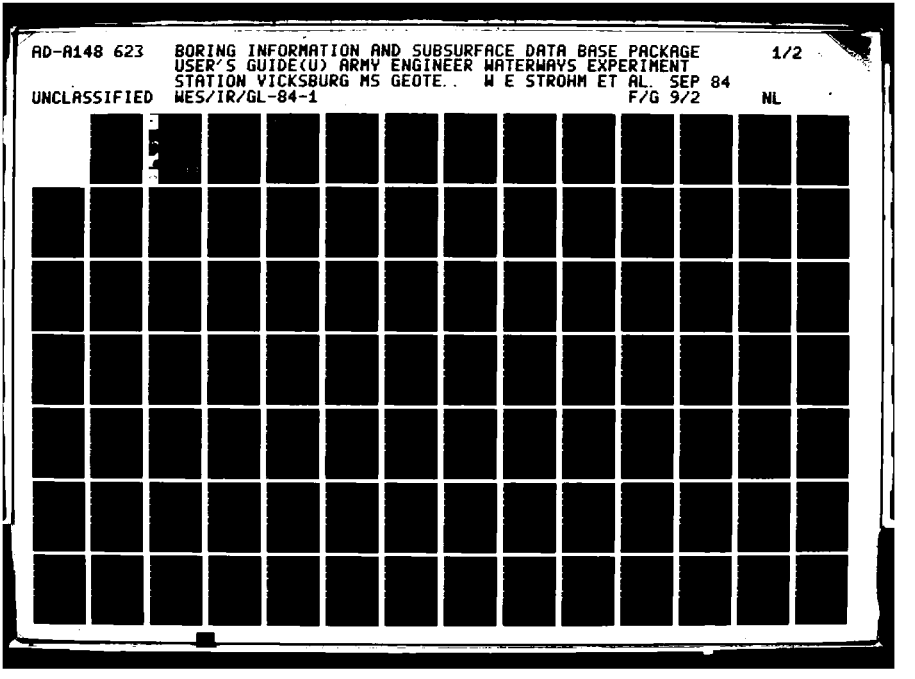
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BORING INFORMATION AND SUBSURFACE DATA BASE PACKAGE USER'S GUIDE(U) ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS GEOTE.. W E STROHM ET AL. SEP 84
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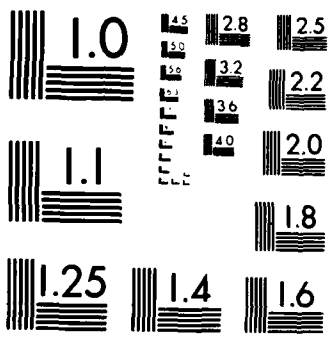
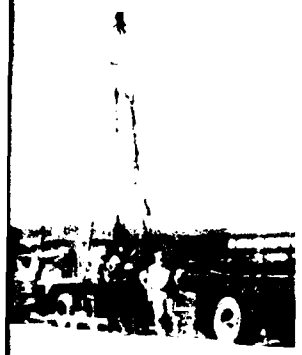


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



INSTRUCTION REPORT GL-84-1

12

BORING INFORMATION AND SUBSURFACE DATA BASE PACKAGE USER'S GUIDE

by

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Geotechnical Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631
Vicksburg, Mississippi 39180-0631

A report under the Computer Applications in Geotechnical Engineering (CAGE) Project

September 1984
Final Report

Prepared for

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US Army Corps of Engineers
Washington, DC 20314-1000

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ATTENTION OF

WESGR

19 November 1984

Errata Sheet

No. 1

BORING INFORMATION AND SUBSURFACE DATA BASE PACKAGE

USER'S GUIDE

Instruction Report GL-84-1

September 1984

Page 122, paragraph 65, line 9: Change Table 10 to Table 11.

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Boring--Computer programs, ~~(LC)~~
BORDB (Information retrieval system), ~~(WES)~~
Data base management, (LC)
Underground areas, (LC)

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A data base package for storage, retrieval, and display of boring and subsurface data for geotechnical projects is described, and detailed instructions for using the package are given with examples for actual projects. The data package is designed for storage, rapid retrieval, and display of boring locations, boring logs and profiles, and contours of selected subsurface data. The package provides for easy, interactive data entry and editing with automatic

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SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

20. ABSTRACT (Continued).

data checks and error messages when data exceeds user-specified ranges. Data storage and retrieval are accomplished using the ~~ACE~~ purchased copy of SYSTEM 2000 Data Base Management System (trademark of Intel Systems Corporation) on the Corps-wide time-sharing service operated (1984) by Control Data Corporation (CDC). The data entry and retrieval programs developed for the package are designed for a low skill level and minimum training of personnel. Data entry can also be accomplished on CE District Harris computers.

PREFACE

This user's manual describes the use of the data base package for boring information and subsurface data. The package is a product of the Computer Applications in Geotechnical Engineering (CAGE) project sponsored by the Office, Chief of Engineers (OCE), US Army Corps of Engineers.

Criteria for the Boring and Subsurface Data Package were developed by the CAGE Task Group of the same name and composed of the following members:

Mr. John Bowman, Chairman, Middle East Division - Rear (Retired)
Mr. Brian Green, Buffalo District
Mr. Leonard Manson, New Orleans District
Mr. Dennis Morgan, St. Louis District
Mr. Ralph Moses, North Atlantic Division ADP Center
Mr. Ron Paul, Middle East Division - Rear
Mr. Joe Rogers, Savannah District
Mr. Richard Royer, Baltimore District (Retired)
Mr. Richard Davidson, OCE
Mr. Richard Malm, OCE
Mr. John Palmerton, Waterways Experiment Station (WES)

The data base design was developed by Mr. John Palmerton, Engineering Geology and Rock Mechanics Division (EGRMD), Geotechnical Laboratory (GL), WES, project engineer for the package, and Mr. Earl Edris, Jr., Soil Mechanics Division, GL. Software was developed by Dr. Darrell Ward and Mr. John W. Meux, through the North Texas State University Computer Science Department. The data entry program was converted for use on District Harris computers by Mr. Larry Mann. Graphics programs were written by Mr. Palmerton. A detailed user's guide for District use, included as Appendix A, was written by Messrs. Richard Truluck and Robert O'Kelly, Savannah District. This report was prepared by Messrs. John Palmerton and William E. Strohm, Jr., EGRMD. Mr. Strohm replaced Mr. David P. Hammer (now Chief, Geotechnical Branch, Engineering Division, Ohio River Division) as the CAGE Project Principal Investigator in November 1980.

Since November 1980, CAGE project work has been directed by a Policy Management Group composed of the following: Mr. Paul Fisher, Chief, Geology Section, Geotechnical and Civil Branch (GCB), OCE (DAEN-ECE-G), Chairman; Mr. Richard Davidson, Chief, Soil Mechanics Sections, GCB, OCE; Mr. Richard Malm, Chief, Computation and Analysis Section, Engineering Support Branch, OCE (DAEN-ECE-S); Mr. Samual Gillespie, Engineer, GCB, OCE; Mr. Leroy McAnear, Chief, SMD, WES Program Manager, Civil Works R&D Program, Materials - Soils;

Dr. Don C. Banks, Chief, EGRMD, WES Program Manager, Civil Works R&D Program, Materials - Rock; and Mr. Strohm, Principal Investigator, CAGE. In June 1984 Mr. Hammer became a member of the Policy Management group in the place of Mr. McAnear. Development of this CAGE package was carried out under the general supervision of Dr. William F. Marcuson III, Chief, GL.

Commanders and Directors of WES during development of this data base package and publication of this user's guide were COL Nelson P. Conover, CE, and COL Tilford C. Creel, CE. Technical Director of WES was Mr. Fred R. Brown.

CONTENTS

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this manual can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
feet	0.3048	metres
inches	2.54	centimetres
pounds (force) per square inch	6.894757	kilopascals
pounds (mass) per cubic foot	16.01846	kilograms per cubic metre

BORING INFORMATION AND SUBSURFACE DATA BASE PACKAGE: USER'S GUIDE

PART I: INTRODUCTION

Purpose

1. The purpose of this report is to provide a description and instructions for the use of the boring information and subsurface data base package entitled BORDB. The package was developed for Corps-wide use under the Computer Applications in Geotechnical Engineering (CAGE) project. This report must be used in conjunction with other applicable instructions regarding the computer operating system (CDC 1982a, Harris 1981) and the instructions for creation and manipulation of the data base (Intel Corp. 1981).

Basic Definitions

2. A data base can be defined as items of information and groups of data values stored together in an orderly form such that access to all or any part of the information or data can be readily accomplished. Boring logs and field and laboratory test data stored in a filing cabinet could be classified as a simple form of a data base. A computerized data base is one that utilizes a computer and associated hardware for data entry, storage, and access. A data base package includes, in addition to the data base itself, all peripheral software that enables the data not only to be quickly and orderly stored, but accessed in any form desired and manipulated or analyzed by whatever means is most useful to the user. A data base package can therefore be categorized as an engineering tool. It can, if properly utilized, be a powerful tool that greatly enhances the usefulness and value of the information and data.

Background

3. The need for the use of data base management systems in geotechnical engineering was established by Hammer and Bennett (1979). A primary need was for rapid retrieval of boring data to save costly searches of physical files and redrilling when existing data was misplaced. Criteria established for

data elements by the Boring and Subsurface Data Task Group was used to develop initial data entry and data base loading programs in 1981. The US Army Engineer District, New Orleans, provided boring data for testing of the loading program from their computer files through a transfer program. The initial BORDB package was used in 1982 by the US Army Engineer District, Portland, to store data for the Bonneville New Navigation Project. A modified version of the programs was developed for the Corps of Engineers (CE) Missile Construction Office (CEMCO) and used in site selection analyses for the Deep Underground Basing Studies.

4. As a result of the 1982 Task Group meeting, graphics programs for boring location plots and contouring were initiated. The data entry and loading programs were modified to add separate blow count elements and two additional test results elements. An Engineer Technical Letter (ETL 1110-116) describing the data base package was issued in November 1982. In 19 , the data entry program was converted to operate on the District Harris Computer. Use of these programs was initiated for the US Army Engineer Division, Lower Mississippi Valley, to store data from borings in the Lower Mississippi Valley and by the US Army Engineer District, Savannah, for boring data from military bases. This District prepared detailed data entry instructions and lists of standard abbreviations (Appendix A). The programs were further modified to allow modification of boring information, store duplicate boring numbers associated with different projects, and to provide options for changing blow count elevation and interval. A graphics program for boring logs was developed during 1983 and refined in March 1984.

Application

5. The data base BORDB is intended to provide a means whereby data obtained from field subsurface investigations may be electronically stored (on a continuing basis) and then subsequently retrieved in a variety of fashions for a variety of applications. When the data base is implemented, the user may query the data base for purposes such as (a) to reexamine the information available for design, (b) to determine what, if any, subsurface information exists within the locality of a given project, and (c) to provide data to others according to their criteria. In addition several plotting programs are included which will permit the user to prepare graphical representations of the data.

System Requirements

6. The data base program files for BORDB reside (1984) on the Teleprocessing Services Procurement contract mainframe computer operated by Control Data Corporation (CDC). The data base is created and maintained under SYSTEM 2000 (trademark of Intel Systems Corporation), a proprietary data base management system (DBMS). All CE offices have access to the CE copy of this DBMS. A time-sharing line printer terminal is needed to obtain access to the system and a graphics terminal (e.g., Tektronix 4010 or 4014) is needed if graphics programs are used. A cassette tape or floppy disc device (for recording and transferring data files from CDC to the Honeywell computer system) is also required for one of the graphics application programs (contouring).

Report Organization

7. The remainder of this report is divided into four parts describing data storage (Part II), data entry (Part III), data retrieval (Part IV), and graphics display (Part V). Detailed examples illustrating all procedures are included in Parts III through V. Appendices are included that describe detailed data entry instructions used by one District (Appendix A), the use of text editors for editing data files (Appendix B), and procedures for backing up a data base (Appendix C).

PART II: DATA STORAGE SCHEME

Data Base Structure

8. System 2000 (S2K) is a hierarchical or tree-type data base management system (DBMS) in which data residing at a given level have a direct relationship to data residing above and below that level. A drilling log (Eng Form 1836), shown in Figure 1, is the basis for the data base structure.* The information at the top of the form (items 1-19) consists of single-valued (one-time) entries that describe general information and conditions related to a unique boring. The information on the lower part of the form (under columns a through g) is multivalued in that a single boring will have multiple entries for strata or feature descriptions (generally as a function of depth or elevation). In addition, the lower portion of the form may contain information about the drilling procedure (also, generally a function of depth or elevation) or about in situ tests performed and/or samples obtained from certain elevations. The hierarchical data structure selected for BORDB is shown in Figure 2. The general information (applicable to the entire boring) resides at the highest level. Beneath this level is the information associated with elevation. These lower level entries are, in DBMS terminology, called "repeating groups" since, in general, there will be multiple entries (a separate entry for each zone of material encountered in the boring) for a particular boring. There are several repeating groups, one for each type of information or data.

Identification of the Data Elements

9. Although the drilling log (Eng Form 1836) is the basis for the data base structure, other items have been added (such as status of boring, location of boring log, and test results for samples) that are not commonly included with the driller's log. To provide an efficient means of data retrieval, information from the driller's log was reordered and certain items were added. All information and data to be stored are termed "data elements."

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* U. S. customary units of measurement used in Figure 1 and elsewhere in this report may be converted to metric (SI) units by use of the conversion factors table presented on page 4.

Hole No. DC-4

DRILLING LOG | DIVISION South Pacific | INSTALLATION Los Angeles | SHEET 1 OF 42 SHEETS

1. PROJECT PRADO DAM, CA
2. LOCATION (Coordinates or Station) See Remarks
3. DRILLING AGENCY Mott Drilling Co
4. HOLE NO (As shown on drawing title) and file number DC-4
5. NAME OF DRILLER Horton
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN 5.0 (575.0)
8. DEPTH DRILLED INTO ROCK 100.0
9. TOTAL DEPTH OF HOLE 475.0
10. SIZE AND TYPE OF BIT #Diamond NWM
11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL #13A" ED.55;
12. MANUFACTURER'S DESIGNATION OF DRILL Sprayvan - 180
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED 4 | UNDISTURBED
14. TOTAL NUMBER CORE BOXES 14
15. ELEVATION GROUND WATER See Remarks
16. DATE HOLE | STARTED 2/18/79 | COMPLETED 3/18/79
17. ELEVATION TOP OF HOLE 575.0
18. TOTAL CORE RECOVERY FOR BORING 994/995 %
19. SIGNATURE OF INSPECTOR Jim Jones

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
573.5	1		(CL) Brown, Sandy CLAY, Roots In Top 6", Moist		1	Brown's Store, Hwy 36, Aprox 3500', C-4, NN 630000, E 1560000
	2		(SC) Brown, Clayey, SAND, Fine To Medium, Moist		2	Drl w/ 11' x 4½" Roller Rock Bit w/ Water Begin 1300 End 1350
	3				3	Ran 5.0' Set 5.3' of 4" Black Iron Pipe 1 w/ Saw Tooth End To 5.0'
570.5	4		Rock Frags		4	Ref At 5.0'
570.0	5		TR			
	6		SANDSTONE - Mss Bdd, Sl, Mic, Med Hd To Hd, F To Med Gra, It Gr To Lt Br, Occ Blk Sh Ptgs, Num Hem Ptgs Upper 3' Of Core	Rec 84%	Box 1 Of 10 Boxes	Drl w/ 11.7 (10.3) NXM Bit # 1234 (V. Good) Shell # 5678 (New) Pull 1 Drl Tools 21.7' WL 7.6' @ 1640 Began 1615 End 1635 Drl Time 20 Min Ran 5.2 Rec 3.8 Loss 1.4 U.L. 0.6 Water Pressure 50 psi Drl Acton - Smooth 100% DWR - 100% CD 9.4'
	7		So To Med Hd, Vf. 0.6 LC			
	8		So, St Red	ROD 79%		Tape ROD 3.5'/4.4' = 0.79%
	9		Op, h/a Jf, 55°			
	10					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) | PROJECT Prado Dam, Ca. | HOLE NO DC-4

Figure 1. Example of drilling log form

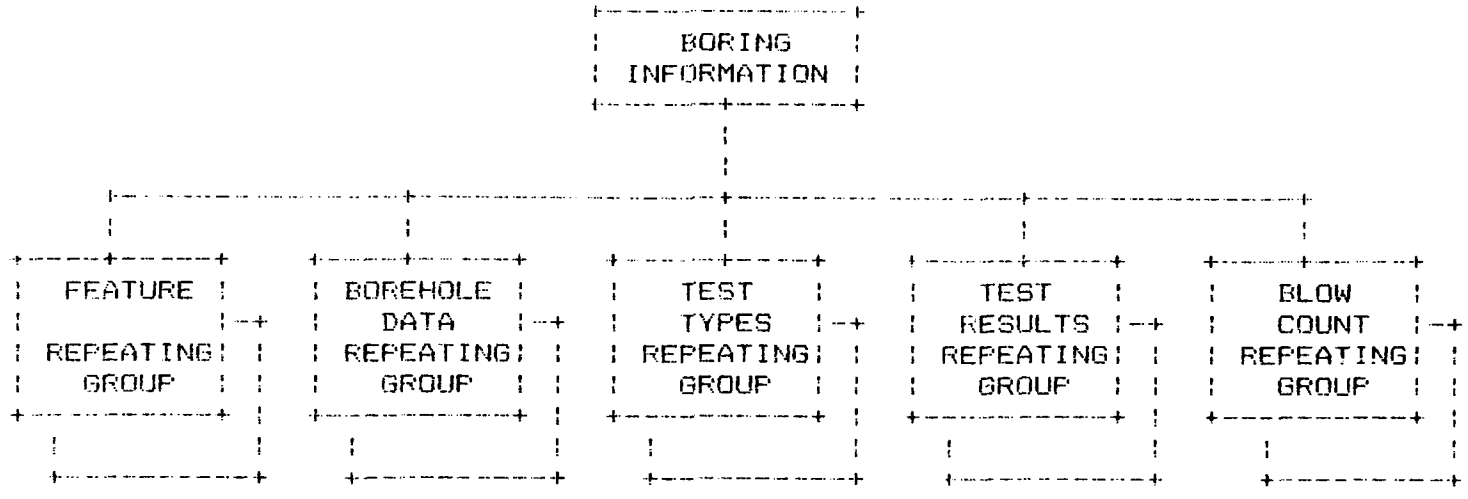


Figure 2. Schematic of boring data base structure

10. The list and brief definition of the data elements that can be contained in BORDB are shown in Table 1. Each data element can be identified by a component number (e.g., C1, C2, or C8) or by its name (e.g., BORID, CLASS, or LAT). The designation of key and nonkey data elements is also shown in Table 1. The only data elements that data can be sorted by in retrievals are those designated as key elements. (However, version 2.8 of System 2000 allows a more expensive search on nonkey elements.) Data retrievals generally take the form "PRINT" (the values of) certain elements "WHERE" (the values of) certain elements or combinations of elements meet some criteria. A data element must be a key element to be used behind the WHERE clause. Ideally, all data elements could be designated as key elements. However, the costs of maintaining the data base increases with the number of key elements. Since cost is a major factor, items that are not generally useful for performing data sorts are not designated as key elements. The types of data elements (e.g., decimal, integer, character, or date) and their field length (number of digits, decimals, or characters) are also shown in Table 1.

11. A more complete description of the data elements for BORDB with examples is shown in Table 2. Descriptive information and values are stored in the data base. Units such as psi are not entered or stored. Thus, units for numerical values need to be known and should be listed with the data elements on a readily available reference sheet. All data for a given project should be entered with a common set of units. Another important item is the need for unique identities for certain data. This includes boring numbers and repetitive information. Each boring should have a unique number since all other information and data for a boring is related to the boring number. However, duplicate boring numbers can be entered when necessary and are related to the unique system identification number (SID, C29 in Table 2). An auxiliary file called BORFL, containing SID, boring number, project name, site name and project description, is updated by the data entry program and used to check boring numbers and to assign a unique SID for each new boring. Repetitive data such as the repeating group for feature information are related to a unique elevation. This characteristic can be used to advantage for storing long feature descriptions, if needed for a stratum, by continuing the description as another feature of the same name at a slightly lower elevation. The same approach can be used for additional test results and data in other repeating groups.

