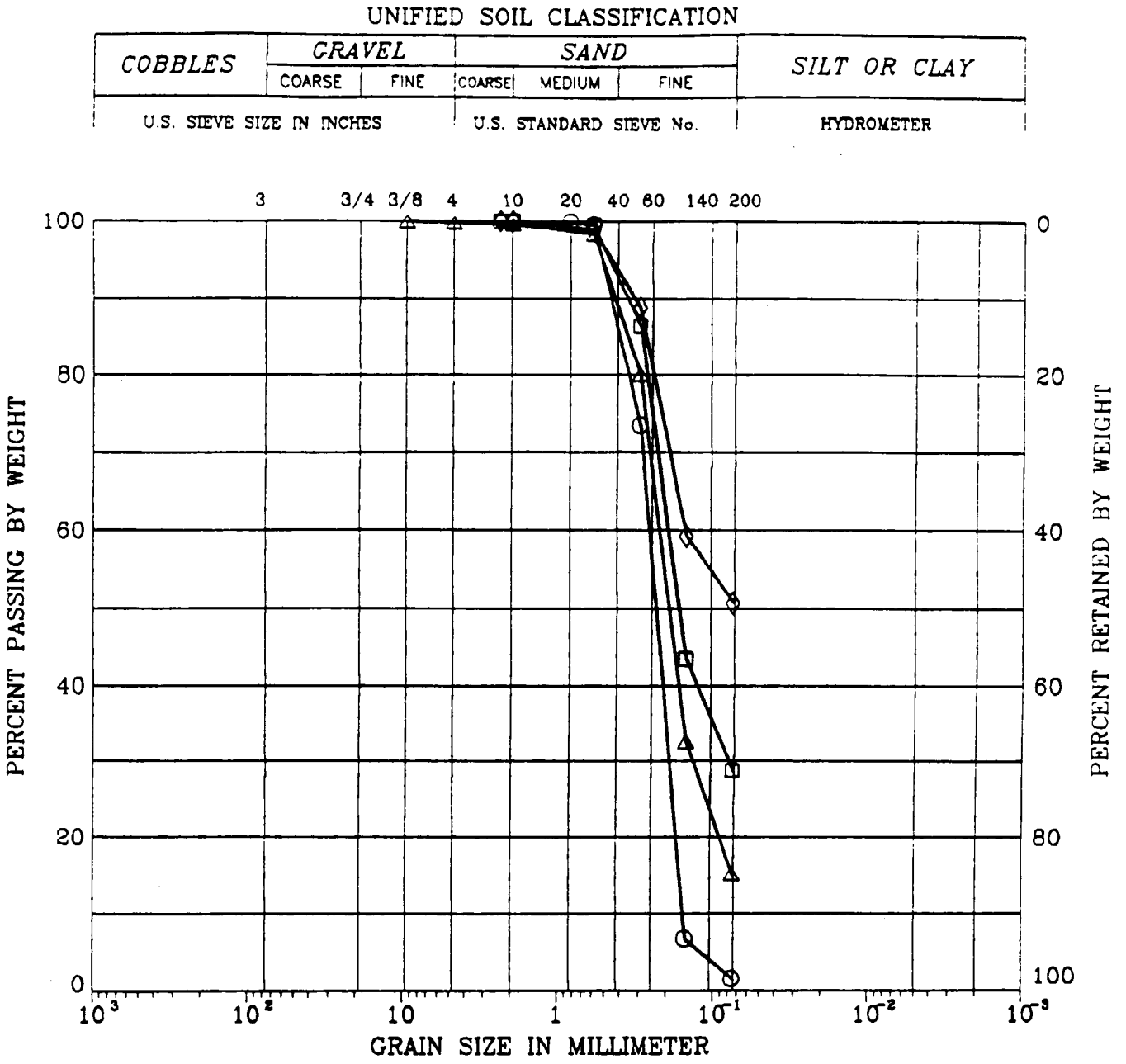
LOCATION ALAMEDA NAS

DATE SAMPLED 6/90 DATE TESTED 10/90 BY: DC CHECKED BY

BORING NUMBER	MW-SA7-4	MW-SA7-5								
DEPTH	4	6								
FIELD CLASSIFICATION										
LABORATORY CLASSIFICATION	D. BROWN SILTY FINE SAND (SM)	D. BROWN SILTY FINE SAND (SM)								
NUMBER OF ~~RINGS~~ INCHES	5	3								
WT. IN GM. RINGS & SOIL	657.9									
WT. IN GM. RINGS	180.3									
WT. IN GM. OF SOIL	477.6	292.2								
RING FACTOR	1.302/5	1.302/3								
WET DENSITY pcf	124.4	126.8								
DRYING DISH NUMBER	5	A-4								
WT. IN GM. MOIST SOIL & DISH	143.9	164.3								
WT. IN GM. DRY SOIL & DISH	121.7	145.5								
WT. IN GM. MOISTURE	22.2	18.8								
WT. IN GM. DISH	19.8	21.4								
WT. IN GM. DRY SOIL	101.9	124.1								
MOISTURE CONTENT %	21.8	15.2								
DRY DENSITY pcf	102.1	110.1								

APPENDIX B

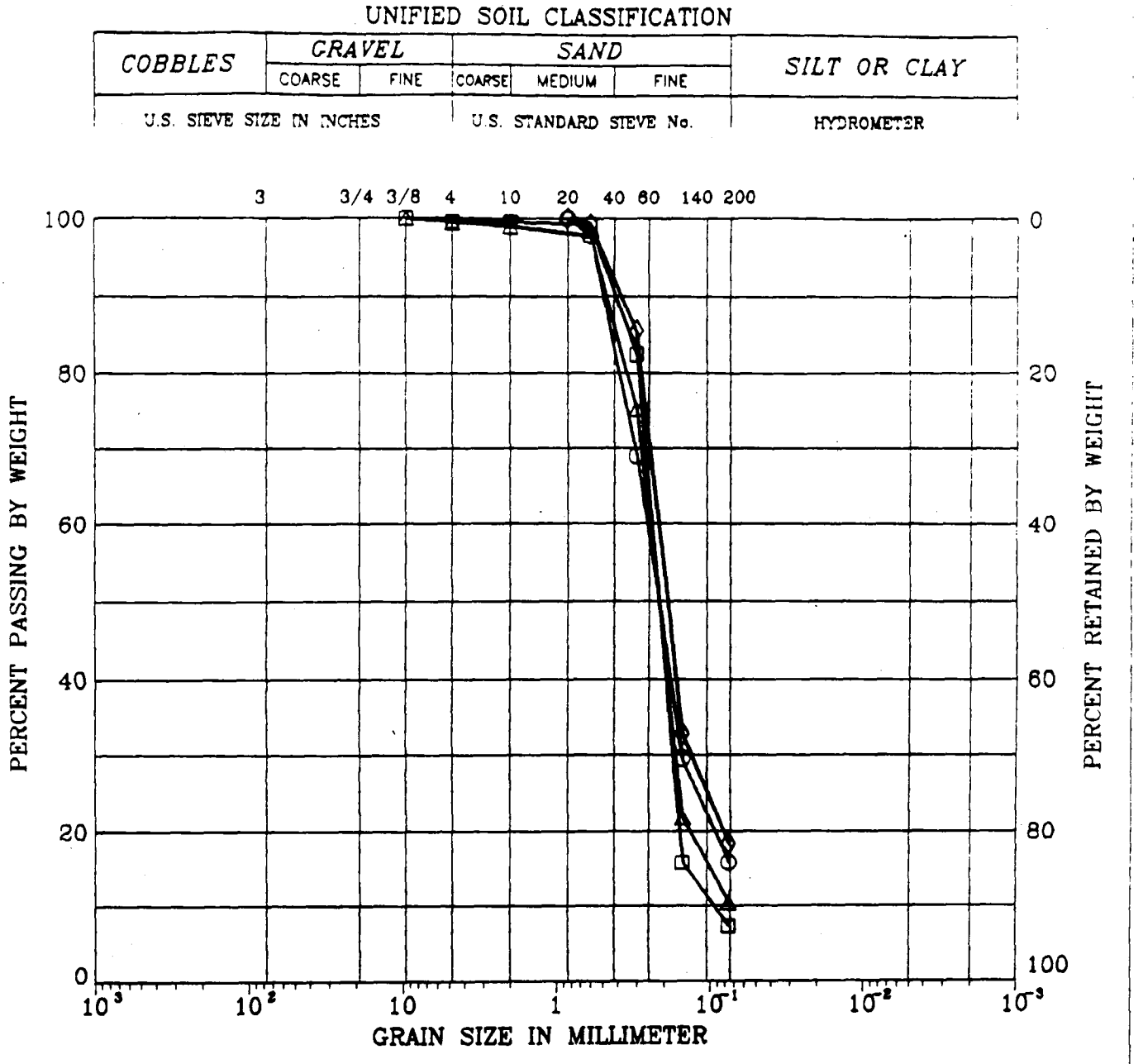
SIEVE ANALYSES RESULTS



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MW360-1	4			Greenish brown fine sand (SP)
□	MW360-1	10.5			Brown clayey fine sand (SC)
△	MW360-2	5.5			Gray-green silty sand w/shells (SM)
◇	MW360-3	3.5			D. brown silty sand to gray baymud

Remark :

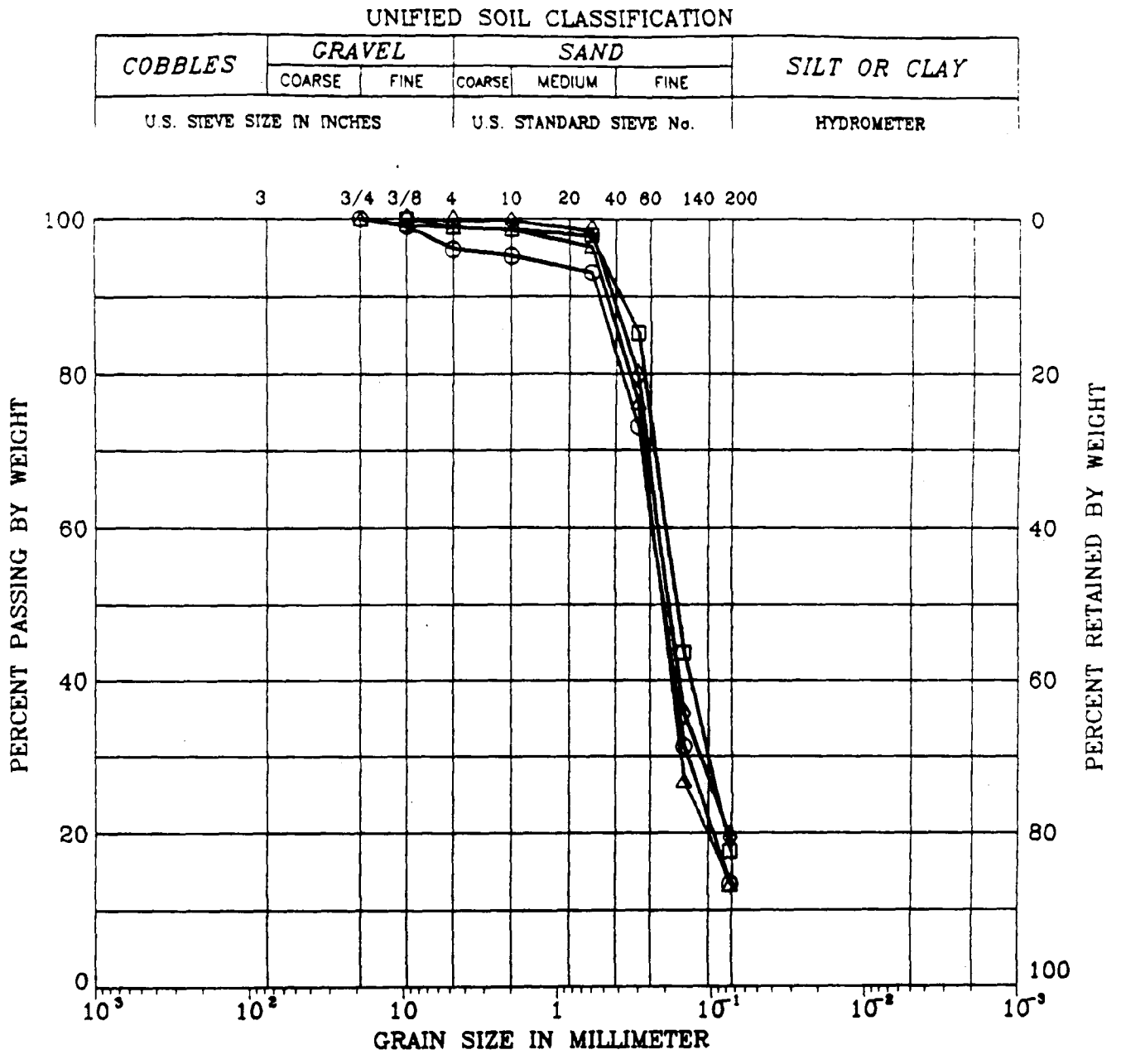
Project No.034-13	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.1



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MW360-3	7.5			Brown silty fine sand (SM)
□	MW360-4	4			Brown fine sand w/silt (SP/SM)
△	B360-5	4			Brown fine sand w/silt & shells (SP/SM)
◇	B360-5	13.5			Brown silty fine sand (SM)

Remark :

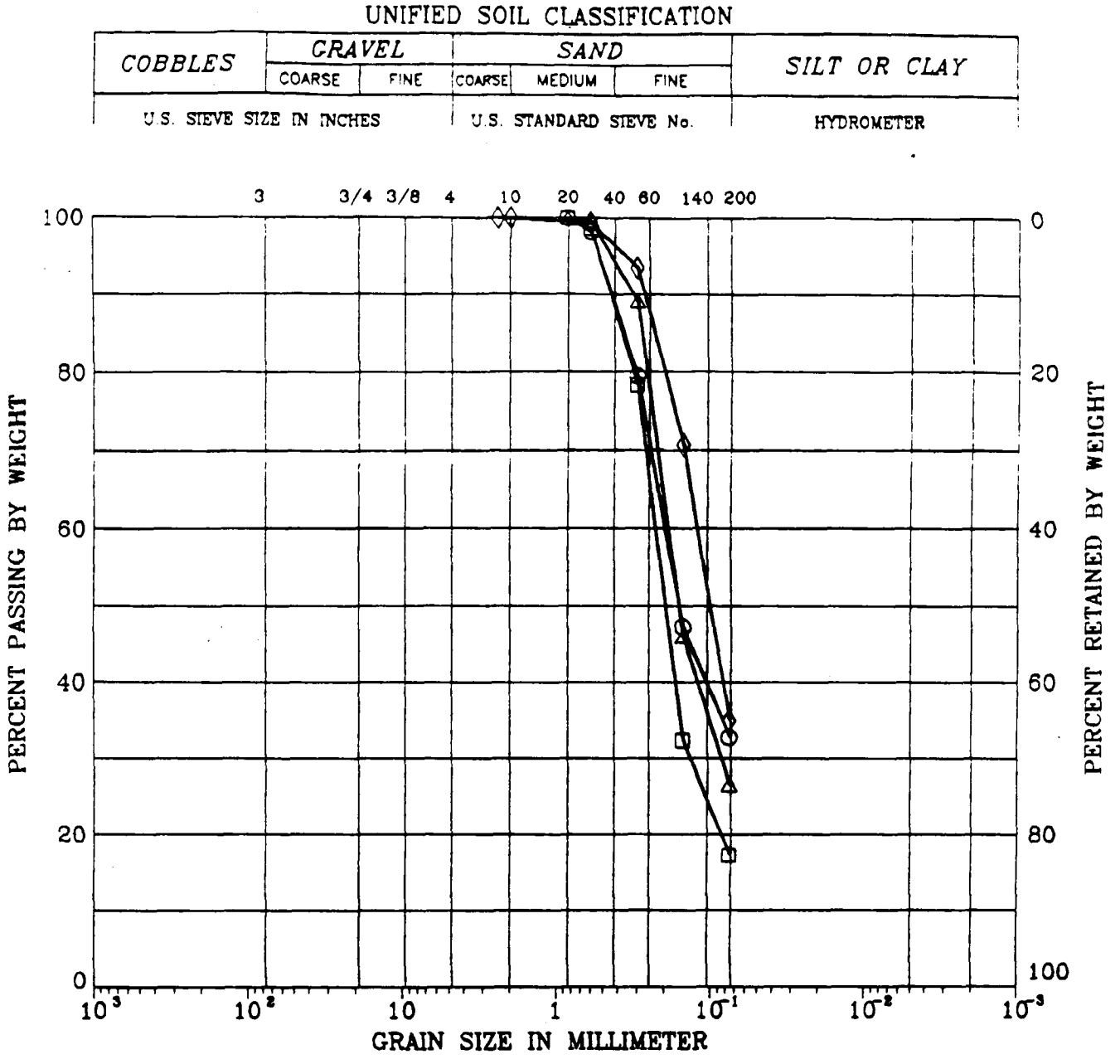
Project No.034-12a	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.2



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	B360-6	4			Green-gray silty fine sand (SM) some cementation
□	B360-7	3.5			Brown silty fine sand (SM)
△	B360-6	6.5			Green-gray silty fine sand (SM) w/shells
◇	B360-8	4			Dark silty fine sand (SM)

Remark :

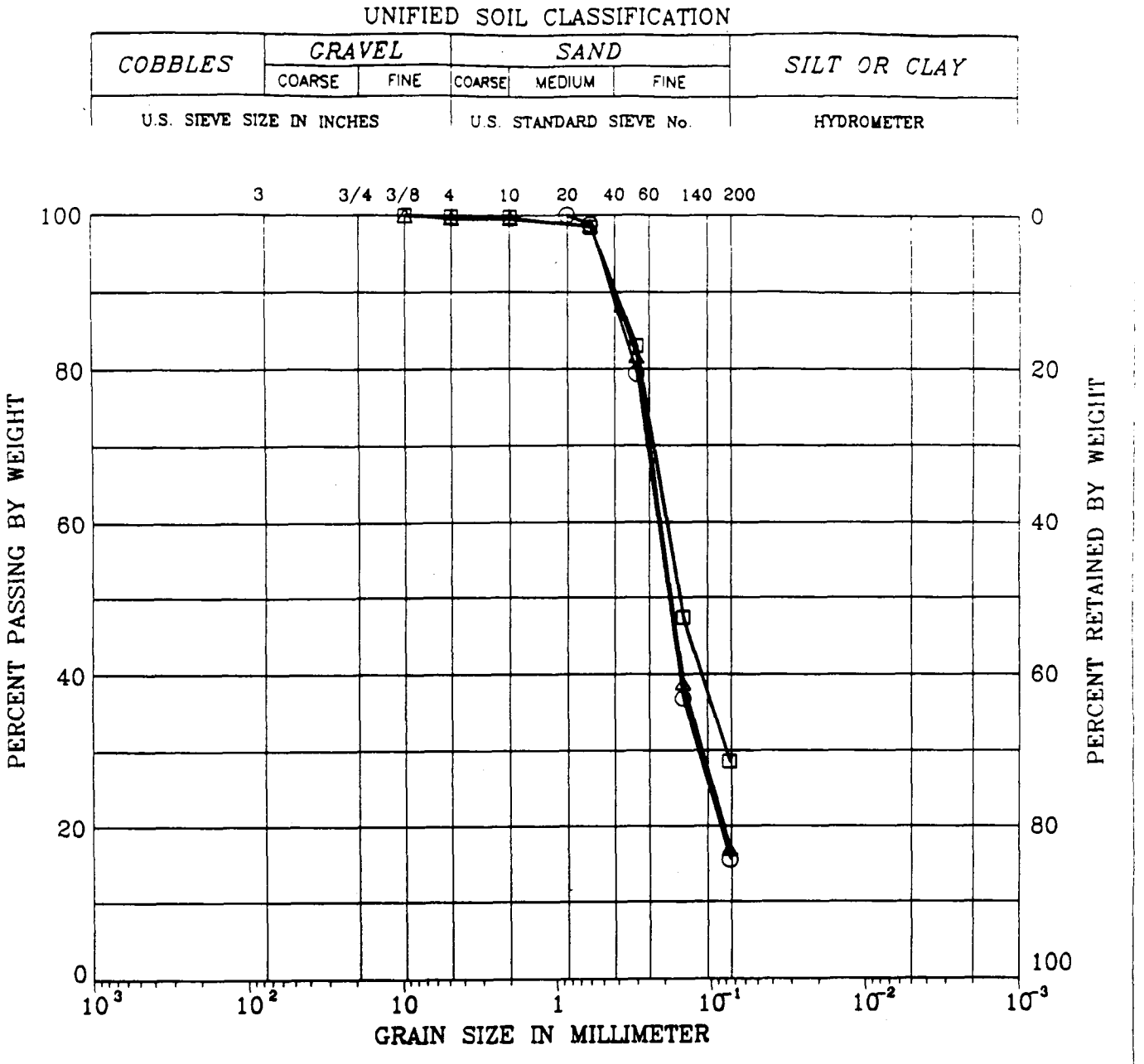
Project No.034-13b	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.3



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	B360-8	7			Mottled gray & brown clayey sand (SC)
□	B360-9	4			Gray silty fine sand (SM)
△	B360-9	13			Brown silty fine sand (SM)
◇	MW547-1	3.5			Green-gray silty fine sand (SM)

Remark :

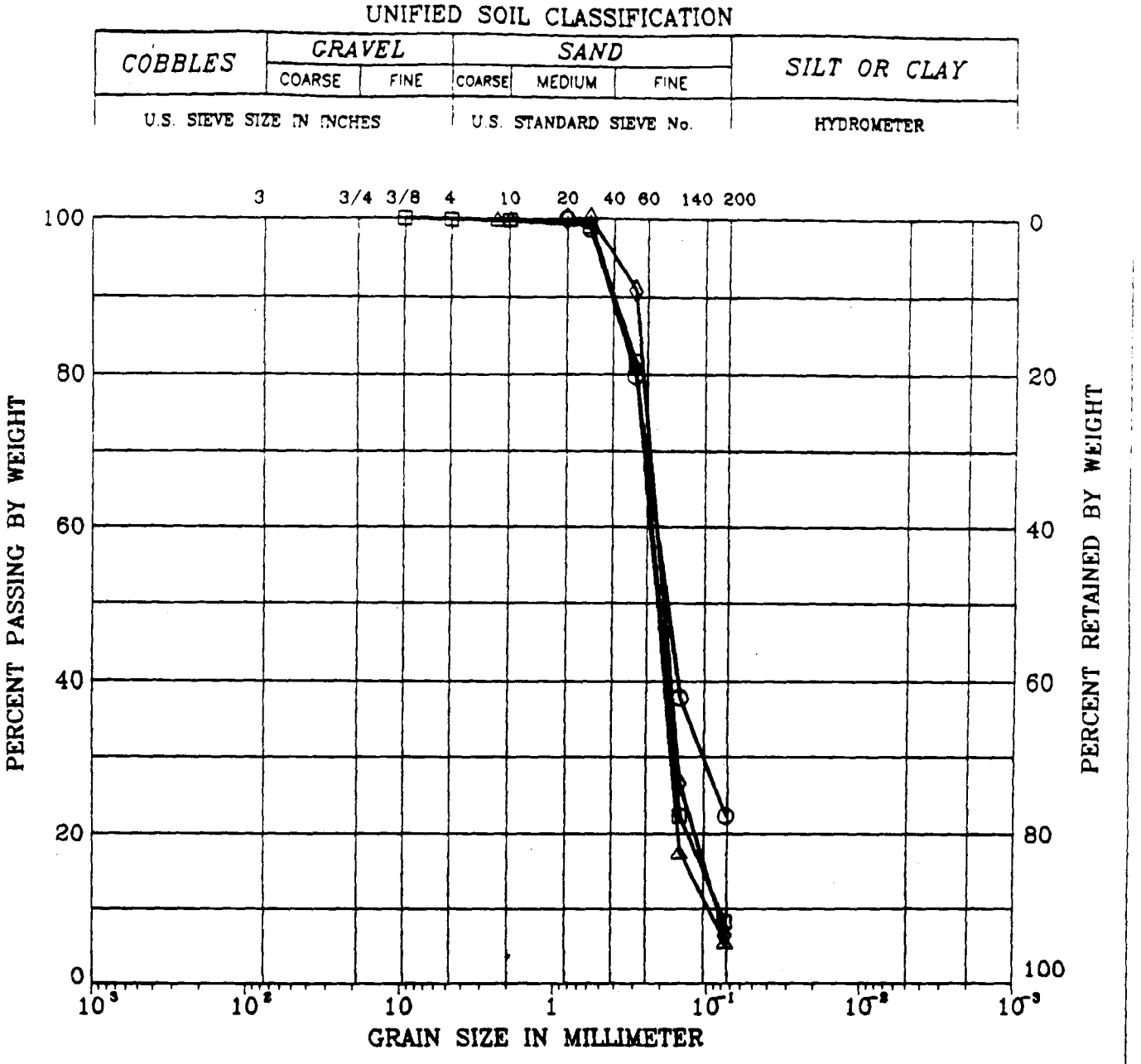
Project No.034-13c	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.4



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MW547-4	3.5			Brown silty fine sand (SM)
□	MW547-4	4			Dark brown silty fine sand (SM)
△	MW547-5	6			Dark brown silty fine sand (SM)

Remark :

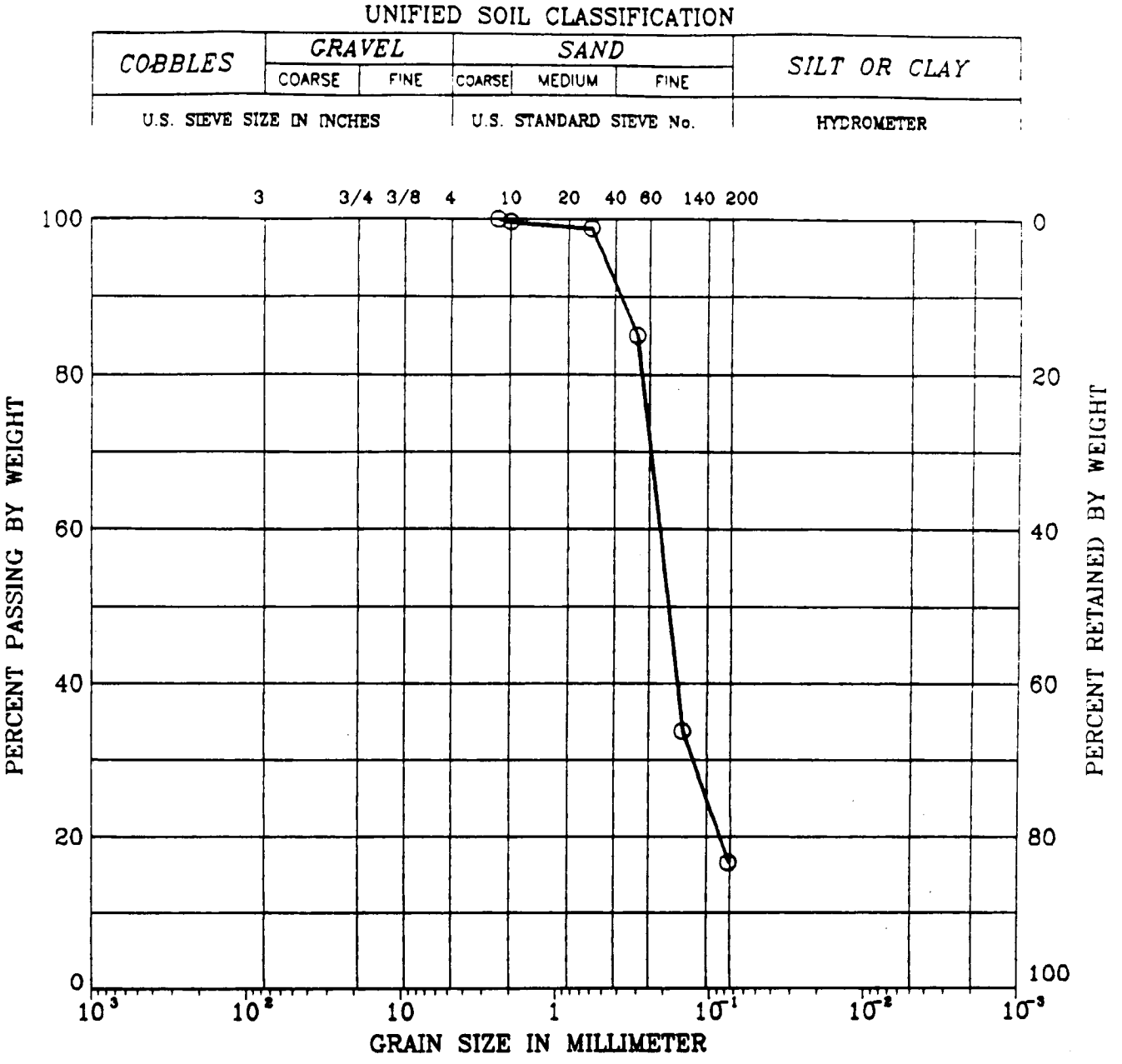
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.16



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MW547-2	3.5			Dark gray-brown silty fine sand (SM)
□	MW547-3	1			Brown fine sand w/silt (SP/SM)
△	B547-7	3.5			Green-brown fine sand w/silt (SP/SM)
◇	B547-8	2.5			Green-brown fine sand w/silt & shells (SP/SM)

Remark :

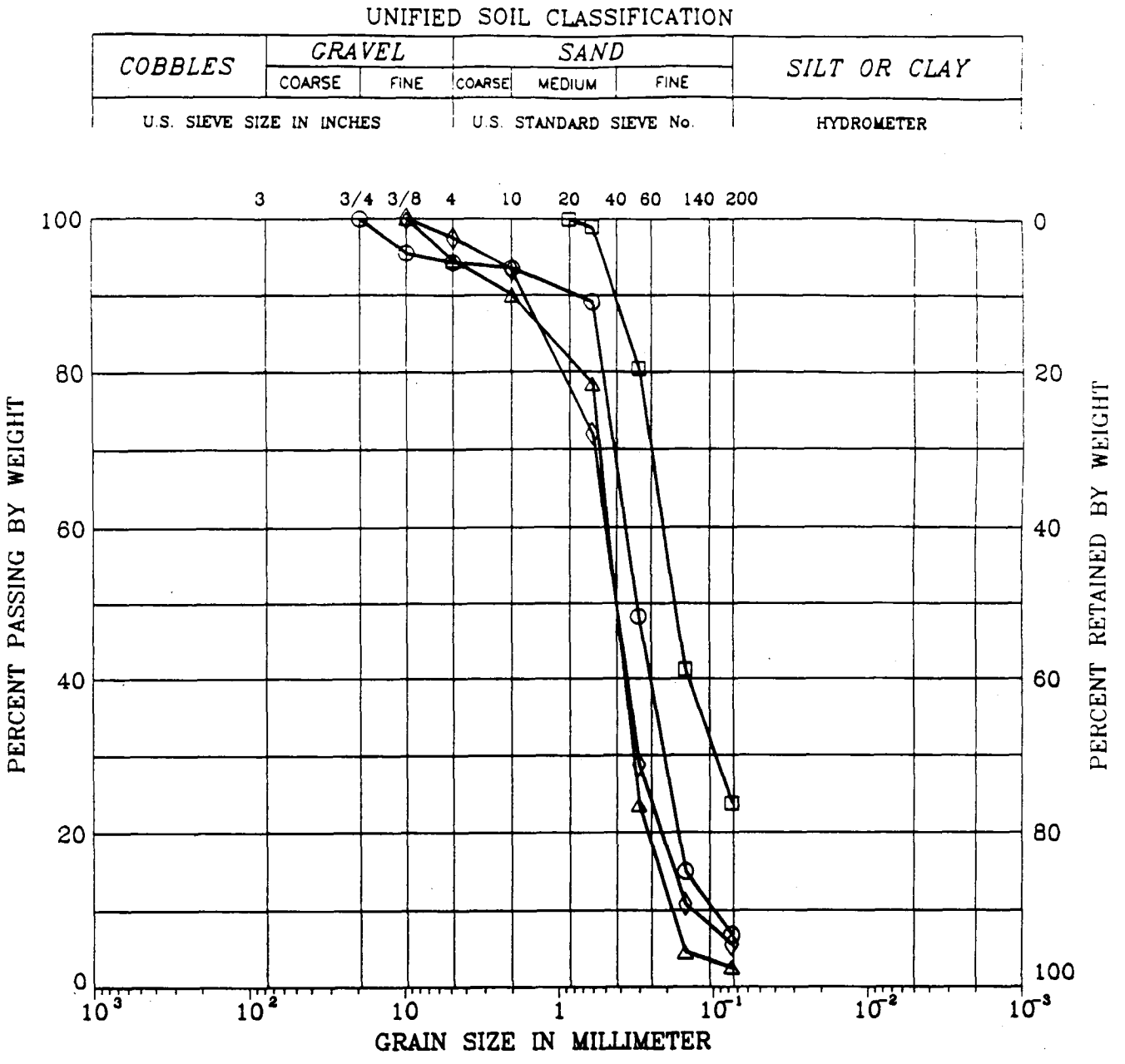
Project No034-13d	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.5



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
O	B547-9	2			Brown silty fine sand (SM)

Remark :

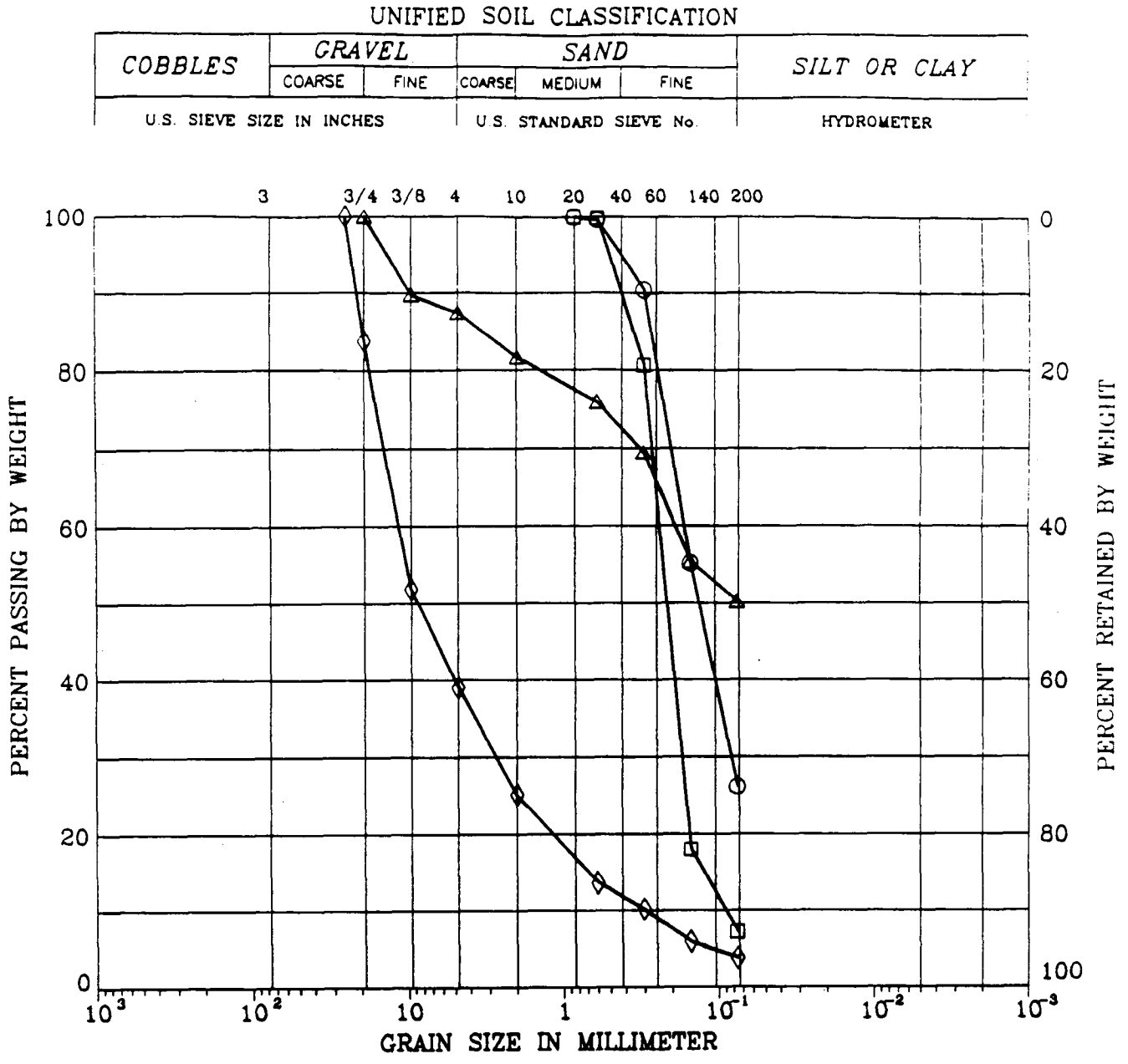
Project No.034-13e	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.6