Table 1
Definition of Data Elements

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
C1	BORID	Boring identification number	KEY	NAME	10 characters
C2	CLASS	Classification of the data set (boring type or other depth or elevation data)	KEY	NAME	10 characters
C3	REMARKS	Any desired remarks	NON-KEY	NAME	40 characters
C4	AUTHOR	Author of the data set	KEY	NAME	10 characters
C5	PROJ-NAME	Project name	KEY	NAME	40 characters
C6	SITE-NAME	Site name	KEY	NAME	40 characters
C7	PROJ-DESC	Project description	NON-KEY	NAME	25 characters
C8	LAT	Latitude location for BORID	KEY	DECIMAL	8 digits
C9	LONG	Longitude location for BORID	KEY	DECIMAL	9 digits
C10	ACCUR	Relative accuracy of locaton	NON-KEY	INTEGER	1 digit
C11	REF	Quad sheet or other reference name	KEY	NAME	10 characters
C12	LOC-NS	Local N-S coordinate	KEY	DECIMAL	9 digits
C13	LOC-EW	Local E-W coordinate	KEY	DECIMAL	9 digits
C14	LOC-ACCUR	Relative accuracy of location coordinates	NON-KEY	INTEGER	1 digit
C15	LOC-REF	Reference for local coordinates	KEY	NAME	10 characters
C16	DATE	Date boring completed	KEY	DATE	10 characters
C17	DRILLER	Name of CE or contract driller	KEY	NAME	20 characters
C18	INSP	Drilling inspector	KEY	NAME	15 characters
C19	LOC-BORLOG	Location of boring log	NON-KEY	NAME	10 characters
C20	LOC-DRILLOG	Location of drilling log	NON-KEY	NAME	10 characters
C21	LOC-STOSAM	Location of stored samples	NON-KEY	NAME	20 characteres
C22	DAT-STAT	Status of this data set	KEY	NAME	10 characters
C23	HOLE-STAT	Current status or use of hole	KEY	NAME	10 characters
C24	PURPOSE	Purpose of boring	KEY	NAME	20 characters
C25	TOP-HOLE	Top of hole elevation	KEY	DECIMAL	7 digits
C26	EL-ACCUR	Relative accuracy, top of hole elevation	NON-KEY	INTEGER	1 digit
C27	DEPTH	Depth of hole	KEY	DECIMAL	6 digits
C28	DAYS-DRILL	Number of days to drill hole	KEY	INTEGER	3 digits
C29	SID	System ID, assigned by computer	KEY	INTEGER	5 digits
C40	FEATURE	REPEATING GROUP FOR FEATURES			
C41	FEAT-NAME	Name of feature (ML, CL, BEDROCK)	KEY	NAME	10 characters
C43	FEAT-ELEV	Elevation of top of feature	KEY	DECIMAL	6 digits
C45	FEAT-DATE	Date measured (e.g. for water table)	NON-KEY	DATE	10 characters
C46	FEAT-DESC	Description of feature (soft, silt lenses)	NON-KEY	NAME	30 characters
C50	BORINFO	REPEATING GROUP FOR BORING SEGMENTS			
C51	BOR-TOOL	Sampling tool or procedure	KEY	NAME	10 characters
C53	BOR-SIZE	Size of boring (dimensions or NW, NQ)	KEY	NAME	5 characters
C55	BOR-ELEV	Elevation of top of segment	KEY	DECIMAL	6 digits
C60	TYPE TESTS	REPEATING GROUP FOR FIELD/LAB TESTS			
C61	TYP-NAME	Test name (pressure, RQD, Q, P, INDEX)	KEY	NAME	10 characters
C63	TYP-NUM	Number of tests	KEY	INTEGER	3 digits
C65	TYP-LOC	Location of test results	NON-KEY	NAME	10 characters

(Continued)

Table 1 (Concluded)

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
C70	TESTS	REPEATING GROUP FOR TEST RESULTS			
C71	TEST-NAME	Name of test	KEY	NAME	10 characters
C73	TEST-DATE	Date of test	KEY	DATE	10 characters
C75	TEST-MAT	Material classification	KEY	NAME	10 characters
C77	TEST-ELEV	Elevation of test	KEY	DECIMAL	6 digits
C79	TEST-RESULT1	First test result	KEY	NAME	10 characters
C81	TEST-RESULT2	Second test result	KEY	NAME	10 characters
C83	TEST-RESULT3	Third test result	KEY	NAME	10 characters
C85	TEST-RESULT4	Fourth test result	KEY	NAME	10 characters
C87	REMARKS	Remarks	NON-KEY	NAME	20 characters
C90	BLOW-TESTS	REPEATING GROUP FOR STD PENE TESTS (SPT)			
C91	BLOW-ELEV	Elevation for SPT blows/ft result	KEY	DECIMAL	5 digits
C93	BLOW-CT	Blows/foot	KEY	INTEGER	3 digits
C95	BLOW-REMARKS	Remarks	KEY	NAME	20 characters

Table 2
Description and Examples for Data Elements

Component Number	Element Abbreviation	Description and Use	Examples	Remarks
C1	BORID	Boring number or name for identification	DC-4; DH-1A; PZ3	Should be unique identifier, if possible
C2	CLASS	Used to classify the type of boring	GEN SAMPLE, ROCK CORE, PIEZ	Use selected abbreviations consistently
C3	REMARKS	Any desired remarks	LEFT ABUT, STA 14+20, 30'RT	Any pertinent remarks
C4	AUTHOR	Identifies person or office entering data	D. DATUM; SPLED-G	For future reference
C5	PROJ-NAME	Project name	SANTA ANA RIVER BASIN, CA	Use with C6 for complete description
C6	SITE-NAME	Site name	PRADO DAM EMBANKMENT	
C7	PROJ-DESC	Project description	SPILLWAY EXPANSION INVEST	Used to further describe activity
C8	LAT	Latitude location for BORID	335730.25	Should be used to provide unique location
C9	LONG	Longitude location for BORID	1173735.15	Should be used to provide unique location
C10	ACCUR	Relative accuracy of locaton	3	1 = survey, 2 = scaled, 3 = approximate
C11	REF	Quad sheet or other reference name	PRADO 1:24000	Reference map sheet for boring location
C12	LOC-NS	Local N-S coordinate	630105	Alternate coordinate such as State Plane
C13	LOC-EW	Local E-W coordinate	1580216	Alternate coordinate
C14	LOC-ACCUR	Relative accuracy of location coordinates	2	Use in same manner as C10
C15	LOC-REF	Reference for local coordinates	PROJ MAP	Same as C11, limited to 10 characters
C16	DATE	Date boring completed	03/18/1979	Completion or beginning date
C17	DRILLER	Name of CE or contract driller	MOTT DRILLING CO; SPL CREW	Identifies drilling agency or company
C18	INSP	Drilling inspector	HORTON	Name of responsible field inspector
C19	LOC-BORLOG	Location of boring log	SPLED-G: F. SMITH	Office or person that keeps original log
C20	LOC-DRILLOG	Location of drilling log	SPLED-G, F&M BRANCH	Same as for boring log
C21	LOC-STOSAM	Location of stored samples	SPD LAB; PRADO WAREHOUSE	Specify location of samples or cores
C22	DAT-STAT	Status of this data set	WAIT TEST; COMPLETE	Describe status of boring or test data
C23	HOLE-STAT	Current status or use of hole	FILLED; PIEZ; INCLIN 6/80	Current or future use of borehole
C24	PURPOSE	Purpose of boring	FOUND INVEST; 60 DEG CORES	Amplify C2 or C23 or describe function
C25	TOP-HOLE	Top of hole elevation	575.0	Leave blank, if unknown
C26	EL-ACCUR	Relative accuracy, top of hole elevation	1	Use in same manner as C10
C27	DEPTH	Depth of hole	475.0	Total depth of boring
C28	DAYS-DRILL	Number of days to drill hole	2	Days to complete the boring
C29	SID	System ID, assigned by load program	3	Unique identifier; C1 sometimes is not

(Continued)

Table 2 (Concluded)

Component Number	Element Abbreviation	Description and Use	Examples	Remarks
C40	FEATURE	REPEATING GROUP FOR FEATURES		Repetitive information on stratigraphy
C41	FEAT-NAME	Name of feature	CL; SC; SANDSTONE; WT	Abbreviation of material classification or WT for water table; short consistent abbreviations are useful for stick log profiles
C43	FEAT-ELEV	Elevation of top of feature	567.4	Can enter depth or elevation
C45	FEAT-DATE	Date measured (for water table)	02/18/79	Asked for only if C41 is WT (water table)
C46	FEAT-DESC	Description of feature	CLAY, BROWN, SANDY, MOIST	Used for short geologic description
C50	BORINFO	REPEATING GROUP FOR BORING SEGMENTS		Repetitive information on drilling methods
C51	BOR-TOOL	Sampling tool or procedure	RK BIT/WTR; SPLT SPOON	Drilling procedure or sampler used
C53	BOR-SIZE	Size of boring	4.5 IN; NWM	Diameter of the boring
C55	BOR-ELEV	Elevation of top of segment	570.0	Can enter depth or elevation
C60	TYPE TESTS	REPEATING GROUP FOR FIELD/LAB TESTS		Repetitive information on tests assigned or performed in situ, or drilling data
C61	TYP-NAME	Name of type of test	INDEX; Q-TRIAX; % RECOV	Short test name; one per repeating group
C63	TYP-NUM	Number of tests	5; 3; 84	Test number or number of tests for C61
C65	TYP-LOC	Location of test results	PRADO LAB; SPD LAB; PULL 1	Physical location of test results
C70	TESTS	REPEATING GROUP FOR TEST RESULTS		Repetitive information on test elevation and test results
C71	TEST-NAME	Name of test	INDEX; Q-TRIAX; RQD	Specific name of test
C73	TEST-DATE	Date of test	04/24/79	Date associated with test
C75	TEST-MAT	Material classification	SC; CL; SANDSTONE	Classification of material tested
C77	TEST-ELEV	Elevation of test	572.5;	Can enter test/sample depth or elevation
C79	TEST-RESULT1	First test result	86; 0.4; 94	Test value e.g. %-4, or cohesion, or RQD
C81	TEST-RESULT2	Second test result	19; 12;	Test value e.g. %-200 or phi in degrees
C83	TEST-RESULT3	Third test result	24; 11.3;	Test value e.g. LL or sample water content
C85	TEST-RESULT4	Fourth test result	18; 96.7	Test value e.g. PL or sample dry density
C87	REMARKS	Remarks	%-4,%-200,LL,PL	Short remark or test components in order, or units: e.g. C,TSF;DEG;WC;DDEN
C90	BLOW-TESTS	REPEATING GROUP FOR STD PENE TESTS (SPT)		Special repeating group for SPT data
C91	BLOW-ELEV	Elevation for SPT blows/ft result	570.0	Must enter elevation
C93	BLOW-CT	Blows/foot	50	Number of blows, N, for the standard count
C95	BLOW-REMARKS	Remarks	1.5-3.0 ft; REF @ 5 ft	Any short pertinent remark

12. Before entering information and data into BORDB through an interactive collection program (described later), the user or users should carefully examine the types and sources of subsurface information that they collect or have access to for storage. The use of acronyms or specific abbreviations is often very advantageous (especially for key character type descriptions), since their use permits subsequent retrieval of data in a very selective fashion (see Part IV for examples). However, the use of abbreviations or acronyms must be consistent. Use of slightly different abbreviations for the same type of information presents problems in retrievals. For example, if it is desired to list all elevations where RBR CLAY exists, only those elevations for the specific name "RBR CLAY" will be listed. If RBR has been entered as REDBR or RBRN, these names will not be listed and the user will not retrieve the complete set of data desired.

Use of Stored Data

13. The main advantage of the boring data base package is the rapid retrieval and graphical display of specific information or data. The package provides the following additional advantages:

a. Eliminates time-consuming searches of files for existing boring information and logs and the need for redrilling an old site when existing subsurface information cannot be found.

b. Allows rapid retrieval and display of boring locations and simplified logs with test results of existing borings for foundation evaluations such as for new buildings at military bases.

c. Provides an organized system for management of active projects and rapid production of report tables and data plots.

d. Provides profiles with simplified logs and contour plots of desired subsurface features (bedrock, water table, or overburden thickness) for geologic and soils studies.

PART III: DATA ENTRY

14. There are two procedures available to the user for entering data to the data base. The first procedure uses an interactive collection program and generates a data file which is loaded to the data base at the user's convenience. A question-and-answer type format is used for this procedure. The data base is accessed only when the data file is being loaded. The second procedure consists of adding data directly to the data base files while the user is working on line with the data base. With this procedure, the data base is not protected against unexpected session interruptions and possible damage of the data base. The cost of the first procedure depends upon how long the collect program is used (connect time) and the computer system (local Harris or CDC). The second procedure also allows the user to change and remove data within the data base, but at a slightly higher cost (connect time plus direct access time to the data base).

Data Entry Using A Data File

Description

15. The data entry procedure uses two programs. The first program is used to collect new data or modify existing data and build a data file which is loaded to the data base using the second program. The collect program prompts the user for input on an item-by-item basis, starting at the boring information level and proceeding through all repeating groups (feature, boring segments, type tests, test results, and standard penetration test). Figure 3 is a flow diagram showing the operation of the collect program. After each prompt, the program waits for a carriage return before proceeding. The prompts used to request the boring information items can be modified to the specific ones desired by the user. The prompts are contained in a separate driver file that the collect program accesses and are shown in Table 3. With the driver file separate from the collect program, the user can modify the wording of the prompts by editing this file.

16. At the start of data entry, the user is asked whether the boring number entered is a new boring. If it is a new boring, prompt options for entering boring information are displayed. The user can select all prompts or only desired prompts in the order desired to match a data sheet format. If it

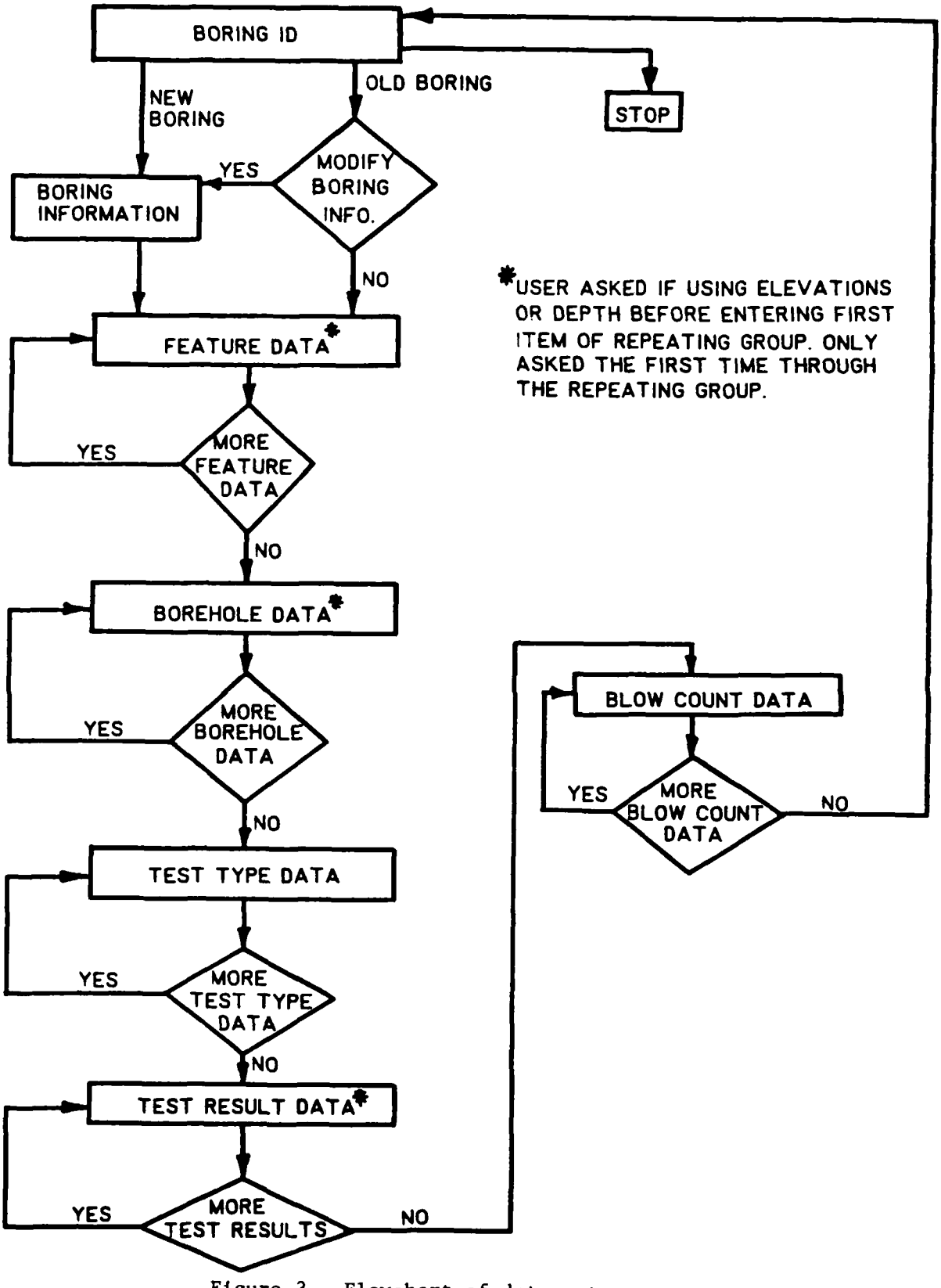


Figure 3. Flowchart of data entry program

is not a new boring, the auxiliary file, BORFL, is checked to see if the boring exists. (If it does not, a message is printed and the user is asked to reenter the number.) The user is then asked if it is desired to modify boring information. If the answer is yes, prompt options are displayed. After the boring information prompts are completed, the user is prompted for other boring data groups. Care has to be taken to correctly enter new boring numbers. If an error is made, it can be corrected by reviewing and editing the resulting data file before loading to the data base. Otherwise, the number has to be corrected in the data base. The file, BORFL, would also have to be corrected. When the user ends a data entry session and successfully loads the data to the data base, the data is available for retrievals.

Procedure

17. The data entry program prompts for data in logical groups as indicated in Table 3. The boring information part is separated into groups of 20 items and 7 items for convenience of input review and editing. Data entry for the repeating groups is segmented by group. This technique allows available information to be entered from the driller's log for immediate use and for later entry of more information as it becomes available. For example, if the coordinates or elevation of top of hole are unknown, they can be left blank and added later. However, if the top of hole elevation is not entered and depths are entered, then depths are stored in the data base. A -1000 is stored for top of hole elevation. The user is first asked if he is entering elevation or depth for those repeating groups that have it as a data element. If the top of hole elevation has been entered and depths are entered, the depths are converted to elevation during loading. Not all data elements have to be entered. The user can enter only those elements needed for future use. If the user presses the return key, the data element is skipped and a blank line is placed in the data file.

18. The data entry program allows the user to edit the data before creating the data file. After entry of each group the data will be automatically listed for the user to check. Any changes can be made at this time by following the instructions that are printed with the listed data. Once the user agrees that the items are correct, more data can be entered. When the user exits the data entry program, the data file is generated. If an error comes to light at a later time, the user can change the data file before calling the load program by following the procedures described later in this part.

Table 3

Prompts for Requested Information in Data Entry Program

	BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
	TYPE OF DATA?(10 CHAR. MAX)
	COMMENTS?(40 CHAR. MAX)
B	ENTER OFFICE SYMBOL.(10 CHAR. MAX)
O	PROJECT NAME?(40 CHAR. MAX)
R	SITE NAME?(40 CHAR. MAX)
I	PROJECT DESCRIPTION?(25 CHAR. MAX)
N	LATITUDE?(DDMMSS.SS)
G	LONGITUDE?(DDDMMSS.SS)
	ACCURACY OF LOCATION?(INTEGER 9 MAX. E.G. 1,2,3, OR 4)
GROUP 1	NAME OF QUAD SHEET?(20 CHAR. MAX)
	N-S COORDINATE?(9999999.99 MAX)
I	E-W COORDINATE?(9999999.99 MAX)
N	ACCURACY OF LOCAL SYSTEM?(INTEGER 9 MAX. E.G. 1,2,3, OR 4)
F	REFERENCE FOR LOCAL SYSTEM(CURED SYS & REF)?(10 CHAR. MAX)
O	DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
R	NUMBER OF DAYS TO DRILL THE HOLE?(INTEGER, 999 MAX)
M	C.E., DRILLER,CONTRACT DRILLER,SOURCE?(20 CHAR. MAX)
A	INSPECTOR?(10 CHAR. MAX)
T	LOCATION OF BORING LOG?(10 CHAR. MAX)
I	LOCATION OF DRILLER'S LOG?(10 CHAR. MAX)
O	LOCATION OF STORED SAMPLES?(10 CHAR. MAX)
N	STATUS OF THIS DATA(E.G.COMPLETE,WAIT LAB)?(10 CHAR. MAX)
	CURRENT STATUS OR USE OF HOLE?(10 CHAR. MAX)
GROUP 2	PURPOSE OF HOLE?(20 CHAR. MAX)
	TOP OF HOLE ELEVATION?(HIT RETURN IF UNKNOWN)(9999.99 MAX)
	ELEVATION ACCURACY?(INTEGER 9 MAX. E.G. 1,2,3, OR 4)
	DEPTH OF HOLE?(9999.99 MAX)
	TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
FEATURE	ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
GROUP	DATE MEASURED?(MM/DD/YYYY)
	DESCRIPTION OF FEATURE?(30 CHAR. MAX)
BORING	TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
SEGMENT	SIZE OF HOLE?(5 CHAR. MAX)
GROUP	ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?(9999.99 MAX)
FIELD LAB	TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
TEST	NUMBER OF THESE TESTS?(INTEGER 999 MAX)
GROUP	LOCATION OF THESE RESULTS?(10 CHAR. MAX)
	TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
	DATE TEST WAS PERFORMED?(MM/DD/YYYY)
	TYPE OF MATERIAL?(10 CHAR. MAX)
TEST	ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
RESULT	1ST RESULT?(10 CHAR. MAX, E.G. 2345.67; 15,000 PSI; 39 - LL)
GROUP	2ND RESULT?
	3RD RESULT?
	4TH RESULT?
	REMARKS(20 CHAR. MAX)
BLOW	ELEV. OF 1ST BLOWCT TEST?(INPUT -1000.0 TO QUIT)(9999.99 MAX)
COUNT	NUMBER OF BLOWS?(INTEGER 999 MAX)(INPUT 999 TO QUIT)
GROUP	REMARKS(20 CHAR. MAX)

19. The data entry program contains some internal editing capabilities in addition to the user review and editing feature. In addition to the prompts in Table 3, the information in Table 4 is contained in the driver file (DRVBOR) that the data entry program uses. The first column indicates the type of data item as indicated below:

Type 1 --- Integer number
Type 2 --- Decimal number
Type 3 --- Character name
Type 4 --- Date

The second column indicates the length of the variable. The number of 10-letter words is shown for character and date items, while the number of digits is shown for numeric items. The next two columns contain the minimum and maximum values of numeric data items that can be preset to user-desired values. If both values are zero, the item will not be checked; however, if one value is nonzero, the data are checked to ensure that the entered value is within the minimum-maximum range. If the value is outside the range, the program will print the following message and will prompt the user for the same data item again:

(entered value) IS NOT WITHIN THE LIMITS: (minimum-maximum)

The ranges should be set up when the system is initiated; the values can be changed when needed. The last two columns in the file are the position of the data item in the data base and the data base name of the item. Using this information, the data entry program knows the type of data, the size, and a range for numeric values. Thus, any large errors (wrong data type or shifts in decimal point) are caught and the user is required to enter revised values before continuing the data entry session. An additional column (not shown in Table 4) lists the allowable number of characters for type 3 data elements and sets of numbers at the bottom of the DRVBOR file (not shown in Table 4) designate the line number limits of data groups for use by the data entry program. Figure 4 shows an example of an editing session (on the Harris computer) with the DRVBOR file to change the wording of selected prompts and to set minimum and maximum values (to the nearest whole number) for selected numeric data elements. The data element names must not be changed, since they are used in setting up the data base and in loading data to the data base. The graphics programs also use these data element names.