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BD13-6	7			Brown fine sand w/silt & some gravel (SP/SM)
□	BD13-7	10			Light brown clayey fine sand (SC)
△	BD13-9	7			Brown fine to medium sand w/fine gravel
◇	BD13-9	9.5			Brown fine sand w/silt (SP/SM)

Remark :

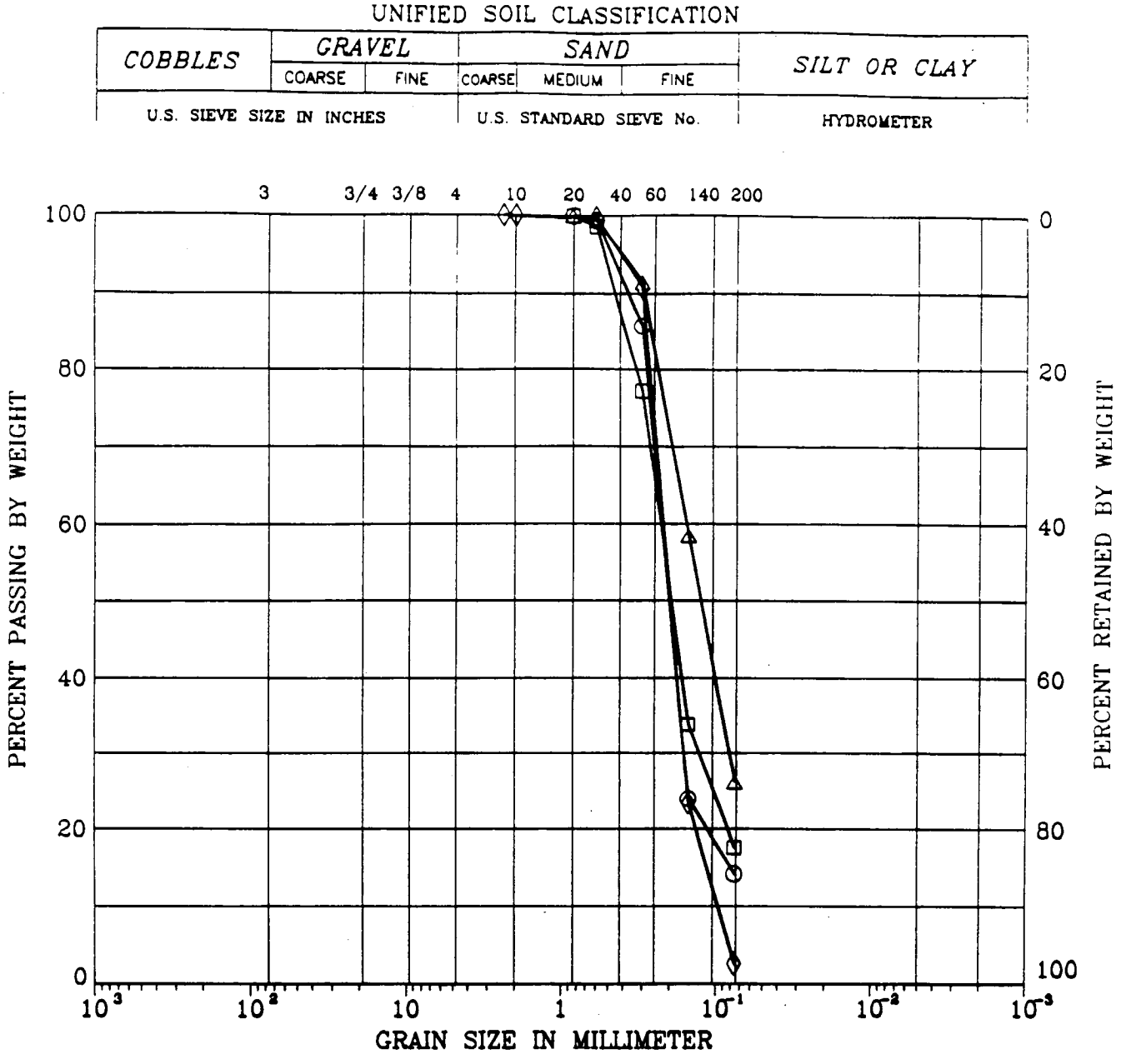
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.1



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BD13-10	9.5			Brown silty fine sand (SM)
□	BD13-11	3			Light brown fine sand w/silt (SP/SM)
△	BD13-11	10	43	20	Gray sandy clay/clayey sand w/gravel (CL/SC)
◇	BD13-11	7.5			Brown sandy gravel (GW)

Remark :

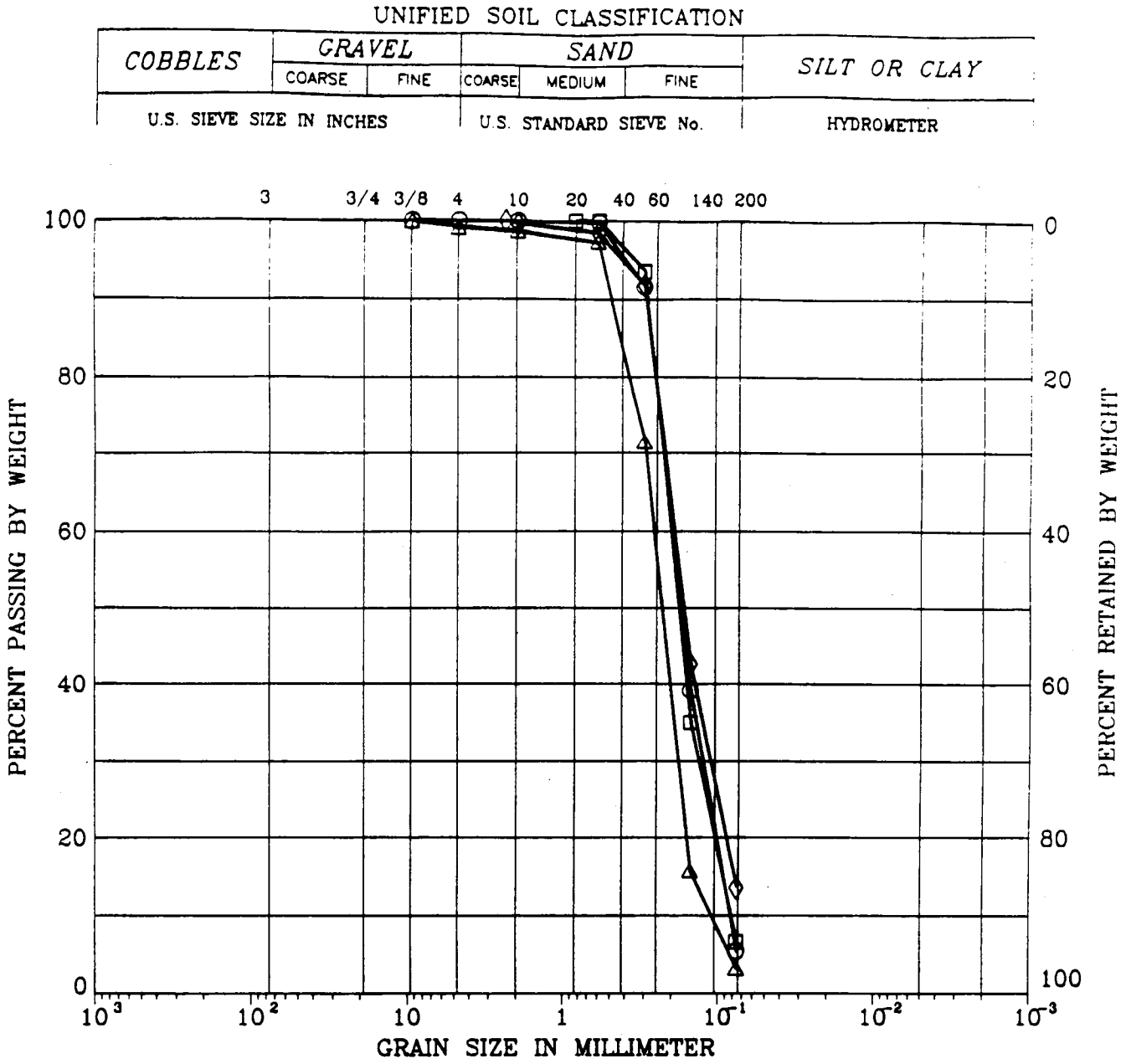
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No. 2



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BD13-12	7.5			Dark gray silty to clayey sand (change)
□	BD13-13	9			Brown silty fine sand (SM)
△	Bor 7	10.5			Brown silty fine sand (SM)
◇	Bor 8	0.5			Brown fine sand (SP)

Remark :

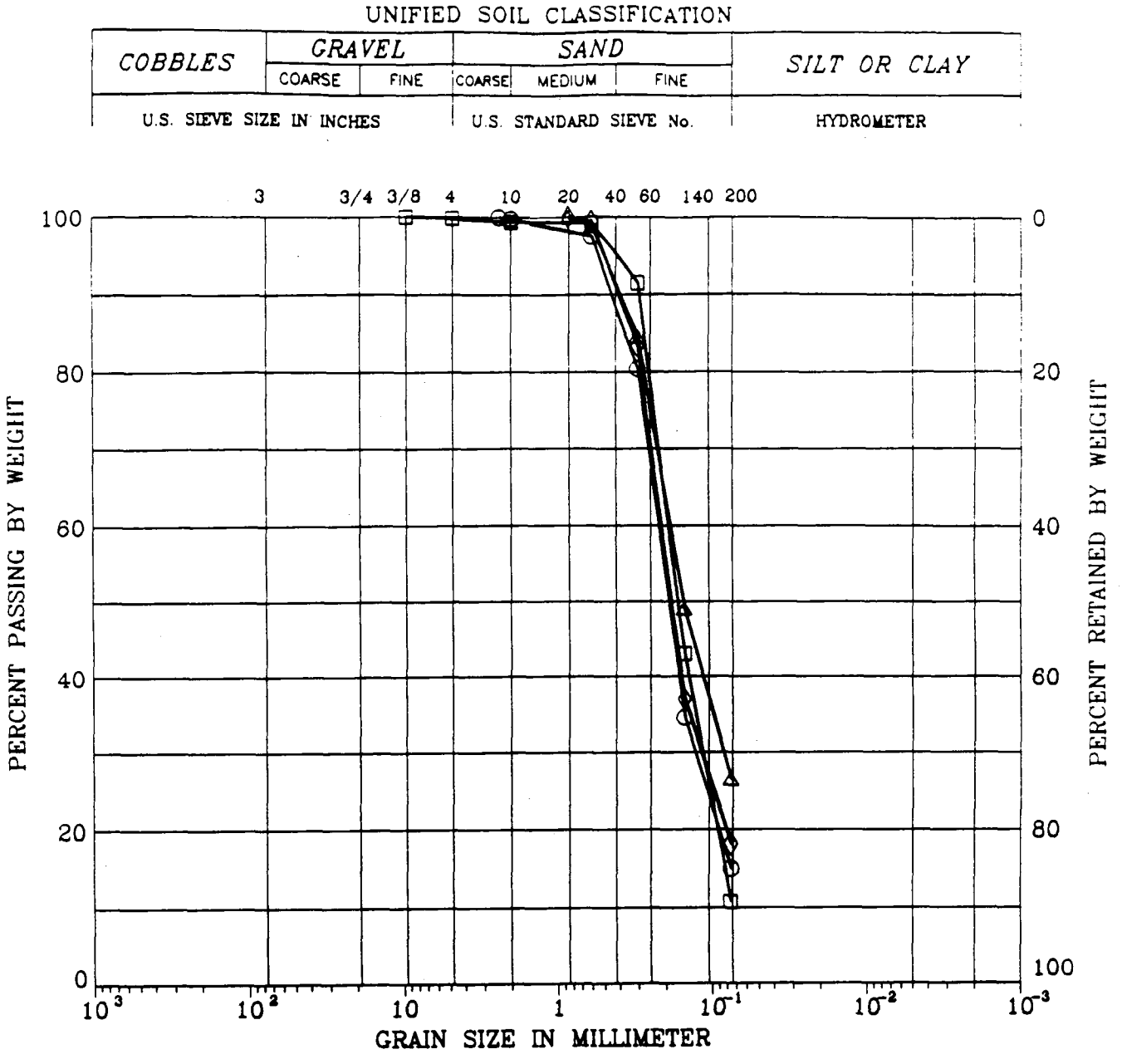
Project No.034-14	canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.3



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MW410-1	9.5			Grayish brown fine sand w/silt (SP/SM)
□	MW410-2	10.5			Gray fine sand w/silt (SP/SM)
△	MW410-3	4.5			Grayish brown fine sand w/shells (SP)
◇	MW410-4	13.5			Black silty fine sand (SM)

Remark :

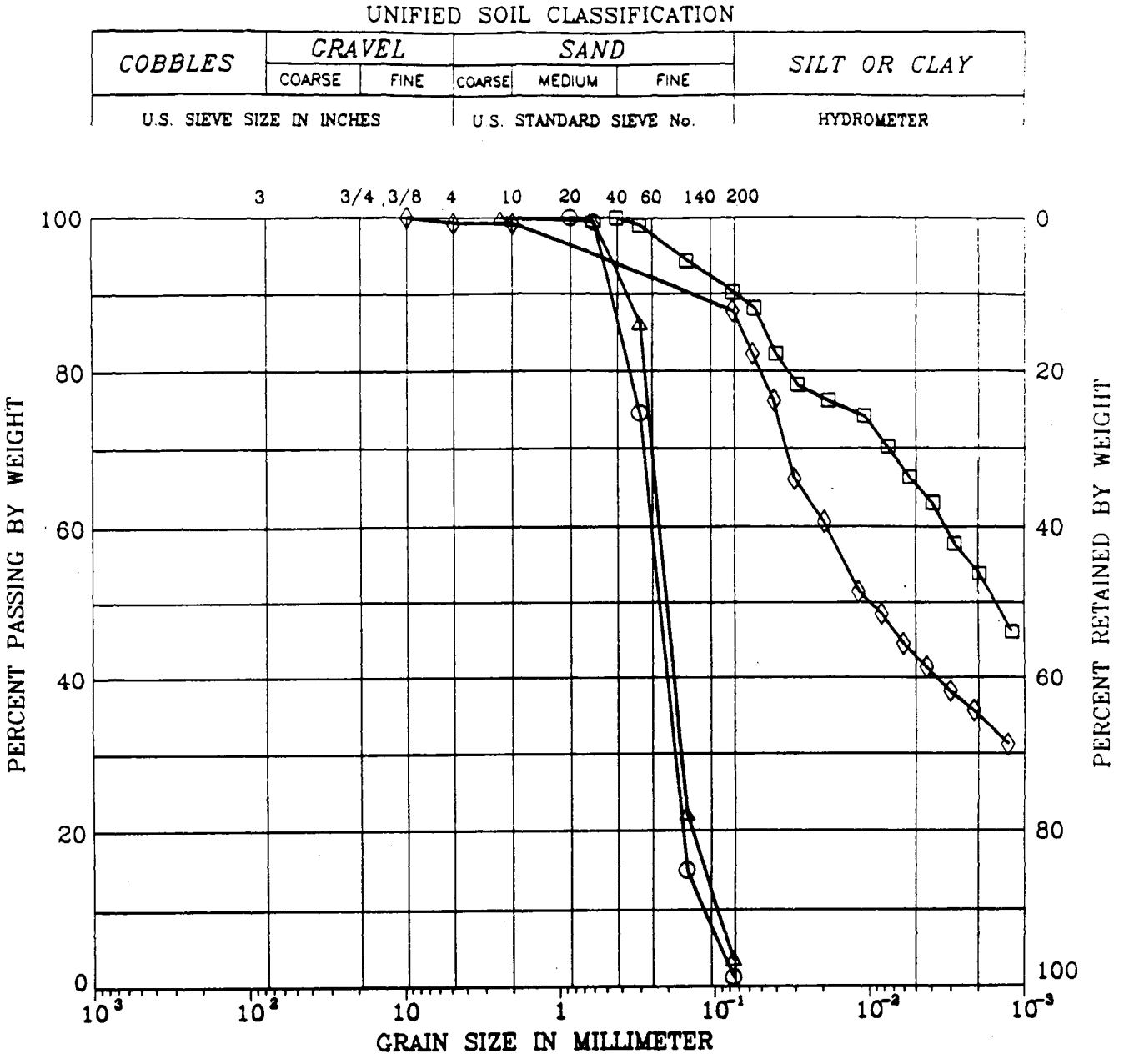
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.15



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MWC2-2	13.5			Garish brown silty fine sand w/lens of baymud
□	MWD13-1	2			Light brown fine sand w/silt (SP/SM)
△	MWOR-1	10			Brown silty fine sand (SM)
◇	MWOR-1	10.5			Brown silty fine sand (SM)

Remark :

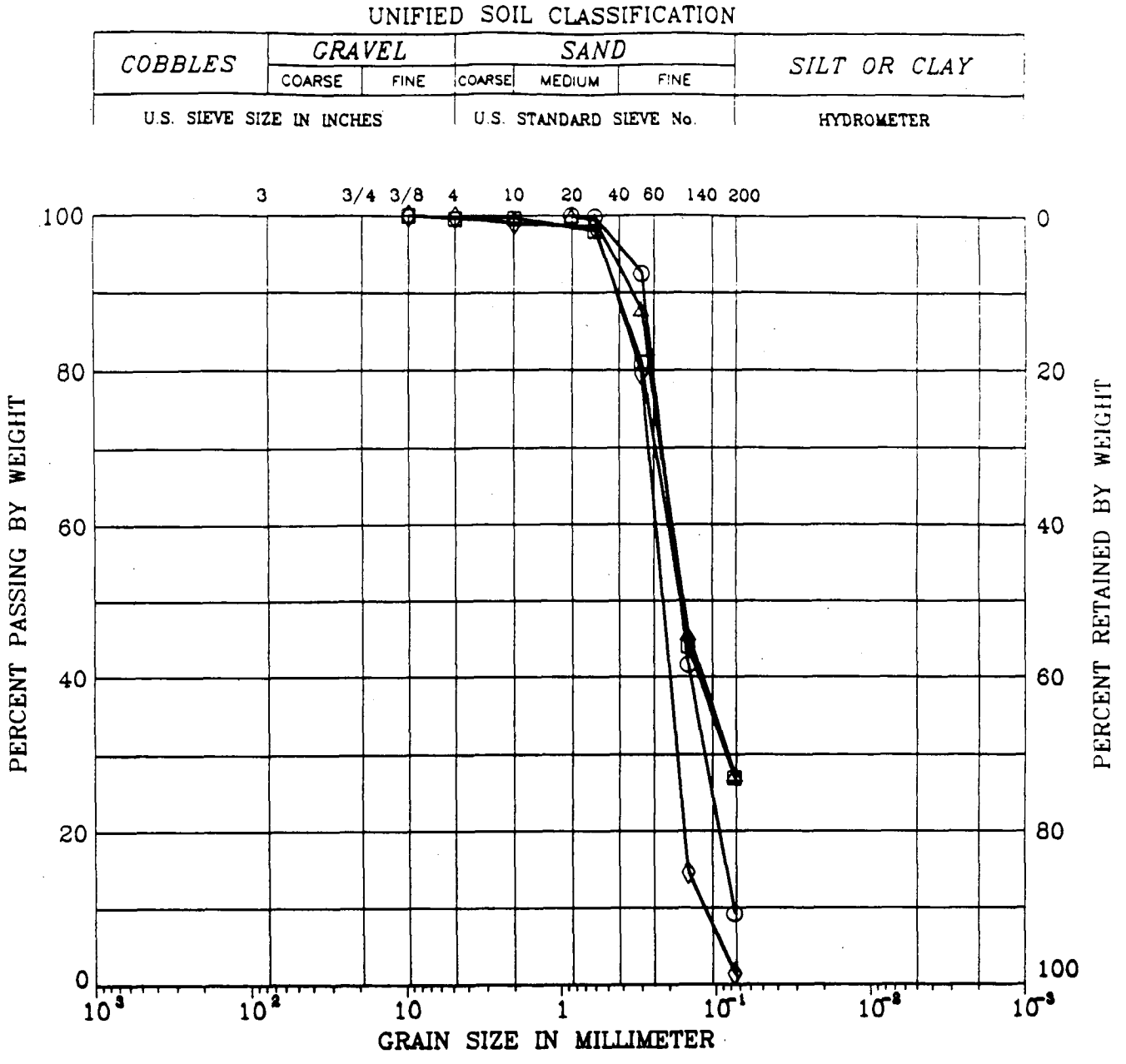
Project No.034-141	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.13



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	Bor 10	2			Brown fine sand (SP)
□	Bor 11	10.5	81	55	Mottled brown & gray silty clay (CH) baymud
△	Bor 12	10			Light gray fine sand w/shells (SP)
◊	Bor 13	9.5	56	34	Gray silty clay (CH) baymud

Remark :

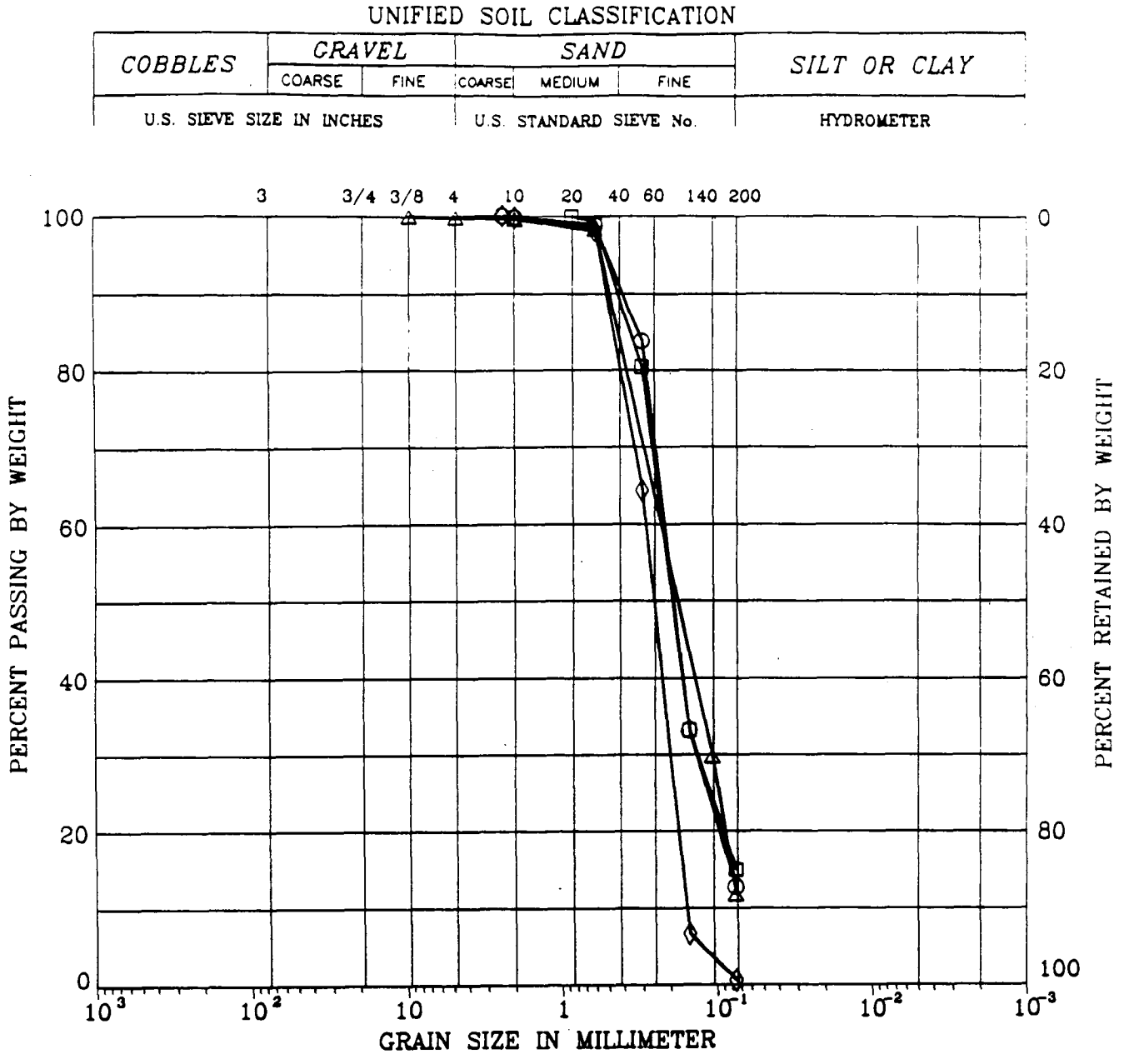
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.4



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	Bor 15	5.5			Greenish brown fine sand w/silt (SP)
□	Bor 16	10.5			Brown silty fine sand (SM)
△	Bor 18	10.5			Brown silty fine sand (SM)
◇	Bor 20	1			Tan fine sand w/shells

Remark :

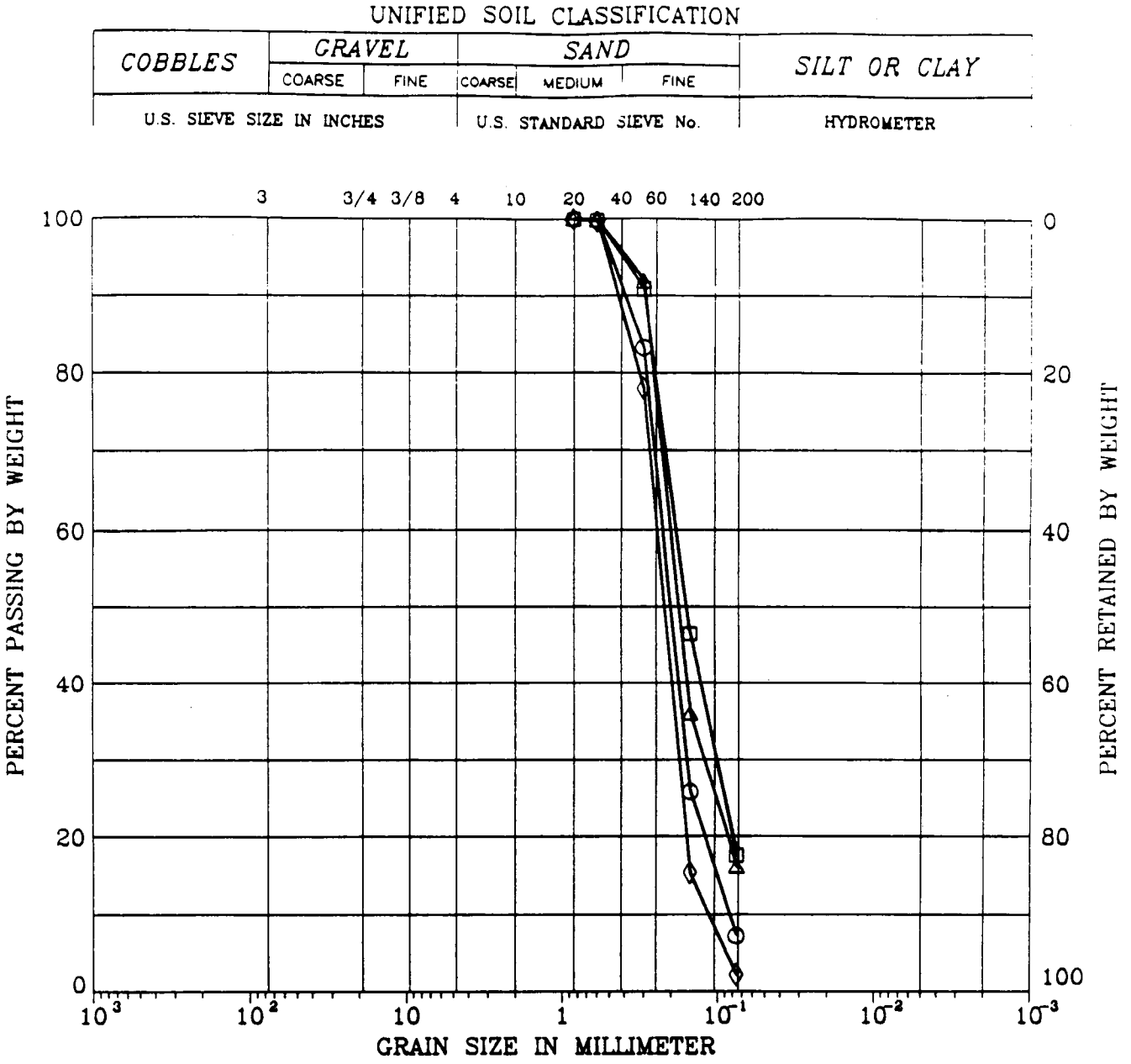
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.5



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	Bor 20	15			Grayish brown silty fine sand (SM)
□	Bor 21	13			Brown silty fine sand (SM)
△	Bor 22	12			Deposits of gray & gray-brown silty fine sand (SM)
◇	Bor 23	1.5			Brown fine sand (SP)

Remark :

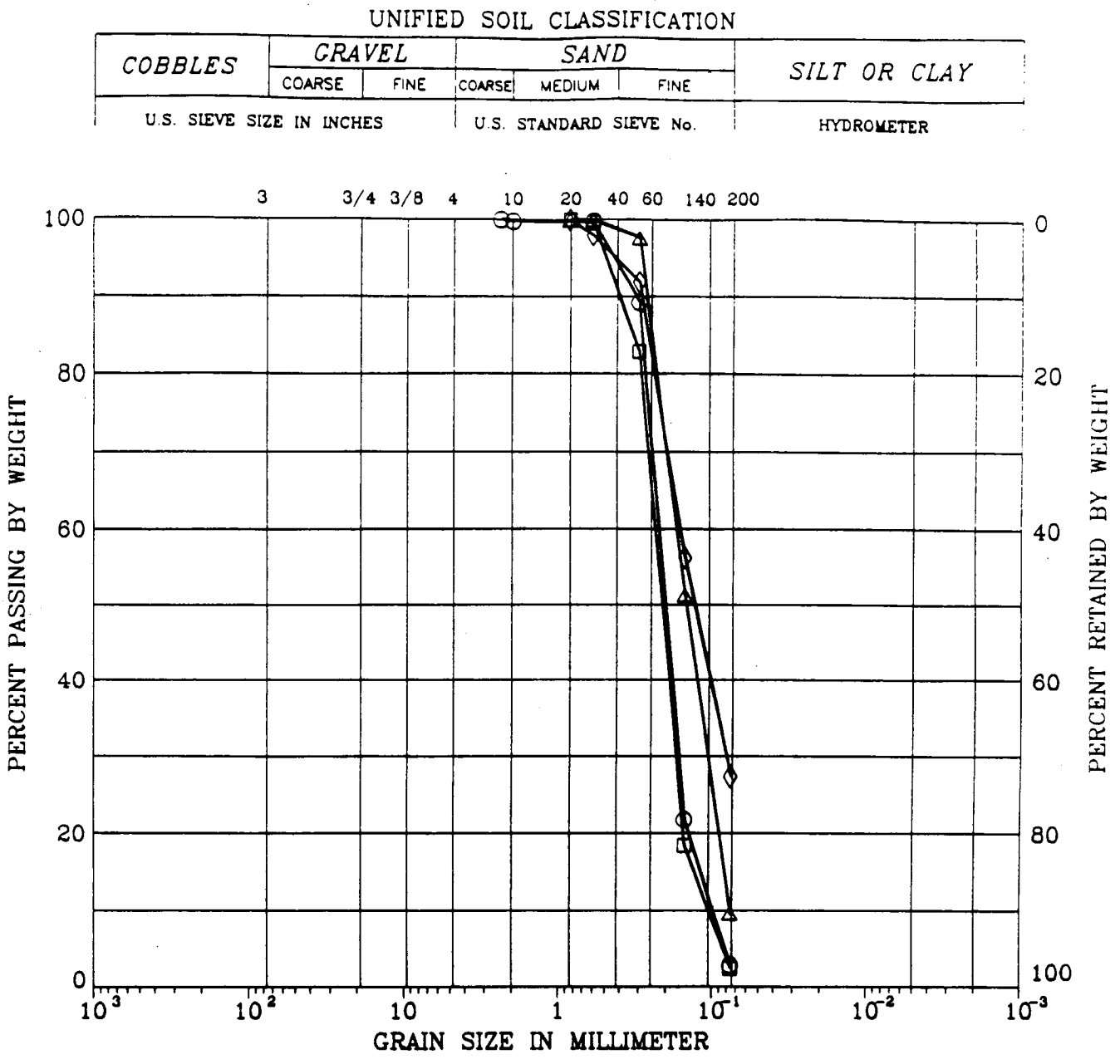
Project No.034-14e	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.6



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	Bor 23	10			Greenish brown fine sand w/silt (SP/SM)
□	Bor 24	13			Brown silty fine sand (SM)
△	B360-7	10			Brown silty fine sand (SM)
◇	B410-5	3.5			Tan fine sand (SP)

Remark :

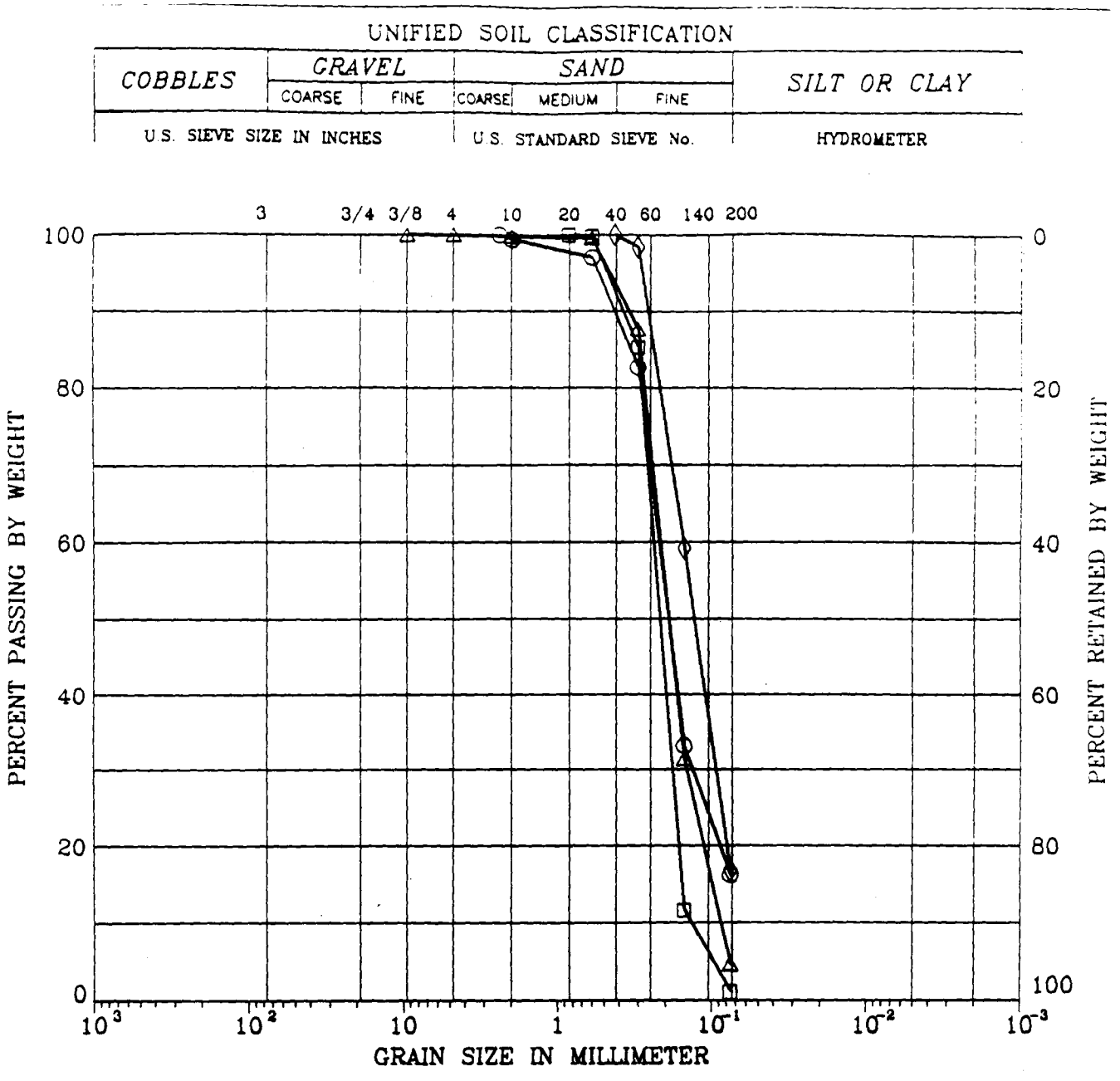
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.7



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	B410-6	2.5			Grayish brown fine sand (SP)
□	BC2-4	1			Brown fine sand (SP)
△	BC2-4	7			Greenish brown fine sand w/silt (SP/SM)
◇	BC2-4	12			Intermingled deposits of sand & clay

Remark :

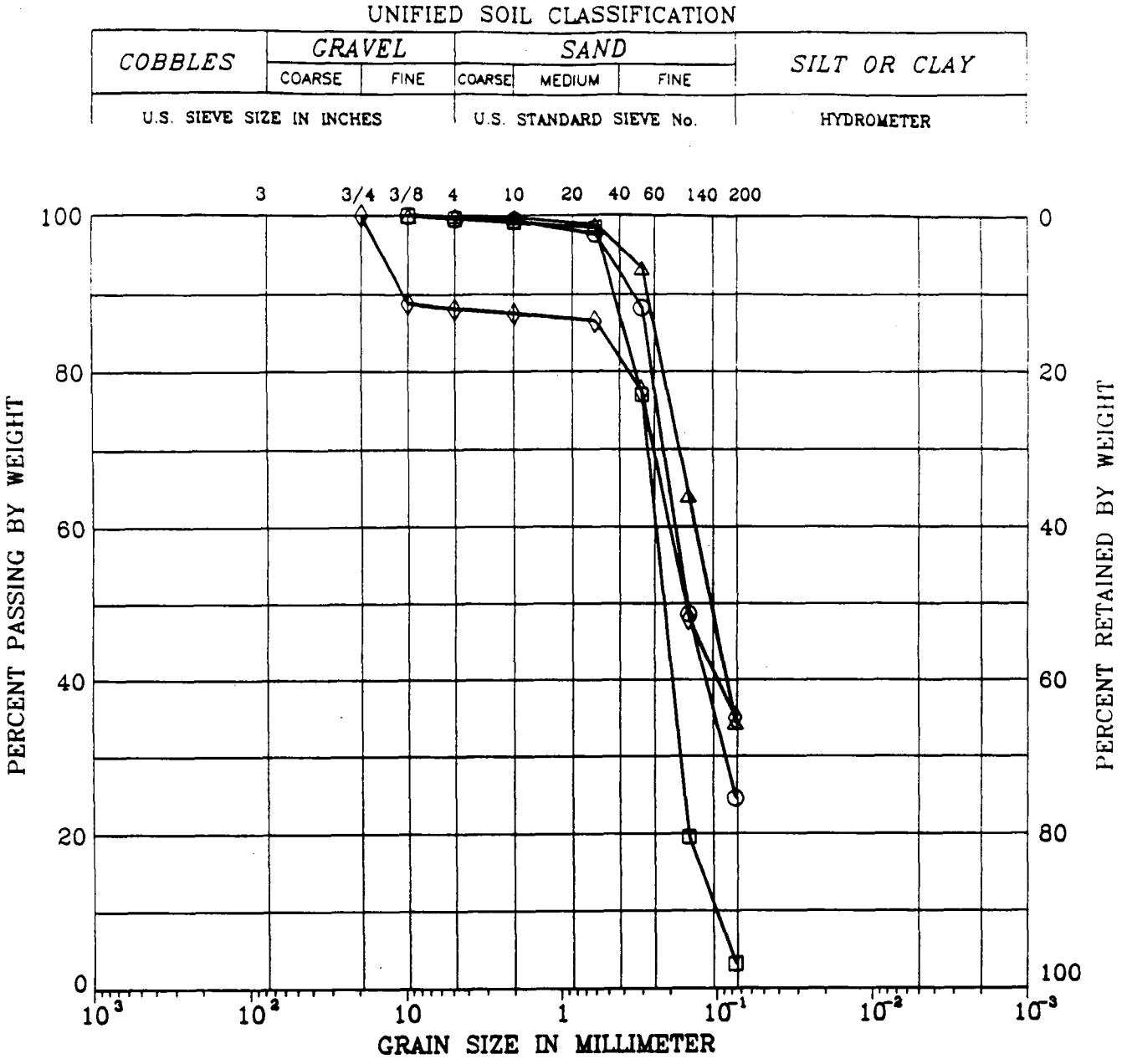
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.8



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BC2-9	12.5			Gray silty fine sand (SM)
□	MWC2-1	3.5			Brown fine sand (SP)
△	MWC2-1	6.5			Grayish brown fine sand (SP)
◇	MWC2-2	13			Greenish brown silty fine sand (SM)

Remark :

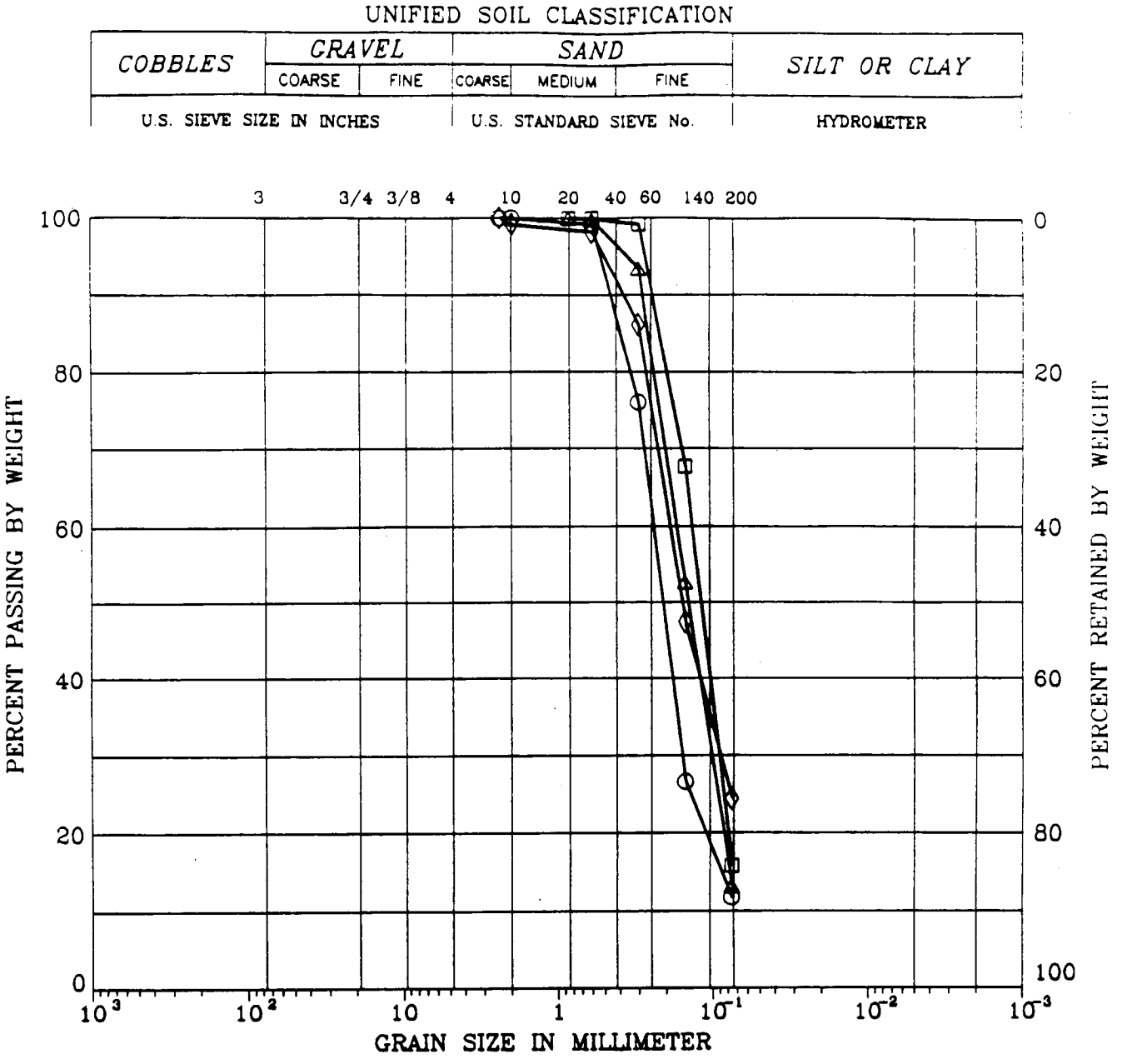
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.12



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BC2-4	12.5	23	5	Gray silty clayey fine sand (SC/SM)
□	BCS-5	9.5			Fine sand w/shells
△	BC2-5	13	26	8	Intermingled deposits of sand & clay (SC)
◇	BC2-6	5.5	39	26	Greenish gray clayey sand (SC)

Remark :

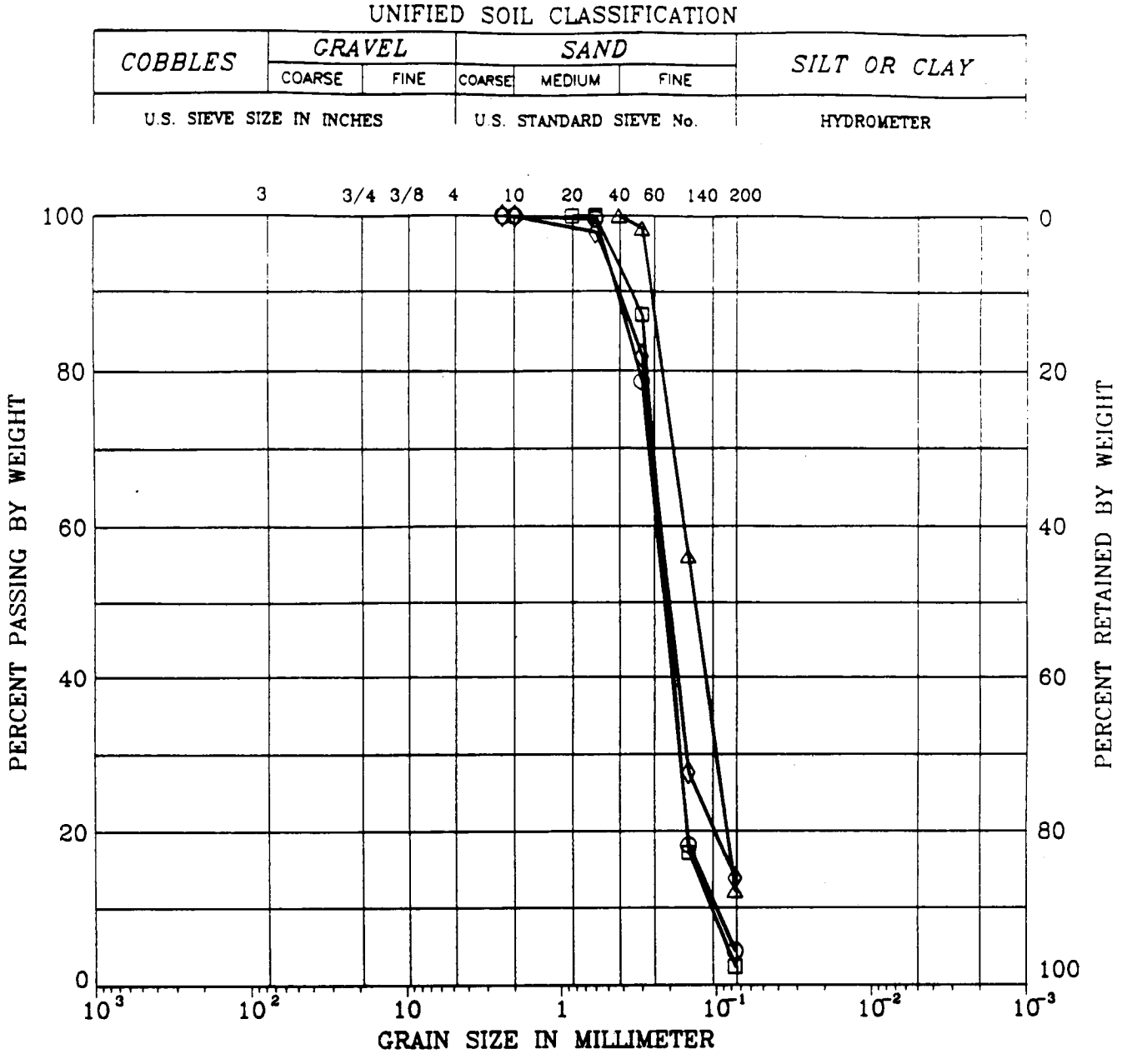
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.9



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BC2-8	2			Light brown fine sand (SW/SM)
□	BC2-8	8.5			Greenish brown silty fine sand (SM)
△	BC2-8	10			Green silty fine sand (SM)
◇	BC2-8	12			Gray & green intermingled deposits of sand & silt

Remark :

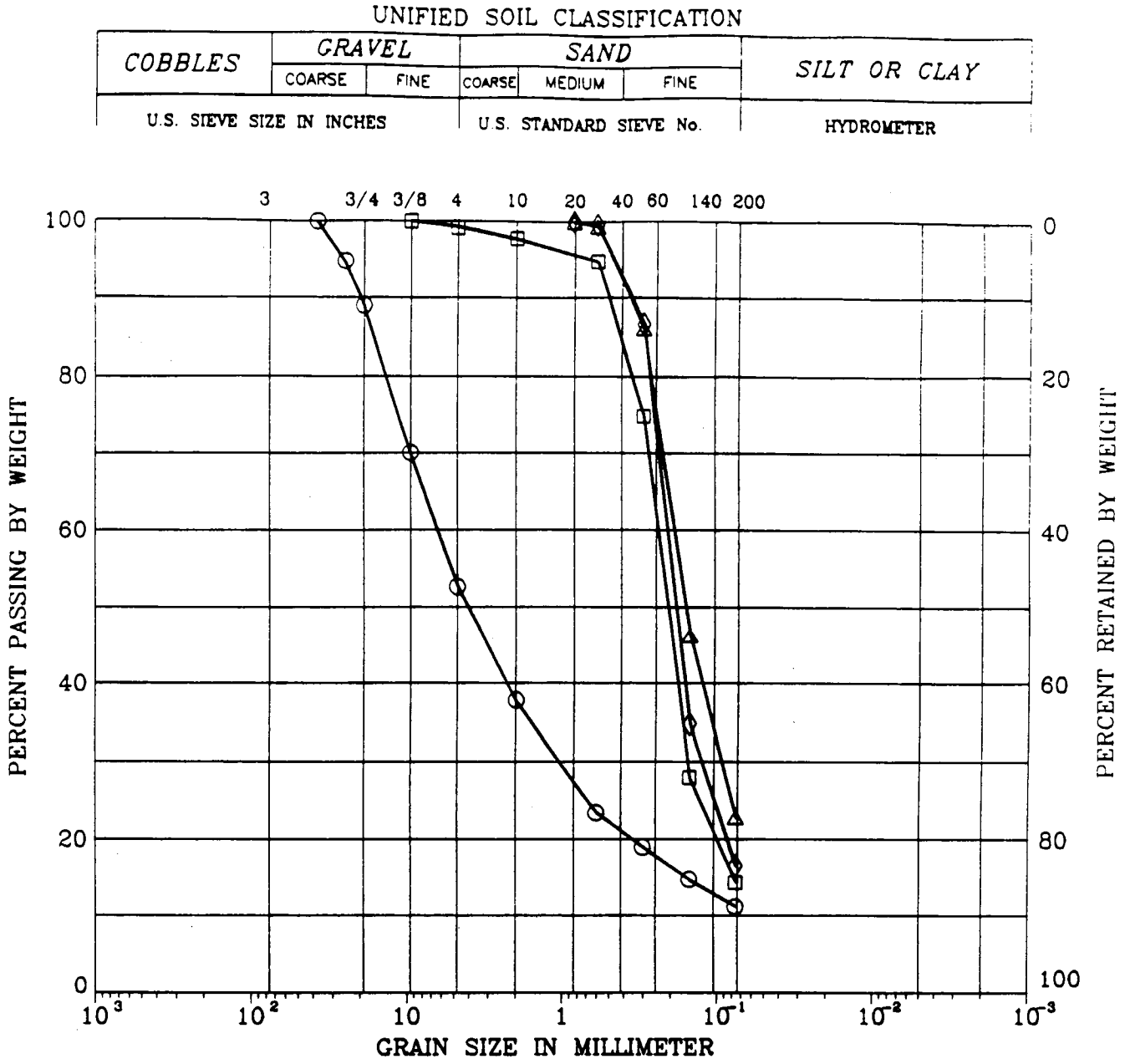
Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.10



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	BC2-9	1			Greenish brown fine sand (SP)
□	BC2-9	2			Brown fine sand (SP)
△	BC2-9	8			Light brown silty fine sand (SM)
◇	BC2-9	11.5			Gray & green silty sand (SM)

Remark :

Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.11



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	MWOR-4	1			Red crushed rock (GP)
□	MW97-3	1			Brown silty fine sand (SM)
△	MW97-3	12.5			Brown silty fine sand (SM)
◇	MW360-2	11			Brown silty fine sand (SM)

Remark :

Project No.034-14	Canonie 86-018-1806
Cooper Testing Labs Mountain View CA	GRAIN SIZE DISTRIBUTION Figure No.14

APPENDIX C

PERMEABILITY RESULTS

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 16.5 %
Initial Dry Density 102.1 pcf.
Perm. at 20°C 2×10^{-3} cm/sec

Job 034-13 (CANONIE 86-018-1906) Boring No. 360-1 Sample No. ____ Depth 4'

Date Sampled ____ By ____ : Test Started 9/5/90 By DC : Computed by ____

Description of Soil GREENISH BROWN FINE SAND (SP) Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
544	631	9/5	1030	SATURATING								
-100			1120	0	5.0	0		1				
444	630		1130	.17	26.8	21.8	20.71		1.9×10^{-3}	23	.93	1.7×10^{-3}
			1141	.35	49.4	44.4	42.18		1.8×10^{-3}	23	.93	1.7×10^{-3}
			1159	.65	91.4	86.4	82.08		1.9×10^{-3}	23	.93	1.8×10^{-3}
			1306	0	4.2	0				—		
			1317	.18	34.8	30.6	29.07		2.5×10^{-3}	24	.91	2.2×10^{-3}
			1331	.42	72.4	68.2	64.79		2.3×10^{-3}	24	.91	2.1×10^{-3}
			1341½	.59	100.4	96.2	91.39		2.4×10^{-3}	24	.91	2.1×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-5} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
123.3	Wt. of 1 rings + soil	126.7
34.7	Wt. of ____ rings	34.7
88.6	Wt. of soil	92.0
1.342	Ring Factor	1.342
118.9	WET DENSITY, PCF	123.5
	Wt. of soil + dish No. 39	113.2
	Dry wt. of soil + dish	97.3
	Net loss of moisture	15.9
	Wt. of dish	21.5
	Wt. of dry soil	75.8
16.5	MOISTURE CONTENT, %	21.0
102.1	DRY DENSITY, PCF	

d = 1.90"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-5}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 21.5 %
Initial Dry Density 105.6 pcf
Perm. at 20°C 5×10^{-8} cm/sec

Job 034-13 (SANDNIE 86-018-1806) Boring No. 360-1 Sample No. _____ Depth 10/2'

Date Sampled _____ By _____ : Test Started 9/5/80 By DC : Computed by _____

Description of Soil BROWN CLAYEY FINE SAND (SC) DENSE Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
675	575	9/5	1205	SATURATING								
-100		9/6	847	0	20.0	0		36		–		
575	572		1546	6.98	21.1	1.10	1.045		6.3×10^{-8}	25	.88	5.6×10^{-8}
		9/7	932	24.75	23.8	3.80	3.61		6.2×10^{-8}	22	.95	5.9×10^{-8}
			1001	32.23	24.8	4.80	4.56		6.0×10^{-8}	26	.87	5.2×10^{-8}
		9/8	1442	55.92	28.0	8.00	7.60		5.7×10^{-8}	26	.87	5.0×10^{-8}
		9/9	1132	74.75	30.1	10.10	9.60		5.4×10^{-8}	23	.93	5.0×10^{-8}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
130.3	Wt. of 1 rings + soil	130.4
34.6	Wt. of _____ rings	34.6
95.7	Wt. of soil	95.8
1.342	Ring Factor	1.342
128.4	WET DENSITY, PCF	128.6
	Wt. of soil + dish No. 5	114.6
	Dry wt. of soil + dish	97.7
	Net loss of moisture	16.9
	Wt. of dish	19.8
	Wt. of dry soil	77.9
21.5	MOISTURE CONTENT, %	21.7
105.6	DRY DENSITY, PCF	

d = 1.90"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

SUMMARY

Initial Moisture Content 23.3 %
Initial Dry Density 104.7 pcf.
Perm. at 20°C 9×10^{-7} cm/sec

LABORATORY PERMEABILITY TEST DATA SHEET

CANONIE

Job 534-13 86-018-1806 Boring No. 360-2 Sample No. ____ Depth 13.5'

Date Sampled ____ By ____ : Test Started 9/5/90 By DC : Computed by ____

Description of Soil BROWN SILTY SAND (SM) SATURATED Checked by ____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Search Dial Before Corr.	Dial Readings in .001 inch: Deff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
817	590	9/5	1344	SATURATING								
-060		9/6	848	0	32.0	0		9		—		
757	585		1546	6.97	37.2	5.2	4.94		1.2×10^{-6}	25	.89	1.1×10^{-6}
		9/7	933	24.75	49.4	17.4	16.53		1.1×10^{-6}	22	.95	1.1×10^{-6}
			1702	32.23	54.1	22.1	21.0		1.1×10^{-6}	26	.87	9.6×10^{-7}
		9/8	1613	55.92	67.4	35.4	33.63		1.0×10^{-6}	26	.87	8.8×10^{-7}
		9/9	1132	74.73	77.0	45.0	42.75		9.7×10^{-7}	23	.93	9.0×10^{-7}
		9/10	1032	97.73	87.6	55.6	52.82		9.1×10^{-7}	22	.95	8.7×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
130.8	Wt. of 1 rings + soil	128.4
34.6	Wt. of ____ rings	34.6
96.2	Wt. of soil	93.8
1.342	Ring Factor	1.342
129.1	WET DENSITY, PCF	125.9
	Wt. of soil + dish No. 68	112.6
	Dry wt. of soil + dish	97.0
	Net loss of moisture	15.6
	Wt. of dish	19.8
	Wt. of dry soil	77.2
23.3	MOISTURE CONTENT, %	20.2
104.7	DRY DENSITY, PCF	

d = 1.90"
$K = 1.52 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-13 (CANONILE 86-018-18016

BORING NO.: B360-8 SAMPLE NO.: _____ DEPTH (FT): 7 SAMPLED BY: _____ /

LABORATORY CLASSIFICATION: MOTTLED GRAY & BROWN V. CLAYEY SAND (SC)

TESTED BY: DC 9/6/90 COMPUTED BY: _____ / / CHECKED BY: _____ /

TYPE OF SAMPLE: ☑ Undisturbed ☐ Remolded

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.00	.99
Sample Diameter (In.)	1.93	1.93
Sample Area (In.^{2})	2.93	2.93
Sample Volume (In.^{3})	2.93	2.90
VOID RATIO		
Volume of Sample - V_t (CC)	48.01	47.53
Volume of Solid - V_s (CC)	28.78	28.78
Volume of Void - V_v (CC)	19.23	18.75
Void Ratio - e	.668	.652
Degree of Saturation - S (%)	95.7	99.7

Specific Gravity (ASSUMED) 2.7

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		116.7
Dry Weight + Tare, gm		98.0
Weight of Water, gm		18.7
Weight of Tare, gm #32		20.3
Weight of Dry Soil, gm		77.7
Moisture Content, %	23.7	24.1
Total Wet Weight, gm	96.1	96.4
Total Dry Weight, gm	77.7	77.7
Weight of Water, gm	18.4	18.7
Wet Density, pcf	125.1	126.5
Dry Density, pcf	101.1	102.0

Cell# 1

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 20.1 %
Initial Dry Density 109.5 pcf.
Perm. at 20°C 3×10^{-7} cm/sec

Job 034-13 (CANONITE 86-018-806) Boring No. 547-2 Sample No. _____ Depth 10½'

Date Sampled _____ By _____ : Test Started 9/7/90 By DC : Computed by _____

Description of Soil BROWN SILTY SAND (SM) SATURATED Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Switch Dial Before Corr.	Dial Readings in .001 inch: Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
522	114	9/7	1328	SATURATING								
-100		9/10	1032	0	35.6	0		17		–		
422	111		1750	7.3	38.2	2.60	2.47		3.1×10^{-7}	24	.91	2.8×10^{-7}
		9/11	930	20.03	43.6	8.0	7.60		3.5×10^{-7}	21	.98	3.4×10^{-7}
			1708	30.60	46.2	10.6	10.07		3.0×10^{-7}	25	.89	2.7×10^{-7}
		9/12	1010	47.63	52.0	16.4	15.58		3.0×10^{-7}	23	.93	2.8×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
129.7	Wt. of 1 rings + soil	128.5
28.7	Wt. of _____ rings	28.7
101.0	Wt. of soil	99.8
1.302	Ring Factor	1.302
131.5	WET DENSITY, PCF	129.9
	Wt. of soil + dish No. 64	120.4
	Dry wt. of soil + dish	104.8
	Net loss of moisture	15.6
	Wt. of dish	21.3
	Wt. of dry soil	83.5
20.1	MOISTURE CONTENT, %	18.7
109.5	DRY DENSITY, PCF	

d = 1.93"

$K = 1.57 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-4}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

Initial Moisture Content	12.9 %
Initial Dry Density	100.6 pcf.
Perm. at 20°C	1×10^{-3} cm/sec

LABORATORY PERMEABILITY TEST DATA SHEET

Job 034-13 (CANONIE F6-018-1406) Boring No. 3547-9 Sample No. _____ Depth 2'

Date Sampled _____ By _____ : Test Started 9/11/90 By DC : Computed by _____

Description of Soil BROWN SILTY FINE SAND (SM) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Search Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
695	058	9/11	1437	SATURATING								
100			1311	0	1.8	0		1		–		
595	056		1321	.17	15.8	14.0	13.3		1.2×10^{-3}	24	.91	1.1×10^{-3}
			1416	1.08	82.8	81.0	76.95		1.1×10^{-3}	25	.89	1.0×10^{-3}
			1512	0	2.6	0				–		
			1537	.42	56.4	53.8	51.11		1.8×10^{-3}	26	.87	1.6×10^{-3}
			1537	0	1.2	0				–		
			1545	.13	13.4	12.2	11.59		1.4×10^{-3}	25	.89	1.2×10^{-3}
			1558	.35	31.8	30.6	29.07		1.3×10^{-3}	25	.89	1.1×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
119.2	Wt. of 1 rings + soil	124.2
34.6	Wt. of _____ rings	34.6
84.6	Wt. of soil	89.6
1.342	Ring Factor	1.342
113.5	WET DENSITY, PCF	120.2
	Wt. of soil + dish No. 129	109.3
	Dry wt. of soil + dish	94.8
	Net loss of moisture	14.5
	Wt. of dish	20.7
	Wt. of dry soil	74.1
12.9	MOISTURE CONTENT, %	19.6
100.6	DRY DENSITY, PCF	

d = 1.90"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY:

Initial Moisture Content 5.5 %
Initial Dry Density 94.9 pcf.
Perm. at 20°C 4×10^{-4} cm/sec

Job 034-14 (CANDUVE 96-015-1506) Boring No. HW-D13-1 Sample No. _____ Depth 2'

Date Sampled _____ By _____ : Test Started 9/26/90 By DC : Computed by _____

Description of Soil LIGHT BROWN FINE SAND (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
813	057	9/26	1111	SATURATING								
-060			1146	0	2.8	0		1				
753	054		1305	1.32	38.0	35.2	33.44		4.0×10^{-4}	24	.91	3.6×10^{-4}
			1403	2.28	61.5	58.7	55.77		3.8×10^{-4}	25	.89	3.4×10^{-4}
			1523	3.62	93.6	90.8	86.26		3.7×10^{-4}	26	.87	3.2×10^{-4}
			1550	0	2.0	0				—		
			1612	.37	15.8	13.80	13.11		5.6×10^{-4}	26	.87	4.8×10^{-4}
			1646	.93	37.2	35.20	33.44		5.6×10^{-4}	26	.87	4.9×10^{-4}
			1754	2.07	76.0	74.00	70.30		5.3×10^{-4}	26	.87	4.6×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
100.7	Wt. of 1 rings + soil	112.1
23.8	Wt. of _____ rings	23.8
76.9	Wt. of soil	88.3
1.302	Ring Factor	1.302
100.1	WET DENSITY, PCF	115.0
	Wt. of soil + dish No. 124	108.6
	Dry wt. of soil + dish	93.2
	Net loss of moisture	15.4
	Wt. of dish	20.5
	Wt. of dry soil	72.7
5.5	MOISTURE CONTENT, %	21.2
94.9	DRY DENSITY, PCF	

d = 1.93"
$K = 1.57 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-1}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 16.8 %
Initial Dry Density 109.6 pcf.
Perm. at 20°C $1 \times 10^{-}$ cm/sec

Job 034-14 (LAKONE 96-018-R06) Boring No. B-D13-7 Sample No. _____ Depth 10'

Date Sampled _____ By _____ : Test Started 9/27/90 By DC : Computed by _____

Description of Soil LIGHT BROWN CLAYEY FINE SAND (SC) DENSE Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.50", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
524	101	9/27	1700	SATURATING								
100		9/28	851	0	33.8	0		15		–		
1124	599		1616	7.42	35.6	1.8	1.71		2.3×10^{-7}	24	.91	2.1×10^{-7}
		9/29	947	24.93	38.4	4.6	4.37		1.8×10^{-7}	23	.93	1.7×10^{-7}
		9/30	1028	49.62	42.0	8.2	7.79		1.6×10^{-7}	23	.93	1.5×10^{-7}
		10/1	835	71.73	44.6	10.8	10.26		1.4×10^{-7}	23	.93	1.3×10^{-7}
			1605	79.23	45.6	11.8	11.21		1.4×10^{-7}	24	.91	1.3×10^{-7}
		10/2	821	95.50	47.2	13.4	12.73		1.4×10^{-7}	20	1.0	1.4×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
129.9	Wt. of 1 rings + soil	131.2
34.5	Wt. of _____ rings	34.5
95.4	Wt. of soil	96.7
1.342	Ring Factor	1.342
128.0	WET DENSITY, PCF	129.8
	Wt. of soil + dish No. 27	116.8
	Dry wt. of soil + dish	101.8
	Net loss of moisture	15.0
	Wt. of dish	20.5
	Wt. of dry soil	81.3
16.8	MOISTURE CONTENT, %	18.5
109.6	DRY DENSITY, PCF	

d = 1.9"

$$K = 1.52 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content _____ %
Initial Dry Density _____ pcf.
Perm. at 20°C 5×10^{-8} cm/sec

Job 034-14 (CANONITE 86-018-1806) Boring No. B-4/10-7 Sample No. _____ Depth 10'

Date Sampled _____ By _____ : Test Started 9/24/90 By DC : Computed by _____

Description of Soil MIX OF BAYMUD & FINE SAND (SC) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
682	050	9/24	1159	SATURATING								
-100		9/25	914	0	2.2	0		22		–		
582	017		1338	4.4	5.4	3.2	3.04		4.9×10^{-7}	24	.91	4.5×10^{-7}
			1733	8.32	9.0	6.8	6.46		5.5×10^{-7}	25	.89	4.9×10^{-7}
		9/26	912	23.97	21.6	19.4	18.43		5.5×10^{-7}	22	.95	5.2×10^{-7}
			1712	31.97	27.6	25.4	24.13		5.4×10^{-7}	25	.89	4.8×10^{-7}
		9/27	1144	50.50	39.4	37.2	35.34		5.0×10^{-7}	24	.91	4.5×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
114.6	Wt. of 1 rings + soil	112.7
28.4	Wt. of _____ rings	28.4
86.2	Wt. of soil	84.3
1.302	Ring Factor	1.302
112.2	WET DENSITY, PCF	109.8
	Wt. of soil + dish No 61	103.6
	Dry wt. of soil + dish	80.5
	Net loss of moisture	23.1
	Wt. of dish	19.7
	Wt. of dry soil	60.8
41.1	MOISTURE CONTENT, %	38.0
79.5	DRY DENSITY, PCF	

d = 1.93"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 21.5 %
Initial Dry Density 99.5 pcf
Perm. at 20°C 6×10^{-6} cm/sec

Job 034-14 (CANONIE SR-019-1806) Boring No. MW-580-1 Sample No. _____ Depth 10'