Table 4
Data Element Specifications

Type	Length	Limits		Position	Name
		Minimum	Maximum		
3	1	0.	0.	1	BORID
3	1	0.	0.	2	CLASS
3	1	0.	0.	3	REMARKS
3	1	0.	0.	7	AUTHOR
3	4	0.	0.	8	PROJ-NAME
3	4	0.	0.	12	SITE-NAME
3	4	0.	0.	16	PROJ-DESC
2	9	0.	0.	19	LAT
2	10	0.	0.	20	LONG
1	1	0.	0.	21	ACCUR
3	2	0.	0.	22	REF
2	10	0.	0.	24	LOC-NS
2	10	0.	0.	25	LOC-EW
1	1	0.	0.	26	LOC-ACCUR
3	1	0.	0.	27	LOC-REF
4	1	0.	0.	28	DATE
1	3	0.	0.	44	DAYS-DRILL
3	2	0.	0.	29	DRILLER
3	2	0.	0.	31	INSP
3	1	0.	0.	33	LOC-BORLOG
3	1	0.	0.	34	LOC-DRLLOG
3	1	0.	0.	35	LOC-STOSAM
3	1	0.	0.	37	DATA-STAT
3	1	0.	0.	38	HOLE-STAT
3	2	0.	0.	39	PURPOSE
2	8	0.	0.	41	TOP-HOLE
1	1	0.	0.	42	EL-ACCUR
2	7	0.	0.	43	DEPTH
3	1	0.	0.	1	FEAT-NAME
2	7	0.	0.	2	FEAT-ELEV
4	1	0.	0.	3	FEAT-DATE
3	3	0.	0.	4	FEAT-DESC
3	1	0.	0.	1	BOR-TOOL
3	1	0.	0.	2	BOR-SIZE
2	7	0.	0.	3	BOR-ELEV
3	1	0.	0.	1	TYP-NAME
1	3	0.	0.	2	TYP-NUM
3	1	0.	0.	3	TYP-LOC
3	1	0.	0.	1	TEST-NAME
4	1	0.	0.	2	TEST-DATE
3	1	0.	0.	3	TEST-MAT
2	7	0.	0.	4	TEST-ELEV
3	1	0.	0.	5	TEST-RESULT1
3	1	0.	0.	6	TEST-RESULT2
3	1	0.	0.	7	TEST-RESULT3
3	1	0.	0.	8	TEST-RESULT4
3	2	0.	0.	9	REMARKS
2	6	0.	0.	1	BLOW-ELEV
1	3	0.	0.	2	BLOW-CT
3	2	0.	0.	3	BLOW-REMARKS

```
COED DRVBOR
E>D 4
TYPE OF DATA?(10 CHAR. MAX)
E>C /DATA/BORING/
TYPE OF BORING?(10 CHAR. MAX)
E>D
COMMENTS?(40 CHAR. MAX)
E>C /COMMENTS/VERT OR ANGLE HOLE, STA & OFFSET/
VERT OR ANGLE HOLE, STA & OFFSET?(40 CHAR. MAX)
E>D
ENTER OFFICE SYMBOL OR USER(10 CHAR. MAX)
E>R PROJECT ENGR OR GEOLOGIST, LAST NAME (10 CHAR. MAX
E>P
PROJECT ENGR OR GEOLOGIST, LAST NAME (10 CHAR. MAX)
E>L /ACCURACY/
ACCURACY OF LOCATION?
E>C /?/(1 FOR SURVEY, 4 FOR SCALED)?/
ACCURACY OF LOCATION(1 FOR SURVEY, 4 FOR SCALED)?
E>L /1ST/
1ST RESULT?
E>C /?/(10 CHAR. MAX)?/
1ST RESULT(10 CHAR. MAX)?
E>L /2  9/
2  9         0.          0. 19  LAT
E>C /     0./335030./
2  9    335030.          0. 19  LAT
E>C /     0./341030./
2  9    335030.    341030. 19  LAT
E>D
2 10         0.          0. 20  LONG
E>C /      0./1173700./
2 10   1173700.          0. 20  LONG
E>C /     1181000./
CANNOT FIND       1181000.
E>C /      0./1181030./
2 10   1173700.    1181000. 20  LONG
E>D 4
2  9         0.          0. 25  LOC-EW
E>C /     0./625500./
2  9    625500.          0. 25  LOC-EW
E>C /     0./630500./
2  9    625500.    630500. 25  LOC-EW
E>B
1  1         0.          0. 24  LOC-ACCUR
E>U 2
2  9         0.          0. 24  LOC-NS
E>C /     0./625500./
2  9    625500.          0. 24  LOC-NS
E>C /     0./630500./
2  9    625500.    630500. 24  LOC-NS
E>B
2  9    625500.    630500. 25  LOC-EW
E>C / 625500./1550000./
2  9   1550000.    630500. 25  LOC-EW
E>C / 630500./1600000./
2  9   1550000.   1600000. 25  LOC-EW
E>L /TOP-HOLE/
2  6         0.          0. 41  TOP-HOLE
E>C /  0./200./
2  6       200.          0. 41  TOP-HOLE
E>C /  0./600./
2  6       200.        600. 41  TOP-HOLE
E>D 2
2  6         0.          0. 43  DEPTH
E>C /0/9/
2  6         9.          0. 43  DEPTH
E>C /  0./250./
2  6         9.        250. 43  DEPTH
E>P *
```

```
DLW
BORING DATA ENTRY SYSTEM
BORING ID(INPUT END TO QUIT)?
TYPE OF BORING?(10 CHAR. MAX)
VERT OR ANGLE HOLE, STA & OFFSET?(40 CHAR. MAX)
PROJECT ENGR OR GEOLOGIST, LAST NAME (10 CHAR. MAX)
PROJECT NAME?(40 CHAR. MAX)
SITE NAME?(40 CHAR. MAX)
ENTER PROJECT DESCRIPTION (25 CHAR. MAX)
LATITUDE?(DDMMSS.SS)
LONGITUDE?(DDDMMSS.SS)
ACCURACY OF LOCATION(1 FOR SURVEY, 4 FOR SCALED)?
NAME OF QUAD SHEET?(15 CHAR. MAX)
ENTER LOCAL N-S COORDINATE.
ENTER LOCAL E-W COORDINATE.
ACCURACY OF LOCAL SYSTEM?
REFERENCE FOR LOCAL SYSTEM(I.E. USGS )?(20 CHAR. MAX)
DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
NUMBER OF DAYS TO DRILL THE HOLE?
C.E. DRILLER,CONTRACT DRILLER,SOURCE?(20 CHAR. MAX)
INSPECTOR?(20 CHAR. MAX)
LOCATION OF BORING LOG?(10 CHAR. MAX)
LOCATION OF DRILLER'S LOG?(10 CHAR. MAX)
LOCATION OF STORED SAMPLES?(20 CHAR. MAX)
STATUS OF THIS DATA(I.E.COMPLETE,WAIT LAB)?(10 CHAR. MAX)
CURRENT STATUS OR USE OF HOLE?(10 CHAR. MAX)
PURPOSE OF HOLE?(20 CHAR. MAX)
TOP OF HOLE ELEVATION? (HIT RETURN IF UNKNOWN)
ELEVATION ACCURACY?
DEPTH OF HOLE?
TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
ELEVATION OR DEPTH AT TOP OF FEATURE?
DATE MEASURED?(MM/DD/YYYY)
DESCRIPTION OF FEATURE?(30 CHAR. MAX)
TYPE OF HOLE(INPUT END TO QUIT)?(20 CHAR. MAX)
SIZE OF HOLE?(5 CHAR. MAX)
ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?
TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
NUMBER OF THESE TESTS?
LOCATION OF THESE TEST RESULTS?(10 CHAR. MAX)
TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
DATE TEST WAS PERFORMED?(MM/DD/YYYY)
TYPE OF MATERIAL?(10 CHAR. MAX)
ELEVATION OR DEPTH OF TEST?
1ST RESULT(10 CHAR. MAX)?
2ND RESULT?
3RD RESULT?
4TH RESULT?
REMARKS?
ELEV. OF 1ST BOWCT TEST?(INPUT 999 TO QUIT)
NUMBER OF BLOWS?
REMARKS(20 CHAR. MAX)
3  1         0.          0.  1  BORID          10
3  1         0.          0.  2  CLASS
3  4         0.          0.  3  REMARKS
3  1         0.          0.  7  AUTHOR
3  4         0.          0.  8  PROJ-NAME      40
3  4         0.          0. 12  SITE-NAME      40
3  3         0.          0. 16  PROJ-DESC      25
2  9    335030.     341030. 19  LAT
2 10   117 700.    1181000. 20  LONG
1  1         0.          0. 21  ACCUR
3  2         0.          0. 22  REF
2  9    625500.     630500. 24  LOC-NS
2  9   1550000.    1600000. 25  LOC-EW
1  1         0.          0. 26  LOC-ACCUR
```

```
REMARKS(20 CHAR. MAX)
3  1         0.          0.  1  BORID          10
3  1         0.          0.  2  CLASS
3  4         0.          0.  3  REMARKS
3  1         0.          0.  7  AUTHOR
3  4         0.          0.  8  PROJ-NAME      40
3  4         0.          0. 12  SITE-NAME      40
3  3         0.          0. 16  PROJ-DESC      25
2  9    335030.     341030. 19  LAT
2 10   1173700.    1181000. 20  LONG
1  1         0.          0. 21  ACCUR
3  2         0.          0. 22  REF
2  9    625500.     630500. 24  LOC-NS
2  9   1550000.    1600000. 25  LOC-EW
1  1         0.          0. 26  LOC-ACCUR
3  2         0.          0. 27  LOC-REF        10
4  1         0.          0. 28  DATE
1  3         0.          0. 44  DAYS-DRILL
3  2         0.          0. 29  DRILLER        20
3  2         0.          0. 31  INSP           15
3  1         0.          0. 33  LOC-BORLOG     10
3  1         0.          0. 34  LOC-DRLLOG     10
3  2         0.          0. 35  LOC-STOSAM     20
3  1         0.          0. 37  DATA-STAT      10
3  1         0.          0. 38  HOLE-STAT
3  2         0.          0. 39  PURPOSE        20
2  6       200.        600. 41  TOP HOLE
1  1         0.          0. 42  EL-ACCUR
2  6         9.        250. 43  DEPTH
3  1         0.          0.  1  FEAT-NAME      10
2  6         0.          0.  2  FEAT-ELEV
4  1         0.          0.  3  FEAT-DATE
3  3         0.          0.  4  FEAT-DESC      30
3  1         0.          0.  1  BOR-TOOL       10
3  1         0.          0.  2  BOR-SIZE        5
2  6         0.          0.  3  BOR-ELEV
3  1         0.          0.  1  TYP-NAME       10
1  3         0.          0.  2  TYP-NUM
3  1         0.          0.  3  TYP-LOC
3  1         0.          0.  1  TEST-NAME
4  1         0.          0.  2  TEST-DATE
3  1         0.          0.  3  TEST-MAT       10
2  6         0.          0.  4  TEST-ELEV
3  2         0.          0.  5  TEST-RESULT1
3  2         0.          0.  6  TEST-RESULT2
3  2         0.          0.  3  TEST-RESULT3
3  2         0.          0.  4  TEST-RESULT4
3  2         0.          0.  5  TEST-REMARKS
2  6         0.          0.  1  BLOW-ELEV
3  1         0.          0.  2  BLOW-CT
3  2         0.          0.  3  BLOW-REMARKS
  1 28
 29 32
 33 35
 36 38
 39 47
 48 50
```

Figure 4. Editing the DRVBOR file to change wording of prompts and to add minimum and maximum values for numeric data elements

Precautions

20. The user should be aware of the following precautions in the data entry procedure:

a. Data should always be entered with no leading blanks. Do not use a colon ":" in any input because the characters following the colon will not be stored by System 2000.

b. The collection program checks boring numbers that were previously entered. However, if a new boring number is entered incorrectly, the incorrect number will be stored in the data base unless it is corrected before loading to the data base.

c. The following error messages are generated by the data collection program as a result of its internal editing:

```
OOPS!  NOT A VALID INTEGER, TRY AGAIN
OOPS!  NOT A VALID REAL, TRY AGAIN
OOPS!  NOT A VALID DATE, TRY AGAIN
```

The collection program also checks the input format for dates and that values for days do not exceed 31 and for month, does not exceed 12.

d. In the collection program, all data entered is printed back to the user for editing except for the boring number. If the boring number is entered incorrectly, the best way to change the number is to edit the data file before loading the data to the data base.

e. The data file should be carefully checked to find and correct any errors that might have been missed during data entry. This is a crucial step before data loading and should be done by an experienced person, other than the one who entered the data. Spacing of numbers and blank lines are significant (e.g., a blank line is inserted for feature date when feature name is not "WT" and when a prompt is skipped; the blank lines are required for proper loading).

f. The load program will generate the following error message in SUMFLE if the data cannot be loaded:

```
WRAP UP CALLED BY ROUTINE 'ROUTINE NAME' AFTER THE DATA
BASE OPERATION OF 'DATA BASE OPERATION' WITH A RETURN CODE
OF 'RETURN CODE' WITH A LEVEL NUMBER OF 'LEVEL NUMBER'.
```

If this condition occurs, the user needs to contact the system administrator to determine the cause of the error and how to correct the data file. A line-by-line comparison of the data file with SUMFLE to the point where WRAP UP was called can often reveal where the error is located.

Accessing the Collection and Load Programs

21. The command for executing the collection program is:

/-INPBOR (/ is the CDC command prompt and the - indicates a procedure file)

The collect program creates a data file called DATBOR. On the Harris computer, the same command without the "-" is used. The data file (DATBOR) is loaded to the data base using the load program that requires no input from the user other than the following commands:

/BEGIN,,UPDBORB

The terminal response is "submit complete" and the assigned job name. The job priority number may be assigned by the user on the JOB card in the UPDBORB procedure file. The process time is also dependent on the number of higher priority jobs waiting to be executed. It is recommended that batch loading be done overnight so that the data base is not inaccessible to the user during the day or the load procedure is terminated because the data base is in use. Batch loading is much cheaper than interactive loading. However, the data will not be available for immediate retrieval. For direct (interactive) loading, the following command is used:

/-UPDBOR

If data is collected on the Harris computer, the DATBOR data file has to be transferred to the CDC computer system before loading to the data base. During the loading process, files called SUMFLE and BORDAY are created. The SUMFLE indicates that the data was successfully loaded or how much data was loaded before an error in the data file was encountered. The BORDAY file gives a summary of operations during a time-sharing session. If any problems develop during the load process, the error message will be located in these files. Figure 5 shows an example of a SUMFLE with no errors, while Figure 6 illustrates a file when an error has occurred. The error must be corrected in the data file, DATBOR, and the portion of the data file that was loaded must be deleted before the user attempts to load the remaining data again. (See Appendix B for use of the edit process on CDC.) After the data is successfully loaded to the data base, the old data file must be cleared and readied for more data. To clear a data file, the following command is used:

/-CLRBOR

The same command, without the "-" is used on the Harris computer. If the data file is not cleared, the next data entered will be appended to the existing data in DATBOR. Thus, several data entry sessions can be accumulated in DATBOR before loading, if desired.

```
/OLD,SUMFLE
/LIST
 N BORID DC-4          .........BORING ID
 BORID TYPE(NEW/OLD) OLD
 N ACTION NEW BLOWCOUNTS
  574.0           15  SPT1 0-1.5 FT
 BLOWCT IS INSERTED  574.0
  572.5           19  SPT2 1.5-3.0 FT
 BLOWCT IS INSERTED  572.5
  571.0           22  SPT3 3.0-4.5 FT
 BLOWCT IS INSERTED  571.0
  570.0           50  REFUSAL AT 570.0 FT
 BLOWCT IS INSERTED  570.0
/
```

Figure 5. Listing of SUMFLE showing successful loading of data

```
/OLD,SUMFLE
/LIST
 N BORID DC-4          .........BORING ID
 BORID TYPE(NEW/OLD) OLD
 N ACTION NEW BLOWCOUNTS
  574.0            1  SPT1 0-1.5 FT
OWRAP UP CALLED BY ROUTINE,DOBLOW

 AFTER THE DATABASE OPERATION OF INSERT

 WITH A RETURN CODE OF     10

 WITH A LEVEL NUMBER OF     3
```

Figure 6. Listing of SUMFLE showing unsuccessful loading and error codes

Example 1

22. Example 1, shown in Table 5, illustrates the data file entry procedure. Throughout the example the data correction and program editing capabilities are shown. An uneven format in the review of input (sheet 14 and others) was caused by a program bug that has been corrected. The entry of detailed rock feature descriptions, use of the field/lab test (test type) group to store actual data (e.g., rock quality descriptor (RQD) and percent core recovery), and the entry of test names and units in the remarks element of the test results group are also illustrated. The data are entered in two separate sessions with loading after each session. The resulting DATBOR and SUMFLE files are included. Blank lines occurring in the DATBOR file (sheet 11) are for the feature date that is only asked for when feature name is WT for water table. These blank lines are required for proper loading and must not be deleted. The cost (1984) to create this example data file was $3 on CDC. An additional $1 was the cost for direct loading of the data to the data base. Thus the total cost was $4. The cost for data entry on the District Harris computer system and transfer to CDC for loading is estimated between $5 and $10.

Example 2

23. Example 2, shown in Table 6, illustrates the use of tailored prompts for data collection. The selected prompts are used to enter certain information for a new boring. Blank lines in the DATBOR file (sheet 4) are for the data elements that were skipped and are required for proper loading to the data base.

Example 3

24. Example 3, shown in Table 7, illustrates the use of the modification option for the data stored in the top level (only groups 1 and 2, Table 3) of the data base in Example 2. The resulting DATBOR file and the contents of SUMFLE are also shown. If the project name, site name, or project description are changed, the auxiliary file, BORFL, is modified. The last part of this example shows how the data base is entered and how all the data for the boring entered in Example 2 are displayed. The command to enter the data base is -GETDB and the required responses (commands) are shown after the "?" prompt. This prompt is used by the CDC system for all program prompts. The data base commands are described in Part IV. The boring information as modified is also shown at the end of this example. It may be noted in the modification data

Table 5

Data Entry Procedure for New Boring

```
/-INFORM

          BORING DATA ENTRY SYSTEM


 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? DC-4
 IS THIS A NEW BORING ID? (Y OR N)

? Y
 PLEASE SELECT ONE OF THE FOLLOWING OPTIONS:
      1 ........ USE THE DEFAULT PROMPT SEQUENCE
      2 ........ CREATE MY PROMPT SEQUENCE
      3 ........ KEEP THE CURRENT PROMPT SEQUENCE

 INPUT THE DESIRED OPTION!


? 1
 TYPE OF DATA?(10 CHAR. MAX)
? BORING
 COMMENTS?(40 CHAR. MAX)
? GEN SAMP/ROCK CORE, LT ABUT 14+20, 40'R
 ENTER OFFICE SYMBOL.(10 CHAR. MAX)
? SPLED-G
 PROJECT NAME?(40 CHAR. MAX)
? SANTA ANA RIVER BASIN, CA
 SITE NAME?(40 CHAR. MAX)
? PRADO DAM EMBANKMENT
 PROJECT DESCRIPTION?(25 CHAR. MAX)
? SPILLWAY EXPANSION INVEST
 LATITUDE?(DDMMSS.SS)
? 335730.25
 LONGITUDE?(DDDMMSS.SS)
? 1173735.15
 ACCURACY OF LOCATION?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 3
 NAME OF QUAD SHEET?(20 CHAR. MAX)
? PRADO DAM 1:24000 73
OIS THERE LOCAL SYSTEM DATA? (Y OR N)?
? Y
```

(Relative accuracy, e.g. 1 for surveyed to 4 for scaled from map)

(Continued)

Table 5 (Continued)

```
 N-S COORDINATE?(9999999.99 MAX)
? 630000
 E-W COORDINATE?(9999999.99 MAX)
? 1580000
 ACCURACY OF LOCAL SYSTEM?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 2
 REFERENCE FOR LOCAL SYSTEM(COORD SYS & REF)?(10 CHAR. MAX)
? STATE PL
 DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
? 03/18/1979
 NUMBER OF DAYS TO DRILL THE HOLE?(INTEGER, 999 MAX)
? 2
 C.E. DRILLER,CONTRACT DRILLER,SOURCE?(20 CHAR. MAX)
? MOTT DRILLING CO
 INSPECTOR?(15 CHAR. MAX)
? HOTTON
 LOCATION OF BORING LOG?(10 CHAR. MAX)
? SPLED-G
 LOCATION OF DRILLER'S LOG?(10 CHAR. MAX)
? GEOTECH BR
 LOCATION OF STORED SAMPLES?(20 CHAR. MAX)
? SPD LAB
 STATUS OF THIS DATA(E.G.COMPLETE,WAIT LAB)?(10 CHAR. MAX)
? COMPLETE
 CURRENT STATUS OR USE OF HOLE?(10 CHAR. MAX)
? PIEZOMETER
 PURPOSE OF HOLE?(20 CHAR. MAX)
? BOUNDATION INVEST    (error corrected on next sheet)
 TOP OF HOLE ELEVATION?(HIT RETURN IF UNKNOWN)(99999.99 MAX)
? 575.0
 ELEVATION ACCURACY?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 1
 DEPTH OF HOLE?(9999.99 MAX)
? 475.0
```

(Continued)

(Sheet 2 of 25)

Table 5 (Continued)

```
OREVIEW OF INPUT
 LINE #     DB NAME          DATA VALUE
    1 .... CLASS        .. BORING
    2 .... REMARKS      .. GEN SAMP/ROCK CORE, LT ABUT 14+20, 40'R
    3 .... AUTHOR       .. SPLED-G
    4 .... PROJ-NAME    .. SANTA ANA RIVER BASIN, CA
    5 .... SITE-NAME    .. PRADO DAM EMBANKMENT
    6 .... PROJ-DESC    .. SPILLWAY EXPANSION INVEST
    7 .... LAT          .. 335730.25
    8 .... LONG         .. 1173735.15
    9 .... ACCUR        .. 3
   10 .... REF          .. PRADO DAM 1:24000 73
   11 .... LOC-NS       .. 630000.
   12 .... LOC-EW       .. 1580000.
   13 .... LOC-ACCUR    .. 2
   14 .... LOC-REF      .. STATE PL
   15 .... DATE         .. 03/18/1979
   16 .... DAYS-DRILL   .. 2
   17 .... DRILLER      .. MOTT DRILLING CO
   18 .... INSP         .. HOTTON
   19 .... LOC-BORLOG   .. SPLED-G
   20 .... LOC-DRLLOG   .. GEOTECH BR
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
? 18
 18...INSPECTOR?(15 CHAR. MAX)
? HORTON
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
O DO YOU WISH TO REVIEW VALUES AGAIN?(Y OR N)?
? N
OREVIEW OF INPUT
 LINE #     DB NAME          DATA VALUE
    1 .... LOC-STOSAM   .. SPD LAB
    2 .... DATA-STAT    .. COMPLETE
    3 .... HOLE-STAT    .. PIEZOMETER
    4 .... PURPOSE      .. BOUNDATION INVEST
    5 .... TOP-HOLE     .. 575.0
    6 .... EL-ACCUR     .. 1
    7 .... DEPTH        .. 475.0
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
? 4
```

(Continued)

(Sheet 3 of 25)

Table 5 (Continued)

```
  4...PURPOSE OF HOLE?(20 CHAR. MAX)
? FOUNDATION INVEST
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
O DO YOU WISH TO REVIEW VALUES AGAIN?(Y OR N)?
? N
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? CL CLAY
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 0.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? BR, SANDY, ROOTS IN TOP 6 IN.
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SC SAND
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 1.5
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? BR, CLAYEY, F TO MED, MOIST
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SC SAND
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 4.5
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? ROCK FRAMMENTS
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 5.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? PULL 1 START, WP=50PSI
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 5.1
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? MSS BDD,SI,MIC,MED HD TO HD,
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
```

(Continued)

(Sheet 4 of 25)

Table 5 (Continued)

```
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 5.2
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? F TO MED GRA, LT GR TO LT BR,
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 5.3
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? SANDSTONE
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 5.4
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? IN TOP 3' OF CORE.
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 6.4
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.2' OF SO TO MED HD, VF
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 6.9
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.1' OF SO TO MED HD, VF
                    COLUMNS
         1           2            3              4
 LINE #
    1     CL CLAY    0.0                         BR, SANDY, ROOTS IN TOP 6 IN.
    2     SC SAND    1.5                         BR, CLAYEY, F TO MED, MOIST
    3     SC SAND    4.5                         ROCK FRAMMENTS
    4     SANDSTONE  5.0                         PULL 1 START, WP=50PSI
    5     SANDSTONE  5.1                         MSS BDD,SI,MIC,MED HD TO HD,
    6     SANDSTONE  5.2                         F TO MED GRA, LT GR TO LT BR,
    7     SANDSTONE  5.3                         SANDSTONE
    8     SANDSTONE  5.4                         IN TOP 3' OF CORE.
    9     SANDSTONE  6.4                         0.2' OF SO TO MED HD, VF
   10     SANDSTONE  6.9                         0.1' OF SO TO MED HD, VF
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
? 3,4
```

(Continued)

Table 5 (Continued)

```
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? ROCK FRAGMENTS
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
? 7,4
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? OCC BLK SH PTGS, NUM HEM PTGS
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
DDO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 7.5
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.5' OF SO, ST RED
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? WT
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 7.6
 DATE MEASURED?(MM/DD/YYYY)
? 02/18/1979
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? WL = 7.6 FT AT 1640 HRS
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 8.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.6' LC, 6.4 TO 8.4 FT
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? WT
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 8.2
 DATE MEASURED?(MM/DD/YYYY)
? 02/18/1979
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? WL = 8.2 FT AT 1800 HRS
```

(Continued)

(Sheet 6 of 25)

Table 5 (Continued)

```
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 8.5
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? OP H/A JT, 55 DEG
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 10.2
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? PULL 2 START, WP=50PSI
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 12.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? OP 1/A JT 15 DEG, ST RED
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 13.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.6' UL,CAV,OP,NO DWL,ROD DROP
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 16.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? OP, MOR JR, SMOOTH
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 19.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.2' UL, SPINS GROUND UP CORE
```

(Continued)

(Sheet 7 of 25)

Table 5 (Continued)

```
                        COLUMNS
          1             2             3                4
LINE #
   1      SANDSTONE     7.5                            0.5' OF SD, ST RED
   2      WT            7.6           02/18/1979       WL = 7.6 FT AT 1640 HRS
   3      SANDSTONE     8.0                            0.6' LC, 6.4 TO 8.4 FT
   4      WT            8.2           02/18/1979       WL = 8.2 FT AT 1800 HRS
   5      SANDSTONE     8.5                            OP H/A JT, 55 DEG
   6      SANDSTONE     10.2                           PULL 2 START, WP=50PSI
   7      SANDSTONE     12.0                           OP 1/A JT 15 DEG, ST RED
   8      SANDSTONE     13.0                           0.6' UL,CAV OP,NO DWL,ROD DROP
   9      SANDSTONE     16.0                           OP, HOR JR, SMOOTH
  10      SANDSTONE     19.0                           0.2' UL, SPINS GROUND UP CORE
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
? 9.4
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? OP, HOR JT, SMOOTH
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
ODO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 20.2
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
```

(Continued)

Table 5 (Continued)

```
? PULL 3 START, WP=50PSI
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 21.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? 0.7' NUM FRACS, ST RED, 0.3'CL
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
                        COLUMNS
          1             2             3                4
 LINE #
    1      SANDSTONE  20.2                             PULL 3 START, WP=50PSI
    2      SANDSTONE  21.0                             0.7' NUM FRACS, ST RED, 0.3'CL
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ELEV. OF 1ST BLOWCT TEST?(INPUT -1000.0 TO QUIT)(9999.99 MAX
? -1000.0
 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 DATA ENTRY TERMINATED
```

(Continued)

Table 5 (Continued)

```
/OLD,DATBOR
/LIST
 BORING LOAD DATA FILE
 DC-4          .........BORING ID
 NEW BORID                    1001
 DC-4
 BORING
 GEN SAMP/ROCK CORE, LT ABUT 14+20, 40'R
 SPLED-G
 SANTA ANA RIVER BASIN, CA
 PRADO DAM EMBANKMENT
 SPILLWAY EXPANSION INVEST
 3          3          5          7          3          0          .          2          5
 1          1          7          3          7          3          5          .          1          5
 3
 PRADO DAM 1:24000 73
 6          3          0          0          0          0          .
 1          5          8          0          0          0          0          .
 2
 STATE PL
 03/18/1979
 2
 MOTT DRILLING CO
 HORTON
 SPLED-G
 GEOTECH BR
 SPD LAB
 COMPLETE
 PIEZOMETER
 FOUNDATION INVEST
 5          7          5          .          0
 1
 4          7          5          .          0
```

(Continued)

Table 5 (Continued)

```
NEW FEATRE
ELEVN
CL CLAY
0          .          0

BR, SANDY, ROOTS IN TOP 6 IN.
SC SAND
1          .          5

BR, CLAYEY, F TO MED, MOIST
SC SAND
4          .          5

ROCK FRAGMENTS
SANDSTONE
5          .          0

PULL 1 START, WP=50PSI
SANDSTONE
5          .          1

MSS BDD,SI,MIC,MED HD TO HD,
SANDSTONE
5          .          2

F TO MED GRA, LT GR TO LT BR,
SANDSTONE
5          .          3

OCC BLK SH PTGS, NUM HEM PTGS
SANDSTONE
5          .          4

IN TOP 3' OF CORE.
SANDSTONE
6          .          4

0.2' OF SO TO MED HD, VF
SANDSTONE
6          .          9

0.1' OF SO TO MED HD, VF
SANDSTONE
7          .          5

0.5' OF SO, ST RED
WT
7          .          6
02/18/1979
WL = 7.6 FT AT 1640 HRS
SANDSTONE
8          .          0

0.6' LC, 6.4 TO 8.4 FT
WT
8          .          2
02/18/1979
WL = 8.2 FT AT 1800 HRS
SANDSTONE
8          .          5

OP H/A JT, 55 DEG
SANDSTONE
1          0          .          2

PULL 2 START, WP=50PSI
SANDSTONE
1          2          .          0

OP 1/A JT 15 DEG, ST RED
SANDSTONE
1          3          .          0

0.6' UL,CAV OP,NO DWL,ROD DROP
SANDSTONE
1          6          .          0

OP, HOR JT, SMOOTH
SANDSTONE
1          9          .          0

0.2' UL, SPINS GROUND UP CORE
SANDSTONE
2          0          .          2

PULL 3 START, WP=50PSI
SANDSTONE
2          1          .          0

0.7' NUM FRACS, ST RED, 0.3'CL
BBBBBBBBBBBBBBBBBBBB END OF BORID
```

(Continued)

(Sheet 11 of 25)

Table 5 (Continued)

```
    /OLD,BORFL
    /LIST
     DC-4
     SANTA ANA RIVER BASIN, CA
     PRADO DAM EMBANKMENT
     SPILLWAY EXPANSION INVEST
          1001

/-UPDBOR

/OLD,SUMFLE
/LIST
 N BORID DC-4          .........BORING ID
 BORID TYPE(NEW/OLD) NEW BORID
 BORID IS INSERTED  DC-4
 N ACTION NEW FEATRE
 CL CLAY          575.00  -NULL-
 FEATURE IS INSERTED  CL CLAY
 SC SAND          573.50  -NULL-
 FEATURE IS INSERTED  SC SAND
 SC SAND          570.50  -NULL-
 FEATURE IS INSERTED  SC SAND
 SANDSTONE        570.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        569.90  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        569.80  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        569.70  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        569.60  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        568.60  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        568.10  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        567.50  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 WT               567.40  1979/02/18
 FEATURE IS INSERTED  WT
 SANDSTONE        567.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 WT               566.80  1979/02/18
 FEATURE IS INSERTED  WT
 SANDSTONE        566.50  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        564.80  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        563.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        562.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        559.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        556.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        554.80  -NULL-
 FEATURE IS INSERTED  SANDSTONE
 SANDSTONE        554.00  -NULL-
 FEATURE IS INSERTED  SANDSTONE
```

(Continued)

(Sheet 12 of 25)

Table 5 (Continued)

```
/-CLRBOR
/-INPBOR

          BORING DATA ENTRY SYSTEM


 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? DC-4
 IS THIS A NEW BORING ID? (Y OR N)

? N
ALL PROJECTS WITH THIS ID WILL BE SHOWN ONE AT A TIME.
WHEN THIS PROJECT APPEARS, PRESS Y TO SELECT IT



BORING ID------->DC-4
PROJECT NAME--->SANTA ANA RIVER BASIN, CA
SITE NAME------->PRADO DAM EMBANKMENT
PROJECT DESC.--->SPILLWAY EXPANSION INVEST

IS THIS THE CORRECT PROJECT?(Y OR N)
?
 DO YOU NEED TO MODIFY BORID INFO?(Y OR N)
? N
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? RK BIT&WTR
 SIZE OF HOLE?(5 CHAR. MAX)
? 4.5
 ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?(9999.99 MAX)
? 0.0
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? 5.3" PIPE
 SIZE OF HOLE?(5 CHAR. MAX)
? 4.0
 ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?(9999.99 MAX)
? -0.3      (pipe extends above ground surface)
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? STD SP SPN
 SIZE OF HOLE?(5 CHAR. MAX)
? 2.5
```

(Continued)

(Sheet 13 of 25)

Table 5 (Continued)

```
 ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?(9999.99 MAX)
? 0.0
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? NWM #1234
 SIZE OF HOLE?(5 CHAR. MAX)
? 3.0
 ELEVATION OR DEPTH AT TOP OF THIS TYPE OF HOLE?(9999.99 MAX)
? 5.0
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
                          COLUMNS
 LINE #
+              1
+                           2
+                                        3
       1
+              RK BIT&WTR
+                           4.5
+                                        0.0
       2
+              5.3" PIPE
+                           4.0
+                                        -0.3
       3
+              STD SP SPN
+                           2.5
+                                        0.0
       4
+              NWM #1234
+                           3.0
+                                        5.0
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? SPT JAR
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 4
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? SPD LAB
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? CORE BOX
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 10
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? SPD LAB
```

(Continued)

(Sheet 14 of 25)

Table 5 (Continued)

```
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD1
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 79
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 5.2'REC 84
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD2
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 93
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 93
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD3
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 92
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 91
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD4
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 96
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 96
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD5
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 86
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 90
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD6
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 94
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 95
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD7
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 90
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 92
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? RQD8
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 97
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 98
```

(Type of Test group used to store RQD in percent and core recovery in feet and percent)

(Continued)

(Sheet 15 of 25)

Table 5 (Continued)

LINE #	COLUMNS 1	2	3
+			
1	SPT JAR		
+		4	
+			SPD LAB
2	CORE,BOX		
+		10	
+			SPD LAB
3	ROD1		
+		79	
+			5.2'REC 84
4	ROD2		
+		93	
+			10' REC 93
5	ROD3		
+		92	
+			10' REC 91
6	ROD4		
+		96	
+			10' REC 96
7	ROD5		
+		86	
+			10' REC 90
8	ROD6		
+		94	
+			10' REC 95
9	ROD7		
+		90	
+			10' REC 92
10	ROD8		
+		97	
+			10' REC 98

(Continued)

(Sheet 16 of 25)

Table 5 (Continued)

```
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? ROD9
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 89
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 91
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? ROD10
 NUMBER OF THESE TESTS?(INTEGER 999 MAX)
? 91
 LOCATION OF THESE RESULTS?(10 CHAR. MAX)
? 10' REC 94
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
                          COLUMNS
 LINE #
+              1
+                           2
+                                        3
      1
+              ROD9
+                           89
+                                        10' REC 91
      2
+              ROD10
+                           91
+                                        10' REC 94
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? INDEX
 DATE TEST WAS PERFORMED?(MM/DD/YYYY)
? 04/10/1979
```

(Continued)

Table 5 (Continued)

```
 TYPE OF MATERIAL?(10 CHAR. MAX)
? SC SAND
 ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
? 2.5
 1ST RESULT?(10 CHAR. MAX, E.G. 2345.67; 15,000 PSI; 39 = LL)
? 28
 2ND RESULT?
? 12
 3RD RESULT?
? 2.54
 4TH RESULT?
? 18
 REMARKS(20 CHAR. MAX)
? LL,PI, GS, %-200
0REVIEW OF INPUT
 LINE #     DB NAME          DATA VALUE
      1 .... TEST-NAME   .. INDEX
      2 .... TEST-DATE   .. 04/10/1979
      3 .... TEST-MAT    .. SC SAND
      4 .... TEST-ELEV   .. 2.5
      5 .... TEST-RESUL  .. 28
      6 .... TEST-RESUL  .. 12
      7 .... TEST-RESUL  .. 2.54
      8 .... TEST-RESUL  .. 18
      9 .... REMARKS     .. LL,PI, GS, %-200
0TO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
? 7
   7...3RD RESULT?
? 2.54
0TO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
0 DO YOU WISH TO REVIEW VALUES AGAIN?(Y OR N)?
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? UNIAX COMP
 DATE TEST WAS PERFORMED?(MM/DD/YYYY)
? 04/12/1979
 TYPE OF MATERIAL?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
? 6.0
 1ST RESULT?(10 CHAR. MAX, E.G. 2345.67; 15,000 PSI; 39 = LL)
? 3.0
```

(Continued)

(Sheet 18 of 25)

Table 5 (Continued)

```
 2ND RESULT?
? 6.3
 3RD RESULT?
? 0.02
 4TH RESULT?
? 17380
 REMARKS(20 CHAR. MAX)
? DIA,HT,%/MIN,UC=PSI
OREVIEW OF INPUT
 LINE #     DB NAME          DATA VALUE
    1 .... TEST-NAME   .. UNIAX COMP
    2 .... TEST-DATE   .. 04/12/1979
    3 .... TEST-MAT    .. SANDSTONE
    4 .... TEST-ELEV   .. 6.0
    5 .... TEST-RESUL  .. 3.0
    6 .... TEST-RESUL  .. 6.3
    7 .... TEST-RESUL  .. 0.02
    8 .... TEST-RESUL  .. 17380
    9 .... REMARKS     .. DIA,HT,%/MIN,UC=PSI
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? PRESSURE
 DATE TEST WAS PERFORMED?(MM/DD/YYYY)
? 03/20/1979
 TYPE OF MATERIAL?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
? 21.4
 1ST RESULT?(10 CHAR. MAX, E.G. 2345.67; 15,000 PSI; 39 = LL)
? 15.3
 2ND RESULT?
? 3.0
 3RD RESULT?
? 12.2
 4TH RESULT?
? 1.0
 REMARKS(20 CHAR. MAX)
? PSI,MIN,GPM,PSI/FT
OREVIEW OF INPUT
 LINE #     DB NAME          DATA VALUE
    1 .... TEST-NAME   .. PRESSURE
    2 .... TEST-DATE   .. 03/20/1979
    3 .... TEST-MAT    .. SANDSTONE
    4 .... TEST-ELEV   .. 21.4
```

(Continued)

(Sheet 19 of 25)

Table 5 (Continued)

```
     5 .... TEST-RESUL .. 15.3
     6 .... TEST-RESUL .. 3.0
     7 .... TEST-RESUL .. 12.2
     8 .... TEST-RESUL .. 1.0
     9 .... REMARKS    .. PSI,MIN,GPM,PSI/FT
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
? 4
  4...ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
? 7.6
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
O DO YOU WISH TO REVIEW VALUES AGAIN?(Y OR N)?
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? PRESSURE
 DATE TEST WAS PERFORMED?(MM/DD/YYYY)
? 03/20/1979
 TYPE OF MATERIAL?(10 CHAR. MAX)
? SANDSTONE
 ELEVATION OR DEPTH OF TEST?(9999.99 MAX)
? 21.4
 1ST RESULT?(10 CHAR. MAX, E.G. 2345.67; 15,000 PSI; 39 = LL)
? 2.6
 2ND RESULT?
? 3.0
 3RD RESULT?
? 20.7
 4TH RESULT?
? 1.0
 REMARKS(20 CHAR. MAX)
? 5' INC.= 18.9 TO 23.9
OREVIEW OF INPUT
 LINE #    DB NAME        DATA VALUE
     1 .... TEST-NAME   .. PRESSURE
     2 .... TEST-DATE   .. 03/20/1979
     3 .... TEST-MAT    .. SANDSTONE
     4 .... TEST-ELEV   .. 21.4
     5 .... TEST-RESUL  .. 2.6
     6 .... TEST-RESUL  .. 3.0
     7 .... TEST-RESUL  .. 20.7
     8 .... TEST-RESUL  .. 1.0
     9 .... REMARKS     .. 5' INC.= 18.9 TO 23.
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
```

(Continued)

(Sheet 20 of 25)

Table 5 (Continued)

```
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ELEV. OF 1ST BLOWCT TEST?(INPUT -1000.0 TO QUIT)
? 574.00
 INPUT INITIAL INTERVAL?
? 1.5
 TYPE IN THE NUMBER OF BLOWS AFTER THE GIVEN
 ELEVATION (INPUT END TO QUIT,-1 TO SKIP
TO ANOTHER ELEVATION,-2 TO CHANGE INTERVALS)
  574.0
 NUMBER OF BLOWS?
? 15
 REMARKS(20 CHAR. MAX)
? SPT1 0-1.5 FT
  572.5
 NUMBER OF BLOWS?
? 19
 REMARKS(20 CHAR. MAX)
? SPT2 1.5-3.0 FT
  571.0
 NUMBER OF BLOWS?
? 22
 REMARKS(20 CHAR. MAX)
? SPT3 3.0-4.5 FT
  569.5
 NUMBER OF BLOWS?
? -1
 INPUT NEXT ELEVATION?
? 570.0
  570.0
 NUMBER OF BLOWS?
? 50
 REMARKS(20 CHAR. MAX)
? REFUSAL AT 570.0
  568.5
 NUMBER OF BLOWS?
? END
                        COLUMNS
 LINE #
+              1
+                        2
+                                  3
      1
+              574.00
+                        15
+                                  SPT1 0-1.5
                        (Continued)
```

(Sheet 21 of 25)

Table 5 (Continued)

```
       2
+              572.50
+                          19
+                                          SPT2 1.5-3
       3
+              571.00
+                          22
+                                          SPT3 3.0-4
       4
+              570.00
+                          50
+                                          REFUSAL AT
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 BORING ID(INPUT END TO QUIT)?
? END
 DATA ENTRY TERMINATED
```

(Continued)

(Sheet 22 of 25)

Table 5 (Continued)

```
/BLD,DATBOR
/LIST
 BORING LOAD DATA FILE
 DC-4          .........BORING ID
 OLD                              1001
 DC-4
 NEW TYPE
 ELEVN
 RK BIT&WTR
 4.5
 0              .              0
 5.3' PIPE
 4.0
 -              0              .              3
 STD SP SPN
 2.5
 0              .              0
 NWM #1234
 3.0
 5              .              0
 NEW LAB
 SPT JAR
 4
 SPD LAB
 CORE,BOX
 1              0
 SPD LAB
 ROD1
 7              9
 5.2'REC 84
 ROD2
 9              3
 10' REC 93
 ROD3
 9              2
 10' REC 91
 ROD4
 9              6
 10' REC 96
 ROD5
 8              6
 10' REC 90
 ROD6
 9              4
 10' REC 95
 ROD7
 9              0
 10' REC 92
 ROD8
 9              7
 10' REC 98
 ROD9
 8              9
 10' REC 91
 ROD10
 9              1
 10' REC 94
 NEW FIELD
 ELEVN
 INDEX
 04/10/1979
 SC SAND
 2              .              5
 28
 12
 2.54
 18
 LL,PI, GS, %-200
 NEW FIELD
 ELEVN
 UNIAX COMP
 04/12/1979
 SANDSTONE
 6              .              0
 3.0
 6.3
 0.02
 17380
 DIA,HT,%/MIN,UC=PSI
 NEW FIELD
 ELEVN
 PRESSURE
 03/20/1979
 SANDSTONE
 7              .              6
 15.3
 3.0
 12.2
 1.0
 PSI,MIN,GPM,PSI/FT
```

(Continued)

(Sheet 23 of 25)

Table 5 (Continued)

```
NEW FIELD
ELEVN
PRESSURE
03/20/1979
SANDSTONE
2          1          .          4
2.6
3.0
20.7
1.0
5' INC.= 18.9 TO 23.
NEW BLOWCOUNTS
5          7          4          .          0          0
1          5
SPT1 0-1.5 FT
5          7          2          .          5          0
1          9
SPT2 1.5-3.0 FT
5          7          1          .          0          0
2          2
SPT3 3.0-4.5 FT
5          7          0          .          0
5          0
REFUSAL AT 570.0 FT
BBBBBBBBBBBBBBBBBBBB END OF BORID
```

(Continued)

(Sheet 24 of 25)

Table 5 (Concluded)

```
/-UPDBOR
/OLD,SUMFLE
/LIST
 N BORID DC-4          .........BORING ID
 BORID TYPE(NEW/OLD) OLD
 N ACTION NEW TYPE
 RK BIT&WTR  4.5                575.00
 TYPE IS INSERTED    RK BIT&WTR
 5.3' PIPE   4.0                575.30
 TYPE IS INSERTED    5.3' PIPE
 STD SP SPN  2.5                575.00
 TYPE IS INSERTED    STD SP SPN
 NWM #1234   3.0                570.00
 TYPE IS INSERTED    NWM #1234
 SPT JAR                4  SPD LAB
 LAB IS INSERTED

 CORE,BOX               10  SPD LAB
 LAB IS INSERTED

 ROD1                   79  5.2'REC 84
 LAB IS INSERTED

 ROD2                   93  10' REC 93
 LAB IS INSERTED

 ROD3                   92  10' REC 91
 LAB IS INSERTED

 ROD4                   96  10' REC 96
 LAB IS INSERTED

 ROD5                   86  10' REC 90
 LAB IS INSERTED

 ROD6                   94  10' REC 95
 LAB IS INSERTED

 ROD7                   90  10' REC 92
 LAB IS INSERTED

 ROD8                   97  10' REC 98
 LAB IS INSERTED

 ROD9                   89  10' REC 91
 LAB IS INSERTED

 ROD10                  91  10' REC 94
 LAB IS INSERTED

 INDEX       1979/04/10 SC SAND        572.500 ********** **********
 2.54        18
 FIELD IS INSERTED

 UNIAX COMP  1979/04/12 SANDSTONE      569.000 ********** **********
 0.02        17380
 FIELD IS INSERTED

 PRESSURE    1979/03/20 SANDSTONE      567.400 ********** **********
 12.2        1.0
 FIELD IS INSERTED

 PRESSURE    1979/03/20 SANDSTONE      553.600 ********** **********
 20.7        1.0
 FIELD IS INSERTED
```

```
N ACTION NEW BLOWCOUNTS
 574.0           15  SPT1 0-1.5 FT
BLOWCT IS INSERTED  574.0
 572.5           19  SPT2 1.5-3.0 FT
BLOWCT IS INSERTED  572.5
 571.0           22  SPT3 3.0-4.5 FT
BLOWCT IS INSERTED  571.0
 570.0           50  REFUSAL AT 570.0 FT
BLOWCT IS INSERTED  570.0
```