Date Sampled _____ By _____ : Test Started 9/24/80 By DC : Computed by _____

Description of Soil MOTTLED LIGHT & DARK GRAY SILTY FINE SAND (SM) NEAR (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 320 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Corr. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
546	086	9/24	1145	SATURATING								
-100		9/25	912	0	2.7	0		15		–		
446	083		1001	.82	11.4	8.7	8.27		1.0×10^{-5}	23	.93	9.5×10^{-6}
			1130	2.30	24.5	21.8	20.71		9.1×10^{-6}	23	.93	8.5×10^{-6}
			1338	4.43	40.4	37.7	35.82		8.2×10^{-6}	24	.91	7.5×10^{-6}
			1732	8.33	61.2	58.5	55.58		6.8×10^{-6}	25	.89	6.0×10^{-6}
			1918	10.10	68.4	65.70	62.42		6.3×10^{-6}	25	.89	5.6×10^{-6}
		9/26	912	0	1.4	0				–		
			1140	2.47	9.6	8.2	7.79		3.2×10^{-6}	22	.95	3.0×10^{-6}
			1151	0	10.6	0		20		–		

OVER

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"
$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"
$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
124.7	Wt. of 1 rings + soil	124.9
34.6	Wt. of _____ rings	34.6
90.1	Wt. of soil	90.3
1.342	Ring Factor	1.342
120.9	WET DENSITY, PCF	121.2
	Wt. of soil + dish No. 39	111.6
	Dry wt. of soil + dish	95.5
	Net loss of moisture	16.1
	Wt. of dish	21.5
	Wt. of dry soil	74.0
21.5	MOISTURE CONTENT, %	21.8
99.5	DRY DENSITY, PCF	

d = 1.9"
$K = 1.52 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 17.5 %
Initial Dry Density 110.1 pcf.
Perm. at 20°C 2×10^{-7} cm/sec

Job 034-14 (CANONIE 86-018-1906) Boring No. MW-OR-1 Sample No. _____ Depth 10.5'

Date Sampled _____ By _____ : Test Started 10/12/90 By DC : Computed by ___

Description of Soil BROWN SILTY FINE SAND (SM) DENSE Checked by

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Deff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
684	050	10/12		SATURATING								
100		10/15	1305	0	22.6	0		36		–		
584	047		1747	4.70	24.6	2.0	1.9		1.7×10^{-7}	24	.91	1.5×10^{-7}
		10/16	820	19.25	32.2	9.6	9.12		1.9×10^{-7}	20	1.0	1.9×10^{-7}
			1654	27.82	36.0	13.4	12.73		1.8×10^{-7}	24	.91	1.7×10^{-7}
		10/17	759	42.90	43.6	21.0	19.95		1.9×10^{-7}	19	1.03	2.0×10^{-7}
			1647	51.70	46.8	24.2	22.99		1.8×10^{-7}	24	.91	1.7×10^{-7}
		10/18	846	67.68	54.0	31.4	29.83		1.8×10^{-7}	21	.98	1.8×10^{-7}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
126.4	Wt. of 1 rings + soil	126.5
27.0	Wt. of ____ rings	27.0
99.4	Wt. of soil	99.5
1.302	Ring Factor	1.302
129.4	WET DENSITY, PCF	129.5
	Wt. of soil + dish No. 55	119.1
	Dry wt. of soil + dish	104.2
	Net loss of moisture	14.9
	Wt. of dish	19.9
	Wt. of dry soil	84.3
17.5	MOISTURE CONTENT, %	17.7
110.1	DRY DENSITY, PCF	

d = 1.93"
$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 7.2 %
Initial Dry Density 98.9 pcf.
Perm. at 20°C 3×10^{-3} cm/sec

Job 034-14 (CANONILE 86-058-1806) Boring No. BOR-10 Sample No. ____ Depth 2

Date Sampled ____ By ____ : Test Started 10/10/90 By DC : Computed by ____

Description of Soil BROWN FINE SAND (SP) Checked by ____

☑ UNDISTURBED, d = ~~2.375"~~ 2.8", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Diff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
808	052	10/10	1535		SATURATING							
-060			830½	0	1.0	0		1		—		
748	049		833½	.05	12.0	11.0	10.45		3.3×10^{-3}	21	.98	3.2×10^{-3}
			842	.19	42.4	41.4	39.33		3.2×10^{-3}	21	.98	3.2×10^{-3}
			851	.34	73.4	72.4	68.78		3.2×10^{-3}	21	.98	3.1×10^{-3}
			1302	0	3.6	0				23	.93	
			1308	.10	26.3	22.7	21.57		3.4×10^{-3}	23	.93	3.1×10^{-3}
			1326	.40	92.0	88.4	83.98		3.3×10^{-3}	23	.93	3.1×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
113.7	Wt. of 1 rings + soil	124.8
34.7	Wt. of ____ rings	34.7
79.0	Wt. of soil	90.1
1.342	Ring Factor	1.342
106.0	WET DENSITY, PCF	120.9
	Wt. of soil + dish No. 83	110.5
	Dry wt. of soil + dish	94.1
	Net loss of moisture	16.4
	Wt. of dish	20.6
	Wt. of dry soil	73.5
7.2	MOISTURE CONTENT, %	22.3
98.9	DRY DENSITY, PCF	

d = 1.9"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-14 (CANONSITE 96-019-1906)
BORING NO.: BOR-11 SAMPLE NO.: _____ DEPTH (FT): 10.5' SAMPLED BY: _____ /
LABORATORY CLASSIFICATION: MOTTLED BROWN & GRAY SILTY CLAY (RAYLIN)

TESTED BY: DC 10/4 PO COMPUTED BY: _____ / / CHECKED BY: _____

TYPE OF SAMPLE: ☑ Undisturbed
☐ Remolded

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.0	.98
Sample Diameter (In.)	1.90	1.85
Sample Area (In.^{2})	2.84	2.69
Sample Volume (In.^{3})	2.84	2.64
VOID RATIO		
Volume of Sample - V_t (CC)	46.54	43.26
Volume of Solid - V_s (CC)	14.26	14.26
Volume of Void - V_v (CC)	32.3	29.0
Void Ratio - e	2.266	2.034
Degree of Saturation - S (%)	99.1	99.3

Specific Gravity (ASSUMED) 2.7

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		87.1
Dry Weight + Tare, gm		58.3
Weight of Water, gm		28.8
Weight of Tare, gm #5		19.8
Weight of Dry Soil, gm		38.5
Moisture Content, %	83.1	74.8
Total Wet Weight, gm	70.5	67.3
Total Dry Weight, gm	38.5	38.5
Weight of Water, gm	32.0	28.8
Wet Density, pcf	94.5	97.0
Dry Density, pcf	51.6	55.5

Cell# 2

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 034-14 (CANONIE PG-018-1806)
BORING NO.: BOR 13 SAMPLE NO.: ____ DEPTH (FT): 9.5 SAMPLED BY: ____ /
LABORATORY CLASSIFICATION: GRAY SILTY CLAY (BAYMUD)

TESTED BY: DC 10/12/90 COMPUTED BY: ____ / / CHECKED BY: ____ /

TYPE OF SAMPLE: ☑ Undisturbed ____
☐ Remolded ____

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.0	.99
Sample Diameter (In.)	1.93	1.88
Sample Area (In.^{2})	2.93	2.78
Sample Volume (In.^{3})	2.93	2.75
VOID RATIO		
Volume of Sample - V_T (CC)	48.01	45.10
Volume of Solid - V_s (CC)	19.48	19.48
Volume of Void - V_v (CC)	28.5	25.62
Void Ratio - e	1.465	1.315
Degree of Saturation - S (%)	95.4	100

Specific Gravity (ASSUMED) 2.7

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		99.9
Dry Weight + Tare, gm		74.3
Weight of Water, gm		25.6
Weight of Tare, gm 75		21.7
Weight of Dry Soil, gm		52.6
Moisture Content, %	51.7	48.7
Total Wet Weight, gm	79.8	78.3
Total Dry Weight, gm	52.6	52.6
Weight of Water, gm	27.2	25.7
Wet Density, pcf	103.7	108.4
Dry Density, pcf	68.3	72.9

Cell# 2

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correct. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 18.0 %
Initial Dry Density 109.1 pcf.
Perm. at 20°C 2×10^{-8} cm/sec

Job 034-14 (CALONNE 86-018-18a) Boring No. BOR-18 Sample No. _____ Depth 10.5'

Date Sampled _____ By _____ : Test Started 10/12/90 By DC : Computed by _____

Description of Soil BROWN SILTY FINE SAND (SM) DENSE Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.90", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Diff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
564	104	10/12		SATURATING				36				
+100		10/15	1364	0	56.4	0				–		
464	103		1746	4.7	57.0	0.6	0.57		5.1×10^{-8}	24	.91	4.7×10^{-8}
		10/16	820	19.26	56.7	0.3	0.29		6.2×10^{-9}	20	1.0	6.2×10^{-9}
			1654	27.83	57.8	1.40	1.33		2.0×10^{-8}	19	1.03	2.1×10^{-8}
		10/17	759	42.92	57.9	1.50	1.43		1.4×10^{-8}	19	1.03	1.4×10^{-8}
			1647	51.72	59.0	2.60	2.47		2.0×10^{-8}	24	.91	1.8×10^{-8}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
130.5	Wt. of 1 rings + soil	130.2
34.6	Wt. of _____ rings	34.6
95.9	Wt. of soil	95.6
1.342	Ring Factor	1.342
128.7	WET DENSITY, PCF	128.3
	Wt. of soil + dish No. 29	115.3
	Dry wt. of soil + dish	101.1
	Net loss of moisture	14.2
	Wt. of dish	20.6
	Wt. of dry soil	80.5
18.0	MOISTURE CONTENT, %	17.6
109.1	DRY DENSITY, PCF	

d = 1.9"
$K = 1.52 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 4.4 %
Initial Dry Density 101.5 pcf.
Perm. at 20°C 1×10^{-3} cm/sec

Job 034-14 (CANONITE 86-018-15806) Boring No. BOR-23 Sample No. _____ Depth 1.5'

Date Sampled _____ By _____ : Test Started 10/10/90 By DC : Computed by _____

Description of Soil BROWN FINE SAND (SP) Checked by _____

☒ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☒ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 5 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sarch Dial Before Corr.	Dial Readings in .001 inch: Deff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
764	196	10/10	810	SATURATING								
100			833	0	1.8	0		1		–		
664	195		853	.33	26.4	24.6	23.37		1.0×10^{-3}	21	.98	1.0×10^{-3}
			900	.45	34.6	32.8	31.16		1.0×10^{-3}	21	.98	1.0×10^{-3}
			1304	0	2.8	0				–		
			1327	.38	36.8	34.0	32.3		1.2×10^{-3}	23	.93	1.2×10^{-3}
			1349	.75	68.4	65.6	62.3		1.2×10^{-3}	24	.91	1.1×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
108.4	Wt. of 1 rings + soil	119.0
27.0	Wt. of _____ rings	27.0
81.4	Wt. of soil	92.0
1.302	Ring Factor	1.302
106.0	WET DENSITY, PCF	119.8
	Wt. of soil + dish No. A-14	112.5
	Dry wt. of soil + dish	98.5
	Net loss of moisture	14.0
	Wt. of dish	20.7
	Wt. of dry soil	77.8
4.4	MOISTURE CONTENT, %	18.0
101.5	DRY DENSITY, PCF	

d = 1.93"
$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-5}
ft/day = 2.84×10^{2}
ft/yr = 1.04×10^{5}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 18.0 %
Initial Dry Density 101.9 pcf
Perm. at 20°C 2×10^{-3} cm/sec

Job 034-14 CANONIE 86-018-1806 Boring No. MW-C2-L Sample No. _____ Depth 3.5'

Date Sampled _____ By _____ : Test Started 10/3/90 By DC : Computed by _____

Description of Soil BROWN FINE SAND (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.87", ℓ = 1" ☐ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Switch Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
537	083	10/3	1014	SATURATING								
100			1042	0	4.1	0		1				
437	081		1056	.23	34.5	30.4	28.88		2×10^{-3}	22	.95	1.9×10^{-3}
			1114½	.54	71.8	67.7	64.32		1.9×10^{-3}	23	.93	1.7×10^{-3}
			1141	0	4.2	0				–		
			1205	.40	56.4	52.2	49.59		1.9×10^{-3}	23	.93	1.8×10^{-3}
			1217½	.61	82.0	77.80	73.91		1.9×10^{-3}	23	.93	1.8×10^{-3}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-5} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
1420	Wt. of 1 rings + soil	1428
55.4	Wt. of _____ rings	55.4
86.6	Wt. of soil	87.5
1.389	Ring Factor	1.389
120.3	WET DENSITY, PCF	121.5
	Wt. of soil + dish No. 40	107.5
	Dry wt. of soil + dish	93.4
	Net loss of moisture	14.1
	Wt. of dish	20.1
	Wt. of dry soil	73.3
18.0	MOISTURE CONTENT, %	19.2
101.9	DRY DENSITY, PCF	

d = 1.87"

$K = 1.57 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-3}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 3.1 %
Initial Dry Density 100.5 pcf.
Perm. at 20°C 9×10^{-4} cm/sec

Job 034-14 (CANONIE 86-019-1806) Boring No. BC2-4 Sample No. _____ Depth 1.0'

Date Sampled _____ By _____ : Test Started 10/2/90 By DC : Computed by _____

Description of Soil BROWN FINE SAND (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 2 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
684	068	10/2		SATURATING								
100			955½	0	24	0		1				
584			1011½	.27	22.4	20.0	19.0		1.0×10^{-3}	22	.95	9.5×10^{-4}
			1028	.54	40.6	38.2	36.29		9.9×10^{-4}	22	.95	9.4×10^{-4}
			1057½	1.03	69.4	67.0	63.65		9.1×10^{-4}	22	.95	8.6×10^{-4}
			1115	1.33	89.2	86.8	82.46		9.1×10^{-4}	23	.93	8.5×10^{-4}
			1123	1.46	97.4	95.0	90.25		9.1×10^{-4}	23	.93	8.5×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
108.3	Wt. of 1 rings + soil	119.8
28.7	Wt. of ____ rings	28.7
79.6	Wt. of soil	91.1
1.302	Ring Factor	1.302
103.6	WET DENSITY, PCF	118.6
	Wt. of soil + dish No. A-15	111.6
	Dry wt. of soil + dish	97.7
	Net loss of moisture	13.9
	Wt. of dish	20.6
	Wt. of dry soil	77.1
3.1	MOISTURE CONTENT, %	18.0
100.5	DRY DENSITY, PCF	

d = 1.93"

$$K = 1.47 \times 10^{-5} \frac{V}{th}$$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 22.4 %
Initial Dry Density 103.9 pcf.
Perm. at 20°C 8×10^{-4} cm/sec

Job 034-14 (CANONITE 96-019-1806) Boring No. B-62-4 Sample No. _____ Depth 7'

Date Sampled _____ By _____ : Test Started 10/3/90 By DC : Computed by _____

Description of Soil GRAYISH BROWN FINE SAND (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375"~~ 1.93, ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 5 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
824	080	10/3	1055	SATURATING								
-040			1058	0	1.4	0		1				
784	078		1336	.63	12.6	11.2	10.64		2.4×10^{-4}	24	.91	2.3×10^{-4}
			1500	2.03	35.4	34.0	32.30		2.3×10^{-4}	26	.87	2.0×10^{-4}
		10/4	853	0	1.4	0				-		
			929	0.60	34.8	33.4	31.73		7.8×10^{-4}	23	.93	7.2×10^{-4}
			1022	0.88	85.0	83.6	79.42		1.3×10^{-4}	23	.93	1.2×10^{-4}
			1128	0	2.0	0				-		
			1149½	.35	20.5	18.5	17.58		7.3×10^{-4}	24	.91	6.7×10^{-4}
			1304	1.60	76.2	74.2	70.49		6.5×10^{-4}	24	.91	5.9×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
125.4	Wt. of 1 rings + soil	
27.7	Wt. of _____ rings	
97.7	Wt. of soil	97.6
1.302	Ring Factor	1.302
127.2	WET DENSITY, PCF	127.1
	Wt. of soil + dish No. 50	118.1
	Dry wt. of soil + dish	100.3
	Net loss of moisture	17.8
	Wt. of dish	20.5
	Wt. of dry soil	79.8
22.4	MOISTURE CONTENT, %	22.3
103.9	DRY DENSITY, PCF	

d = 1.93"

$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 23.6 %
Initial Dry Density 100.4 pcf.
Perm. at 20°C 1×10^{-6} cm/sec

Job 034-14 (CANONIE 86-018-1806) Boring No. B-C2-4 Sample No. ____ Depth 12

Date Sampled ____ By ____ : Test Started 10/10/90 By DC : Computed by ____

Description of Soil INTERMINGLED DEPOSITS OF SAND & CLAY Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.90", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED d = 4.00" ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sarch Dial Before Corr.	Diff. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
545	100	10/10	1450	SATURATING								
100		10/11	828	0	24.8	0		10		—		
245	597		1102	2.57	27.4	2.6	2.47		1.5×10^{-6}	21	.98	1.5×10^{-6}
			1301	4.55	29.4	4.6	4.37		1.5×10^{-6}	23	.93	1.4×10^{-6}
			1449	6.35	31.4	6.6	6.27		1.6×10^{-6}	24	.91	1.4×10^{-6}
			1702	8.57	33.6	8.8	8.36		1.5×10^{-6}	25	.89	1.4×10^{-6}
		10/12	1020	25.86	51.0	26.2	24.89		1.5×10^{-6}	20	1.0	1.5×10^{-6}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-4} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-4} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
127.1	Wt. of 1 rings + soil	126.8
34.6	Wt. of ____ rings	34.6
92.5	Wt. of soil	92.2
1.342	Ring Factor	1.342
124.1	WET DENSITY, PCF	123.7
	Wt. of soil + dish No. 61	111.1
	Dry wt. of soil + dish	93.9
	Net loss of moisture	17.2
	Wt. of dish	19.7
	Wt. of dry soil	74.2
23.6	MOISTURE CONTENT, %	23.2
100.4	DRY DENSITY, PCF	

d = 1.90"
K = $1.57 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-2}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

LABORATORY PERMEABILITY TEST DATA SHEET

Initial Moisture Content 24.9 %
Initial Dry Density 97.1 pcf
Perm. at 20°C 2×10^{-4} cm/sec

Job 034-14 (CANONIE 86-017-1806) Boring No. BC2-8 Sample No. ____ Depth 10'

Date Sampled ____ By ____ : Test Started 10/8/90 By DC : Computed by ____

Description of Soil GREEN FINE SAND w/ SILT Checked by ____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

____ blows of a ____ lb. hammer dropped ____ inches on each of ____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Dial Readings in .001 inch: Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
811	070	10/8	1520	SATURATING								
-060		10/9	1029	0	2.8	0		1		–		
751	068		1142	1.22	17.2	14.40	13.68		1.7×10^{-4}	21	.98	1.6×10^{-4}
			1259	2.50	32.4	29.6	28.12		1.7×10^{-4}	22	.95	1.6×10^{-4}
			1331½	3.04	38.6	35.8	34.01		1.6×10^{-4}	23	.93	1.5×10^{-4}
			1731	7.03	80.2	77.4	73.53		1.5×10^{-4}	25	.89	1.4×10^{-4}
		10/10	947	0	4.2	0				–		
			1149	2.03	44.4	40.2	38.19		2.8×10^{-4}	22	.95	2.6×10^{-4}
			1334	3.78	73.2	69.0	65.55		2.6×10^{-4}	23	.93	2.4×10^{-4}
			1405	4.30	84.4	80.2	76.19		2.6×10^{-4}	24	.91	2.4×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
120.2	Wt. of 1 rings + soil	____
27.0	Wt. of ____ rings	____
93.2	Wt. of soil	92.7
1.302	Ring Factor	1.302
121.3	WET DENSITY, PCF	120.7
	Wt. of soil + dish No. 39	114.2
	Dry wt. of soil + dish	96.1
	Net loss of moisture	18.1
	Wt. of dish	21.5
	Wt. of dry soil	74.6
24.9	MOISTURE CONTENT, %	24.3
97.1	DRY DENSITY, PCF	

d = 1.93

$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 15 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 3.8 %
Initial Dry Density 96.3 pcf.
Perm. at 20°C 3×10^{-4} cm/sec

Job 034-14 (CANONIE 96-014-1806) Boring No. B-C2-9 Sample No. _____ Depth 1'

Date Sampled _____ By _____ : Test Started 10/23/90 By DC : Computed by _____

Description of Soil GREENISH BROWN FINE SAND (SP) Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 1 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sarch Dial Before Corr.	Dial Readings in .001 inch: Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Volume of Water Used, V, in cc: Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
545	070	10/23		SATURATING								
-100			1432	0	4.0	0		2				
445	769		1449	.28	21.4	17.4	16.53		4.3×10^{-4}	23	.93	4.0×10^{-4}
			1513	.68	39.2	35.2	33.44		3.6×10^{-4}	23	.93	3.4×10^{-4}
			1543	1.18	58.6	54.60	51.87		3.2×10^{-4}	24	.91	2.9×10^{-4}
			1610	1.63	75.7	71.40	67.83		3.1×10^{-4}	24	.91	2.8×10^{-4}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
105.4	Wt. of 1 rings + soil	119.1
28.7	Wt. of _____ rings	28.7
76.7	Wt. of soil	90.4
1.302	Ring Factor	1.302
99.9	WET DENSITY, PCF	117.7
	Wt. of soil + dish No. 47	110.0
	Wt. of wet soil + dish	93.6
	Net loss of moisture	16.4
	Wt. of dish	20.0
	Wt. of dry soil	73.6
3.8	MOISTURE CONTENT, %	22.3
96.3	DRY DENSITY, PCF	

d = 1.93"
$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{-3}
ft/yr = 1.04×10^{-6}
gal/ft²-day = 2.12×10^{-4}

Lab 13 (4-60)

COOPER TESTING LABORATORY

LABORATORY PERMEABILITY TEST DATA SHEET

SUMMARY

Initial Moisture Content 21.0 %
Initial Dry Density 104.1 pcf.
Perm. at 20°C 2×10^{-6} cm/sec

Job 034-14 (CALDWELL 96-018-1806) Boring No. B-C2-9 Sample No. _____ Depth 12.5'

Date Sampled _____ By _____ : Test Started 10/3/90 By DC : Computed by _____

Description of Soil GRAY SILTY FINE SAND (SM) DENSE SATURATED Checked by _____

☑ UNDISTURBED, d = ~~2.375~~ 1.93", ℓ = 1" ☑ or ℓ = 2" ☐

☐ REMOLDED, d = 4.00", ℓ = 4.59" (1/30 cubic foot mold)

_____ blows of a _____ lb. hammer dropped _____ inches on each of _____ layers

Apparatus No. 3 Surcharge Pressure 300 lbs./sq. ft.

Dial Readings in .001 inch: Sample Dial Before Corr.	Defl. Dial After Corr.	Date	Time	Elapsed Time, t, in hours	Burette Reading in cc	Volume of Water Used, V, in cc: Original	Corr. .95 x orig.	Head of Water, h in inches	Perm. in cm/sec at test temp.	Test Temp. in °C	Viscosity Correc. Factor	Permeability, K, in cm/sec at 20°C
905	071	10/3	SATURATED									
040		10/4	850	0	8.8	0		21		—		
865			1057	2.12	14.6	5.8	5.51		1.8×10^{-6}	23	.93	1.7×10^{-6}
			1546	6.93	29.8	21.0	19.95		2.0×10^{-6}	26	.87	1.8×10^{-6}
		10/5	902	24.2	83.4	74.6	70.87		2.0×10^{-6}	23	.93	1.9×10^{-6}
			1507	0	7.6	0				—		
		10/6	1101	19.90	67.7	60.10	57.10		2.0×10^{-6}	21	.98	2.0×10^{-6}

CONSTANT-HEAD TEST

$$K = \frac{V\ell}{thA}$$

K = coeff. of perm. in cm/sec
V = volume of water in cc.
ℓ = length of sample in inches
t = elapsed time in hours
h = head of water in inches
A = area of sample in sq. inches

For a sample with ℓ = 1", d = 2.375"

$$K = 9.72 \times 10^{-6} \frac{V}{th}$$

For a sample with ℓ = 4.59", d = 4"

$$K = 1.57 \times 10^{-6} \frac{V}{th}$$

MOISTURE-DENSITY DATA

Before Test		After Test
123.7	Wt. of 1 rings + soil	122.5
27.0	Wt. of _____ rings	27.0
96.7	Wt. of soil	95.5
1.302	Ring Factor	1.302
125.9	WET DENSITY, PCF	124.3
	Wt. of soil + dish No. 100	114.9
	Dry wt. of soil + dish	99.4
	Net loss of moisture	15.5
	Wt. of dish	19.9
	Wt. of dry soil	79.5
21.0	MOISTURE CONTENT, %	19.5
104.1	DRY DENSITY, PCF	

d = 1.93"

$K = 1.47 \times 10^{-5} \frac{V}{th}$

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONVERSION FACTORS

(Multiply by these factors to convert from cm/sec to the indicated units)

ft/sec = 3.28×10^{-6}
ft/day = 2.84×10^{3}
ft/yr = 1.04×10^{6}
gal/ft²-day = 2.12×10^{4}

Lab 13 (4-60)

FALLING HEAD PERMEABILITY TEST

PROJECT & LOCATION: 031-14 (CANONIE 86-018-180%)
BORING NO.: MW-97-1 SAMPLE NO.: _____ DEPTH (FT): 9.5' SAMPLED BY: _____ /
LABORATORY CLASSIFICATION: GRAY SILTY CLAY (BAYMUD)

TESTED BY: DC 9/21/90 COMPUTED BY: _____ / / CHECKED BY: _____ /

TYPE OF SAMPLE: ☑ Undisturbed _____
☐ Remolded _____

SAMPLE DIMENSIONS	Initial	Final
Sample Height (In.)	1.00	.97
Sample Diameter (In.)	1.93	1.87
Sample Area (In.^{2})	2.93	2.75
Sample Volume (In.^{3})	2.93	2.66
VOID RATIO		
Volume of Sample - V_t (CC)	48.01	43.66
Volume of Solid - V_s (CC)	14.93	14.93
Volume of Void - V_v (CC)	33.08	28.73
Void Ratio - e	2.216	1.924
Degree of Saturation - S (%)	100.0	99.6

Specific Gravity (ASSUMED) 2.7

MOISTURE & DENSITY DATA

	Before	After
Wet Weight + Tare, gm		88.4
Dry Weight + Tare, gm		59.9
Weight of Water, gm		28.5
Weight of Tare, gm #59		19.6
Weight of Dry Soil, gm		40.3
Moisture Content, %	82.1	70.7
Total Wet Weight, gm	73.4	68.9
Total Dry Weight, gm	40.3	40.3
Weight of Water, gm	33.1	28.6
Wet Density, pcf	95.3	98.60
Dry Density, pcf	52.4	57.8

Cell# 1

SATURATION & CONSOLIDATION

DATE TIME	PRESSURE CELL	PRESSURE BACK	PORE PRESSURE	Δ U	Δ CELL	B

VISCOSITY CORRECTION FACTORS

Test Temp. in °C	Viscosity Correc. Factor
16	1.11
17	1.08
18	1.05
19	1.03
20	1.00
21	.98
22	.95
23	.93
24	.91

CONSOLIDATION DATA

DATE	TIME Hr.	TIME Elapsed Min.	Burette Reading
		0	

APPENDIX D

ATTERBURG LIMITS RESULTS

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 38 PLASTICITY INDEX 8

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 234-14 (CANONE 86-019-1806) BORING NO. MW DB-3 SAMPLE NO. _____ DEPTH 10'

DATE TESTED 9/21/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY & GREEN SANDY SILT w/ GRAVEL

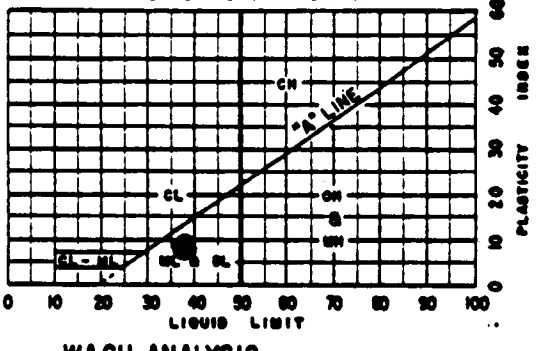
PAN C

110

DISH NUMBER E-5		PLASTIC LIMIT B-7	B-52	B-58	LIQUID LIMIT A-8	A-20	A-21	A-26
WT IN GMS.	MOIST SOIL & DISH	10.57	17.83	16.48	27.33	25.26	22.63	23.80
	DRY SOIL & DISH	9.18	15.29	14.24	23.03	21.47	19.43	20.30
	MOISTURE	1.39	2.54	2.24	4.30	3.79	3.20	3.50
	DISH	4.42	6.67	6.75	11.22	11.46	11.33	11.75
	DRY SOIL	4.76	8.62	7.49	11.81	10.01	8.10	8.55
MOISTURE CONTENT, %		29.2%	29.5%	29.9%	36.4%	37.9%	39.5%	40.9%
					47	24	15	10
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART

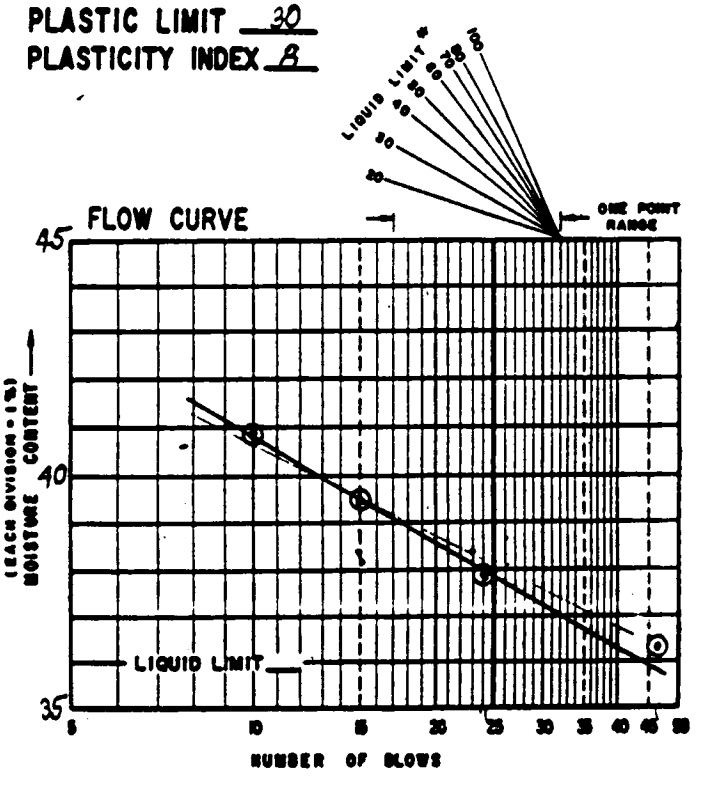


LIQUID LIMIT 38

PLASTIC LIMIT 30

PLASTICITY INDEX 8

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (#200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 48 PLASTICITY INDEX 16

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (ML)

JOB 034-14 (CANONIE Fa-018-F&OG) BORING NO. B-D13-6 SAMPLE NO. _____ DEPTH 6'

DATE TESTED 9/21/80 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL DARK GRAY CLAY w/ PEAT, SAND POCKET

90 gm

PAN I

DISH NUMBER E-8		PLASTIC LIMIT B-5	B-13	B-55	LIQUID LIMIT A-1	A-7	A-12	A-13
WT IN GMS	MOIST SOIL & DISH	10.99	11.08	17.18	22.77	21.32	19.48	22.52
	DRY SOIL & DISH	9.37	9.46	14.60	19.28	18.21	16.96	18.87
	MOISTURE	1.62	1.62	2.58	3.49	3.11	2.52	3.65
	DISH	4.48	4.42	6.64	11.50	11.46	11.73	11.78
	DRY SOIL	4.89	5.04	7.96	7.78	6.75	5.23	7.09
MOISTURE CONTENT, %		33.1%	32.1%	32.4%	44.9%	46.1%	48.2%	51.5%
NUMBER OF BLOWS					45	34	24	11

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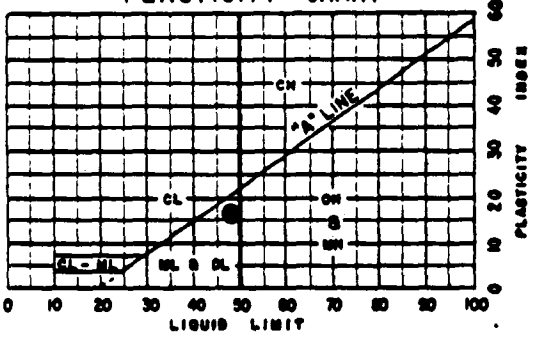
PLASTICITY CHART

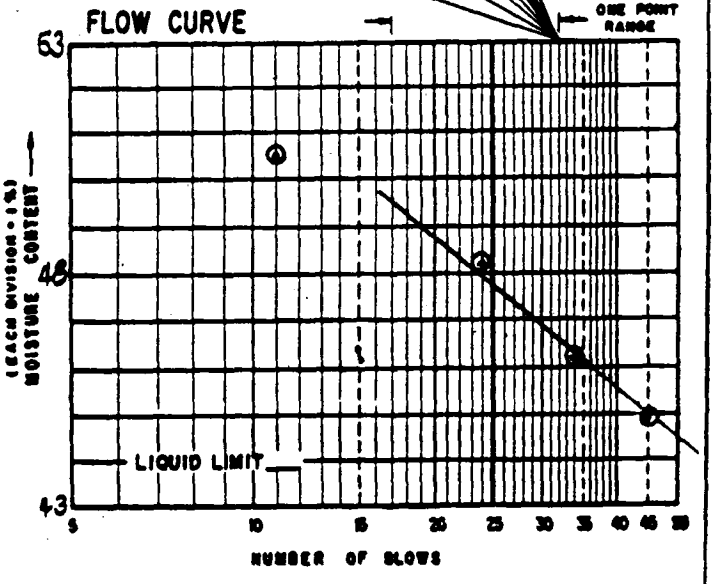


LIQUID LIMIT 48

PLASTIC LIMIT 32

PLASTICITY INDEX 16

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 30 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ PAGE _____

LOCATION _____

LAB 31( )

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 43 PLASTICITY INDEX 20

% GRAVEL ____ SAND ____ FINES ____ CLASSIFICATION (CL)

JOB 034-14 (CANONILE '86-018-1980) BORING NO. B-D2-11 SAMPLE NO. ____ DEPTH 10'

DATE TESTED 9/21/80 BY DC COMPUTED BY ____ CHECKED BY ____

DESCRIPTION OF SOIL D. GRAY SILTY CLAY (BAYMUD)

110

PAN 15

DISH NUMBER E-4	PLASTIC LIMIT B-14	B-15	B-18	LIQUID LIMIT A-9	A-18	A-23	A-31
WT. IN GMS. MOIST SOIL & DISH	14.13	11.67	15.84	24.74	24.29	23.81	24.84
DRY SOIL & DISH	12.35	10.32	13.72	20.87	20.54	20.03	20.72
MOISTURE	1.78	1.35	2.12	3.87	3.75	3.78	4.12
DISH	4.42	4.35	4.38	11.15	11.42	11.23	11.70
DRY SOIL	7.93	5.97	9.34	9.72	9.12	8.80	9.02
MOISTURE CONTENT, %	22.4%	22.6%	22.7%	39.8%	41.1%	43.0%	45.7%
NUMBER OF BLOWS				54	36	25	16

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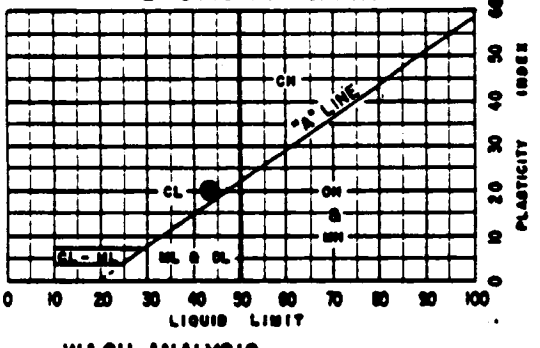
PLASTICITY CHART



LIQUID LIMIT 43

PLASTIC LIMIT 23

PLASTICITY INDEX 20

WASH ANALYSIS (# 200 SIEVE)

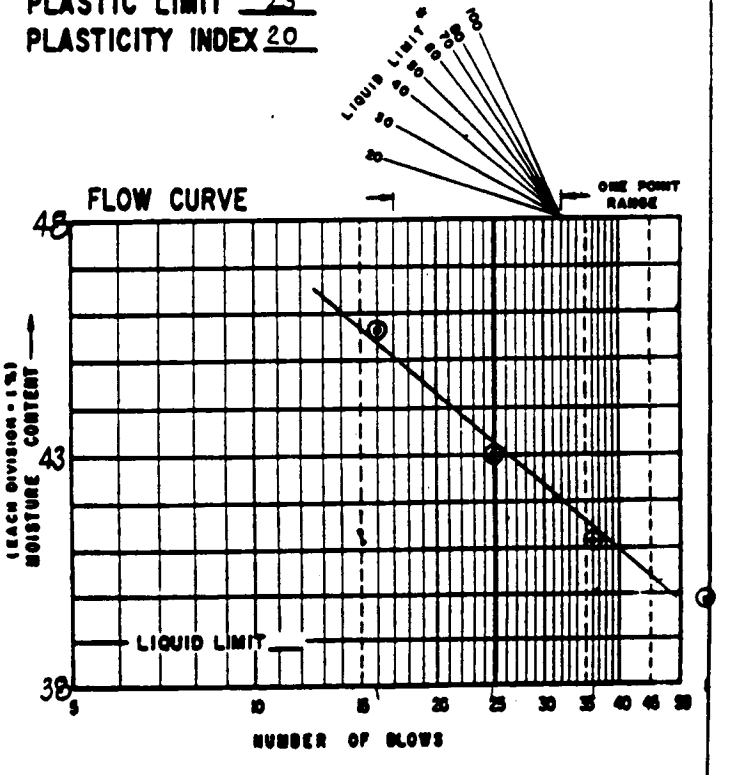
	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. ____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL ____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

DRAWN BY ____ DATE ____

CHECKED BY ____ DATE ____

JOB NUMBER ____ NAME ____

LOCATION ____

AB 3(2-6)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT _____ PLASTICITY INDEX _____

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 534-4 (CANONITE 86-018-1806) BORING NO. B-D3-12 SAMPLE NO. _____ DEPTH 7 1/2

DATE TESTED 9/21/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY CLAYEY SAND

PAN D

DISH NUMBER	E-7	B-12	B-67	B-59	A-13	A-22	A-24	A-31
WT. IN GMS: MOIST SOIL & DISH								
WT. IN GMS: DRY SOIL & DISH		NONPLASTIC						
WT. IN GMS: MOISTURE								
WT. IN GMS: DISH		4.42	6.86	6.73	11.78	11.41	11.61	11.70
WT. IN GMS: DRY SOIL								
MOISTURE CONTENT, %								

PLASTIC LIMIT

LIQUID LIMIT

NUMBER OF BLOWS

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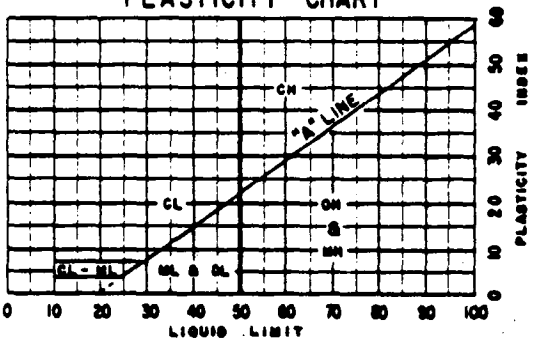
PLASTICITY CHART

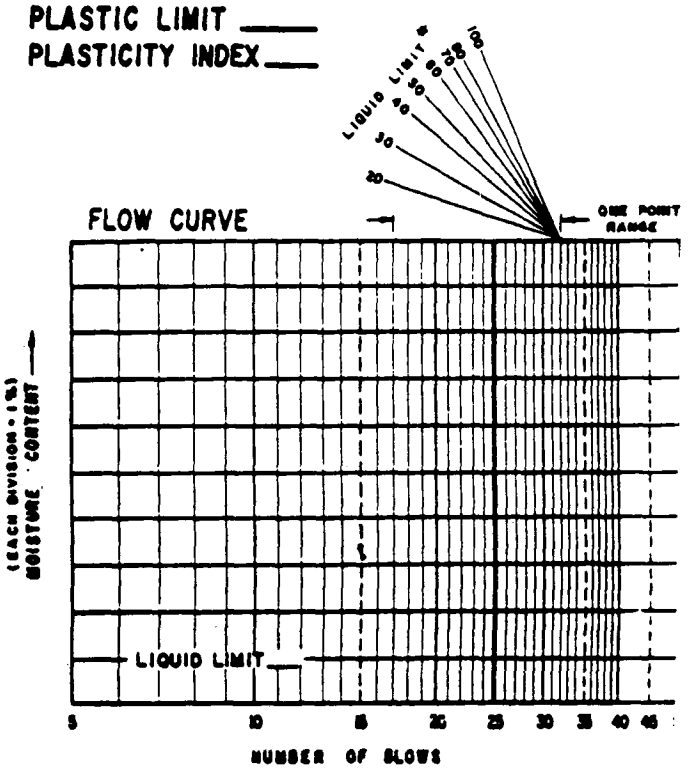


LIQUID LIMIT _____

PLASTIC LIMIT _____

PLASTICITY INDEX _____

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (@ 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

10

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3 (2-88)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 83 PLASTICITY INDEX 55

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 0344 CANONIE (86-018-1806) BORING NO. BOR 10 SAMPLE NO. _____ DEPTH 10'

DATE TESTED 10-1-90 BY EAF COMPUTED BY _____ CHECKED BY _____

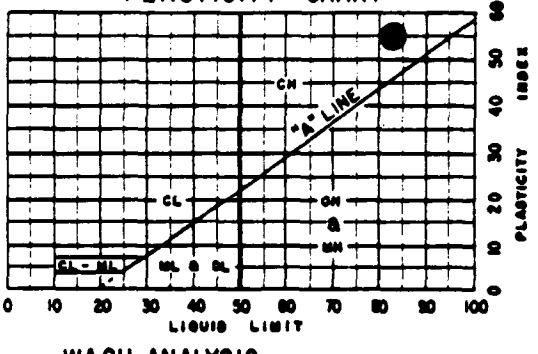
DESCRIPTION OF SOIL Black & gray brn clay (Bay Mud)

PAN I

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		A7		A34	A32	A33	A11	A23
WT. IN GMS	MOIST SOIL & DISH	19.18	7.27	17.21	22.30	18.79	18.70	17.37
	DRY SOIL & DISH	17.42	6.17	16.07	17.76	15.70	15.40	14.69
	MOISTURE	1.76	1.10	1.14	4.54	3.09	3.30	3.28
	DISH	11.46	2.27	11.82	11.89	11.79	11.68	11.22
	DRY SOIL	5.96	3.90	4.25	5.87	3.91	3.72	3.47
MOISTURE CONTENT, %		29.5%	28.2%	26.8%	77.3%	79.0%	88.7%	94.5%
NUMBER OF BLOWS					31	38	14	8

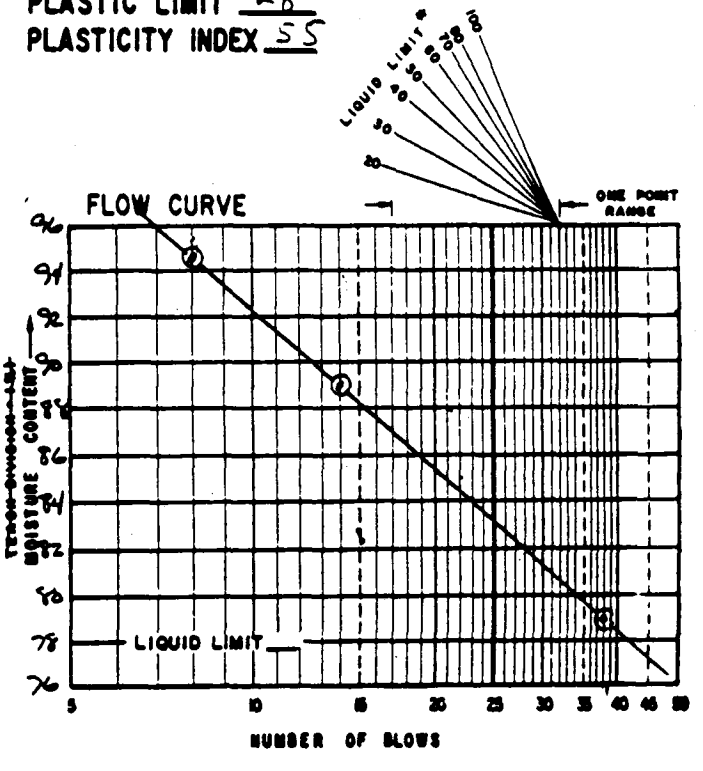
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 83
PLASTIC LIMIT 28
PLASTICITY INDEX 55

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 26 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (@ 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 81 PLASTICITY INDEX 55

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 034-14 (CANONIE 86-04-1216) BORING NO. BOR-11 SAMPLE NO. _____ DEPTH 10.5'

Possible faint odor of sewa

DATE TESTED 10/4/86 BY DC COMPUTED BY _____ CHECKED BY _____

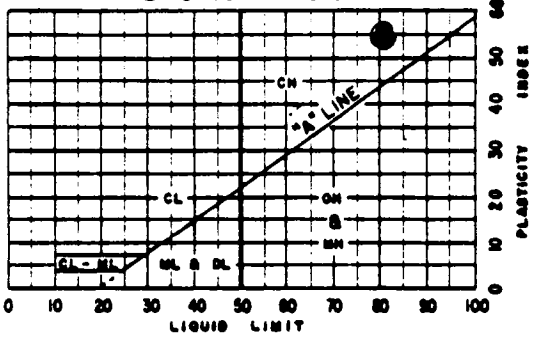
DESCRIPTION OF SOIL MOTTLED BROWN & GRAY SILTY CLAY (BAYMUD)

Pan B

DISH NUMBER E-7		PLASTIC LIMIT B-10	PLASTIC LIMIT B-13	PLASTIC LIMIT B-15	LIQUID LIMIT BD	LIQUID LIMIT WD	LIQUID LIMIT ID	LIQUID LIMIT KD
WT IN GMS	MOIST SOIL & DISH	13.40	15.36	14.63	19.72	15.96	16.01	15.44
	DRY SOIL & DISH	11.52	13.08	12.50	15.13	11.59	12.21	11.17
	MOISTURE	1.88	2.28	2.13	4.59	4.37	3.80	4.27
	DISH	4.41	4.42	4.35	9.17	6.12	7.22	6.34
	DRY SOIL	7.11	8.66	8.15	5.96	5.47	4.99	4.83
MOISTURE CONTENT, %		26.4	26.3	26.1	77.0	79.9	76.2	88.4
					58	26	42	13
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART

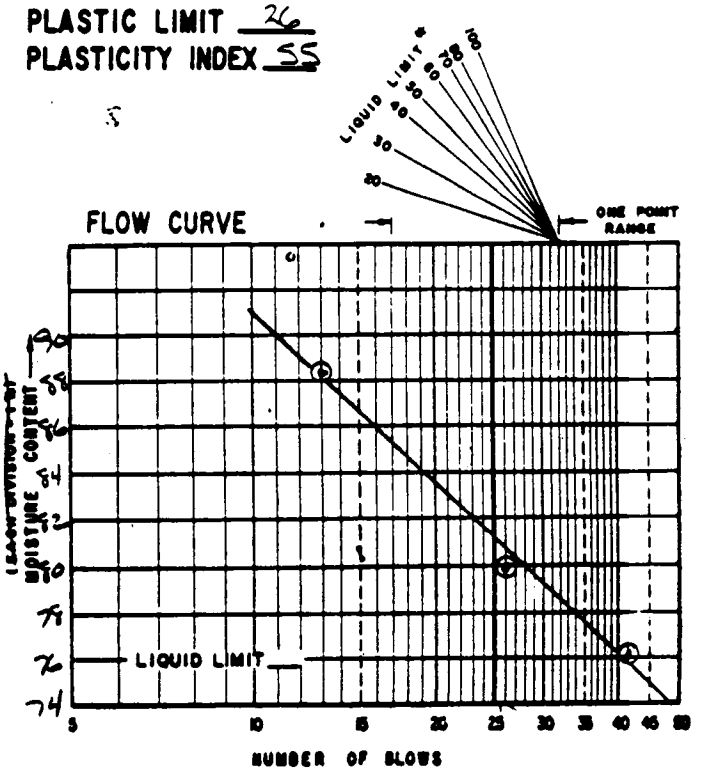


LIQUID LIMIT 81

PLASTIC LIMIT 26

PLASTICITY INDEX 55

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 42 PLASTICITY INDEX 22

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CL)

JOB 034-14 (CARNDIE 5/L-019-R01C) BORING NO. B-13 SAMPLE NO. _____ DEPTH 5

DATE TESTED 10/4/80 BY DC COMPUTED BY _____ CHECKED BY _____

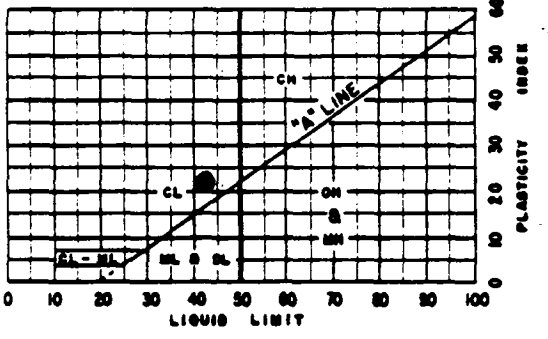
DESCRIPTION OF SOIL GRAY SILTY CLAY (BAYMUD)
SAVE SAMPLE FOR SPECIFIC GRAVITY

PAN # 8-X

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		E-α	D-16	D-64	B-57	A-30	A-32	A-33	A-36
WT. IN GMS	MOIST SOIL & DISH		12.52	17.90	20.48	22.49	23.80	23.28	23.30
	DRY SOIL & DISH		11.16	16.03	18.15	19.42	20.31	19.83	19.65
	MOISTURE		1.36	1.87	2.33	3.07	3.49	3.45	3.65
	DISH		4.30	6.80	6.86	11.76	11.89	11.79	11.81
	DRY SOIL		6.86	9.23	11.79	7.66	8.42	8.04	7.84
MOISTURE CONTENT, %			19.8%	20.3%	20.6%	40.1%	41.4%	42.9%	46.6%
NUMBER OF BLOWS						40	27	18	10

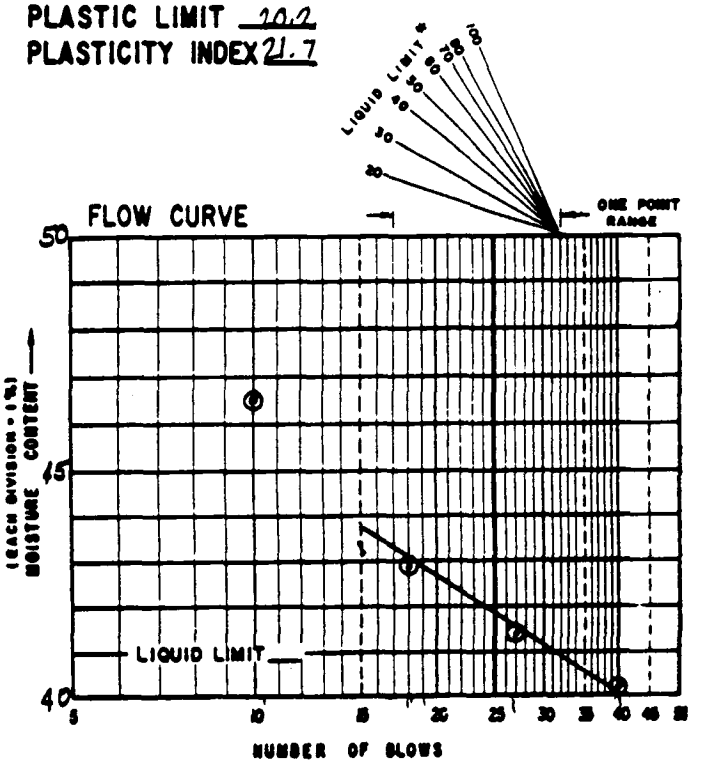
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 41.9
PLASTIC LIMIT 20.2
PLASTICITY INDEX 21.7

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 51 PLASTICITY INDEX 31

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 034-14 CAMMANE (86-018-18A1) BORING NO. B-12 13 SAMPLE NO. _____ DEPTH 8.5'

DATE TESTED 11-11-90 BY EAF COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL Gray clay with lens of fi sand (Bay mud) Clay tested

PAN E

DISH NUMBER		B50	B10	B51
WT. IN GMS.	MOIST SOIL & DISH	9.30	8.60	8.54
	DRY SOIL & DISH	8.46	7.91	7.90
	MOISTURE	.84	.69	.64
	DISH	4.39	4.41	4.48
	DRY SOIL	4.07	3.50	3.42
MOISTURE CONTENT, %		21%	20%	19%

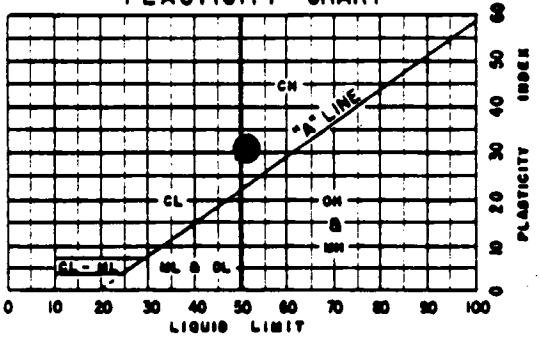
PLASTIC LIMIT

DISH NUMBER	B17	A18	B12	B1
MOIST SOIL & DISH	16.20	23.35	16.95	15.14
DRY SOIL & DISH	12.45	19.31	12.63	11.14
MOISTURE	3.75	4.04	4.32	4.00
DISH	4.37	11.42	4.42	4.47
DRY SOIL	8.08	7.89	8.21	6.67
MOISTURE CONTENT, %	46.4%	51.2%	52.6%	60.0%
NUMBER OF BLOWS	40	32	19	8

LIQUID LIMIT

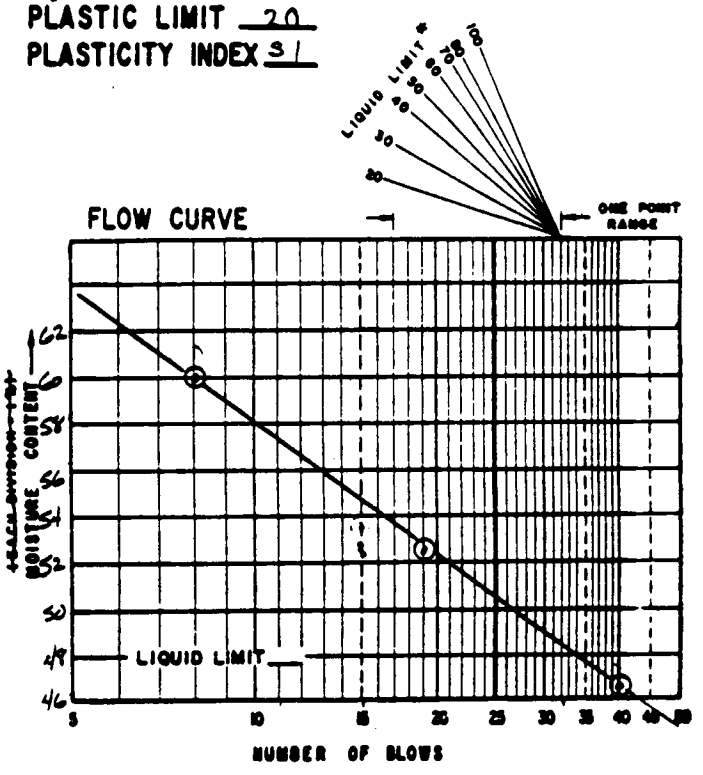
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 51
PLASTIC LIMIT 20
PLASTICITY INDEX 31

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 56 PLASTICITY INDEX 34

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 034-14 (CANONILE 86-08-1806) BORING NO. B2-13 SAMPLE NO. _____ DEPTH 9.5

DATE TESTED 10/12/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL GRAY SILTY CLAY

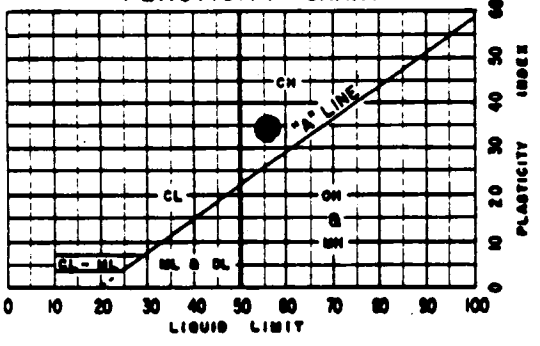
SAVE SAMPLE FOR SPECIFIC GRAVITY

PAN #4

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER		A13	A36	A8	A12	A24	A20	A-1
WT. IN GMS.	MOIST SOIL & DISH	20.29	22.03	19.56	24.32	20.68	21.86	20.72
	DRY SOIL & DISH	18.76	20.19	18.06	20.07	17.54	18.22	17.17
	MOISTURE	1.53	1.84	1.50	4.25	3.14	3.64	3.55
	DISH	11.78	11.81	11.22	11.73	11.61	11.46	11.50
	DRY SOIL	6.98	8.38	6.84	8.34	5.93	6.76	5.67
MOISTURE CONTENT, %		21.9%	22.0%	21.9%	51.0%	53.0%	53.8%	62.6%
					40	34	25	13
					NUMBER OF BLOWS			

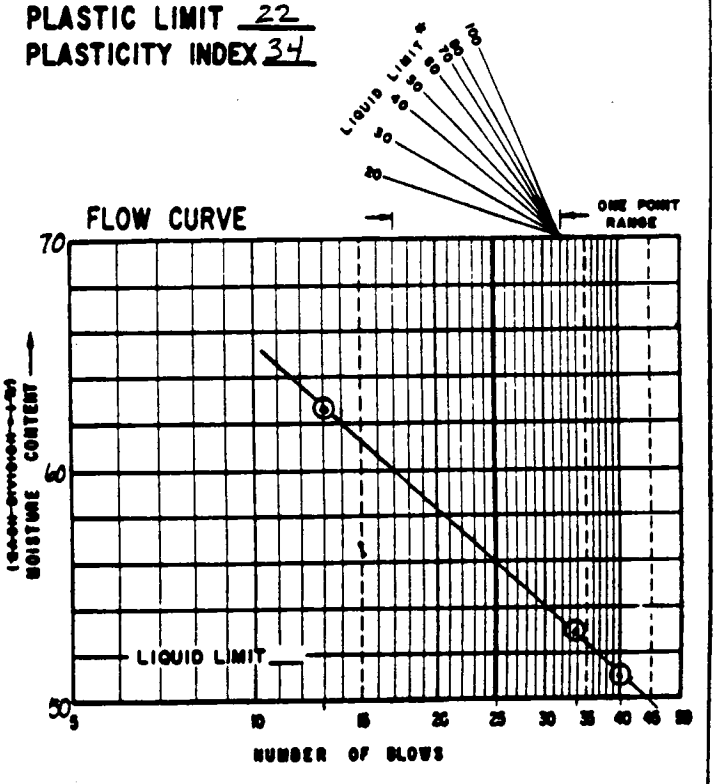
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 56
PLASTIC LIMIT 22
PLASTICITY INDEX 34

FLOW CURVE



USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 35 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 312-

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT _____ PLASTICITY INDEX _____

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 034-14 CANONIC (86-012-1804) BORING NO. BOR 15 SAMPLE NO. _____ DEPTH 10.5'

DATE TESTED _____ BY _____ COMPUTED BY _____ CHECKED BY _____

Definite odor of petroleum products

DESCRIPTION OF SOIL Grey si fi sand

PAN M

DISH NUMBER				
WT IN GMS.	MOIST SOIL & DISH			
	DRY SOIL & DISH			
	MOISTURE			
	DISH			
	DRY SOIL			
MOISTURE CONTENT, %				

PLASTIC LIMIT

Non-plastic

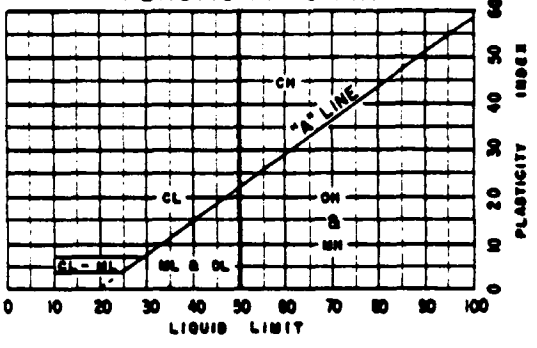
LIQUID LIMIT

A21	A28	A26	A31
21.10	23.02	22.60	24.88
19.17	21.06	20.75	22.70
11.33	11.86	11.75	11.70
11	21	26	37

NUMBER OF BLOWS

This line is 1/8" thick

PLASTICITY CHART

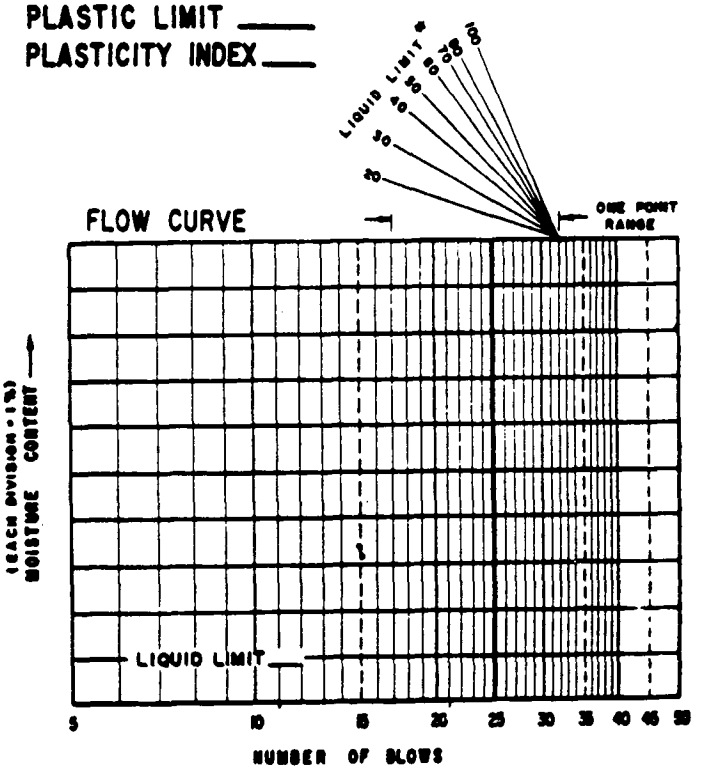


LIQUID LIMIT _____

PLASTIC LIMIT _____

PLASTICITY INDEX _____

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 35 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (@ 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-d)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 25 PLASTICITY INDEX 8

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 034-14 (CANONNIE 5/6-015-1806) BORING NO. BK19 SAMPLE NO. _____ DEPTH 5'

DATE TESTED 10/4/90 BY DC COMPUTED BY _____ CHECKED BY _____

DESCRIPTION OF SOIL MOTTLED GRAY & BROWN SILTY SAND

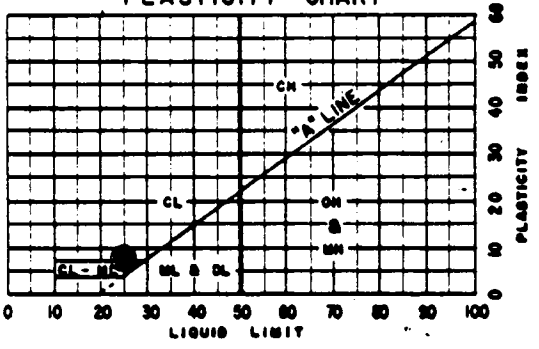
Possible presence of hydrocarbons. Water would not mix easily with sample

PAN # 6

DISH NUMBER E-10		PLASTIC LIMIT			LIQUID LIMIT			
		B-50	B-55	B-59	AO	CO	EO	GO
WT. IN GMS.	MOIST SOIL & DISH	14.00	17.21	22.06	21.76	23.04	21.68	23.22
	DRY SOIL & DISH	12.63	15.68	19.85	19.40	20.74	19.44	20.55
	MOISTURE	1.37	1.53	2.21	2.36	2.30	2.24	2.67
	DISH	4.39	6.64	6.73	9.12	11.02	10.59	10.51
	DRY SOIL	17.88	9.04	13.12	10.28	9.72	8.85	10.04
MOISTURE CONTENT, %		16.6	16.9	16.8	23.0	23.7	25.3	26.6
					50	31	19	10
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART

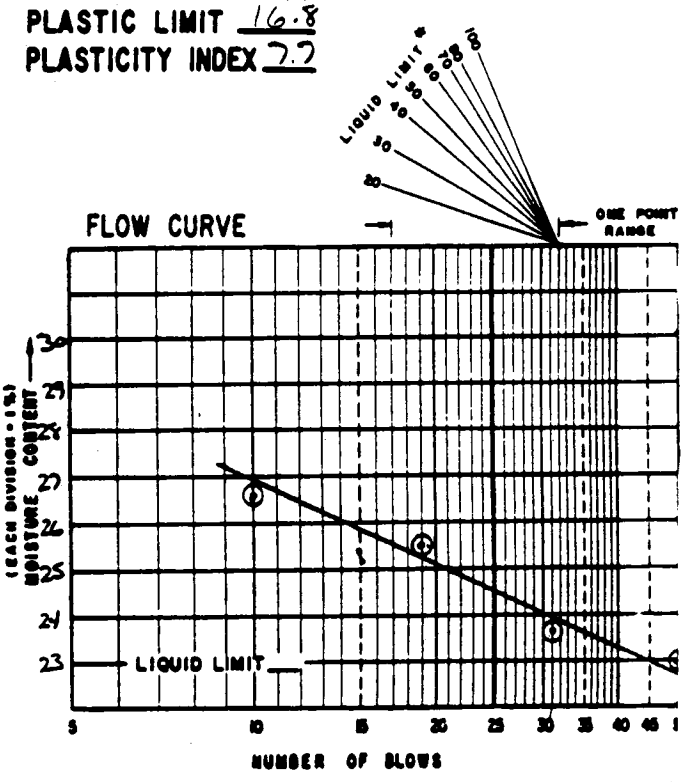


LIQUID LIMIT 24.5

PLASTIC LIMIT 16.8

PLASTICITY INDEX 7.7

FLOW CURVE



USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (# 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 312-66)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 23 PLASTICITY INDEX 5

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 034-14 (CANONIE 86-018-1806) BORING NO. B-C2-4 SAMPLE NO. _____ DEPTH 12.5

DATE TESTED 10/2/90 BY DC COMPUTED BY _____ CHECKED BY _____

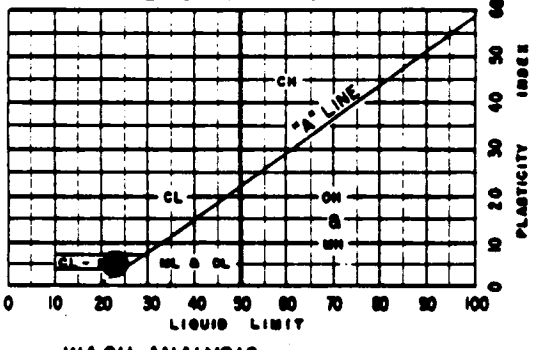
DESCRIPTION OF SOIL GRAY SILTY FINE SAND

PAN 14

DISH NUMBER E-3		PLASTIC LIMIT B-6	PLASTIC LIMIT B-5	PLASTIC LIMIT B-11	LIQUID LIMIT A-7	LIQUID LIMIT A-8	LIQUID LIMIT A-13	LIQUID LIMIT A-20
WT. IN GMS.	MOIST SOIL & DISH	12.11	10.60	10.81	23.12	22.27	22.52	23.65
	DRY SOIL & DISH	10.92	9.67	9.82	21.02	20.21	20.45	21.20
	MOISTURE	1.19	0.93	0.99	2.10	2.06	2.07	2.45
	DISH	4.43	4.48	4.49	11.46	11.22	11.78	11.46
	DRY SOIL	6.49	5.19	5.33	9.56	8.99	8.67	9.74
MOISTURE CONTENT, %		18.3	17.9	18.6	22.0	22.9	23.9	25.2
					36	22	17	9
					NUMBER OF BLOWS			

This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 22.9

PLASTIC LIMIT 18.3

PLASTICITY INDEX 4.6

WASH ANALYSIS (#200 SIEVE)

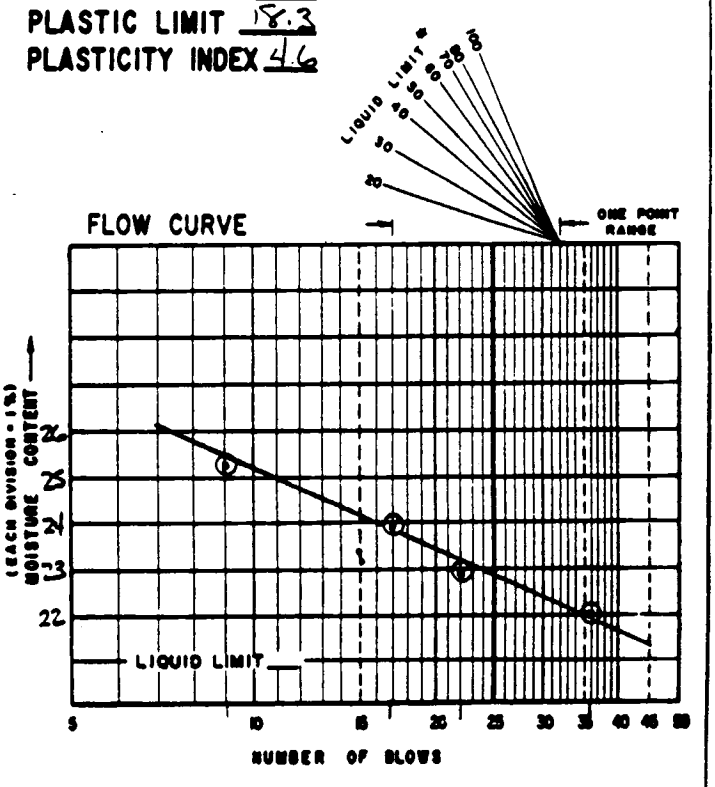
	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/8"			
#4			
#10			
#40			
#200			
PAN		100	0