(Sheet 25 of 25)

Table 6

Data Entry for Tailored Prompt Sequence

```
/-INPBOR


          BORING DATA ENTRY SYSTEM


 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? DC-5
 IS THIS A NEW BORING ID? (Y OR N)

? Y
 PLEASE SELECT ONE OF THE FOLLOWING OPTIONS:
     1 ........ USE THE DEFAULT PROMPT SEQUENCE
     2 ........ CREATE MY PROMPT SEQUENCE
     3 ........ KEEP THE CURRENT PROMPT SEQUENCE

 INPUT THE DESIRED OPTION!


? 2
 DO YOU NEED THE PROMPT LIST?(Y OR N)
? Y
  NO.           PROMPTS
    1 ........ TYPE OF DATA?(10 CHAR. MAX)
    2 ........ COMMENTS?(40 CHAR. MAX)
    3 ........ ENTER OFFICE SYMBOL.(10 CHAR. MAX)
    4 ........ PROJECT NAME?(40 CHAR. MAX)
    5 ........ SITE NAME?(40 CHAR. MAX)
    6 ........ PROJECT DESCRIPTION?(25 CHAR. MAX)
    7 ........ LATITUDE?(DDMMSS.SS)
    8 ........ LONGITUDE?(DDDMMSS.SS)
    9 ........ ACCURACY OF LOCATION?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
   10 ........ NAME OF QUAD SHEET?(20 CHAR. MAX)
   11 ........ N-S COORDINATE?(9999999.99 MAX)
   12 ........ E-W COORDINATE?(9999999.99 MAX)
   13 ........ ACCURACY OF LOCAL SYSTEM?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
   14 ........ REFERENCE FOR LOCAL SYSTEM(COORD SYS & REF)?(10 CHAR. MAX)
   15 ........ DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
   16 ........ NUMBER OF DAYS TO DRILL THE HOLE?(INTEGER, 999 MAX)
   17 ........ C.E. DRILLER,CONTRACT DRILLER,SOURCE?(20 CHAR. MAX)
   18 ........ INSPECTOR?(15 CHAR. MAX)
   19 ........ LOCATION OF BORING LOG?(10 CHAR. MAX)
   20 ........ LOCATION OF DRILLER'S LOG?(10 CHAR. MAX)
   21 ........ LOCATION OF STORED SAMPLES?(20 CHAR. MAX)
   22 ........ STATUS OF THIS DATA(E.G.COMPLETE,WAIT LAB)?(10 CHAR. MAX)
   23 ........ CURRENT STATUS OR USE OF HOLE?(10 CHAR. MAX)
   24 ........ PURPOSE OF HOLE?(20 CHAR. MAX)
   25 ........ TOP OF HOLE ELEVATION?(HIT RETURN IF UNKNOWN)(99999.99 MAX)
   26 ........ ELEVATION ACCURACY?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
   27 ........ DEPTH OF HOLE?(9999.99 MAX)
 INPUT THE PROMPT NUMBER (HIT RETURN TO STOP)
  !?
? 1
  !?        (Prompts could have been selected
? 3          in a desired order)
  !?
? 4
  !?
? ?
```

(Continued)

(Sheet 1 of 5)

Table 6 (Continued)

```
   #?
? 8
   #?
? 9
   #?
? 15
   #?
? 25
   #?
? 26
   #?
? 27
   #?
?
 TYPE OF DATA?(10 CHAR. MAX)
? BORING
 ENTER OFFICE SYMBOL.(10 CHAR. MAX)
? SPLED-G
 PROJECT NAME?(40 CHAR. MAX)
? SANTA ANA RIVER BASIN,CA
 LATITUDE?(DDMMSS.SS)
? 335730.75
 LONGITUDE?(DDDMMSS.SS)
? 1173735.15
 ACCURACY OF LOCATION?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 3
 DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
? 03/20/1979
 TOP OF HOLE ELEVATION?(HIT RETURN IF UNKNOWN)(99999.99 MAX)
? 577.0
 ELEVATION ACCURACY?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 1
 DEPTH OF HOLE?(9999.99 MAX)
? 380.
OREVIEW OF INPUT
 LINE #     DB NAME         DATA VALUE
    1 .... CLASS       .. BORING
    2 .... AUTHOR      .. SPLED-G
    3 .... PROJ-NAME   .. SANTA ANA RIVER BASIN,CA
    4 .... LAT         .. 335730.75
    5 .... LONG        .. 1173735.15
    6 .... ACCUR       .. 3
    7 .... DATE        .. 03/20/1979
    8 .... TOP-HOLE    .. 577.0
    9 .... EL-ACCUR    .. 1
   10 .... DEPTH       .. 380.
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? CL CLAY
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 0.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? ROOTS IN TOP 6 IN.
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SC SAND
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 3.4
```

(Continued)

(Sheet 2 of 5)

Table 6 (Continued)

```
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? F TO MED MOIST
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? SC SAND
 ELEVATION OR DEPTH AT TOP OF FEATURE?(9999.99 MAX)
? 6.0
 DESCRIPTION OF FEATURE?(30 CHAR. MAX)
? ROCK FRAG.
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
                      COLUMNS
          1           2             3               4
 LINE #
    1     CL CLAY     0.0                           ROOTS IN TOP 6 IN.
    2     SC SAND     3.4                           F TO MED MOIST
    3     SC SAND     6.0                           ROCK FRAG.
 TO CHANGE AN ITEM TYPE ITS LINE NUMBER, A COMMA
 AND ITS COLUMN NUMBER (E.G. 3,2 - LINE 3 COLUMN 2)
 OTHERWISE HIT RETURN
?
 ARE YOU USING ELEVATIONS?(Y OR N)
? END
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ELEV. OF 1ST BLOWCT TEST?(INPUT -1000.0 TO QUIT)(9999.99 MAX
? -1000.0
 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 DATA ENTRY TERMINATED
```

(Continued)

(Sheet 3 of 5)

Table 6 (Continued)

```
OLD-DATBOR
LIST
BORING LOAD DATA FILE
DC-5          .........BORING ID
NEW BORID                    1002
DC-5
BORING

SPLED-G
SANTA ANA RIVER BASIN,CA

3         3         5         7         3         0         .         7         5
1         1         7         3         7         3         5         .         1         5
3

03/20/1979

5         7         7         .         0
1
3         8         0         .
NEW FEATRE
ELEVN
CL CLAY
0         .         0

ROOTS IN TOP 6 IN.
SC SAND
3         .         4

F TO MED MOIST
SC SAND
6         .         0

ROCK FRAG.
BBBBBBBBBBBBBBBBBBB END OF BORID
/
```

(Continued)

(Sheet 4 of 5)

Table 6 (Concluded)

```
 OLD.SUMFLE
/LIST
 N BORID DC-5          ........BORING ID
 BORID TYPE(NEW/OLD) NEW BORID
 BORID IS INSERTED  DC-5
 N ACTION NEW FEATRE
 CL CLAY          577.00  -NULL-
 FEATURE IS INSERTED  CL CLAY
 SC SAND          573.60  -NULL-
 FEATURE IS INSERTED  SC SAND
 SC SAND          571.00  -NULL-
 FEATURE IS INSERTED  SC SAND
/
```

(Sheet 5 of 5)

Table 7

Data Entry for Modification of Existing Boring Information

```
/-INPBOR


          BORING DATA ENTRY SYSTEM


 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? DC-5
 IS THIS A NEW BORING ID? (Y OR N)

? N
ALL PROJECTS WITH THIS ID WILL BE SHOWN ONE AT A TIME.
WHEN THIS PROJECT APPEARS, PRESS Y TO SELECT IT




BORING ID------>DC-5
PROJECT NAME--->SANTA ANA RIVER BASIN,CA
SITE NAME------>-NULL-
PROJECT DESC.-->-NULL-

IS THIS THE CORRECT PROJECT?(Y OR N)
? Y
 DO YOU NEED TO MODIFY BORID INFO?(Y OR N)
? Y
 PLEASE SELECT ONE OF THE FOLLOWING OPTIONS:
     1 ........ USE THE DEFAULT PROMPT SEQUENCE
     2 ........ CREATE MY PROMPT SEQUENCE
     3 ........ KEEP THE CURRENT PROMPT SEQUENCE

 INPUT THE DESIRED OPTION!


? 2
 DO YOU NEED THE PROMPT LIST?(Y OR N)
? N
 INPUT THE PROMPT NUMBER (HIT RETURN TO STOP)
  #?
? 7
  #?
? 8
  #?
? 10
  #?
? 11
  #?
? 12
  #?
? 13
  #?
? 14
  #?
? 15
  #?
? 20
```

(Continued)

(Sheet 1 of 5)

Table 7 (Continued)

```
  #?
? 27
  #?
?
 LATITUDE?(DDMMSS.SS)
? 335730.50
 LONGITUDE?(DDDMMSS.SS)
? 1173735.90
 NAME OF QUAD SHEET?(20 CHAR. MAX)
? PRADO DAM 1:24000 73
 N-S COORDINATE?(9999999.99 MAX)
? 630000
 E-W COORDINATE?(9999999.99 MAX)
? 1580000
 ACCURACY OF LOCAL SYSTEM?(INTEGER 9 MAX, E.G. 1,2,3, OR 4)
? 2
 REFERENCE FOR LOCAL SYSTEM(COORD SYS & REF)?(10 CHAR. MAX)
? STATE PL
 DATE HOLE WAS COMPLETED?(MM/DD/YYYY)
? 03/22/1979
 LOCATION OF DRILLER'S LOG?(10 CHAR. MAX)
? GEOTECH BR
 DEPTH OF HOLE?(9999.99 MAX)
? 425.
OREVIEW OF INPUT
 LINE #    DB NAME        DATA VALUE
    1 .... LAT         .. 335730.50
    2 .... LONG        .. 1173735.90
    3 .... REF         .. PRADO DAM 1:24000 73
    4 .... LOC-NS      .. 630000.
    5 .... LOC-EW      .. 1580000.
    6 .... LOC-ACCUR   .. 2
    7 .... LOC-REF     .. STATE PL
    8 .... DATE        .. 03/22/1979
    9 .... LOC-DRLLOG  .. GEOTECH BR
   10 .... DEPTH       .. 425.
OTO CHANGE AN ITEM, TYPE ITS LINE #
 OTHERWISE HIT RETURN
?
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF FEATURE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF HOLE(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 TYPE OF TESTS(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ARE YOU USING ELEVATIONS?(Y OR N)
? N
 TYPE OF TEST(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 ELEV. OF 1ST BLOWCT TEST?(INPUT -1000.0 TO QUIT)(9999.99 MAX
? -1000.0
 BORING ID(INPUT END TO QUIT)?(10 CHAR. MAX)
? END
 DATA ENTRY TERMINATED
```

(Continued)

(Sheet 2 of 5)

Table 7 (Continued)

```
-UPDBOR
/OLD.SUMFLE
/LIST
 N BORID DC-5          .........BORING ID
 BORID TYPE(NEW/OLD) OLD        MODIFIED
 BORID IS MODIFIED  DC-5
 N ACTION BBBBBBBBBBBBBBBBBBB END OF BORID
/
```

(Continued)

(Sheet 3 of 5)

Table 7 (Continued)

Boring DC-5 as Originally Entered

```
-GETDB

'S2K 2.60F'

83/12/02. 15.16.51. BEGIN SYSTEM 2000  VERSION 2.60F
---
? USER.DLW:SHARED DBN IS BORDB;
-556-   ASSIGNED    BORDB                    1     25 83/12/02. 15.09.53.
---
? PRINT/NAME/CO WH C1 EQ DC-5;

BORID* DC-5
CLASS* BORING
AUTHOR* SPLED-G
PROJ-NAME* SANTA ANA RIVER BASIN,CA
LAT* 335730.75
LONG* 1173735.10
ACCUR* 3
DATE* 03/20/1979
TOP-HOLE*   577.00
EL-ACCUR* 1
DEPTH*  380.00
SID*     3

  FEAT-NAME* CL CLAY
  FEAT-ELEV*  577.00
  FEAT-DESC* ROOTS IN TOP 6 IN.

  FEAT-NAME* SC SAND
  FEAT-ELEV*  573.60
  FEAT-DESC* F TO MED MOIST

  FEAT-NAME* SC SAND
  FEAT-ELEV*  571.00
  FEAT-DESC* ROCK FRAG.
---
? EXIT;
-506-   CLOSED      BORDB                    1     25 83/12/02. 15.09.53.
83/12/02. 15.17.58. END   SYSTEM 2000  VERSION 2.60F
```

(Continued)

(Sheet 4 of 5)

Table 7 (Concluded)

Boring DC-5 as Modified

```
-GETDB

 "S2K 2.60F"

 83/12/02. 15.18.57. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
? USER.DLW:SHARED DBN IS BORDB:
 -556-   ASSIGNED   BORDB                    1    26 83/12/02. 15.18.26.
 ---
? PRINT/NAME/CO WH C1 EO DC-5:

 BORID* DC-5
 CLASS* BORING
 AUTHOR* SPLED-C
 PROJ-NAME* SANTA ANA RIVER BASIN.CA
 LAT* 335730.50
 LONG* 1173735.90
 ACCUR* 3
 REF* PRADO DAM 1
 LOC-NS*  630000.00
 LOC-EW* 1580000.00
 LOC-ACCUR* 2
 LOC-REF* STATE PL
 DATE* 03/22/1979
 LOC-DRLLOG* GEOTECH BR
 TOP-HOLE*   577.00
 EL-ACCUR* 1
 DEPTH*  425.00
 SID*     3

   FEAT-NAME* CL CLAY
   FEAT-ELEV*  577.00
   FEAT-DESC* ROOTS IN TOP 6 IN.

   FEAT-NAME* SC SAND
   FEAT-ELEV*  573.60
   FEAT-DESC* F TO MED MOIST

   FEAT-NAME* SC SAND
   FEAT-ELEV*  571.00
   FEAT-DESC* ROCK FRAG.
 ---
? EXIT:
 -506-   CLOSED     BORDB                   1    26 83/12/02. 15.18.26.
 83/12/02. 15.19.46. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
/
```

(Sheet 5 of 5)

entry (sheet 1) that the quad sheet name contained a colon. On sheet 5 the corresponding data (REF*) shows that only the part of the name before the colon was stored in the data base. Thus, a colon should not be used in any data entry input.

25. The modification option can also be used to remove elements of boring information from the top level of the data base. This removal is done by including the desired prompts in the tailored prompt sequence for the elements to be removed and then skipping these prompts (by hitting the return key) during data entry with the data entry program. The existing elements are replaced with a blank field (blank line in DATBOR) when the modified data are loaded to the data base.

Interactive Data Modifications

26. There are three important commands that can be used to either add or modify data while the user is on line with the data base. They are ADD, CHANGE, and REMOVE. These commands are used to add to or modify existing data groups and are described below. After entering the data base (using -GETDB), the data base is opened with the following command.

USER,***;DBN IS BORDB; (*** is the user password)

To close the data base after making modifications, the user enters the EXIT; command. The data base can be damaged in this interactive mode and a back-up copy should be made before attempting to make modifications (see Appendix C). If the user needs to modify existing boring information (groups 1 and 2 only, Table 3) or add new boring information or repeating data groups, the data entry program should be used.

27. Before using the commands, the user must understand the WHERE clause information discussed in this section because each command will modify or add data as specified by the WHERE clause. Thus, each WHERE clause must uniquely identify the data set (related to boring number and feature elevation, or other group and a unique element value), so that only the intended data is modified. The user is reminded that only key elements (Table 1) can be used in the WHERE clause. After each command is executed, System 2000 will respond with the number of selected data sets that were modified. If more data sets are involved than expected, the user needs to query the pertinent parts of the

data base (Part IV) to determine necessary corrections. Before making modifications, the LIST command (Part IV) can be used as a check to see how many data sets will be modified. Also, the SID (system identifier, a unique number and key element, C29 assigned to each set of boring data stored in the data base) can be used to uniquely identify the desired boring number (a list of SID and boring numbers is needed; see sheet 3 of Table 8).

ADD command

28. The ADD command is used to add one or several elements of data to an existing data group where no data presently exist. This command is used when a few elements of data need to be added to a data group.

29. If water table feature had been entered without the date, it could be checked first with the following LIST command and then added with the ADD command.

```
? LIST FEAT-DATE,FEAT-ELEV WHERE BORID EQ DC-5 AND
    FEAT-ELEV EQ 571.3;  (response is omitted)
? ADD FEAT-DATE EQ 03/22/1979*WHERE BORID EQ DC-5 AND
---
   FEAT-ELEV EQ 571.3;
-      1 SELECTED DATA SETS -
---
```

The computer system prompt is a "?" and System 2000 responds with "---" and no "?" when no semicolon is entered at the end of the command line; thus command lines can be continued until a semicolon is entered (a carriage return starts a new line). A space is required at the beginning of continue lines. In the above example, System 2000 responded with "1 SELECTED DATA SETS" indicating one data set had been modified. In this case, the date shown was added to the feature having a unique elevation of 571.3. If the elevation had not been unique to this feature, the same date would also have been added to any other feature group with the same elevation. Element names or component numbers (C45, C1, and C43) can be used alone or mixed in a command statement. While component numbers are simple to use, it is also easy to use the wrong ones.

30. If test results three and four (cohesion = 2.4 and friction angle = 21) were to be added to an existing incomplete test results data group, the following command would be used.

```
? ADD TESTS EQ 83*2.4*85*21*END*WHERE C1 EQ DC-5
---
```

```
      AND C77 EQ 576.3;
-       1 SELECTED DATA SETS -
---
?
```

In this case C1 (BORID) and C77 (TEST-ELEV) values uniquely identified the specific data group to be appended. To add more than one data element in the same repeating group, the component numbers without the prefix "C" must be used, as shown with a separating "*" symbol and "END*" before the WHERE clause.

CHANGE command

31. The CHANGE command is used to modify one or several existing data element values. This command is used to correct errors that are found in the data base. Two examples of the CHANGE command are:

```
? CHANGE C1 EQ DC-5* WHERE SID EQ 4;
-         1 SELECTED DATA SETS -
---
? CHANGE C93 EQ 38*WHERE C1 EQ DC-5 AND C91 EQ 371.2;
-         1 SELECTED DATA SETS -
---
?
```

In the first command, an incorrect boring number is changed to DC-5 using the SID number. The SID and corresponding boring number can be determined by a query to the data base (see Part IV). In the second command, an incorrect blow count is changed to 38, by specifying the boring number and the unique elevation corresponding to the incorrect blow count. Details of the CHANGE command are the same as the ADD command.

REMOVE command

32. The purpose of the REMOVE command is to delete data from the data base. It is important to uniquely define the data to be removed so that other data are not lost. An example of the REMOVE command is:

```
? REMOVE FEAT-DATE WHERE C1 EQ DC-5 AND C43 EQ 572.3;
-       1 SELECTED DATA SETS -
---
?
```

The nomenclature has been previously defined. The exception is that the "*" is not used before the WHERE clause. In this example, the date is removed from the feature having a unique elevation of 572.3 for boring DC-5.

Multiple data elements cannot be removed by using one command; however, a complete data group can be removed using:

```
? REMOVE TREE C90 WHERE C1 EQ DC-5 AND C91 EQ 577.5;
-       1 SELECTED DATA SETS -
---
?
```

This command removes all data for the blow count group (C91 through C95) with an elevation of 577.5. The group name "BLOW-TESTS" could have been used instead of C90. If elevation had not been specified, all blow count groups for boring DC-5 would have been deleted.

Conditional terms

33. Conditional terms can be used in all WHERE clauses to specify a range or limit of element values such as elevations for data groups. An example is "WHERE ... AND C91 EQ 577.4* 561.2;" and means is equal to 577.4 through 561.2 (... indicates omitted conditions). Other terms are:

GT (greater than)
GE (greater than or equal to)
LT (less than)
LE (less than or equal to)
NE (not equal to)
SPANS (from to)

The terms NE and SPANS can also be used with a range (e.g., WHERE ... AND BLOW-CT NE 10*20; or WHERE ... AND C91 SPANS 10*50;). The WHERE clause can also specify where something exists like a remark in a group using "EXISTS" (e.g., ... AND C95 EXISTS), or where something does not exist using "FAILS" (e.g., ... AND BLOW-CT FAILS;). However, the use of exists and fails is not recommended because more data elements or groups could be modified than expected.

PART IV: DATA RETRIEVAL

34. There are three methods of retrieving data from the data base: ad hoc, Report Writer, and Program Language External (PLEX). The ad hoc retrievals are done interactively while in the data base by asking questions using the System 2000 Query Language (Intel Corp. 1981a). This method is the simplest and most flexible of the three methods because the data requested are quickly displayed during the time-sharing session and the user can see if it is the data wanted. The retrieved information can be saved into a data file, if desired. Each query requires a scan of the data base. On the other hand, Report Writer retrievals use a series of preprogrammed query commands that retrieve specified data and automatically produce a formatted report, table or file from a single scan of the data base. Report Writer command files can be developed using a helpful software package called "GENIUS" (Intel Corp. 1982), available on CDC for Corps-wide use and previewed by the following commands.

```
GET, LISTER/UN=CECELB
LISTER,GENHELP,UN=CECE2K
```

Some knowledge of the data base query language plus the Report Writer features of System 2000 are needed. The PLEX retrievals are FORTRAN programs that interface with the data base to retrieve data required by the program (Intel Corp. 1983). Some computer programming experience is required to develop these programs, but once operational, they are easy to use.

35. In any retrieval, "--SHARED DBN IS--" should be used to open the data base for read only and prevent accidental damage. This form also allows other users to access and query the data base at the same time. The next sections describe the ad hoc query method. Report Writer command files and PLEX programs have not been developed, since data retrievals for graphics programs (boring logs, boring location plots, and contouring) require only ad-hoc retrievals. A potential Report Writer need is to produce the filled-in drilling log form (Eng Form 1836). However, many different formats are used in entering the data on this form, and many special versions of the Report Writer would be required. Thus, each CE District would need to develop its own Report Writer. To help meet this need, the boring log graphics program (Part V) has options, such as a remarks column, to produce a format similar to the columns a through g on Eng Form 1836.

36. Costs for retrievals depend on the query (number of times the data base is searched for the required data), the size of the data base, and other user-dependent variables, such as skill in using ad hoc commands and time on line with the data base. The cost can range from a few dollars to as high as $20 for complex retrievals from a large data base (several hundred borings).