FLOW CURVE



USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 26 PLASTICITY INDEX 8

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION _____

JOB 034-14 (LANONIE 86-018-1936) BORING NO B-22-5 SAMPLE NO. _____ DEPTH 13'

DATE TESTED 10/3/90 BY DC COMPUTED BY _____ CHECKED BY _____

Results on composite materials

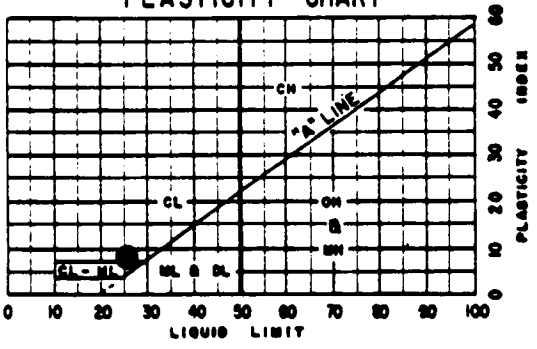
DESCRIPTION OF SOIL INTERMINGLED DEPOSIT OF SAND & CLAY

PAN K

DISH NUMBER E-5		PLASTIC LIMIT B-12	B-14	B-51	LIQUID LIMIT A-11	A-12	A-22	A-26
WT IN GMS	MOIST SOIL & DISH	14.20	16.32	16.42	25.52	25.64	24.70	25.41
	DRY SOIL & DISH	12.73	14.47	14.59	22.87	22.78	22.01	22.27
	MOISTURE	1.47	1.85	1.83	2.65	2.86	2.69	3.14
	DISH	4.42	4.42	4.48	11.68	11.73	11.41	11.75
	DRY SOIL	8.31	10.05	10.11	11.19	11.05	10.60	10.52
MOISTURE CONTENT, %		17.7	18.4	18.1	23.7	25.9	25.4	29.8
					46	22	32	9
					NUMBER OF BLOWS			

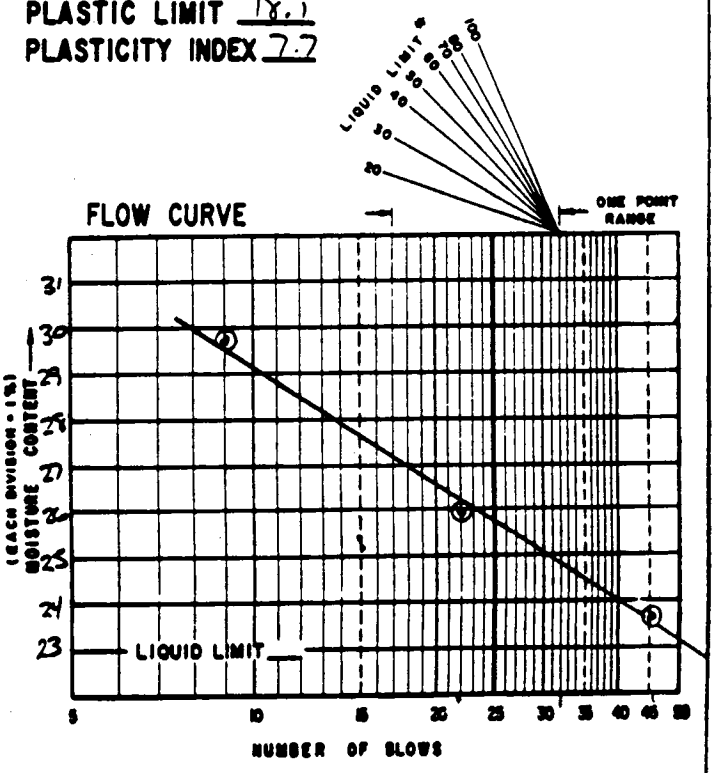
This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 25.8
PLASTIC LIMIT 18.1
PLASTICITY INDEX 7.7

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (@ 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/8"			
#4			
#10			
#40			
#200			
PAN		100	0

DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
JOB NUMBER _____ NAME _____
LOCATION _____

LAB 3 (2-90)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 39 PLASTICITY INDEX 26

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CL)

JOB 034-14 (CANONIE 86-018-1806) BORING NO. B-22-6 SAMPLE NO. _____ DEPTH 5.5'

DATE TESTED 10/3/90 BY DC COMPUTED BY _____ CHECKED BY _____

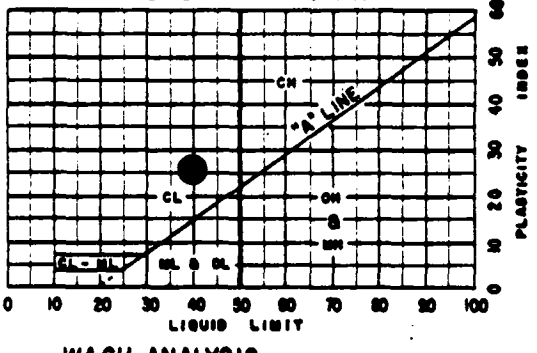
DESCRIPTION OF SOIL GREENISH GRAY SANDY CLAY TO SAND (CHANGE) CLAY TESTED

PAN F

		PLASTIC LIMIT			LIQUID LIMIT			
DISH NUMBER	E-4	B-7	B-9	Z2	A-1	A-18	A-21	A-23
WT. IN GMS.	MOIST SOIL & DISH	13.71	12.33	19.24	21.55	21.86	21.75	21.91
	DRY SOIL & DISH	12.55	11.45	17.85	18.87	18.99	18.74	18.66
	MOISTURE	1.16	0.88	1.39	2.68	2.87	3.01	3.25
	DISH	4.42	4.32	6.76	11.50	11.42	11.33	11.27
	DRY SOIL	8.13	7.13	11.09	7.37	7.57	7.41	7.44
MOISTURE CONTENT, %		14.3	12.3	12.5	36.4	37.9	40.6	43.7
NUMBER OF BLOWS					51	31	19	12

This line is 1/8" thick

PLASTICITY CHART



LIQUID LIMIT 39.1

PLASTIC LIMIT 13.0

PLASTICITY INDEX 26

WASH ANALYSIS (@ 200 SIEVE)

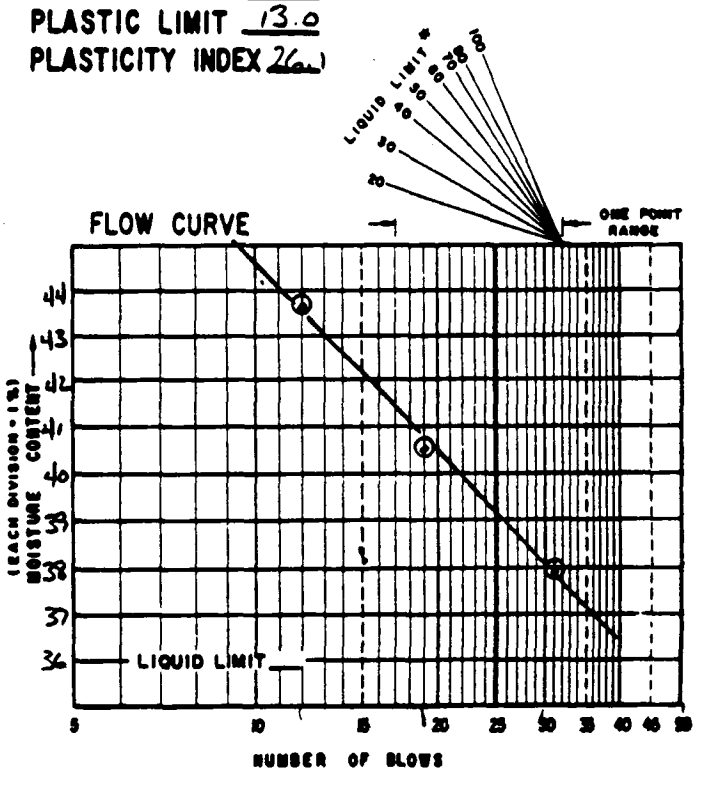
	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
#4			
#10			
#40			
#200			
PAN		100	0

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 35 BLOWS) TO THE 25-BLOW LINE.

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-86)

DATA SHEET FOR CLASSIFICATION TEST

COOPER TESTING LABORATORY

SUMMARY:

LIQUID LIMIT 92 PLASTICITY INDEX 57

% GRAVEL _____ SAND _____ FINES _____ CLASSIFICATION (CH)

JOB 234-14 (CANONIE 96-015-R&C) BORING NO. MW 97-1 SAMPLE NO. _____ DEPTH 5.5'

DATE TESTED 9/25/90 BY DC COMPUTED BY _____ CHECKED BY _____

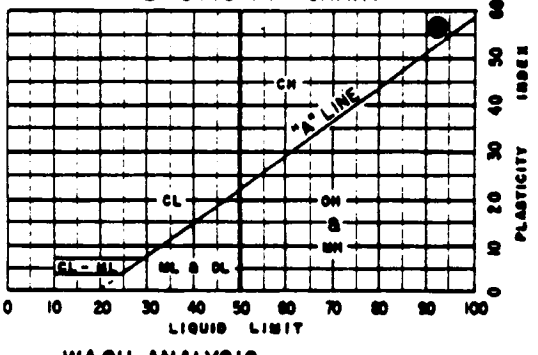
DESCRIPTION OF SOIL GRAY SILTY CLAY (BAYMUD)

PAN # 10

DISH NUMBER E-1		B-52	B-58	B-60	A-4	A-29	A-31	A-34
WT. IN GMS.	MOIST SOIL & DISH	13.52	14.35	17.51	23.69	22.69	23.81	26.93
	DRY SOIL & DISH	11.74	12.39	14.65	17.97	17.42	17.94	19.24
	MOISTURE	1.78	1.96	2.86	5.77	5.27	5.87	7.69
	DISH	6.67	6.75	6.76	11.15	11.61	11.70	11.82
	DRY SOIL	5.07	5.64	7.89	6.72	5.81	6.24	7.42
MOISTURE CONTENT, %		35.1%	34.8%	36.2%	85.9%	90.7%	94.1%	103.6%
NUMBER OF BLOWS					48	29	19	11

This line is 1/8" thick

PLASTICITY CHART

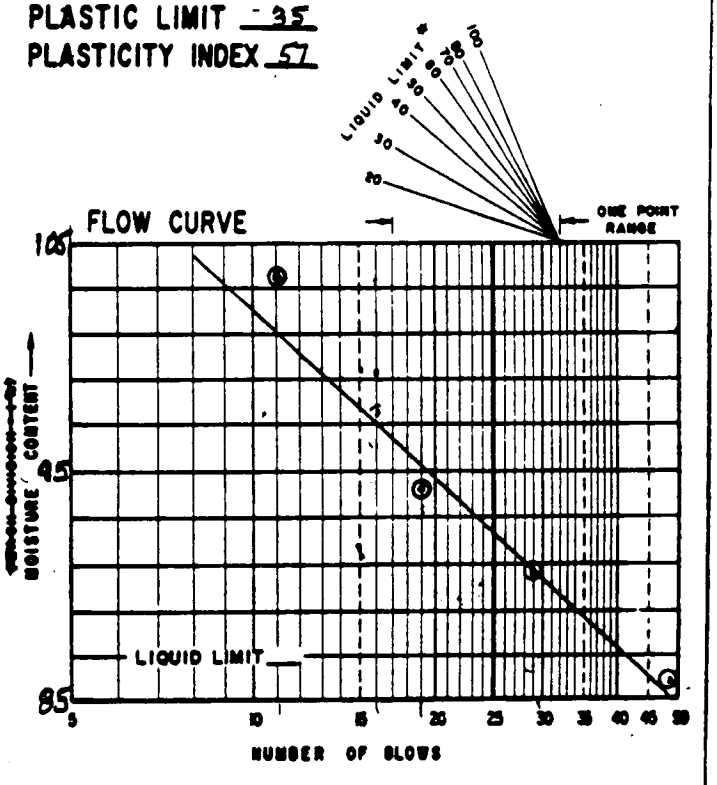


LIQUID LIMIT 92

PLASTIC LIMIT 35

PLASTICITY INDEX 57

FLOW CURVE



* USE THE APPROPRIATE SLOPE TO EXTRAPOLATE ONE-POINT LIQUID LIMIT TRIALS (BETWEEN 17 AND 36 BLOWS) TO THE 25-BLOW LINE.

WASH ANALYSIS (@ 200 SIEVE)

	BEFORE WASH	AFTER WASH
WT. OF DISH + OVEN-DRY SOIL		
WT. OF DISH NO. _____		
WT. OF OVEN-DRY SOIL		

% COARSE SOIL _____

SIEVE ANALYSIS

U.S. SIEVE NUMBER	CUMULATIVE WEIGHT RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
3"			
3/4"			
@ 4			
@ 10			
@ 40			
@ 200			
PAN		100	0

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

JOB NUMBER _____ NAME _____

LOCATION _____

LAB 3(2-4)

APPENDIX E

SPECIFIC GRAVITY RESULTS

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 031-13 NAME CANONIE 86-014-1906 LOCATION ALAMEDA NAS

TESTED BY DC DATE 9/11/90 CHECKED BY

Dish Number	E			
Boring Number	MW 360-1			
Depth of Sample in Feet	4 1/2			
Field Classification of Soil				
Lab Classification of Soil	BROWN FINE SAND (SP)			
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100%			
Pycnometer Number	3			
Wt. of Pycnometer + Soil + Water..... Wb	323.1			
Test Temperature in °C, Tx	23			
Wt. of Pycnometer + Water..... Wa (from calibration curve)	291.74			
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil..... Wo	50.05			
Temp. Correction Factor..... K (from chart below)	.9993			
K. Wo	50.015			
Wo + Wa — Wb	18.69			
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.68			

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-14 NAME CANONIE 96-018-1906 LOCATION ALAMEDA NAS

TESTED BY DC DATE 9/27/90 CHECKED BY

Dish Number	C-2	C-22	E	C-2
Boring Number	MW-D13-1	MW-410-1	B-D13-7	B-D13-6
Depth of Sample in Feet	2'	2.5'	10'	7
Field Classification of Soil				
Lab Classification of Soil	LT. BROWN FINE SILTY SAND (SM)	LT. BROWN FINE SAND (SP)	LT. BROWN CLAYEY FINE SAND (SC)	BROWN SILTY FINE SAN (SM)
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100	100	100	100
Pycnometer Number	3	3	3	3
Wt. of Pycnometer + Soil + Water ..... Wb	322.0	323.2	322.3	312.8
Test Temperature in °C, Tx	24	24	25	25
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.68	291.68	291.64	291.64
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	48.53	50.07	49.96	33.97
Temp. Correction Factor ..... K (from chart below)	.9991	.9991	.9989	.9989
K. Wo	48.49	50.02	49.91	33.93
Wo + Wa — Wb	18.17	18.50	19.25	12.77
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.67	2.70	2.59	2.66

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-14 NAME CANONIE 86-018-1906 LOCATION ALAMEDA NAS

TESTED BY DC DATE 10/2/90 CHECKED BY

Dish Number	F	C-22	C-13	E
Boring Number	B-D13-15	B-D13-9	BOR-19	BOR-23
Depth of Sample in Feet	3.5'	10'	5'	1.5'
Field Classification of Soil				
Lab Classification of Soil	BROWN FINE SAND (SP)	BROWN SILTY FINE SAND (SM)	MOTTLED GRAY & BROWN SILTY SAND (SM)	BROWN FINE SAND (SP)
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	-#4 100%	-#4 100%	-#4 100%	-#4 100%
Pycnometer Number	3	3	3	3
Wt. of Pycnometer + Soil + Water ..... Wb	322.6	322.4	322.58	322.9
Test Temperature in °C, Tx	24	24	25	25
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.68	291.68	291.64	291.64
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	49.60	49.90	50.03	49.27
Temp. Correction Factor ..... K (from chart below)	.9991	.9991	.9989	.9989
K Wo	49.55	49.86	49.98	49.22
Wo + Wa — Wb	18.64	19.14	19.04	18.01
Specify Gravity (20°C) = K Wo / (Wo + Wa — Wb)	2.66	2.61	2.63	2.73

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-14 NAME CANONIE 86-018-1806 LOCATION ALAMEDA NAS

TESTED BY DC DATE 10/5/90 CHECKED BY

Dish Number	C-8	F	C-3	F
Boring Number	BOR - 13	BOR 12	BOR-18	BOR - 15
Depth of Sample in Feet	8	1.0	10.5'	5.5
Field Classification of Soil				
Lab Classification of Soil	GRAY SANDY CLAY (BAYMUD)	Grey-tan fine sand poorly graded (SP)	BROWN SILTY FINE SAND	GREEN-BROWN FINE SAN W/SILT (SP/SM
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100% -#4	100% -#4	100% -#4	100% -#4
Pycnometer Number	3	3	3	3
Wt. of Pycnometer + Soil + Water ..... Wb	308.55	323.26	322.6	323.1
Test Temperature in °C, Tx	26	24.5°	25	25
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.58	291.66	291.64	291.64
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	27.50	50.15	49.91	50.46
Temp. Correction Factor ..... K (from chart below)	.9986	.9990	.9988	.9989
K. Wo	27.46	50.10	49.86	50.40
Wo + Wa — Wb	10.49	18.50	18.95	19.0
Specify Gravity (20°C) = $\frac{K\,Wo}{Wo + Wa - Wb}$	2.62	2.71	2.63	2.65

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

$$\frac{K\,W_o}{(K\,W_o) + W_a - W_b}$$

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

COOPER TESTING LABS

DATA SHEET FOR SPECIFIC GRAVITY TEST

JOB NO. 034-14 NAME CANONIE 96-019-1906 LOCATION ALAMEDA NAS

TESTED BY DC DATE 10/22/90 CHECKED BY

Dish Number	C-13	E	4	
Boring Number	BOR 21	B-C2-9	BOR-13	
Depth of Sample in Feet	13	1'	9.5	
Field Classification of Soil				
Lab Classification of Soil	BROWN SILTY FINE SAND (SM)	GREENISH BROWN FINE SAND (SP)	GRAY SILTY CLAY BAY MUD	
Test Performed on Whole Sample? Or Some Fraction? Specify Percent	100% -#4	100% -#4	100% -#4	
Pycnometer Number	3	3	3	
Wt. of Pycnometer + Soil + Water ..... Wb	321.70	322.78	304.68	
Test Temperature in °C, Tx	22	22	22	
Wt. of Pycnometer + Water ..... Wa (from calibration curve)	291.78	291.78	291.78	
Drying Dish Number				
Wt. of Dry Soil + Dish				
Wt. of Dish				
Wt. of Dry Soil ..... Wo	48.18	49.41	21.44	
Temp. Correction Factor ..... K (from chart below)	.9996	.9996	.9996	
K. Wo	48.16	49.39	21.43	
Wo + Wa — Wb	18.26	18.41	8.54	
Specify Gravity (20°C) = $\frac{K\ Wo}{Wo + Wa - Wb}$	2.64	2.68	2.51	

Notes: 1. Based on "Standard Method of Test for Specific Gravity of Soils," ASTM Designation D 854-52. (For sand and fines)

2. All weights are in grams.

Tx	K
18	1.0004
19	1.0002
20	1.0000
21	.9998
22	.9996
23	.9993
24	.9991
25	.9989
26	.9986
27	.9983
28	.9980
29	.9977
30	.9974

Lab 11 (2-60)

APPENDIX F

CONSOLIDATION RESULTS

COOPER TESTING LABORATORY

Project: CANONIE FG-018-1806 Location: ALAMEDA NAS Job No. 034-3

Soil Classification: D. BROWN FINE SAND w/SOME SILT (SP/SM) Boring No. 360-1

Sample No.

Test Started By: DC 915 AM Test Completed By: / / Depth (ft) 6.5-7.0

Data Computed By: / / Data Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 300 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.9798
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.871
Weight of Ring(s) + Wet Soil – gm	131.0	131.1
Weight of Rings Only – gm	27.0	27.0
Weight of Wet Soil – gm	104.0	104.1
Wet Density – pcf	135.4	138.3
Weight of Wet Soil + Dish (Ring) – gm	104.0	151.7
Weight of Dry Soil + Dish (Ring) – gm	90.8	138.5
Weight of Lost Moisture – gm	13.2	13.2
Weight of Dish (Ring) – gm (A-14)		47.7
Weight of Dry Soil – gm 20.7 27.0		90.8
Moisture as % of Dry Weight – %	14.4	14.5
Dry Density – pcf	118.3	120.8

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final

REMARKS:

EQUIPMENT: Consolidometer 1

Load Factor: 1 CGR = psf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\quad)}{(\quad)(\quad)(16.4)(1)} =$

H_c: Height of sample after consolidation

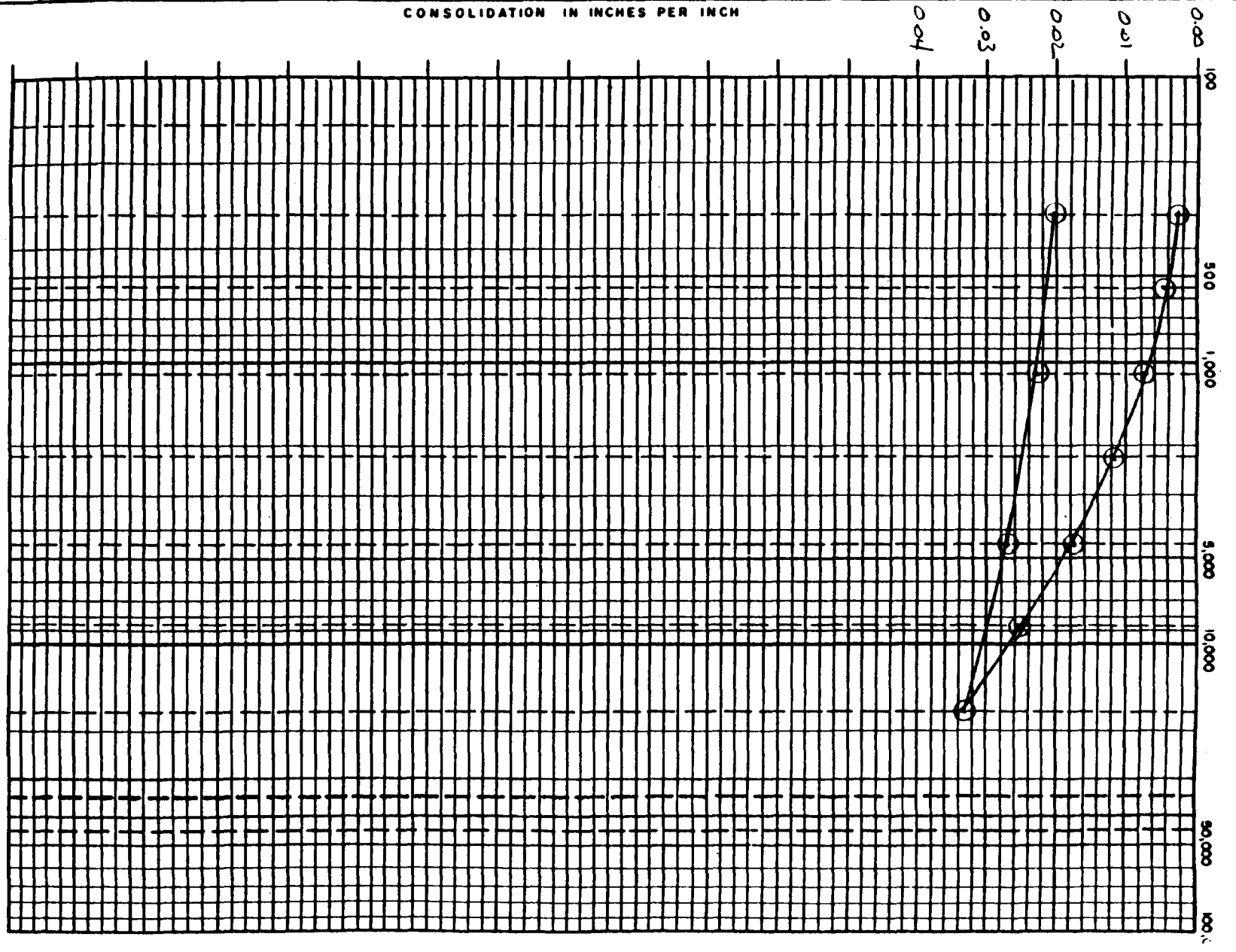
e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\quad) / (\quad) =$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
		.0000		

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION DESCRIPTION	Symbol	ATTERBERG LIMITS LL %	PL %	PI	INITIAL Moist. %	Dry Density pcf	FINAL Moist. %	Dry Density pcf	Po PSF	Pc PSF	C



COOPER TESTING LABORATORY

Project: CANONIE 916-018-1906 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: DARK GRAY SANDY SILT w/GRAVEL TO BROWN CLAYEY SAND w/GRAVEL. Boring No. MW-D13-3

Sample No.

Test Started By: DK 9/21 Test Completed By: / / Depth (ft) 10

Data Computed By: / / Data Plotted By: / / Checked By: / /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

DATA REQUIREMENT

$\gamma_{dmx.}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle: DARK GRAY CLAY TESTED.

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.8543
Sample Diameter (D_o) – in.	1.87	1.87
Sample Area (A_o) – in.	2.75	2.75
Sample Volume (V_o) – in./cc	2.75	2.35
Weight of Ring(s) + Wet Soil – gm	135.8	131.6
Weight of Rings Only – gm	55.2	55.2
Weight of Wet Soil – gm	80.6	76.4
Wet Density – pcf	112.0	124.2
Weight of Wet Soil + Dish (Ring) – gm	80.6	96.3
Weight of Dry Soil + Dish (Ring) – gm	56.5	76.8
Weight of Lost Moisture – gm	24.1	19.5
Weight of Dish (Ring) – gm (51)		20.3
Weight of Dry Soil – gm		56.5
Moisture as % of Dry Weight – %	42.6	34.5
Dry Density – pcf (Final Dry Density = Initial Dry Density x H_o/H_f)	78.9	92.3

G_s: Specific Gravity 2.7 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
98	94

REMARKS:

EQUIPMENT: Consolidometer 2

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(56.5)}{(2.7)(2.75)(16.4)(1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (1)/(.4641) = 2.155 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.00	1.155
150		.0066	.9934	1.147
300		.0168	.9832	1.136
550		.0240	.9760	1.127
1100		.0472	.9528	1.101
2200		.0780	.9220	1.065
4400		.1249	.8751	1.011
8800		.1760	.8240	.952
2200		.1699	.8301	.959
550		.1590	.8410	.971
150		.1457	.8543	.987

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
9/21	1047	0	150	5000		
	1048		(.4)	4948	SAT.	
	1126			4936		
9/22	1028			4934		.0066
	1029	0	300	4934		
9/23	1002		(.7)	4832		.0168
	1003	0	550	4832		
9/24	905		(.9)	4760		.0240
	906	0	1100	4760		
	1800		(1.3)	4534		
9/25	805			4528		.0472
	807	0	2200	4528		
		.1	(2.2)	4476		
		.25		4461		
		.5		4448		
	808	1		4428		
	809	2		4404		
	811	4		4377		
	815	8		4344		
	822	15		4313		
	837	30		4281		
	907	60		4260		
	1007	120		4247		
	1207	240		4237		
	1607	480		4228		
	1926			4223		
9/26	812			4220		.0780
	813	0	4400	4220		
		.1	(4.0)	4149		
		.25		4132		
		.5		4112		
	814	1		4083		
	815	2		4047		
	817	4		4008		
	821	8		3961		
	828	15		3913		
	843	30		3858		
	913	60		3823		
	1013	120		3796		
	1213	240		3777		
	1547			3756		
9/27	810			3751		.1249
	815	0	8800	3751		
	1731		(7.5)	3247		
9/28	833			3240		.1760
	835	0	2200	3240		
	1615		(2.2)	3296		
9/29	949			3301		.1699

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	950	0	550	3201		
9/30	1015		(.9)	3410		.1590
	1046	0	150	3410		
10/1	737		(.4)	3543		.145

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

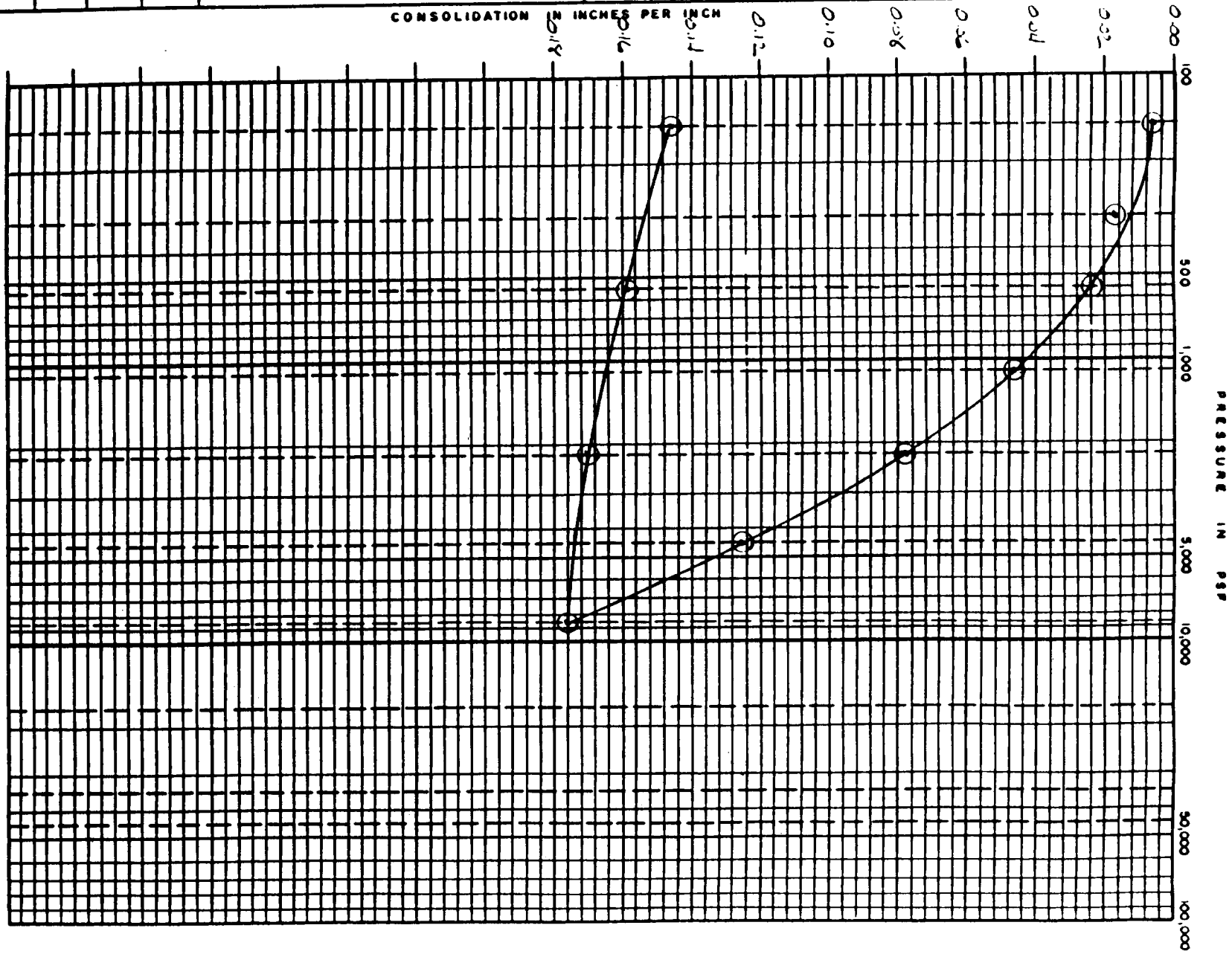
PAGE ____ OF ____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



COOPER TESTING LABORATORY

Project: CANONIE 86-018-1806 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: DARK GRAY SILT W/ PEAT TO SAND Boring No. B-D13-6

SILT TESTED Sample No.

Test Started By: DC 9/21 Test Completed By: / / Depth (ft) 6'

Date Computed By: / / Date Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.7818
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.29
Weight of Ring(s) + Wet Soil – gm	90.5	83.8
Weight of Rings Only – gm	27.7	27.7
Weight of Wet Soil – gm	62.8	56.1
Wet Density – pcf	81.8	93.4
Weight of Wet Soil + Dish (Ring) – gm	62.8	75.7
Weight of Dry Soil + Dish (Ring) – gm	31.5	51.5
Weight of Lost Moisture – gm	31.3	24.2
Weight of Dish (Ring) – gm (23)		20.0
Weight of Dry Soil – gm		31.5
Moisture as % of Dry Weight – %	98.1	76.8
Dry Density – pcf	41.3	52.8

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity 2.6 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
86	

REMARKS:

EQUIPMENT: Consolidometer 3

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(31.5)}{(2.6)(2.93)(16.4)(1)} = .2$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = \frac{1}{H_c/H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\ 1\ )\ /\ (.254) = 3.966$ -1

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	2.
150		.0041	.9959	2.[illegible]
300		.0134	.9866	2.9[illegible]
550		.0343	.9657	2.86
1100		.0729	.9271	2.7[illegible]
2200		.1204	.8796	2.6[illegible]
4400		.1910	.8090	2.4[illegible]
8800		.2751	.7249	2.[illegible]
2200		.2598	.7402	2.1[illegible]
550		.2418	.7582	2.2[illegible]
150		.2182	.7818	2.3[illegible]

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
9/21	1113	0	150	5000		
	1127		(.5)	4957	SAT.	
	1727			4960		
9/22	1029			4959		.0041
	1030	0	300	4959		
9/23	1003		(.7)	4866		.0134
	1004	0	550	4866		
9/24	907		(.9)	4657		.0343
	909	0	1100	4657		
		.1	(1.3)	4553		
		.25		4539		
		.5		4515		
	910	1		4497		
	911	2		4475		
	913	4		4460		
	917	8		4445		
	924	15		4431		
	939	30		4413		
	1009	60		4391		
	1109	120		4370		
	1309	240		4346		
	1800			4311		
9/25	809			4271		.0729
	810	0	2200	4271		
		.1	(2.2)	4162		
		.25		4136		
		.5		4115		
	811	1		4088		
	812	2		4061		
	814	4		4031		
	818	8		4001		
	825	15		3975		
	840	30		3943		
	910	60		3921		
	1010	120		3892		
	1210	240		3858		
	1610	480		3820		
	1926			3796		.1204
9/26	819	0	4400	3796		
	1847		(4.0)	3133		
9/27	815			3080		.1910
	817	0	8800	3080		
	1931		(7.5)	2329		
9/28	835			2249		.2751
	847	0	2200	2249		
	1615		(2.2)	2389		
9/29	950			2402		.2598
	951	0	550	2402		
9/30	1046		(.9)	2582		.2418

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	1046	0	150	2582		
10/1	740		(.5)	2818		.2182

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

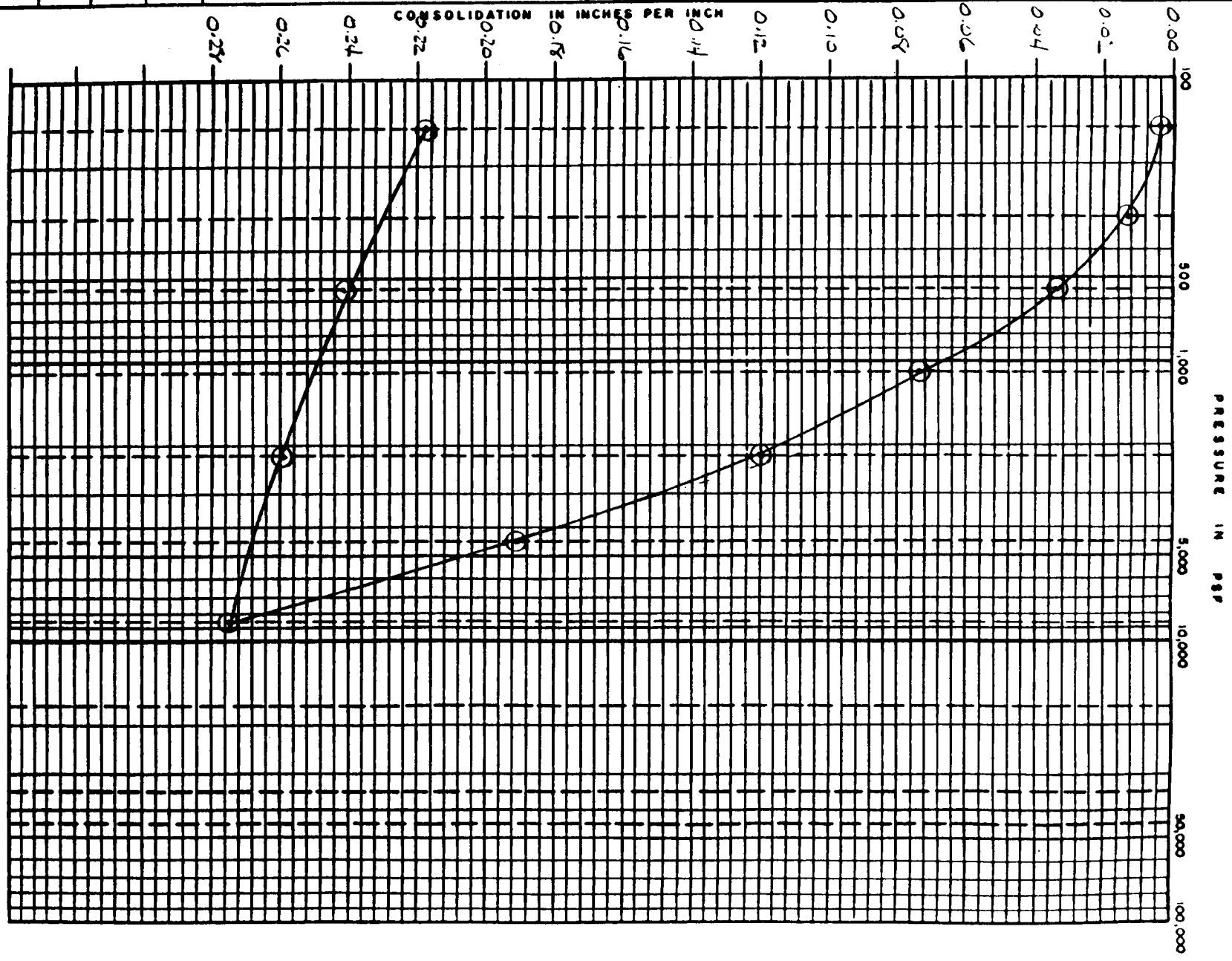
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION DESCRIPTION	Symbol	ATTERBERG LIMITS LL %	PL %	PI	INITIAL Moist. %	Dry Density pcf	FINAL Moist. %	Dry Density pcf	Po PSF	Pc PSF	C
									3		2		10			



CONSOLIDATION TEST DATA

COOPER TESTING LABORATORY

Project: CANONIE SE-018-1906 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: DARK GRAY SILTY CLAY (BAYMUD) (CL) Boring No. B-D13-11

Sample No.

Test Started By: DC 9 / 21 / 80 Test Completed By: / / Depth (ft) 10

Date Computed By: / / Date Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.00	.8260
Sample Diameter (D_o) – in.	1.90	1.90
Sample Area (A_o) – in.	2.84	2.84
Sample Volume (V_o) – in./cc	2.84	2.34
Weight of Ring(s) + Wet Soil – gm	111.9	106.5
Weight of Rings Only – gm	34.7	34.7
Weight of Wet Soil – gm	77.2	71.8
Wet Density – pcf	103.6	116.7
Weight of Wet Soil + Dish (Ring) – gm	77.2	92.5
Weight of Dry Soil + Dish (Ring) – gm	50.6	72.3
Weight of Lost Moisture – gm	26.6	20.2
Weight of Dish (Ring) – gm (75)		21.7
Weight of Dry Soil – gm		50.6
Moisture as % of Dry Weight – %	50.4	39.9
Dry Density – pcf (Final Dry Density = Initial Dry Density x H_o/H_f)	68.9	83.4

G_s: Specific Gravity 2.7 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
92	88

REMARKS:

EQUIPMENT: Consolidometer 4

Load Factor: 1 CGR = psf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(50.6)}{(2.7)\ (2.84)\ (16.4)\ (1)} = .402$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (1) / (.402) = 2.485 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	1.485
150		.0016	.9984	1.426
300		.0125	.9875	1.466
550		.0233	.9767	1.450
1100		.0532	.9468	1.406
2200		.0963	.9037	1.342
4400		.1481	.8519	1.265
8800		.2000	.8000	1.188
2200		.1913	.8087	1.201
550		.1864	.8136	1.208
150		.1740	.8260	1.227

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
3/21	1126	0	150	5000		
	1127		(.5)	4980	54	
	1727			4986		
3/22	1230			4984		.0016
	1031	0	300	4984		
3/23	1203		(.7)	4875		.0125
	1204	0	550	4875		
3/24	913		(.9)	4767		.0233
	914	0	1100	4767		
		.1	(1.3)	4696		
		.25		4684		
		.5		4673		
	915	1		4660		
	916	2		4644		
	918	4		4626		
	922	8		4605		
	929	15		4584		
	944	30		4555		
	1014	60		4528		
	1114	120		4508		
	1314	240		4493		
	1800			4480		
3/25	815			4468		.0532
	816	0	2200	4468		
		.1	(2.2)	4410		
		.25		4395		
		.5		4378		
	817	1		4360		
	818	2		4335		
	820	4		4304		
	824	8		4263		
	831	15		4220		
	846	30		4167		
	916	60		4117		
	1132			4065		
	1216	240		4060		
	1937			4043		.0963
3/26	824			4037		
	826	0	4400	4037		
		.1	(4.0)	3986		
		.25		3970		
		.5		3952		
	827	1		3929		
	828	2		3900		
	830	4		3859		
	834	8		3807		
	841	15		3750		
	856	30		3682		
	926	60		3616		
	1026	120		3571		
	1226	240		3546		
	1847			3525		

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
3/27	817			3518		.1481
	1235	0	8800	3518		
3/28	838		(7.5)	3300		.2200
	840	0	2200	3300		
	1616		(2.3)	3088		
3/29	950			3087		.1913
	951	0	550	3087		
3/30	1048		(.9)	3136		.1864
	1048	0	150	3136		
10/1	746		(.5)	3260		.1740

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

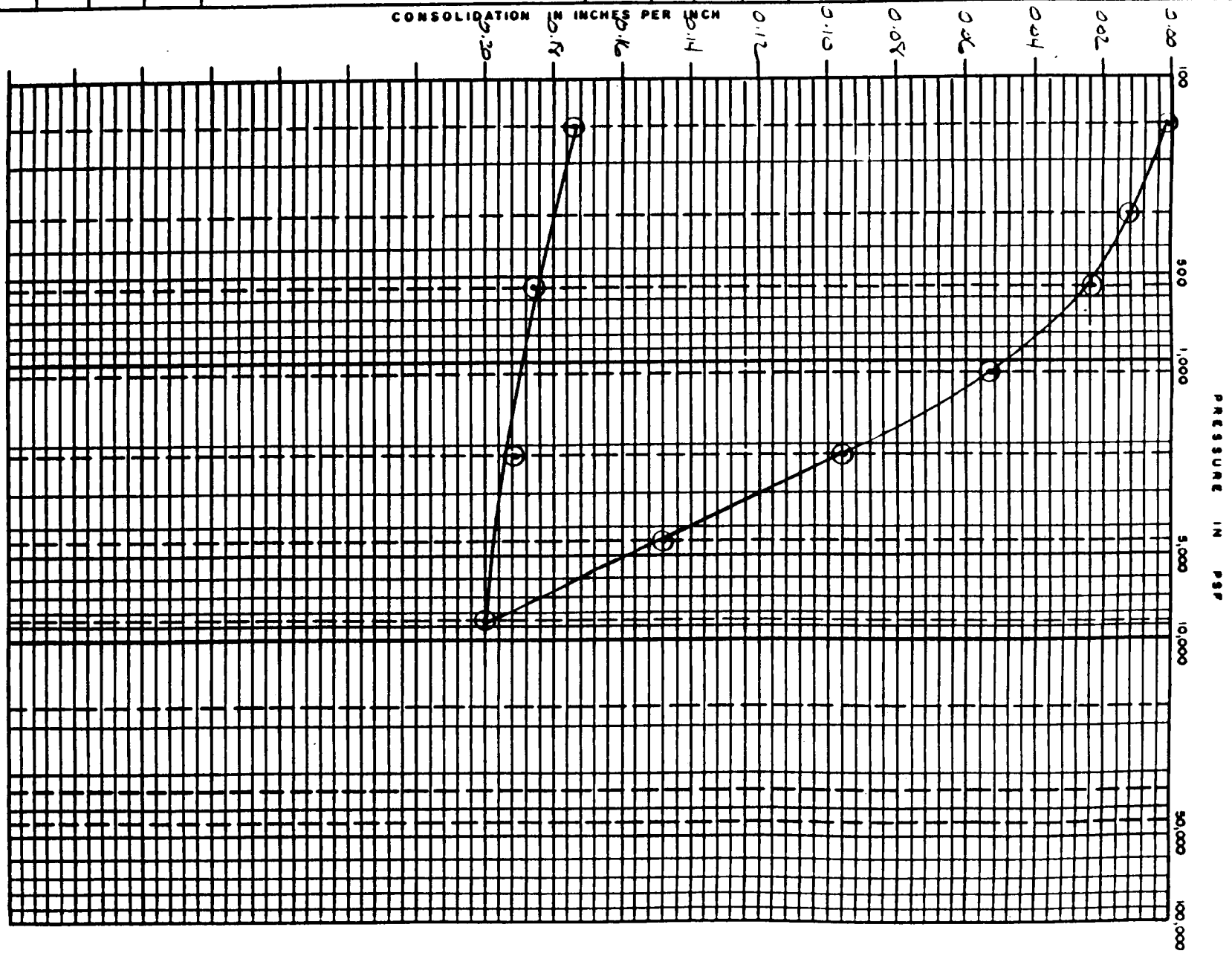
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION DESCRIPTION	Symbol	ATTERBERG LIMITS LL %	PL %	PI	INITIAL Moist. %	Dry Density pcf	FINAL Moist. %	Dry Density pcf	Po PSF	Pc PSF	C



COOPER TESTING LABORATORY

Project: CANONIE 86-018-1806 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: DARK GRAY CLAYEY SAND (SC) Boring No. B-D13-12

Sample No.

Test Started By: DC 9/21 Test Completed By: / / Depth (ft) 7½

Data Computed By: / / Data Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

DATA REQUIREMENT

$\gamma_{dmx.}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.8700
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.55
Weight of Ring(s) + Wet Soil – gm	120.5	114.8
Weight of Rings Only – gm	28.7	28.7
Weight of Wet Soil – gm	91.8	86.1
Wet Density – pcf	119.5	128.9
Weight of Wet Soil + Dish (Ring) – gm	91.8	105.7
Weight of Dry Soil + Dish (Ring) – gm	69.7	89.7
Weight of Lost Moisture – gm	22.1	16.0
Weight of Dish (Ring) – gm (47)		20.0
Weight of Dry Soil – gm		69.7
Moisture as % of Dry Weight – %	31.1	23.0
Dry Density – pcf	91.2	104.8

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity 2.7 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
98	83

REMARKS:

EQUIPMENT: Consolidometer 5

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(69.7)}{(2.7)\ (2.93)\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\ 1\ )\ /\ (.537) = 1.861 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	.861
150		.0096	.9904	.853
300		.0205	.9795	.843
550		.0369	.9631	.829
1100		.0590	.9410	.810
2200		.0870	.9130	.78
4400		.1173	.8827	.76
8800		.1459	.8541	.73
2200		.1413	.8587	.73
550		.1359	.8641	.74
150		.1300	.8700	.74

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
9/21	1146	0	150	5000		
	1150		(.5)	4951	SAT.	
	1727			4911		
9/22	1051			4904		.0096
	1031	0	300	4904		
9/23	1004		(.7)	4795		.0205
	1005	0	550	4795		
9/24	919		(.9)	4631		.0369
	920	0	1100	4631		
		.1	(1.3)	4607		
		.25		4600		
		.5		4592		
	921	1		4582		
	922	2		4568		
	924	4		4550		
	928	8		4529		
	935	15		4507		
	1005			4476		
	1020	60		4468		
	1120	120		4453		
	1320	240		4439		
	800			4423		
9/25	822			4410		.0590
	826	0	2200	4410		
		.1	(2.2)	4372		
		.25		4360		
		.5		4348		
	827	1		4332		
	828	2		4309		
	830	4		4281		
	834	8		4249		
	841	15		4221		
	856	30		4198		
	926	60		4109		
	1026	120		4165		
	1226	240		4150		
	1927			4130		.0870
9/26	828	0	4400	4130		
	1848		(4.0)	3836		
9/27	836			3827		.1173
	838	0	8800	3827		
	1755		(7.5)	3552		
9/28	848			3541		.1459
	850	0	2200	3541		
	1616		(2.2)	3583		
9/29	952			3587		.1413
	952	0	550	3587		
9/30	1049		(.9)	3641		.1359

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	1049	0	150	3641		
10/1	750		(.5)	3700		.1300

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

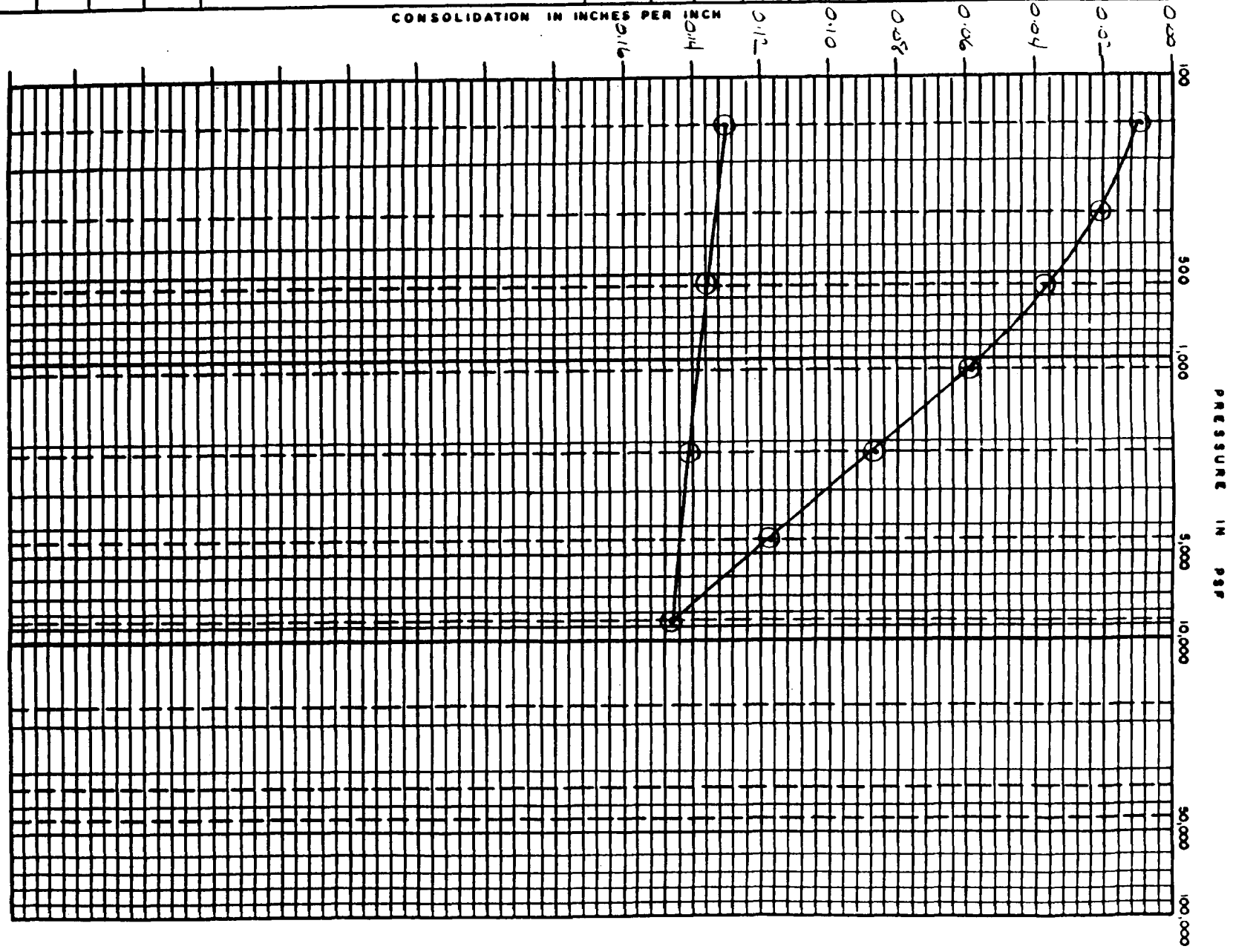
PAGE ____ OF ____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



COOPER TESTING LABORATORY

Project: CANONIE 86-018-506 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: BROWN FINE SAND (SP) Boring No. MW-410-1

Sample No.

Test Started By: DC 9/21/86 Test Completed By: / / Depth (ft) 3 1/2

Data Computed By: / / Data Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % Dd ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 300 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.9694
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.84
Weight of Ring(s) + Wet Soil – gm	100.7	112.2
Weight of Rings Only – gm	23.8	23.8
Weight of Wet Soil – gm	76.9	88.4
Wet Density – pcf	100.1	118.7
Weight of Wet Soil + Dish (Ring) – gm	76.9	108.6
Weight of Dry Soil + Dish (Ring) – gm	71.8	92.4
Weight of Lost Moisture – gm	5.1	16.2
Weight of Dish (Ring) – gm (A-15)		20.6
Weight of Dry Soil – gm		71.8
Moisture as % of Dry Weight – %	6.6	22.6
Dry Density – pcf	93.9	96.8

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity 2.7 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
22	78

REMARKS:

EQUIPMENT: Consolidometer 1

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\ 71.8\ )}{(2.7)\ (2.93)\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\ 1\ )\ /\ (.553) = 1.807 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	.8[illegible]
300		.0043	.9957	.804
550		.0073	.9927	.801
1100		.0117	.9883	.79[illegible]
2200		.0182	.9818	.79[illegible]
4400		.0256	.9744	.786
8800		.0333	.9667	.7[illegible]
2200		.0370	.9630	.7[illegible]
300		.0306	.9694	.7[illegible]

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
9/21	1029	0	300	5000		
	1047		(.7)	4967	SAT.	
	1726			4960		
9/22	1027			4957		.0043
	1027	0	550	4957		
9/23	1001		(.3)	4927		.0073
	1002	0	1100	4927		
9/24	904		(1.3)	4883		.0117
	905	0	2200	4883		
	1800		(2.2)	4820		
9/25	804			4818		.0182
	805	0	4400	4818		
	1916		(4.0)	4744		
9/26	811			4744		.0256
	812	0	8800	4744		
	1847		(7.5)	4667		
9/27	809			4667		.0333
	810	0	17,600	4667		
	1731		(14.5)	4571		
9/28	830			4570		.0430
	833	0	8800	4570		
	1614		(7.5)	4587		
9/29	948			4590		.0410
	949	0	2200	4590		
9/30	1035		(2.2)	4630		.0370
	1035	0	300	4630		
10/1	735		(.7)	4694		.0306

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation

NOTES: _____

Sample: _____

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

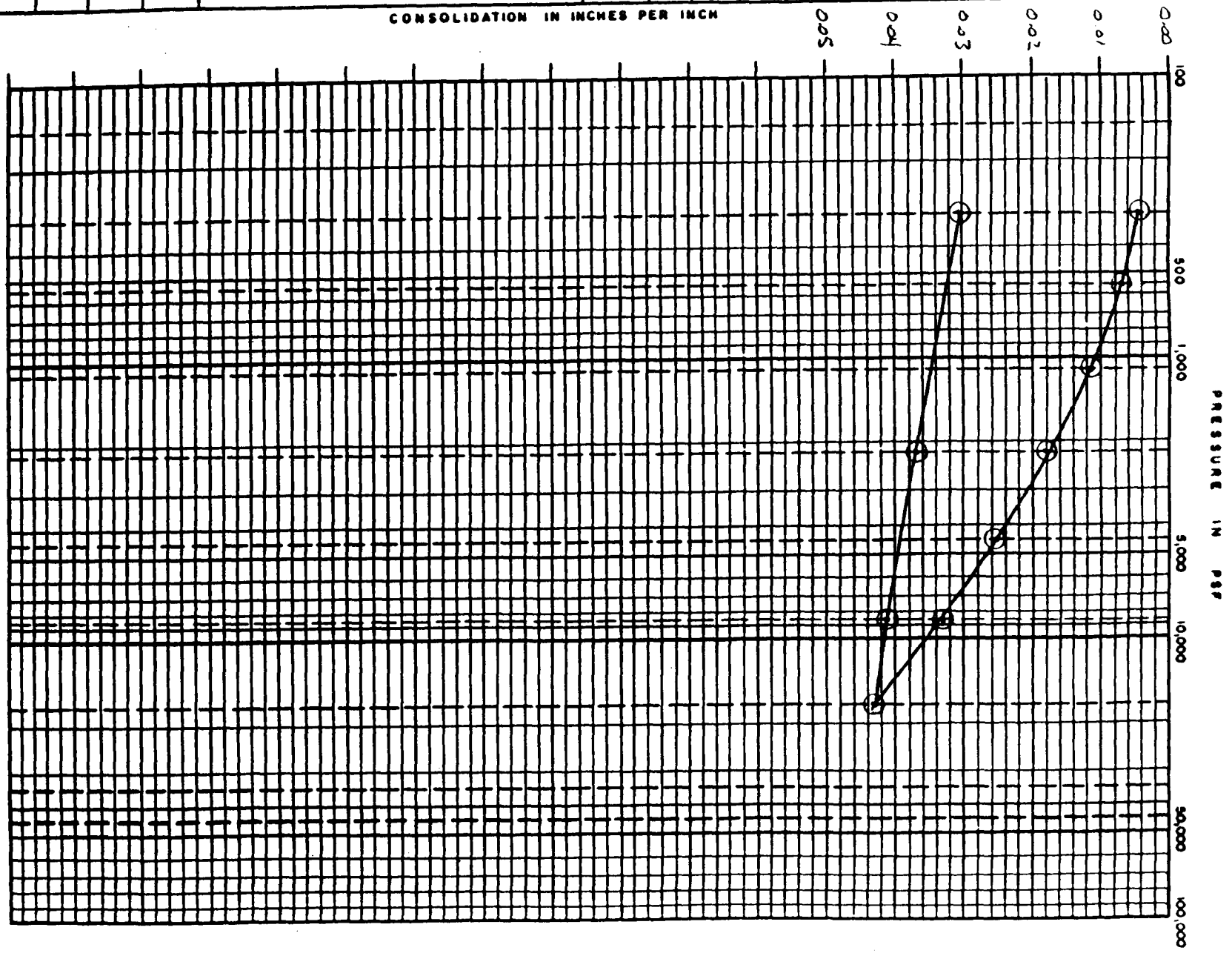
Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			

CONSOLIDATION IN INCHES PER INCH



COOPER TESTING LABORATORY

Project: CANNONIE Pg-018-1906 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: MOTTLED BROWN & GRAY SILTY CLAY (RAYMOND) (CH) Boring No. BOR-11

Sample No.

Test Started By: DC 6/14 RO Test Completed By: / / Depth (ft) 10.5'

Data Computed By: / / Data Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % Dd ☐ % Compaction

DATA REQUIREMENT

$\gamma_{dmx.}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

V_T = 46.54

V_S = 14.44

V_V = 32.10

e_o = 2.22

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.8351
Sample Diameter (D_o) – in.	1.90	1.90
Sample Area (A_o) – in.	2.84	2.84
Sample Volume (V_o) – in./cc	2.84	2.37
Weight of Ring(s) + Wet Soil – gm	106.2	99.3
Weight of Rings Only – gm	34.3	34.3
Weight of Wet Soil – gm	71.9	65.0
Wet Density – pcf	96.5	104.5
Weight of Wet Soil + Dish (Ring) – gm	71.9	118.6
Weight of Dry Soil + Dish (Ring) – gm	39.0	92.7
Weight of Lost Moisture – gm	32.9	25.9
Weight of Dish (Ring) – gm (78 / 19.4)		53.7
Weight of Dry Soil – gm		39.0
Moisture as % of Dry Weight – %	84.4	66.4
Dry Density – pcf (Final Dry Density = Initial Dry Density x H_o/H_f)	52.4	62.8

G_s: Specific Gravity 2.7 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
100	97

REMARKS:

EQUIPMENT: Consolidometer 4

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(39.0)}{(2.7)\ (2.84)\ (16.4)\ (1)} = ?$$

H_c: Height of sample after consolidation

e : Void ratio

$$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$$

$$\cdots\cdots \frac{1}{H_s} = (\ /\ )\ /\ (.310) = 3.225$$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	2.22
150		.0016	.9984	2.22
300		.0101	.9899	2.20
550		.0283	.9717	2.16
1100		.0659	.9341	2.07
2200		.1287	.8713	1.9
4400		.2043	.7957	1.7
1100		.1853	.8147	1.8
150		.1649	.8351	1.8

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
10/4	1513	0	50	5000		
	1517		(.5)	4972	541	
	1754			4985		
10/5	807			4984		.0016
	807	0	300	4984		
			(3)			
	1708			4905		
10/6	1104			4899		.0101
	1105	0	550	4899		
10/8	811		(.9)	4717		.0283
	814	0	1100	4717		
		.1	(1.3)	4685		
		.25		4688		
		.5		4681		
	815	1		4670		
	816	2		4656		
	818	4		4634		
	822	8		4604		
	829	15		4571		
	844	30		4532		
	914	60		4471		
	1014	120		4424		
	1214	240		4393		
	1654			4364		
10/9	825			4341		.0659
	846	0	2200	4341		
		.1	(2.2)	4305		
		.25		4295		
		.5		4283		
	847	1		4265		
	848	2		4239		
	850	4		4219		
	854	8		4151		
	901	15		4088		
	916	30		3999		
	946	60		3905		
	1046	120		3829		
	1246	240		3783		
	1646	480		3747		
10/10	817			3713		.1287
	822	0	4400	3713		
		.1	(4.0)	3674		
		.25		3657		
		.5		3645		
	823	1		3623		
	824	2		3591		
	826	4		3546		
	830	8		3481		
	837	15		3403		
	852	30		3291		
	922	60		3177		

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	1022	120				
	1222	240		3036		
	1630			2986		
10/11	857			2957		.2043
	859	0	1100	2957		
	1702		(1.3)	3137		
10/12	831			3147		.1853
	831	0	150	3147		
10-13	1533		(.5)	3351		.1649

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

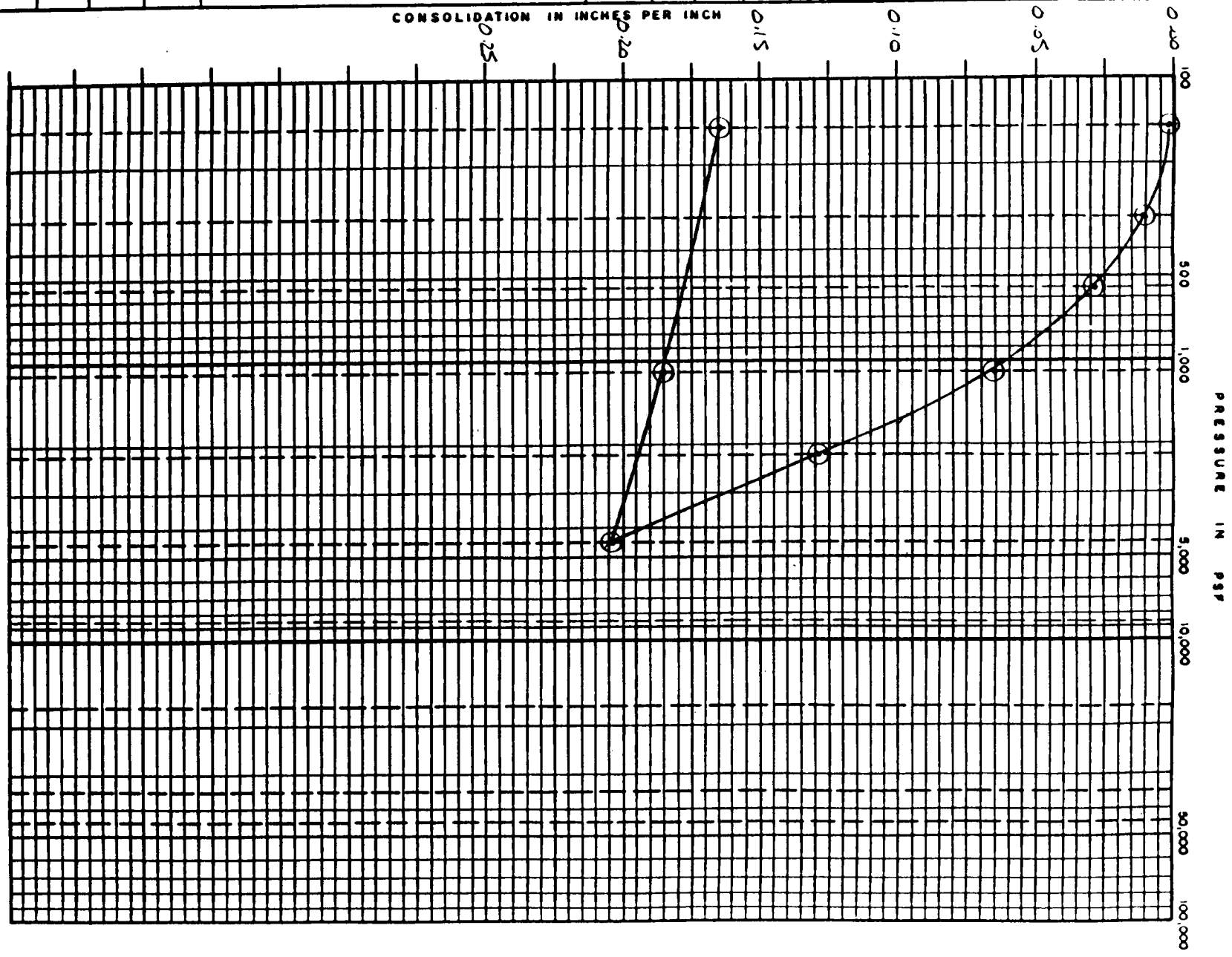
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



COOPER TESTING LABORATORY

Project: CANONIE 86-018-1806 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: GRAY SANDY CLAY (BAY MUD) (CL) Boring No. B012 13

Sample No.

Test Started By: DC 10/4 Test Completed By: / / Depth (ft) 8

Data Computed By: / / Data Plotted By: / / Checked By: / /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

$\gamma_{dmx.}$ = pcf

DATA REQUIREMENT

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.8668
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.54
Weight of Ring(s) + Wet Soil – gm	116.1	111.7
Weight of Rings Only – gm	28.5	28.5
Weight of Wet Soil – gm	87.6	83.2
Wet Density – pcf	114.1	125.0
Weight of Wet Soil + Dish (Ring) – gm	87.6	133.4
Weight of Dry Soil + Dish (Ring) – gm	65.0	115.2
Weight of Lost Moisture – gm	22.6	18.2
Weight of Dish (Ring) – gm (75)		50.2
Weight of Dry Soil – gm 21.7		65.0
Moisture as % of Dry Weight – %	34.9	28.0
Dry Density – pcf	84.6	97.6

(Final Dry Density = Initial Dry Density x H_o/H_f)

G_s: Specific Gravity 2.62 ☐ Assumed ☑ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
98	

REMARKS:

EQUIPMENT: Consolidometer S

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(\ 65.0\ )}{(2.62)\ (2.93)\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\ 1\ )\ /\ (1.516) = 1.937 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	.9[illegible]
150		.0009	.9991	.936
300		.0074	.9926	.930
550		.0166	.9834	.921
1100		.0285	.9715	.910
2200		.0486	.9514	.89[illegible]
4400		.0778	.9222	.8[illegible]
8800		.1157	.8843	.8[illegible]
17,600		.1562	.8438	.7[illegible]
4400		.1501	.8499	.79[illegible]
1100		.1440	.8560	.80[illegible]
150		.1332	.8668	.812

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
10/4	1602	0	150	5000		
	1606		(.5)	4981	SAT.	
	1754			4990		
10/5	808			4991		.0009
	808	0	300	4991		
	1707		(.7)	4927		
10/6	1105			4926		.0074
	1106	0	550	4926		
10/7	818		(.9)	4834		.0166
	819	0	1100	4834		
	1653		(1.3)	4720		
10/9	849			4715		.0285
	855	0	2200	4715		
		.1	(2.2)	4669		
		.25		4658		
		.5		4648		
	856	1		4636		
	857	2		4620		
	859	4		4608		
	903	8		4589		
	910	15		4578		
	925	30		4569		
	955	60		4556		
	1055	120		4546		
	1255	240		4535		
	1655	480		4519		
10/10	825			4514		.0486
	828	0	4400	4514		
		.1	(4.0)	4452		
		.25		4432		
		.5		4415		
	829	1		4394		
	830	2		4371		
	832	4		4350		
	836	8		4329		
	843	15		4316		
	858	30		4300		
	928	60		4285		
	1028	120		4271		
	1228	240		4249		
	1630			4233		
10/11	800			4222		.0778
	802	0	8800	4222		
		.1	(7.5)	4156		
		.25		4130		
		.5		4097		
	803	1		4065		
	804	2		4025		
	806	4		3986		
	810	8		3961		
	817	15		3939		

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	832	30		3922		
	902	60		3907		
	1002	120		3893		
	1202	240		3872		
	1602			3854		
10/12	833			3843		.115
	836	0	17,600	3843		
10-13	1533		(14.5)	~~3843~~		
10/14	1039			3438		.156
	1042	0	4400	3438		
10/15	757		(4.0)	3499		.150
	758	0	1100	3499		
	1057		(1.3)	3556		
	1748			3560		.144
	1749	0	150	3560		
10/16	812		(.5)	3668		.1332

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

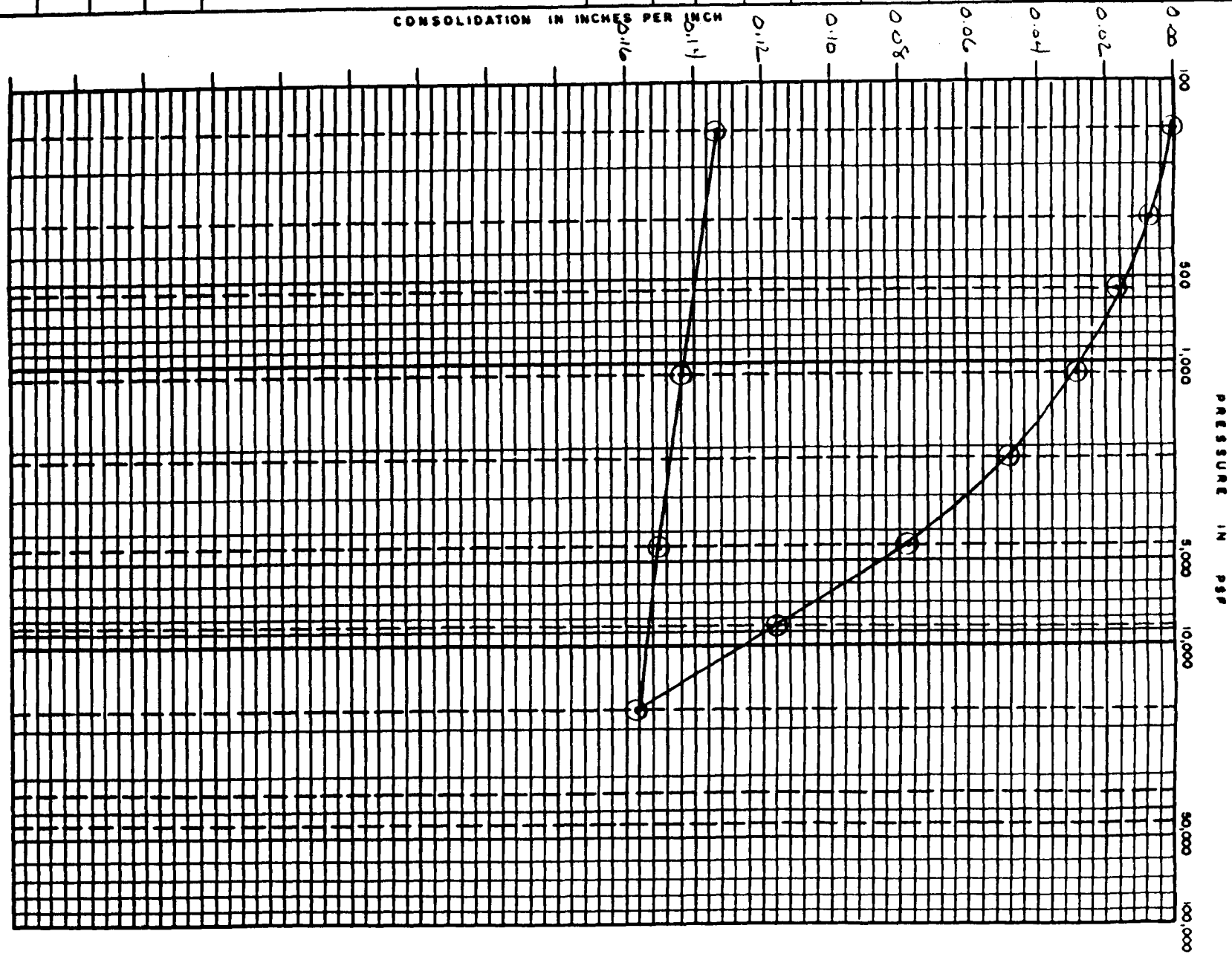
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



COOPER TESTING LABORATORY

Project: CANONIE 86-058-1806 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: MOTTLED GRAY & BROWN SILTY SAND Boring No. BOR 19

Sample No.