37. System 2000 allows commands to be entered on multiple lines from the user's terminal. All data base commands must end in a semicolon (;). The system will not execute any command until the semicolon is encountered (if omitted, but intended, it can be entered on the next line followed by a return). If multiple lines are used to input a command, a space should be used at the beginning of each continue line to prevent syntax errors.

38. The command to enter the data base system is -GETDB. The user then specifies the boring data base with the command:

```
? USER,***;SHARED DBN IS BORDB;   (*** is a password)
```

After queries are made and the user wishes to exit the data base, the following command will close the data base and exit to the CDC system.

```
? EXIT;  (If this does not work the first time, "; EXIT;"
          will always work.)
```

If a query command starts producing an unwanted listing, the listing can usually be stopped by using the "Break" or "Interrupt" key on the terminal.

Output Files

39. Retrieved data can be directed to an output file for later use in analyses or graphics programs. The commands used in retrieving the data can also be directed to a file. The following describes how commands and retrieved data are saved in files.

Report files

40. Normally the Report File, which will contain the results of the queries, is assigned to OUTPUT, the user's terminal. However, the user can designate a file name for output which can then be saved. The following sequence of commands is used:

```
? REPORT FILE IS OUT1;
---
? (Ad hoc retrieval commands)
---
? REPORT FILE IS OUTPUT;
```

Multiple query commands can be entered on separate lines, and the retrieved data will be sequentially appended to the file OUT1. The format of the data in file OUT1 will depend on the query command used. The last statement returns any further output to the user's terminal. After exiting from the data base, the temporary file OUT1 can be saved as a permanent file with the command:

```
SAVE,OUT1
```

The file is then accessed like any other permanent file on CDC.

Message file

41. A message file generated while in the data base contains a list of user commands and any error messages that resulted from the commands. A file name can be assigned to this file just like the report file above. The same name can be used in both commands to document the commands and results of the queries. The commands are illustrated as follows:

```
? REPORT FILE IS OUT2;
---
? MESSAGE FILE IS OUT2;
---
? (Ad hoc retrievals)
---
? REPORT FILE IS OUTPUT;
---
?
```

The file OUT2 will contain the query commands, any error messages, and the retrieved data.

Ad Hoc Retrievals

42. To facilitate data retrieval, the System 2000 query language with commands, operators, and clauses is used. The queries are generally simple commands that the user initiates to rapidly retrieve specific data from the data base. Some requests can become complicated with titles and paging information, but the costs for such requests generally dictates that a Report Writer command file be used. The following discussion is not an exhaustive reference, but important types of commands are described that are particularly useful in extracting data or reviewing information and data in the data base.

The queries in this section are limited to version 2.6. Extended query commands are available for the recently installed version 2.8. The user is referred to the System 2000 QUEST Language Manual (Intel Corp. 1981a) for more detailed information on the query language. All data base component numbers and element names used in examples in this section are described in Table 1.

PRINT command

43. The PRINT command allows the user to print any data from the data base in a sequential vertical list. Two examples are:

```
PRINT BORID;
PRINT FEAT-NAME WHERE BORID EQ DC-4;
```

The first request would list all boring numbers in the data base. The second request would list all feature names only for boring DC-4. Element names and component numbers can be used alone or intermixed (e.g., PRINT BORID,C12,C13 WHERE C1 EQ DC-4;). If the top level information for a boring was wanted, a system operator /GROUP/ would be used.

```
PRINT/GROUP/CO WHERE C1 EQ DC-4;
PRINT C1,C40 WHERE C1 EQ DC-5 AND FEAT-ELEV LE 590.0;
```

The first request would list the top level information (C1 through C29) for boring DC-4. If CO were used without /GROUP/ everything for that boring would be listed. The operator /GROUP/ does not have to be used for repeating groups when the group component number or name is used. In the second request the boring number and all feature data for elevations less than or equal to 590.0 would be listed. The PRINT command lists one data component number and data element value per line. The data element name can be printed in the listing instead of the component number, if desired by using the operator /NAME/ as shown in the following example.

```
PRINT/NAME/C1,C40 WHERE C1 EQ DC-5 AND FEAT-ELEV LE 590.0;
```

The term /STUB SUPPRESS/ can be used in place of /NAME/ to suppress both the component name and number. PRINT statements can be used with any correct WHERE clause, described in the previous section on modifications (paragraph 27). The term OR can be used in place of AND to specify several elements (e.g., ... WHERE C1 EQ DC-5 OR C1 EQ DC-7 OR C1 EQ DC-8;). An "ORDERED BY" specification can be included in the PRINT statement when a WHERE clause is used, as described later.

LIST command

44. The LIST command is similar to the PRINT command except that the data values are spread across the page in a tabular format with the data element name at the top of each column. The LIST command prints out to 80 characters, then wraps around to the next line. An error message may result, if a component column crosses the 80 character limit. Caution should be used not to exceed the limit of the line printer. The operators /GROUP/ and /NAME/ cannot be used with the LIST command. Several examples of the list command are:

```
LIST C1,C12,C13,C25,C27 WHERE C6 EQ PRADO DAM EMBANKMENT;
LIST C1,FEAT-ELEV,FEAT-NAME WHERE C1 EQ DC-5;
LIST C1,C41,C43 WHERE C5 EQ PRADO DAM EMBANKMENT AND C41 EQ WT;
```

The first command will tabulate the boring number, local coordinates, top of hole elevation, and depth for all specified project borings. The second request will tabulate the boring number and all feature elevations and feature names for boring DC-5 (i.e., a simple boring log table). The last request will tabulate boring number, water table (WT), and all water table elevations for the specified project. Data values are listed out in the same order as they were entered during data entry. Use of the ORDERED BY clause, described next, may be necessary to ensure an ordered tabulation.

Ordering statements

45. The ORDERED BY clause allows the user to sequence the output in ascending (low) or descending (high) order according to data elements associated with the request. There must be a comma between the list of data elements and the ORDERED BY clause. NON-KEY data elements cannot be used in the ORDERED BY clause. Ascending order is assumed by System 2000, for example:

```
LIST BORID,LOC-NS,LOC-EW,DEPTH, ORDERED BY LOC-NS,LOC-EW
  WHERE C5 EQ PRADO DAM EMBANKMENT AND C1 EXISTS;
```

will list in increasing order for LOC-NS and where two or more borings have the same north-south coordinate, in increasing order for east-west coordinates. Using EXISTS will cause the data for all borings to be listed, including any without coordinates (with a blank space under the coordinate columns). If descending order is described, the HIGH and LOW modifiers should be used in front of each data element as shown next.

```
LIST C1,C12,C13,C25,C27, ORDERED BY HIGH C25, LOW C27 WHERE ...;
LIST TOP-HOLE,C43,C41,OB HIGH C43 WH C1 EQ DH 1606;
```

In the first request, the listing would be ordered by decreasing elevation and increasing depth for borings with duplicate top of hole elevations. The second request would produce a brief log by decreasing elevation of feature descriptions for the drill hole. Two letter abbreviations can be used for certain items (see paragraph 50). The ORDERED BY clause can also be used in the PRINT command:

```
PRINT C1,TOP-HOLE,FEAT-ELEV,FEAT-NAME,FEAT-DESC,OB HIGH
  FEAT-ELEV WHERE C1 SPANS DC-1*DC-5;
```

A sequential list of brief logs of borings DC-1 through DC-5 would be produced.

System functions

46. System 2000 can also produce the following statistical data:

COUNT (BORID) - count how many borings exist.

MIN (TOP-HOLE) - determine the minimum top of hole elevation.

MAX (DEPTH) - determine the maximum boring depth.

AVG (DAYS-DRILL) - determine the average of number of days to drill a hole

SUM (DAYS-DRILL) - sum the number of drilling days.

SIGMA (BLOW-CT) - generate the standard deviation of all blow counts

These functions can only be used in the LIST or PRINT commands, and not in a WHERE clause. An example is:

```
LIST COUNT(C93),MIN(C93),MAX(C93),SUM(C93),AVG(C93),SIGMA(C93),
  WHERE C1 EQ DC-5 AND BLOW-ELEV 577.3*523.4 AND C93 EXISTS;
```

DITTO command

47. After successfully typing in a long query and obtaining the desired listing, the user may want the same information for a different WHERE-clause condition. The DITTO command causes the previous command on the left of the WHERE clause to be reused. Using the above example, the user would enter the following to obtain the same information for another boring or elevation range.

```
DITTO WHERE C1 EQ DC-4 AND C93 EXISTS;
```

SAME command

48. The SAME command does the same as the DITTO command, but for the right side of the WHERE clause. The following example illustrates this command.

```
LIST C1,C43 WHERE C41 EQ WT AND C43 LE 567.4 AND C45 FAILS;
LIST C12,C13 WH SAME;
```

Both the DITTO and SAME commands can be combined in the same LIST or PRINT command to duplicate a query for a better printout or because of transmission problems. The SAME command has an additive property to narrow or expand the search for data.

```
LIST C1,C43, OB HIGH C43 WHERE (C41 EQ CLAY-SILT OR C41 EQ
  SILTY-CLAY) AND C1 EQ DC-4;
DITTO WHERE SAME AND C43 EQ 567.5*550.0;
DITTO WHERE SAME OR C41 EQ WT;
```

The first command defines the feature names for a specific boring. The use of parentheses causes the OR specification to be done concurrently in one search and not in two searches. The second command adds the elevation limits and the third command expands the query to include water table features.

TALLY command

49. The TALLY command provides a summary of unique values and occurrences of KEY elements. WHERE clauses are not allowed. The format for the commands are:

TALLY/EACH/BORID;	Prints the element name and a table of frequency versus unique value, then the number of unique values and total number of occurrences.
TALLY/ALL/LOC-NS;	Prints the element name, minimum value, maximum value, number of unique values and total number of occurrences. (Useful for numerical values.)

Abbreviations

50. A number of abbreviations are allowed for queries to simplify their use. Valid abbreviations are:

PR = PRINT

LI = LIST

WH = WHERE

OB = ORDERED BY

DI = DITTO

SA = SAME

TA = TALLY

DESCRIBE command

51. The DESCRIBE command will print a directory of data base element component numbers and element names. Certain attributes (type and size) are

also shown. The command used to list all elements is "DESCRIBE;". To list only part of the data base elements, the component group numbers (Table 1) are used (e.g., DESCRIBE C40 THRU C60;).

Formatted LIST command

52. The LIST command can be used to list information in desired formats by using TITLE options. The TITLE options would generally be used for reports that require sorted lists of information or data. Three options can be defined in the TITLE clause:

a. D(nn) Text. Add a heading at the top of the report. The current date will be centered under the "Text" heading. If no text is added, only the date will be printed. Commas are not allowed in the heading. The value of nn is the starting position (in characters from the left) of the beginning character of "Text."

b. F(mm) Text. Add a report footing at the bottom of each page and specify a page size. The text will be printed following one blank line at the bottom of each page and will start in the leftmost print column. If "Text" is omitted, mm defines the page size (try 55).

c. Column-headers. Modify the headers on each column of output to print multiline, user-specified headers instead of data element names. The user will need to refer to the full System 2000 documentation for details on this option.

d. Examples. Page heading and footnote formats are:

```
LIST/TITLE D(20)SUMMARY OF BORING LOCATIONS/ ...;
LIST/TITLE F(55).COORDINATES ARE IN ASCENDING ORDER./ ...;
```

Headings, footnotes, and column-headers can be combined in one LIST command.

Ad Hoc Retrieval Examples

53. The following data base session, shown in Table 8, illustrates some of the data sets selected by the ad hoc retrievals discussed in the previous section. To limit the amount of output generated, some of the WHERE clauses are more restrictive in the examples than in the previous descriptions. The session accessed a small data base for about 1 hour and cost $2.50.

Table 8

Data Base Ad Hoc Retrievals

```
/-GETDB
***
*** FOR SYSTEM 2000 VERSION 2.8 NEWS:
***          GET,NEWS280/UN=CECE2K
***          LIST,F=NEWS280
***

 'S2K 2.60F'

 84/09/04. 15.45.32. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
? USER,DLW;SHARED DBN IS BORDB;
 -556-   ASSIGNED   BORDB                    1   575 84/08/09. 08
 ---
? PRINT BORID;
 1* DUMMY
 1* DC-4
 1* DC-5
 1* DC-6
 1* DC-23
 1* DC-55
 1* DC-56
 1* DC-57
 1* DC-58
 1* DC-59
 1* DC-60
 1* DC-61
 1* DC-62
 1* B-353
 1* B-454
 1* B-456
 1* B-460
 1* B-494
```

```
? PR/GROUP/CO WH C1 EQ B-494
 ---
? ;

 1* B-494
 2* BORING
 3* VERTICAL HOLE, FAILING 314
 4* SAMED-G
 5* TEN-TOM CANAL
 6* LOCK B SPILLWAY, DM NO. 23
 7* SECTION G-G, SPILLWAY C/L
 12* 1603340.00
 13*  623725.00
 14* 1
 15* ST PL COOR
 16* 08/28/1975
 17* MOB. A.B. TAYLOR
 18* CHILDERS
 19* APP III,DM
 22* COMPLETE
 24* FOUND INVES
 25*   232.00
 26* 1
 27*  126.50
 28*  14
 29*    18
 ---
```

(Continued)

(Sheet 1 of 10)

Table 8 (Continued)

```
* PR C1,C43 WH C41 EQ WT;
 1* DC-4
   43*  567.40
 1* DC-4
   43*  566.80
 1* B-353
   43*  232.50
 1* B-454
   43*  224.90
 1* B-460
   43*  222.70
 1* B-456
   43*  224.50
 1* B-494
   43*  219.90
---
* PR FEAT-NAME WHERE BORID EQ B-494;
   41* CL CLAY
   41* CL CLAY
   41* SC SAND
   41* SM SAND
   41* GC GRAVEL
   41* GC GRAVEL
   41* GP-GM GRAV
   41* GC GRAVEL
   41* ML SILT
   41* ML SILT
   41* CH CLAY
   41* CH CLAY
   41* CH CLAY
   41* SM SAND
   41* CH CLAY
   41* CH CLAY
   41* SM SAND
   41* SM-ML SAND
   41* CH/CL CLAY
   41* CH/CL CLAY
   41* SM SAND
   41* CH/CL CLAY
   41* SM SAND
   41* CH/CL CLAY
   41* CH/CL CLAY
   41* SM SAND
   41* SM SAND
   41* WT
   41* EOTAW
---
```

(Continued)

(Sheet 2 of 10)

Table 8 (Continued)

```
? LIST BORID,LOC-NS,LOC-EW,DEPTH; ORDERED BY LOC-NS,LOC-EW WHERE
---
?  C6 EQ LOCK & SPILLWAY, DM NO. 23 AND C1 EXISTS;
   BORID                LOC-NS          LOC-EW          DEPTH
***
* B-353            1602550.00       624165.00       100.50
* B-456            1602891.00       623968.00       150.50
* B-460            1603113.00       623838.00       132.70
* B-494            1603340.00       623725.00       126.50
---
? LIST C1,C12,C13,C25,C27,OB HIGH C25, LOW C27 WHERE SAME;
   BORID                LOC-NS          LOC-EW      TOP-HOLE        DEPTH
***
* B-353            1602550.00       624165.00        234.10       100.50
* B-494            1603340.00       623725.00        232.00       126.50
* B-456            1602891.00       623968.00        232.00       150.50
* B-460            1603113.00       623838.00        231.60       132.70
---
? LIST BORID,SID,OB BORID WH SID EQ 14:18;
   BORID                SID
***
* B-353                 14
* B-454                 15
* B-456                 16
* B-460                 17
* B-494                 18
---
```

(Continued)

(Sheet 3 of 10)

Table 8 (Continued)

```
> LIST TOP-HOLE,C43,C41,OB HIGH C43 WH C1 EQ B-430;
     TOP-HOLE    FEAT-ELEV    FEAT-NAME
***
*       231.60       231.60    CL CLAY
*       231.60       228.60    CL CLAY
*       231.60       225.60    CL CLAY
*       231.60       224.10    CL CLAY
*       231.60       222.70    WT
*       231.60       222.60    SC SAND
*       231.60       221.00    SP-SM SAND
*       231.60       219.60    GP GRAVEL
*       231.60       218.10    GP-GM GRAV
*       231.60       216.60    GP GRAVEL
*       231.60       215.10    GW GRAVEL
*       231.60       213.60    GM GRAVEL
*       231.60       212.10    CH CLAY
*       231.60       212.00    EUTAW
*       231.60       209.10    ML SILT
*       231.60       198.80    CH/ML
*       231.60       193.30    SM/ML
*       231.60       193.20    SM/ML
*       231.60       156.60    CL/CH CLAY
*       231.60       143.20    CH CLAY
*       231.60       138.50    CH/CL CLAY
*       231.60       129.90    CH CLAY
*       231.60       126.50    CL CLAY
*       231.60       121.50    SC SAND
*       231.60       119.80    SM/SP-SM
*       231.60       118.70    SM/SP-SM
---
> LIST C41,C43,LAB WH C1 EQ DC-3;
     TYP-NAME      TYP-NUM    TYP-LOC
***
* SPT JAR              4    SPD LAB
* CORE-BOX            10    SPD LAB
* RQD1                79    5.2'REC 84
* RQD2                93    10' REC 93
* RQD3                92    10' REC 91
* RQD4                96    10' REC 96
* RQD5                86    10' REC 90
* RQD6                94    10' REC 95
* RQD7                90    10' REC 92
* RQD8                97    10' REC 98
* RQD9                89    10' REC 91
* RQD10               91    10' REC 94
---
```

(Continued)

(Sheet 4 of 10)

Table 8 (Continued)

```
? LIST C1,C12,C15,C25,C27 WH C5 EQ TEN-TOM CANAL;
   BORID              LOC-NS          LOC-EW      TOP-HOLE        DEPTH
***
* B-353          1602550.00       624165.00        234.10        100.50
* B-454          1602718.00       624072.00        232.50        131.80
* B-456          1602891.00       623968.00        232.00        150.50
* B-460          1603113.00       623838.00        231.60        132.70
* B-494          1603340.00       623725.00        232.00        126.50
---
? LIST C1,FEAT-ELEV,FEAT-NAME WH C1 EQ B-454;
   BORID         FEAT-ELEV    FEAT-NAME
***
* B-454             232.50    CL CLAY
* B-454             226.50    CH CLAY
* B-454             225.00    CL CLAY
* B-454             224.90    WT
* B-454             222.00    SC SAND
* B-454             220.50    CL CLAY
* B-454             217.50    GP GRAVEL
* B-454             210.00    SP SAND
* B-454             208.50    SP-SM SAND
* B-454             205.50    ML SILT
* B-454             180.50    CH CLAY
* B-454             174.50    SM SILT
* B-454             154.20    CL/CH CLAY
* B-454             147.80    CH/CL CLAY
* B-454             160.50    CH/SM
* B-454             155.50    SM SILT
* B-454             147.20    CH/CL SLAY
* B-454             125.90    CH CLAY
* B-454             122.50    SM/SC SAND
* B-454             117.90    SM SAND
* B-454             116.50    SM SAND
* B-454             105.70    SM SAND
* B-454             208.40    EUTAW
---
```

(Continued)

(Sheet 5 of 10)

Table 8 (Continued)

```
? LIST COUNT(C93),MIN(C93),MAX(C93),AVG(C93),SIGMA(C93)
---
?  WH C1 EQ B-353;

 ***
 *          17              4              84          22.706          20.654
 ---
? DITTO WH C1 EQ B-454;

 ***
 *          18              1             100          20.556          22.364
 ---
? DITTO WH C1 EQ B-456;

 ***
 *          15              2              43          20.400          11.451
 ---
? DITTO WH C1 EQ B-460;

 ***
 *          15              3              32          18.200           8.231
 ---
? DITTO WH C1 EQ B-494;

 ***
 *          17              1              38          19.353          11.805
 ---
```

(Continued)

(Sheet 6 of 10)

Table 8 (Continued)

```
? LIST C93,OB HIGH BLOW-ELEV WH C1 EQ B-353;
   BLOW-CTS
***
*          4
*          7
*          8
*         34
*         84
*         45
*         46
*         34
*         11
*          9
*         10
*         10
*          7
*         18
*         18
*         18
*         23
---
? LIST C93,C91,OB HIGH C91 WH SAME
----
? ;
   BLOW-CTS    BLOW-ELEV
***
*          4        233.1
*          7        231.6
*          8        230.1
*         34        228.6
*         84        227.1
*         45        225.6
*         46        224.1
*         34        222.6
*         11        221.1
*          9        219.6
*         10        218.1
*         10        216.6
*          7        215.1
*         18        213.6
*         18        212.1
*         18        210.6
*         23        209.1
----
```

(Continued)

(Sheet 7 of 10)

Table 8 (Continued)

```
? TALLY/EACH/BORID;
**************************
 ELEMENT-      BORID
**********************
FREQUENCY    VALUE
--------------------------
         1       BF-190-77
         1       BF-191-76
         1       B-1
         1       B-350
         1       B-351
         1       B-352
         1       B-353
         1       B-354
         1       B-441
         1       B-442
         1       B-443
         1       B-444
         1       B-445
         1       B-446
         1       B-447
         1       B-448
         1       B-450
         1       B-451
         1       B-452
         1       B-453
         1       B-454
         1       B-455
         1       B-456
         1       B-457
         1       B-458
         1       B-459
         1       B-460
         1       B-494
         1       B-495
         1       B-496
         1       B-497
         1       B-498
         1       B-505
         1       DC-23
         1       DC-4
         2       DC-5
         1       DC-55
         1       DC-56
         1       DC-57
         1       DC-58
         1       DC-59
         1       DC-6
         1       DC-60
         1       DC-61
         1       DC-62
         1       DH-1
         1       DH-2
         1       DUMMY
--------------------------
        48   UNIQUE VALUES
--------------------------
        49   OCCURRENCES
--------------------------
---

? TALLY/EACH/TEST-NAME;
**************************
 ELEMENT-      TEST-NAME
**********************
FREQUENCY    VALUE
--------------------------
         1       CONSOL.
         1       INDEX
        13       LIMITS
        20       MA
        10       PRESSURE
         1       UNIAX COMP
--------------------------
         6   UNIQUE VALUES
--------------------------
        46   OCCURRENCES
--------------------------
---
? TALLY/ALL/C93;
**************************
 ELEMENT-      BLOW-CTS
**********************
 MINIMUM-          1
--------------------------
 MAXIMUM-        100
--------------------------
        37   UNIQUE VALUES
--------------------------
       100   OCCURRENCES
--------------------------
---
```

(Continued)

(Sheet 8 of 10)

Table 8 (Continued)

```
* LIST C51,C53,C55,OB HIGH C55 WH C1 EQ B-454 AND C51 EQ FLD W.C.;
   BOR-TOOL      BOR-SIZE     BOR-ELEV
***
* FLD W.C.        23            231.50
* FLD W.C.        22            230.00
* FLD W.C.        23            228.50
* FLD W.C.        21            227.00
* FLD W.C.        24            225.50
* FLD W.C.        18            224.00
* FLD W.C.        19            222.50
* FLD W.C.        21            221.00
* FLD W.C.        26            219.50
* FLD W.C.        23            218.00
* FLD W.C.        15            216.50
* FLD W.C.        9             215.00
* FLD W.C.        10            213.50
* FLD W.C.        13            212.00
* FLD W.C.        11            210.50
* FLD W.C.        19            207.50
* FLD W.C.        21            206.00
* FLD W.C.        30            203.50
* FLD W.C.        37            202.00
* FLD W.C.        26            197.50
* FLD W.C.        29            195.00
* FLD W.C.        32            188.00
* FLD W.C.        27            185.50
* FLD W.C.        29            180.50
* FLD W.C.        25            176.00
* FLD W.C.        27            170.50
* FLD W.C.        27            166.00
* FLD W.C.        29            158.00
* FLD W.C.        18            153.00
* FLD W.C.        17            151.20
* FLD W.C.        14            146.20
* FLD W.C.        14            142.30
* FLD W.C.        14            136.50
* FLD W.C.        16            133.50
* FLD W.C.        18            130.00
* FLD W.C.        15            124.00
* FLD W.C.        16            121.00
* FLD W.C.        27            114.00
* FLD W.C.        28            110.80
* FLD W.C.        28            102.50
```

(Continued)

Table 8 (Concluded)

```
? LIST C71,C75,C77,C79,C81,C83,C85,OR HIGH C77 WH C1 EQ B-494;
   TEST-NAME     TEST-MAT      TEST-ELEV    TEST-RESULT1    TEST-RESULT2    TEST-RESULT3    TEST-RESULT4
 ***
 * LIMITS        CL CLAY          225.50    LL = 42         PL = 20         W.C.= 23.3
 * LIMITS        CL CLAY          221.00    LL = 40         PL = 17         W.C.= 23.5
 * MA            GC GRAVEL        213.50    71% GRAVEL      21% SAND        8% FINES        D10= 0.21
 * MA            ML SILT          208.50                    9% SAND         91% FINES       D10LT .074
 * MA            ML SILT          184.20                    20% SAND        80% FINES       D10LT .074
 * MA            SM SAND          116.10                    85% SAND        15% FINES       D10LT .074
 * MA            CH CLAY          109.50                    24% SAND        76% FINES       D10LT.001
 * CONSOL.       CH CLAY          109.50    SP GR=2.71      W1 = 20.3       DEN= 109.1      CSUBC=0.10
 ---
? DITTO WH C1 EQ B-456;
   TEST-NAME     TEST-MAT      TEST-ELEV    TEST-RESULT1    TEST-RESULT2    TEST-RESULT3    TEST-RESULT4
 ***
 * LIMITS        CL CLAY          227.00    LL = 24         PL = 14         W.C.= 17.5
 * MA            GP GRAVEL        218.00    91% GRAVEL      8% SAND         1% FINES        D10= 5.1
 * MA            GP GRAVEL        215.00    84% GRAVEL      3% SAND         3% FINES        D10= 1.7
 * MA            SM SAND          207.80    0 % GRAVEL      69% SAND        31% FINES       D10LT .074
 * LIMITS        CH CLAY          191.80    LL = 60         PL = 27         W.C.= 24.4
 * LIMITS        CH CLAY          127.00    LL = 70         PL = 20         W.C.= 26.3
 ---
? EXIT;
 -506-   CLOSED     BORDB                    1   575 84/08/09. 08.44.46.
 84/09/05. 12.24.10. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
```

PART V: GRAPHICS DISPLAY

54. The three graphics display programs available for use with the boring data base are:

a. BORMAP, to plot the location of borings.

b. BORCON, to contour selected elevation data.

c. BORLOG, to plot individual boring logs or profiles (cross sections) of selected logs.

Two steps are required to use these programs. The first step is to create a data file of the desired data from the data base (Part IV) and the second step is to access the desired program. Each program has the option of plotting at the graphics terminal and/or directing plots to a drum plotter. The programs require the use of a Tektronix type graphics terminal. The programs use the CE Graphics Compatibility System (GCS) with library routines that are outside the programmer's control. Thus, some inconveniences are encountered, such as unexpected screen erasures after an initial prompt and after completion of drum plot option prompts. Instructions to overcome this problem are given in the detailed descriptions. This part describes the capabilities and use of each program and gives examples of their use.

Boring Location Plots

Capabilities

55. The boring location plot program, BORMAP, asks for the data file name and allows the user to review the data file and select the data group desired for plotting. The user is then queried for plotting options. The options include data columns to plot, type of coordinates, plot title, scales, grid display, and symbol numbers with corresponding boring numbers. Local coordinates can be automatically converted to latitude and longitude by entering the values for the first listed boring. A polyconic projection can also be obtained. Files with station and offset can also be used (if they include column headings labeled "PSTA" and "POFF") and values are automatically converted to decimal numbers with offsets converted to plus and minus numbers. Boring location plots can be displayed at the graphics terminal and also directed to a drum plotter to produce a plot to a desired scale for use as an overlay on an existing map. The program is available on CDC and the Honeywell computer system.

BORMAP data files

56. The data file for use with BORMAP must be generated with the LIST command (paragraph 44). The file should contain the boring numbers and appropriate coordinates (C8,C9 and/or C12,C13). The WHERE clause in the LIST command should specify the desired borings (e.g., B-350*B-490). A simple way to specify borings is to use the SID numbers (e.g., WH C29 EQ 1*30 or WH C29 LE 10 AND C29 GE 40). Coordinate limits within which all existing borings are desired to be plotted can also be used (e.g., WH C12 EQ 1604500*1605000 AND C13 EQ 634000*636000). The data components can be in any order, since the program displays the headings for the user to select. If it is desired to have boring numbers listed in numerical order with the symbol numbers at the side of the plot, the ORDERED BY clause should be used for C1 when creating the data file (e.g., LIST C1,C8,C9,C12,C13,C25,OB C1 WH C1 EQ B-350*B-505). Data files that already exist with the desired data in the desired order can also be used. Multiple LIST commands can be issued and collected in the same REPORT file or in multiple REPORT files.

BORMAP execution

57. Access and execution of BORMAP is accomplished with the following command.

```
BEGIN,,BORMAP
```

At the beginning of the program, two choices are given for selection of 80 or 132 character width screen by a GCS routine (choices O and K). Always choose O, since K causes the program to stop with error messages. Next, enter the data file name when asked and answer the prompts described after the next paragraph.

BORMAP scales

58. The BORMAP program uses fractional map scales (e.g., 1:10,000) and displays the limiting scales of the data to be plotted to stay within the graphics screen limits. To produce a true scale drawing on the graphics terminal hard copy machine, entered scales are multiplied by five and the resulting scales are shown at the top of the plot. For example, if the limiting scales for the data were 1:1,000 and 1:2,000 and scales of 1:2,000 were selected for both coordinate sets, then the resulting plot would have scales of 1:10,000. Thus, to obtain an engineer scale of 1 in. = 1000 ft (12,000 in.) for this example, scales of 1:2,400 should be selected to produce a hard copy with scales of 1:12,000. Plots directed to drum plotter are drawn to the

user-specified scales. In the above example the drum plot would be drawn accurately to a scale of 1:2,400 (even though the preview plot on the screen would be drawn to the scale of 1:12,000).

BORMAP prompts

59. The program prompts and their results are described below.

DATA FILE NAME? (ENTER 04 TO KEEP CURRENT FILE)

The user should enter the file name for the first plot and can then enter 04 for other plots with the same data later in the session.

RECORD # & # LINES TO BE PRINTED?
(ENTER 0,0 TO CHANGE DATA FILE)

In the event that a data file contains the results of multiple LIST commands, enter the number of the corresponding record number (otherwise, enter a 1), followed by the number of lines to be displayed. A response that exceeds the number of records in the file will simply cause a message, "END-OF-FILE" to be displayed and the same prompt to be shown.

IS THIS THE RECORD YOU WANT (Y OR N)?

A response of N will cause the preceding prompt to be displayed. This option is useful for examining the contents of the data file to check the file contents or sequence of data groups.

ENTER X-COL# & Y-COL# (OR LAT# & LONG#)

The pair of numbers identifying the columns containing the desired coordinates are entered. Note that in the event that the column headings are either LAT and LONG or LOC N-S & LOC E-W, the order of the entered numbers is ignored. The vertical ordinate is always LAT or LOC N-S and the horizontal ordinate is always LONG or LOC E-W. In the event that the column numbers entered are for LOC N-S and LOC E-W, a second prompt "ARE LOC N-S & LOC E-W ALREADY IN DEGREES (Y OR N)?" is issued. A response of Y will cause the prompt "DO YOU WANT TO LIST 04?" to be displayed. An answer of N will cause the query "DO YOU WANT TO CONVERT TO LAT & LONG (Y/N)?" to be displayed. An answer of N will display the prompt, "DO YOU WANT TO LIST 04?" An answer of Y will result in the query:

ENTER LAT (DDMMSS.SS) & LONG (DDDMMSS.SS)
OF THE 1ST GIVEN NS & EW POINT IN RECORD

The latitude and longitude of the first (usable) pair of coordinates in the record is entered. The entered coordinates are used to convert all coordinates from feet to degrees.

DO YOU WANT TO LIST 04?

Entering Y produces the listing and N causes the program to skip to the next prompt.

PLOT TITLE?

The plot title is entered (50 characters maximum) and will appear across the top of the plot.

BORING DESCRIPTORS TO BE PRINTED ON PLOT

If the response is Y, the plotted points will be numbered (1, 2, 3, 4, etc.) and a table of these numbers and corresponding boring numbers will be included on the right side of the plot. If N is entered, numbers and the table will not be shown on the plot.

SCALING OPTIONS. ENTER 0-AUTO 1-SET MANUALLY 2-USE LAST SCALE

Entering 0 results in automatic grid scaling for the limits of the data. Entering 1 allows user selection of the grid scale limits. Entering 2 specifies that the grid scale used for the last plot in the current session is to be used for the next plot.

DO YOU WANT THE GRID DRAWN? (Y/N OR H IF YOU WANT THE GRID TICK LINES BUT NO LABELS)

Entering Y produces a complete grid with coordinate labels and N suppresses the grid and labels. Entering H produces tick lines around the border and at grid intersections.

```
CHOOSE VERT SCALE  >=1:      XXXX
CHOOSE HORZ SCALE  >=1:      XXXX
```

The minimum scale values for the data to fit on the screen are shown and the user enters desired values equal to or greater than those shown (e.g., 2,400, 2,400 for equal vertical and horizontal scales to produce an engineering scale of 1 in. = 1000 ft, i.e., 5 x 2,400 = 1:12,000). If scaling operations are to be set manually (a choice in a preceding prompt), then the prompt requesting vertical and horizontal scales is replaced with a display of the maximum and minimum values of the x and y coordinates and the user is asked to enter the desired values (e.g., 622,500, 625,500, 1,601,000, 1,605,000).

ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER? Y/N/M--
(M FOR MAYBE-GIVES PREVIEW ON SCREEN)

After entering the desired option the following message appears:

MAKE COPY AND/OR HIT RETURN

At this point the user can copy the screen before hitting the return key. On CDC the user should enter a number (e.g., 3) before hitting the return key (otherwise the program may stop with a series of error messages). Entering Y

skips the screen plot and starts drum plot queries. A reply of N produces a plot on the screen and skips the drum plot option. Entering M produces a plot with options to send it to the drum plotter after review or to start a new plot. After every plot is finished, the terminal beeps to allow the user to copy the plot before hitting the return key. In the M option, after the plot is produced and return is entered, the user is asked "TO DRUM NOW?". If the reply is N, new plot queries are started. If the reply is Y on CDC, the user is asked for his user number. When the user number is entered, the screen should be copied before hitting the return key because the system responds that TAPE999 is the plot tape file and the screen is quickly erased. (The user has to contact the local ADP center to pull the plot file from CDC and plot it.) On the Honeywell system, the user is asked for his identification and other data to define the remote site and type of plot. After entering the type of plot options, the screen should be copied, since a snub number is displayed and the screen is immediately erased. It may be necessary for the user to contact the local ADP center to pull the plot file from the Division Honeywell system.

BORMAP examples

60. Table 9 shows examples of data file generation and use of the BORMAP program. In the first example, a data file is created for plots of boring locations using latitude and longitude to illustrate selection of data groups. The second example illustrates the use of one data group of local coordinates to produce plots of different scales, direct plots to a drum plotter (on CDC first and then on Honeywell) and finally to convert the local coordinates to latitude and longitude and plot the bring locations. The cost for these examples on CDC was about $12.

Contouring

Capabilities

61. The contouring program, BORCON, for boring and subsurface data can produce a contour plot of any elevation or depth data. The program is the same as that for BORMAP with contouring added. The contouring option was adapted from a program developed by Mr. Fred Tracy, Automation Technology Center, US Army Engineer Waterways Experiment Station. The user is asked for the data file name and questions about the options for columns to plot, type

Table 9

Example of Boring Location Plots Using Program BORMAP

Sign on CDC

```
-GET*DB
  S2K 2.60F'
 83/12/06. 13.50.29. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
? USER,DLW,SHARED DBN IS BORDB;
 -556-    ASSIGNED    BORDB                    4  1211 83/12/05. 11.59.33.
 ---
? LIST C1,C29,C8,C9,C25 WH C29 GE 10,AND C29 LT 20;
   BORID              SID          LAT          LONG      TOP-HOLE
 ***
 * 16                  10      300349.00      912834.00        -9.00
 * 53                  11      300355.00      912827.00        -9.00
 * 54                  12      300345.00      912842.00       -15.00
 * 15                  13      30040  00      912820.00        -4.00
 * 52                  14      30041_.00      912815.00        -3.00
 * 14                  15      300420.00      912815.00        -6.00
 * 51                  16      300430.00      912817.00        -4.00
 * 13                  17      300436.00      912819.00        -3.00
 * 50                  18      300445.00      912822.00        -3.00
 * 69                  19      300020.00      912853.00        -4.00
 ---
? REPORT FILE IS BIMBO;
 ---
? LIST C1,C29,C8,C9,C25 WH C29 GE 10 AND C29 LE 20;
 ---
? LIST C1,C29,C9ØC8,C25 WH C29 GT 20 AND C29 LT 30;
 ---
? LIST C1,C8,C9 WH C29 GE 30 AND C29 LT 40;
 ---
? EXIT;
 -506-    CLOSED      BORDB                    4  1211 83/12/05. 11.59.33.
 83/12/06. 13.55.13. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
/SAVE,BIMBO        Saving Data File, BIMBO
/
```

(Continued)

(Sheet 1 of 21)

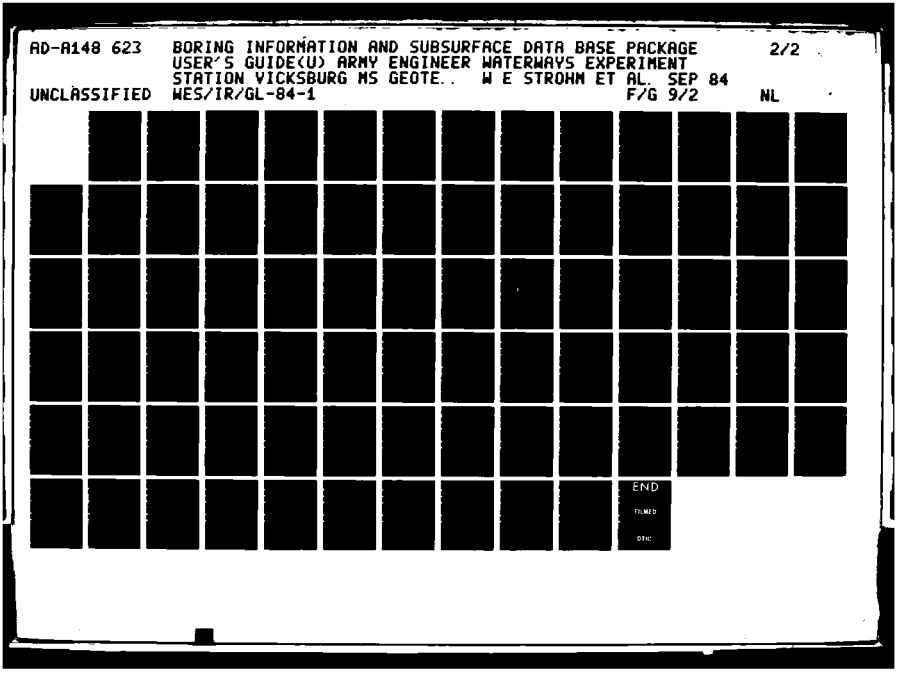
Table 9 (Continued)

Listing of Data File BIMBO

```
OLD,BIMBO
 LIST
   BORID          SID          LAT          LONG       TOP-HOLE
 ***
 * 16              10     300349.00     912834.00         -9.00
 * 53              11     300355.00     912827.00         -9.00
 * 54              12     300345.00     912842.00        -15.00
 * 15              13     300404.00     912820.00         -4.00
 * 52              14     300415.00     912815.00         -3.00
 * 14              15     300420.00     912815.00         -6.00
 * 51              16     300430.00     912817.00         -4.00
 * 13              17     300436.00     912819.00         -3.00
 * 50              18     300445.00     912822.00         -3.00
 * 69              19     300020.00     912853.00         -4.00
 * 26              20     300015.00     912847.00         -4.00
   BORID          SID          LONG          LAT       TOP-HOLE
 ***
 * 70              21     912844.00     300010.00         -4.00
 * 71              22     912838.00     300005.00         -4.00
 * 22              23     912922.00     300145.00         -1.00
 * 63              24     912933.00     300147.00          1.00
 * 62              25     912928.00     300157.00         -3.00
 * 60              26     912924.00     300223.00         -5.00
 * 59              27     912922.00     300230.00         -7.00
 * 61              28     912925.00     300205.00         -5.00
 * 21              29     912924.00     300215.00         -2.00
   BORID           LAT          LONG
 ***
 * 20        300237.00     912921.00
 * 58        300241.00     912922.00
 * 57        300309.00     912913.00
 * 19        300258.00     912917.00
 * 56        300320.00     912911.00
 * 18        300326.00     912910.00
 * 17        300338.00     912856.00
 * 11        300503.00     912829.00
 * 12        300449.00     912822.00
 * 49        300455.00     912825.00
```

(Continued)

(Sheet 2 of 21)


AD-A148 623 BORING INFORMATION AND SUBSURFACE DATA BASE PACKAGE USER'S GUIDE(U) ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS GEOTE.. W E STROHM ET AL. SEP 84
2/2
UNCLASSIFIED WES/IR/GL-84-1 F/G 9/2 NL
END
FILMED
DTIC

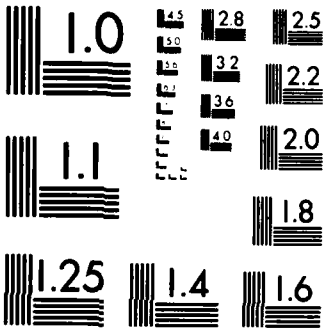


Table 9 (Continued)

```
RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*BIMBO
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,5
  BORID            SID           LAT           LONG      TOP-HOLE
XXX
* 16               10      300349.00      912834.00         -9.00
* 53               11      300355.00      912827.00         -9.00
* 54               12      300345.00      912842.00        -15.00

--------------------------------------------------------------------------
BORID       SID          LAT          LONG         TOP-HOLE
1           2            3            4            5

--------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*N
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*2,5
  BORID                LAT           LONG
XXX
* 20              300237.00      912921.00
* 58              300247.00      912922.00
* 57              300309.00      912913.00

--------------------------------------------------------------------------
BORID       LAT          LONG
1           2            3

--------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*N
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*2,5
  BORID            SID           LONG           LAT      TOP-HOLE
XXX
* 70               21      912844.00      300010.00         -4.00
* 71               22      912838.00      300005.00         -4.00
* 22               23      912922.00      300145.00         -1.00

--------------------------------------------------------------------------
BORID       SID          LONG         LAT          TOP-HOLE
1           2            3            4            5

--------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*N
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*5,5
END OF FILE -REC #=  5 TRY AGAIN
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,0
```

(Continued)

(Sheet 3 of 21)

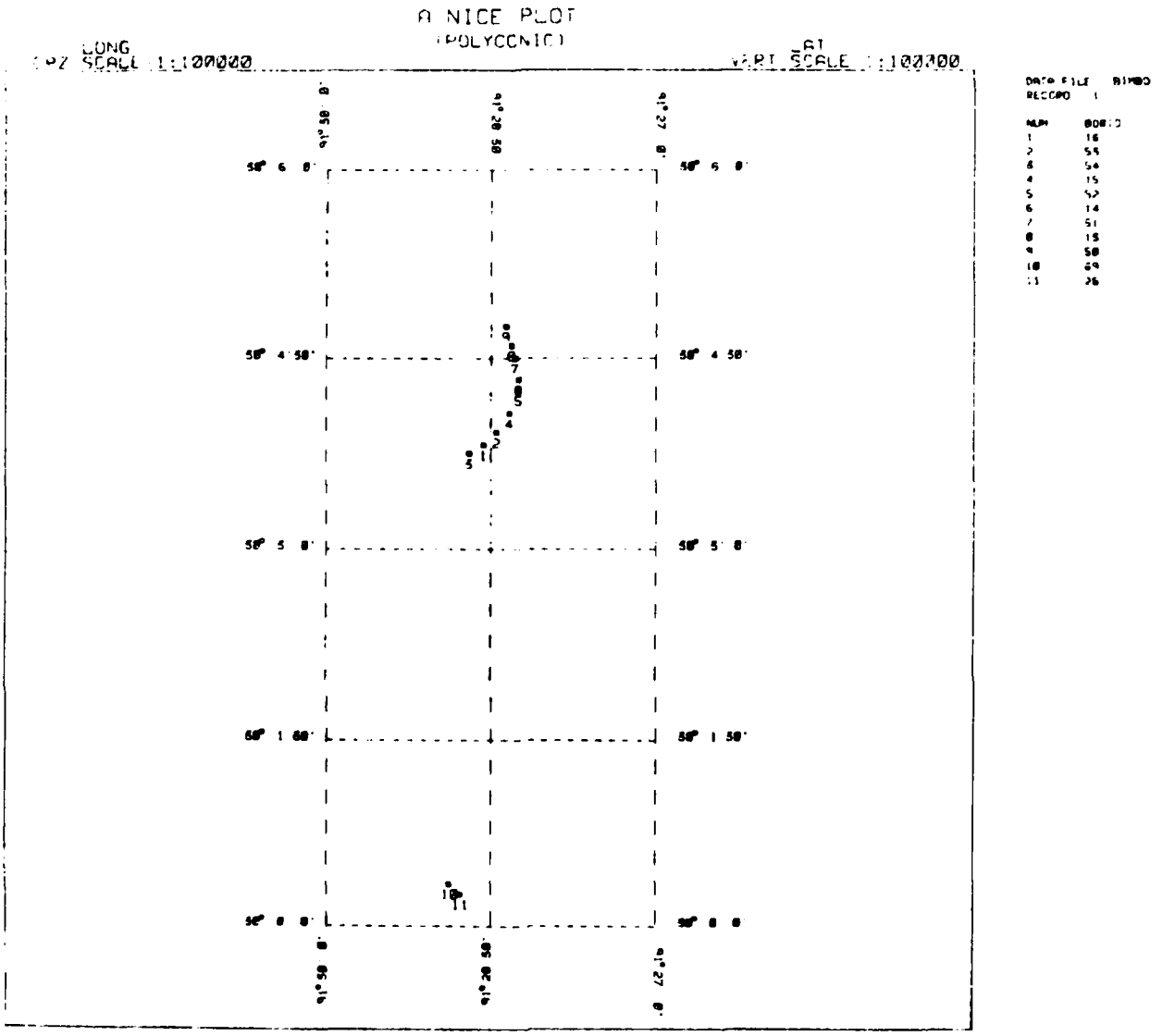
Table 9 (Continued)

```
-------------------------------------------------------------------------
BORID       SID         LAT         LONG        TOP-HOLE
1           2           3           4           5
-------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
•Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
•3,4
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
•1
  11 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
•Y
     329314.00       108229.00        -999.99     16
     329307.00       108235.00        -999.99     53
     329322.00       108225.00        -999.99     54
     329300.00       108244.00        -999.99     15
     329295.00       108255.00        -999.99     52
     329295.00       108260.00        -999.99     14
     329297.00       108270.00        -999.99     51
     329299.00       108276.00        -999.99     13
     329302.00       108285.00        -999.99     50
     329333.00       108020.00        -999.99     69
     329327.00       108015.00        -999.99     26
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
•A NICE PLOT
DATA IS IN DEGREES--DO YOU WANT A POLYCONIC PROJECTION ? (Y/N)
•Y
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
•Y
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
•0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
•Y
CHOOSE MAPSCALE >•1:    18180
•20000
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
•N
MAKE COPY AND/OR HIT RETURN
•
```