Test Started By: DC 10/4/90 Test Completed By: / / Depth (ft) 5'

Data Computed By: / / Data Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

DATA REQUIREMENT

$\gamma_{d_{max.}}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.9616
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.82
Weight of Ring(s) + Wet Soil – gm	127.3	126.5
Weight of Rings Only – gm	27.3	27.3
Weight of Wet Soil – gm	100.0	99.2
Wet Density – pcf	130.2	134.3
Weight of Wet Soil + Dish (Ring) – gm	100.0	148.5
Weight of Dry Soil + Dish (Ring) – gm	86.2	135.5
Weight of Lost Moisture – gm	13.8	13.0
Weight of Dish (Ring) – gm (90 / 22.0)		49.3
Weight of Dry Soil – gm		86.2
Moisture as % of Dry Weight – %	16.0	15.1
Dry Density – pcf (Final Dry Density = Initial Dry Density x H_o/H_f)	112.2	116.7

G_s: Specific Gravity 2.63 ☐ Assumed ☑ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
90	89

REMARKS:

EQUIPMENT: Consolidometer 8

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(86.2)}{(2.63)\ (2.93)\ (18.4)\ (1)} = .6$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = \frac{1}{H_c/H_s} - 1$

$\cdots\cdots \frac{1}{H_s} = (\ 1\ )\ /\ (.682) = 1.466 - 1$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.000	.46[illegible]
150		.0034	.9966	.4[illegible]
300		.0048	.9952	.46[illegible]
550		.0079	.9921	.46[illegible]
1100		.0118	.9882	.461
2200		.0197	.9803	.45[illegible]
4400		.0283	.9717	.45[illegible]
8800		.0382	.9618	.44[illegible]
17,600		.0504	.9496	.44[illegible]
4400		.0462	.9538	.4[illegible]
1100		.0413	.9587	.44[illegible]
150		.0384	.9616	.448

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
10/10	856	0	150	5000		
	958		(.5)	4965	SAT	
	1630			4966		
10/11	857			4966		.0034
	808	0	300	4966		
	1309		(.7)	4953		
	1702			4952		
10/12	836			4952		.0048
	837	0	550	4952		
10-13	1533		(.9)	4920		
10/14	1042			4921		.0079
	1043	0	1100	4921		
10/15	758		(1.3)	4882		.0118
	800	0	2200	4882		
	1748		(2.2)	4803		
10/16	817			4803		.0197
	818	0	4400	4803		
	1752		(4.0)	4717		
10/17	802			4717		.0283
	804	0	8800	4717		
		.1	(7.5)	4672		
		.25		4666		
		.5		4662		
	805	1		4657		
	806	2		4652		
	808	4		4647		
	812	8		4642		
	820	16		4639		
	834	30		4636		
	904	60		4633		
	1004	120		4630		
	1209	240		4626		
	1738			4619		
10/18	838			4618		.0382
	842	0	17,600	4618		
		.1	(14.5)	4658		
		.25		4651		
		.5		4646		
	843	1		4640		
	844	2		4634		
	846	4		4629		
	850	8		4523		
	857	15		4518		
	912	30		4514		
	942	60		4511		
	1042	120		4507		
	1242	240		4503		
	1729			4497		
10/19	810			4496		.0504

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
10/19	816	0	4400	4496		
	1640		(4.0)	4534		
10/20	1001			4538		.046
	1002	0	1100	4538		
10/21	1110		(1.3)	4587		.041
	1111	0	150	4587		
10/22	858		(.5)	4615		.038

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

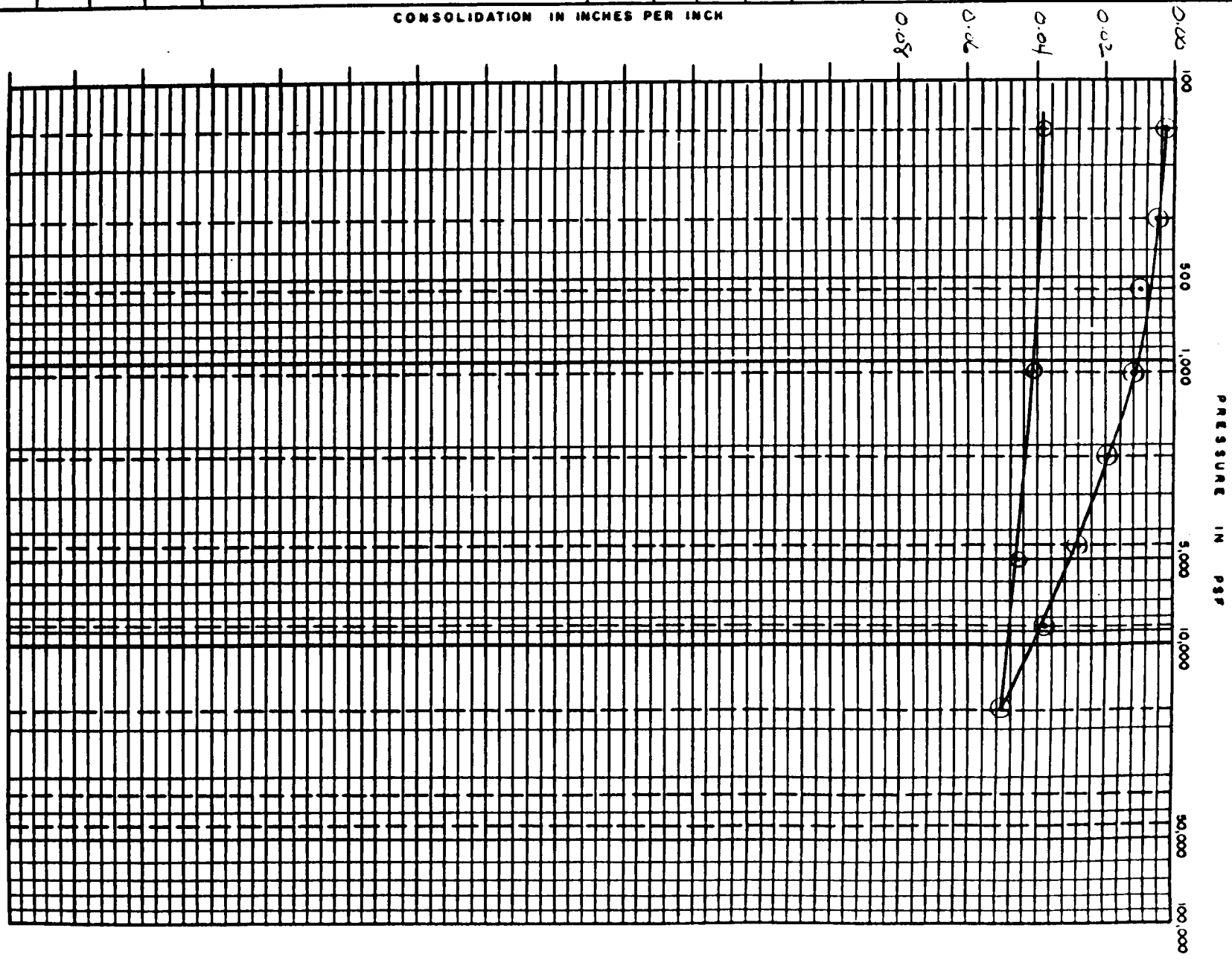
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



CONSOLIDATION TEST DATA

COOPER TESTING LABORATORY

Project: CANONIE FOOR-1806 Location: ALAMEDA NAS Job No. 034-14

Soil Classification: GRAY SILTY FINE SAND (SM) SATURATED Boring No. B-C2-4

Sample No.

Test Started By: DC 10/2 Test Completed By: / / Depth (ft) 12.5

Date Computed By: / / Date Plotted By: / / Checked By: /

SAMPLE TYPE

☐ Undisturbed ☐ Undisturbed (Trimmed to) ☐ Remolded to ☐ % D_d ☐ % Compaction

DATA REQUIREMENT

$\gamma_{dmx.}$ = pcf

☐ e log P curve ☐ c log P curves ☐ k vs. e plot ☐ others (specify)

TEST METHOD

☐ STANDARD:

– Inundate sample at ☑ beginning ☐ completion of 150 psf

– Load cycle:

– Take time vs. deformation reading at:

☐ SPECIAL:

Instruction and notes:

By: / /

MOISTURE & DENSITY DATA

	Initial	Final
Sample Height (H_o) – in.	1.0	.9876
Sample Diameter (D_o) – in.	1.93	1.93
Sample Area (A_o) – in.	2.93	2.93
Sample Volume (V_o) – in./cc	2.93	2.60
Weight of Ring(s) + Wet Soil – gm	122.6	117.8
Weight of Rings Only – gm	28.9	28.9
Weight of Wet Soil – gm	93.7	88.9
Wet Density – pcf	122.0	130.4
Weight of Wet Soil + Dish (Ring) – gm	93.7	138.3
Weight of Dry Soil + Dish (Ring) – gm	71.1	120.7
Weight of Lost Moisture – gm	22.6	17.6
Weight of Dish (Ring) – gm (3)		49.6
Weight of Dry Soil – gm 20.7		71.1
Moisture as % of Dry Weight – %	31.5	24.8
Dry Density – pcf (Final Dry Density = Initial Dry Density x H_o/H_f)	92.8	104.5

G_s: Specific Gravity 2.75 ☑ Assumed ☐ Determined

S : Degree of Saturation = (G_s x Water Content) / e

Initial	Final
100	

REMARKS:

EQUIPMENT: Consolidometer 1

Load Factor: 1 CGR = pcf

VOID RATIO COMPUTATION

H_s: Height of Solid

$= \frac{\text{Weight of Solid in gm}}{(G_s)\ (A_o \text{ in cm}^2)\ (\gamma_w)} = \frac{(71.1)}{(2.75)\ (2.93)\ (16.4)\ (1)} =$

H_c: Height of sample after consolidation

e : Void ratio

$= \frac{H_c - H_s}{H_s} = H_c \frac{1}{H_s} - 1$

$\frac{1}{H_s} = (\ )\ /\ (.548) = 1.859$

Load, psf	Dial Reading .0001 in.	H, in.	Height of Sample, H_c	e
0		.0000	1.00	.8[illegible]
150		.0129	.9871	.8[illegible]
300		.0229	.9771	.8[illegible]
550		.0391	.9609	.8[illegible]
1100		.0539	.9461	.8[illegible]
2200		.0784	.9216	.79[illegible]
4400		.1033	.8967	.77[illegible]
8100		.1259	.8741	.75[illegible]
2200		.1215	.8785	.75[illegible]
550		.1148	.8852	.76[illegible]
150		.1124	.8876	.76[illegible]

CONSOLIDATION TEST DATA SHEET (Continued)

PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
10/2	1655	0	150	5000		
	1658		(.4)	4933	SAT.	
10/3	752			4871		.0129
	753	0	300	4871		
	1715		(.7)	4774		
10/4	809			4771		.0229
	810	0	550	4771		
	1753		(.9)	4613		
10/5	802			4609		.0391
	806	0	1100	4609		
	1709		(1.3)	4568		
10/6	1103			4461		.0539
10/8	808	0	2200	4450		
		.1	(2.2)	4396		
		.25		4387		
		.5		4377		
	809	1		4364		
	810	2		4348		
	812	4		4328		
	816	8		4307		
	823	15		4291		
	838	30		4275		
	908	60		4262		
	1008	120		4249		
	1208	240		4236		
	1654			4222		
10/9	818			4216		.0784
	822	0	4400	4216		
		.1	(4.0)	4150		
		.25		4133		
		.5		4118		
	823	1		4098		
	824	2		4077		
	826	4		4054		
	830	8		4036		
	837	15		4023		
	852	30		4013		
	922	60		4004		
	1022	120		3995		
	1222	240		3987		
	1622	480		3976		
10/10	814			3967		.1033
	817	0	8800	3967		
	1630		(7.5)	3745		
10/11	755			3741		.1259
	756	0	2200	3741		
	1722		(2.2)	3780		
10/12	828			3785		.1215

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consolidation
	830	0	550	3785		
10-13	1555		(.9)	3849		
10/14	1036			3852		.1148
	1037	0	150	3852		
10/15	923		(.4)	3876		.1124

NOTES: _____

CONSOLIDATION TEST DATA SHEET (Continued)

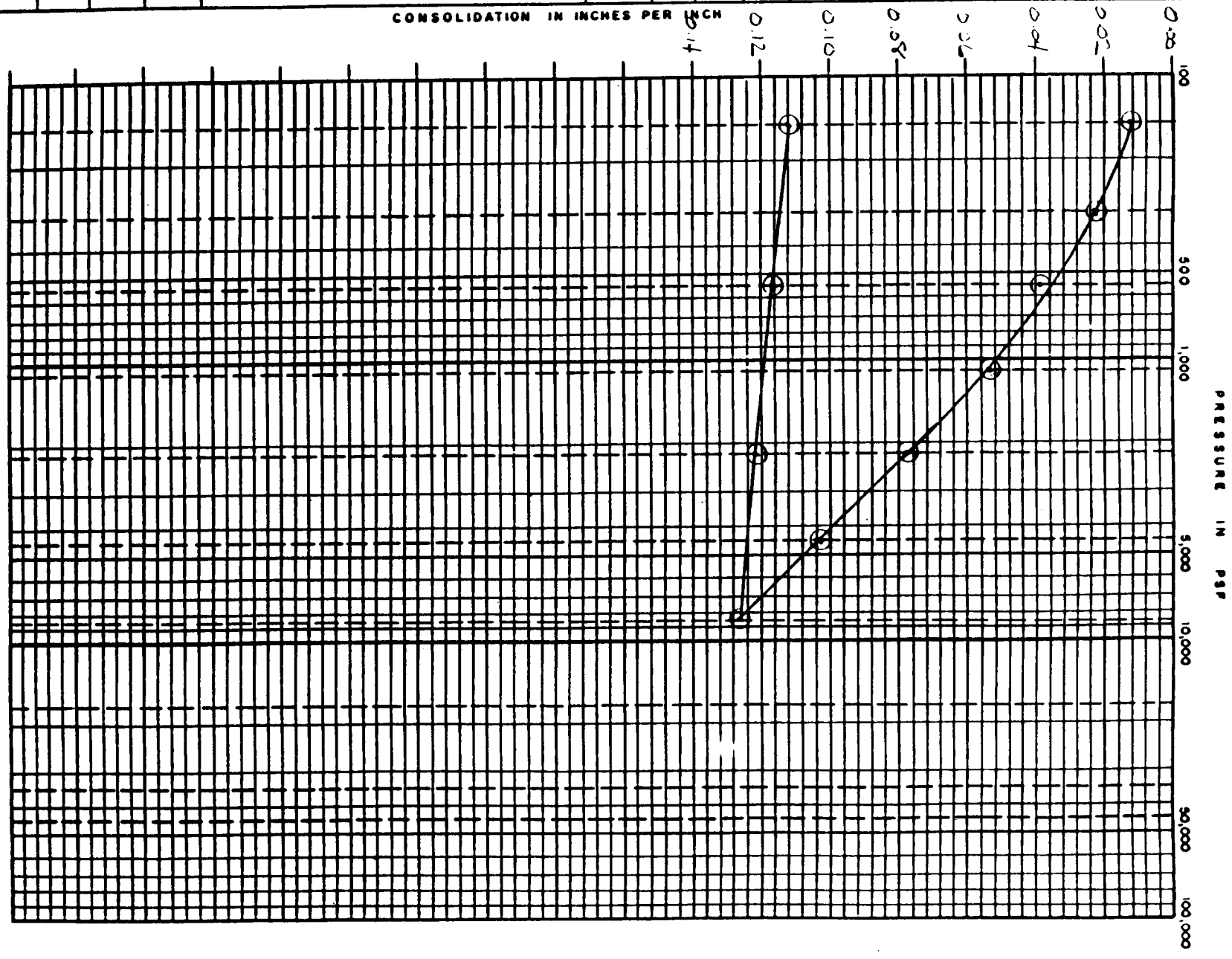
PAGE _____ OF _____

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

Date	Time	Elapsed Time in Mins.	Load (PSF)	Dial Reading (.0001 in.)	Consol. Under This Load	Total Consoli-dation

NOTES: _____

Key	Boring	Sample	Depth (ft)	Elev. (ft)	SOIL CLASSIFICATION		ATTERBERG LIMITS			INITIAL		FINAL		Po PSF	Pc PSF	C
					DESCRIPTION	Symbol	LL %	PL %	PI	Moist. %	Dry Density pcf	Moist. %	Dry Density pcf			



APPENDIX G

MODIFIED PROCTOR COMPACTION RESULTS

Job 334-14 [illegible]

Date Tested 10/5/90 By [illegible] Boring No. 32-5 Sample No. _____ Depth 0-45'

Description of Soil GRAY FINE SAND w/ GRAVEL

Initial Gradation: +¾ _____ %, Portion Tested: All ☑, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐ —No.4 ☑

☑ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

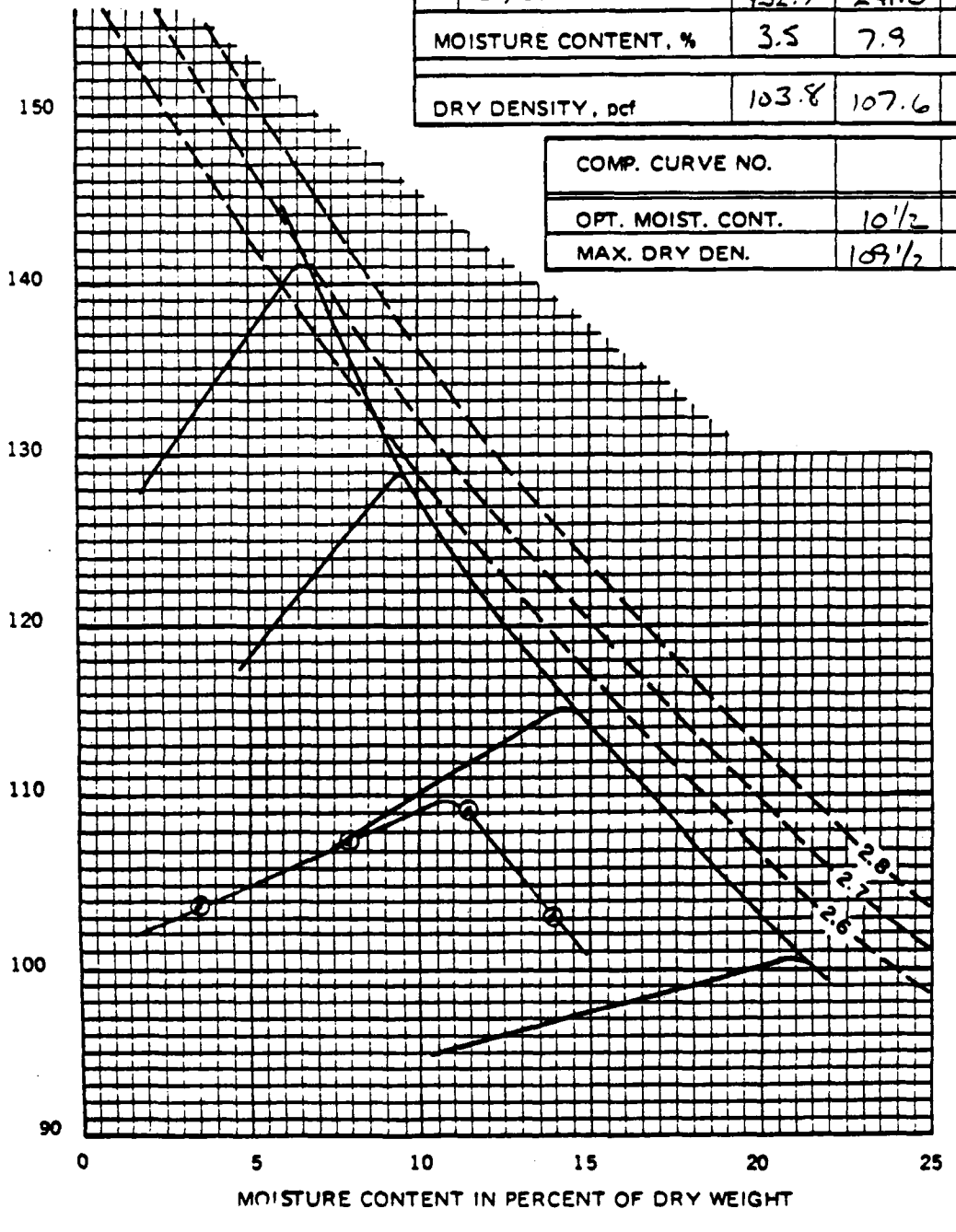
☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil	8.08	8.37	8.55	8.42		
	Mold	4.50	4.50	4.50	4.50		
	Moist Soil	3.58	3.87	4.05	3.92		
Factor (1/Vol. of Soil, cu ft)		30					
WET DENSITY, pcf		107.4	116.1	121.5	117.6		
wt. in grms.	Moist Soil and Dish	499.4	277.2	301.4	317.9		
	Dry Soil and Dish	484.4	258.1	272.5	281.2		
	Moisture	15.0	19.1	28.9	36.7		
	Dish	(C-1) 51.5	(F) 17.1	(C-3) 16.1	(C-22) 15.9		
	Dry Soil	432.9	241.0	256.4	265.3		
MOISTURE CONTENT, %		3.5	7.9	11.3	13.8		
DRY DENSITY, pcf		103.8	107.6	109.2	103.3		

COMP. CURVE NO.				
OPT. MOIST. CONT.	10½			
MAX. DRY DEN.	109½			

SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.



Job _____

Date Tested _____ By _____ Boring No. BCE-14 (CR-1) Sample No. _____ Depth Surface Soil

Description of Soil Brown Fine Sand Poorly Graded

Initial Gradation : +¾ _____ %, Portion Tested: All ☐, —¾" ☐, +¾" Repl. with No. 4 x ¾" ☐ —No.4 ☐

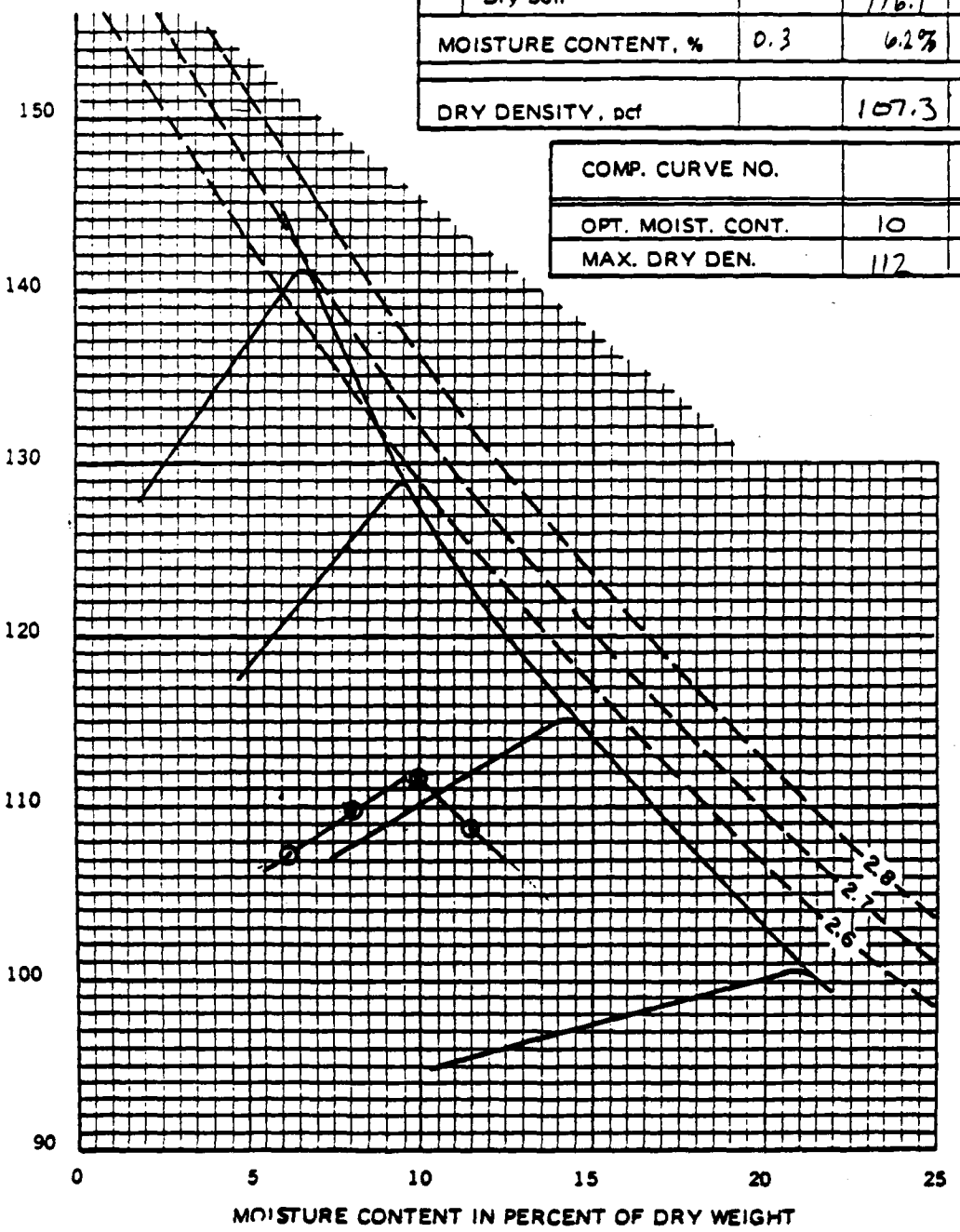
☑ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☐ 6" MOLD 1/13 cu ft

☑ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil		8.30	8.46	8.60	8.54
	Mold		4.50	4.50	4.50	4.50
	Moist Soil		3.80	3.96	4.10	4.04
Factor (1/Vol. of Soil, cu ft)			30	30	30	
WET DENSITY, pcf			114.0	118.8	123	121.2
wt. in gms.	Moist Soil and Dish	318.1	864.1	839.7	756.8	979.6
	Dry Soil and Dish	317.4	815.9	780.3	692.2	884.0
	Moisture		48.2	59.4	64.6	95.6
	Dish	88.9	m) 39.8	A) 53.9	B1) 43.7	C) 53.5
	Dry Soil		776.1	726.4	648.5	830.5
MOISTURE CONTENT, %		0.3	6.2%	8.2%	10.0%	11.5%
DRY DENSITY, pcf			107.3	109.8	111.8	108.7

COMP. CURVE NO.				
OPT. MOIST. CONT.	10			
MAX. DRY DEN.	112			



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

Date Tested _____ By _____ Boring No. MW[illegible] Sample No. [illegible] Depth surface

Description of Soil Gray silty fine sand with gravel

Initial Gradation : +¾ _____ %. Portion Tested: All ☐, —¾" ☒, +¾" Repl. with No. 4 x ¾" ☐ —No.4 ☐

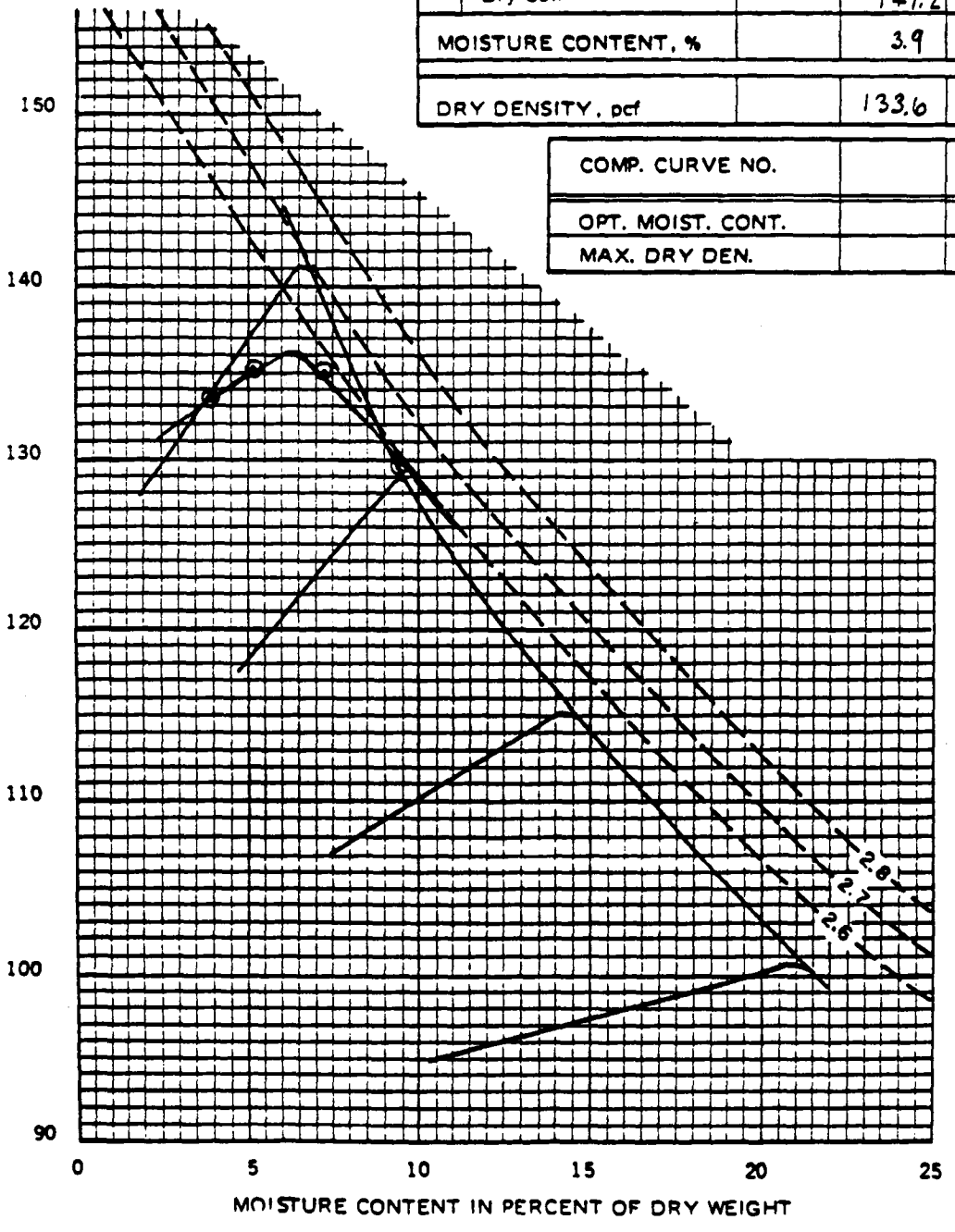
☐ MODIFIED AASHO
10 lb. rammer dropped 18" on each of 5 layers (ASTM Des¾ D1557-70T)

☒ 6" MOLD 1/13 cu ft

☐ 4" MOLD 1/30 cu ft

wt. in lbs	Mold and Moist Soil		16.65	16.89	17.10	16.86	
	Mold		6.24	6.29	6.24	6.24	
	Moist Soil		10.41	10.65	10.86	10.62	
Factor (1/Vol. of Soil, cu ft)			13.33				
WET DENSITY, pcf			138.8	142.0	144.8	141.6	
wt. in gms.	Moist Soil and Dish		1029.4	774.6	1116.7	1382.0	
	Dry Soil and Dish		987.0	737.4	1045.2	1268.4	
	Moisture		37.4	37.2	71.5	113.6	
	Dish		39.8	10.4	52.8	53.4	
	Dry Soil		947.2	727.0	992.4	1215.0	
MOISTURE CONTENT, %			3.9	5.1	7.2	9.3	
DRY DENSITY, pcf			133.6	135.1	135.0	129.5	

COMP. CURVE NO.				
OPT. MOIST. CONT.		6½		
MAX. DRY DEN.		136		



SOURCE OF SOIL:
USE OF SOIL:
REASON FOR TEST:
ETC.

NOTE:
Composition made it diffi
to obtain good check poi