(Continued)

(Sheet 4 of 21)

Table 9 (Continued)



(Continued)

(Sheet 5 of 21)

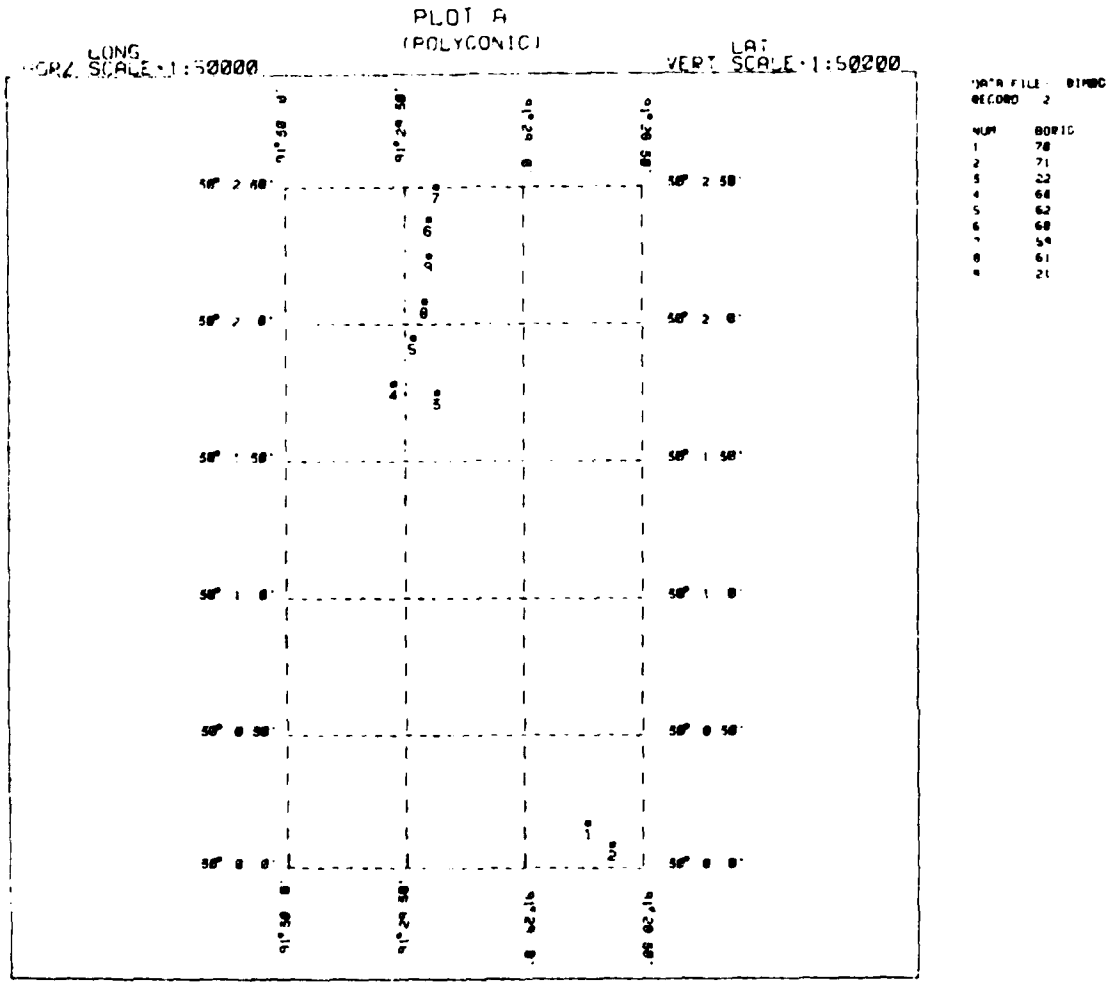
Table 9 (Continued)

```
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*BIMBO
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*2,0

-------------------------------------------------------------------
BORID       SID         LONG        LAT         TOP-HOLE
1           2           3           4           5

-------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
*3,4
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
*1
   9 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
*N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
*PLOT A
DATA IS IN DEGREES--DO YOU WANT A POLYCONIC PROJECTION ? (Y/N)
*Y
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
*Y
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
*0
DO YOU WANT THE GRID DRAWN ? (Y/N OR M IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
*Y
CHOOSE MAPSCALE >=1:     7575
*10000
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
*M
MAKE COPY AND/OR HIT RETURN
*
```

(Continued)

(Sheet 6 of 21)

Table 9 (Continued)



(Continued)

(Sheet 7 of 21)

Table 9 (Continued)

```
-GETDB

 'S2K 2.60F'

 84/04/18. 10.14.10. BEGIN SYSTEM 2000 VERSION 2.60F
 ---
? USER,DLW;SHARED DBN IS BORDB;
 -556-   ASSIGNED   BORDB                    1   558 84/04/18. 10.13.14
 ---
? REPORT FILE IS TENTOM2;
 ---
? LIST C1,C12,C13,C25,C41,C43,OB C1 WH C41 EQ EUTAW;
 ---
? REPORT FILE IS OUTPUT;
 ---
? EXIT;
 -506-   CLOSED     BORDB                    1   558 84/04/18. 10.13.14
STOP S2K
/SAVE,TENTOM2
```

(Continued)

(Sheet 8 of 21)

Table 9 (Continued)

OLD_TENTOM2
LIST

BORID	LOC-NS	LOC-EW	TOP-HOLE	FEAT-NAME	FEAT-ELEV
BF-190-77	1602941.00	623252.00	230.70	EUTAW	208.30
BF-191-76	1603571.00	624324.00	232.30	EUTAW	208.30
B-350	1602970.00	624095.00	232.50	EUTAW	211.50
B-351	1602625.00	624295.00	234.80	EUTAW	207.80
B-352	1602277.00	624500.00	234.50	EUTAW	203.00
B-353	1602550.00	624165.00	234.10	EUTAW	209.00
B-354	1602700.00	624425.00	235.30	EUTAW	210.40
B-441	1601570.00	624395.00	233.80	EUTAW	205.30
B-442	1601755.00	624567.00	232.40	EUTAW	212.90
B-443	1601920.00	624713.00	243.30	EUTAW	219.30
B-444	1602094.00	624605.00	233.70	EUTAW	211.20
B-445	1602300.00	624690.00	233.10	EUTAW	209.10
B-446	1602075.00	624338.00	233.10	EUTAW	212.10
B-447	1601950.00	624105.00	232.00	EUTAW	212.50
B-448	1602465.00	624400.00	235.70	EUTAW	210.20
B-450	1602156.00	623981.00	231.40	EUTAW	210.90
B-451	1602464.00	624015.00	233.30	EUTAW	210.80
B-452	1602378.00	623855.00	232.60	EUTAW	208.60
B-453	1602795.00	624210.00	232.80	EUTAW	209.30
B-454	1602718.00	624072.00	232.50	EUTAW	208.40
B-455	1602594.00	623720.00	232.70	EUTAW	210.20
B-456	1602891.00	623968.00	232.00	EUTAW	209.90
B-457	1602902.00	623755.00	231.60	EUTAW	210.60
B-458	1602810.00	623600.00	231.60	EUTAW	207.60
B-459	1603190.00	623960.00	231.90	EUTAW	209.40
B-460	1603113.00	623838.00	231.60	EUTAW	212.00
B-461	1603405.00	623840.00	231.70	EUTAW	209.40
B-462	1603160.00	624175.00	232.40	EUTAW	209.90
B-463	1603625.00	623715.00	231.50	EUTAW	211.50
B-464	1603550.00	623970.00	231.40	EUTAW	210.40
B-466	1602855.00	624650.00	234.70	EUTAW	210.70
B-484	1602940.00	624310.00	233.00	EUTAW	209.00
B-485	1603606.00	623900.00	232.40	EUTAW	211.40
B-486	1603845.00	623790.00	232.70	EUTAW	211.70
B-487	1604050.00	623645.00	232.70	EUTAW	213.20
B-488	1603835.00	623605.00	232.60	EUTAW	210.60
B-489	1603645.00	623445.00	232.20	EUTAW	210.20
B-490	1603510.00	623205.00	231.90	EUTAW	207.90
B-491	1603285.00	623335.00	231.90	EUTAW	212.40
B-492	1603040.00	623475.00	231.10	EUTAW	208.60
B-493	1603150.00	623665.00	231.30	EUTAW	211.30
B-494	1603340.00	623725.00	232.00	EUTAW	208.90
B-495	1603300.00	623910.00	232.30	EUTAW	210.30
B-496	1602700.00	623900.00	233.80	EUTAW	208.30
B-497	1604230.00	623885.00	233.40	EUTAW	212.40
B-498	1602825.00	623025.00	230.40	EUTAW	207.90
B-505	1603370.00	624040.00	232.30	EUTAW	212.80

(Continued)

Table 9 (Continued)

```
.4 04/18. 11.46.00. AC2F5DA
EASTERN CYBERNET CENTER SN487 NOS       1.4/531.523/19AD
FAMILY:  KOE,CER0K2
PASSWORD
[redacted]ER0EGC,CER0K2
TERMINAL:     331, NAMIAF
$CHARGE,CER0EGC,CER0K2.

07.55.26. WARNING

/BEGIN,,BORMAP

 IF YOU WANT TO USE ORD (80 CHARACTER RECORDS)
 CALCOMP RJE PLOT ROUTINES, ENTER AN O.

 IF YOU WANT TO USE KANSAS CITY(132 CHARACTER RECORDS)
 CALCOMP RJE PLOT ROUTINES, ENTER A K.

? O
```

(Continued)

(Sheet 10 of 21)

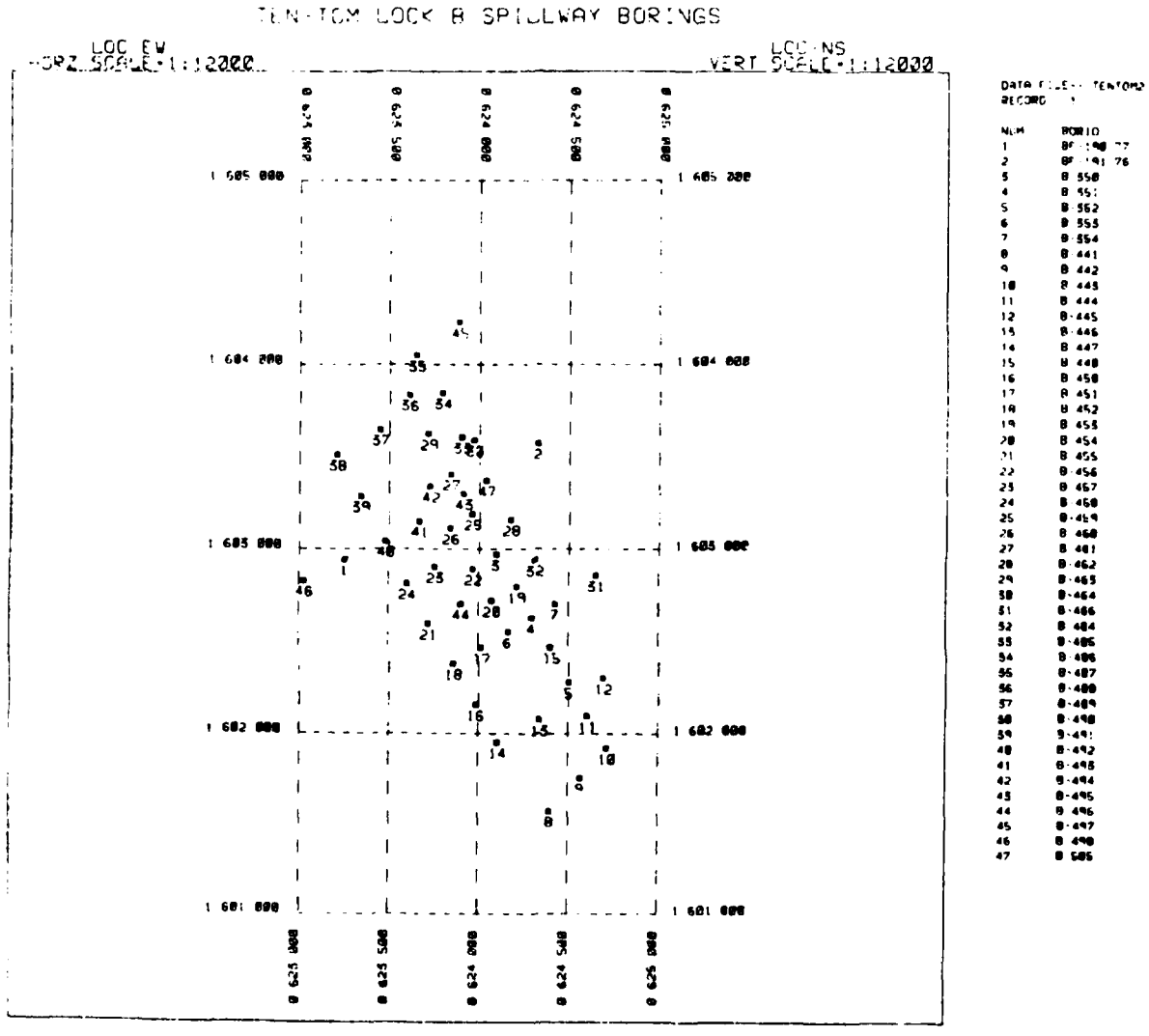
Table 9 (Continued)

```
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*TENTOM2
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,4
  BORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
***
* BF-190-77       1602941.00       623252.00       230.70       208.20
* BF-191-76       1603571.00       624324.00       232.30       208.30

-----------------------------------------------------------------------
BORID        LOC-NS       LOC-EW       TOP-HOLE     FEAT-ELEV
1            2            3            4            5

-----------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
*2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
*N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
*N
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
*1
  47 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
*N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
*TEN-TOM LOCK B SPILLWAY BORING LOCATIONS, 1-IN = 1000 FT
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
*Y
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
*0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
*Y
CHOOSE VERT SCALE >*1:      2000
CHOOSE HORZ SCALE >*1:      1000
*2400,2400
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
*N
MAKE COPY AND/OR HIT RETURN
*
```

(Continued)

(Sheet 11 of 21)

Table 9 (Continued)



(Continued)

(Sheet 12 of 21)

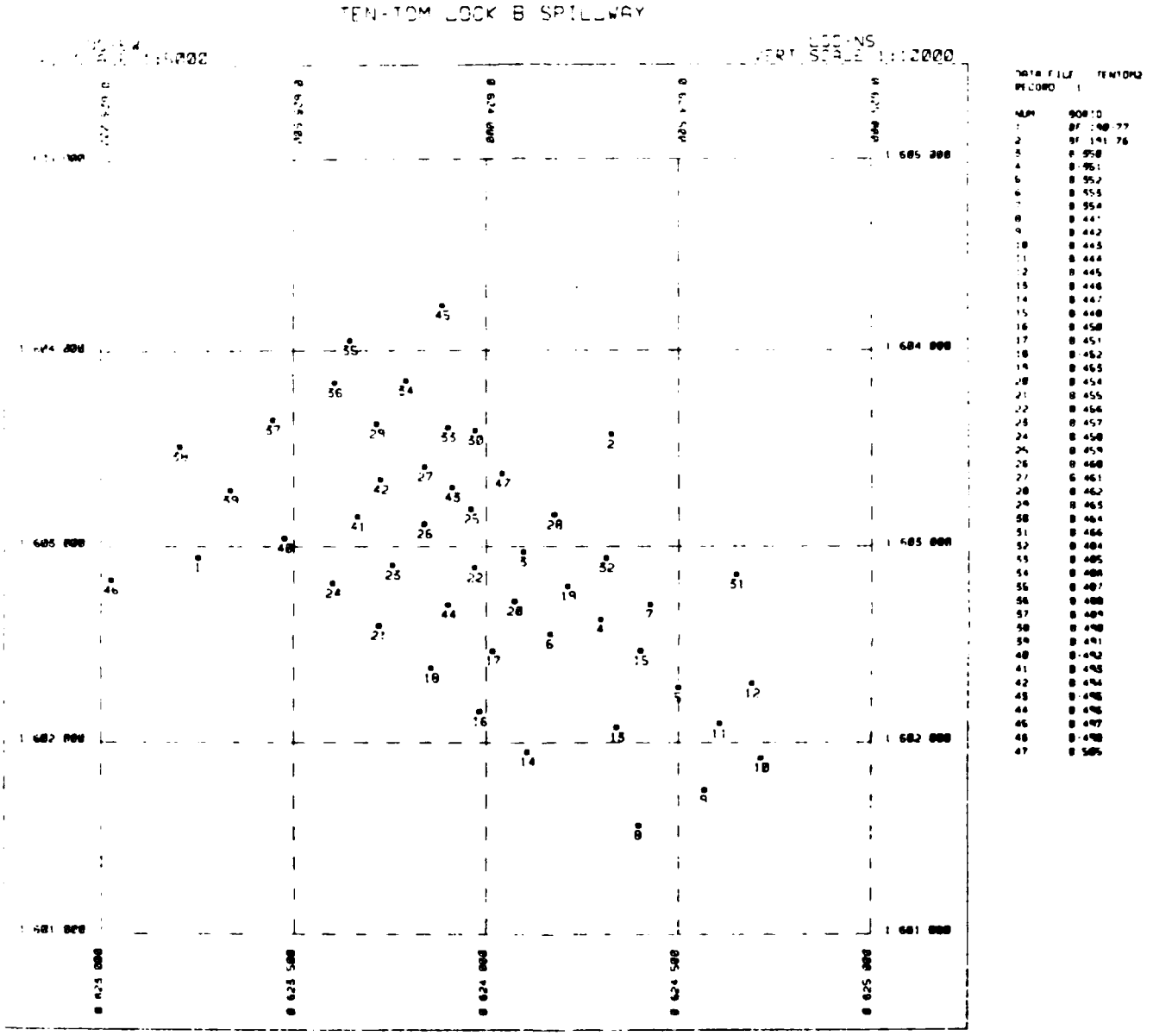
Table 9 (Continued)

```
 A RESPONSE OF R TO ANY Y/N QUESTION WILL
 REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

 DATAFILE NAME ?
  (ENTER 04 TO KEEP CURRENT FILE)
? 04
 DO YOU WANT TO LIST 04 ? (Y/N)
? N
 A RESPONSE OF R TO ANY Y/N QUESTION WILL
 REDIRECT CONTROL TO THE QUERY 'TITLE'

 PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
? TEN-TOM LOCK B SPILLWAY
 BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
? Y
 SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
? 0
 DO YOU WANT THE GRID DRAWN ? (Y/N OR M IF
  YOU WANT THE GRID TICLINES BUT NO LABELS)
? Y
 CHOOSE VERT SCALE )*1:      2000
 CHOOSE HORZ SCALE )*1:      1000
? 2000,1000
 ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
  Y/N/M--(M FOR MAYBE-GIVES PREVIEW ON SCREEN)
? N
 MAKE COPY AND/OR HIT RETURN
```

(Continued)

(Sheet 13 of 21)

Table 9 (Continued)



(Continued)

(Sheet 14 of 21)

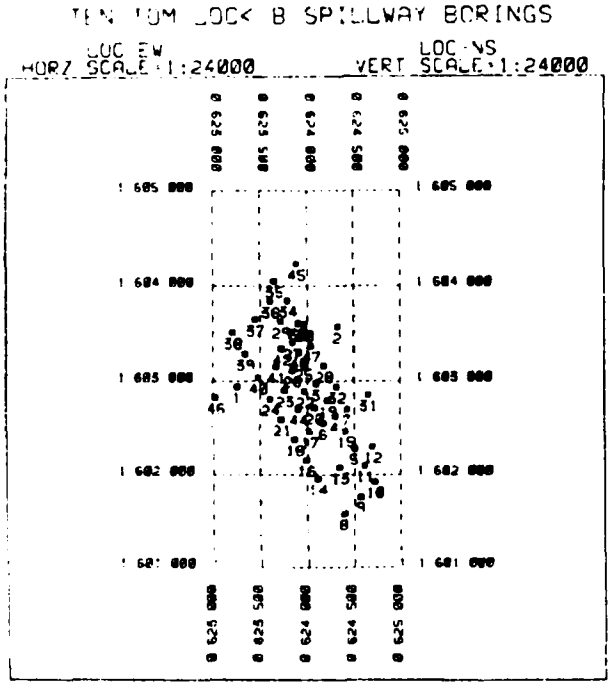
Table 9 (Continued)

```
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*TENTOM2
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,3
  BORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
###
# BF-190-77       1602941.00       623252.00       230.70       208.20

-------------------------------------------------------------------------
BORID       LOC-NS      LOC-EW      TOP-HOLE    FEAT-ELEV
1           2           3           4           5

-------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
*2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
*N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
*N
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
*1
  47 DATA LINES WRITTEN ON @4
DO YOU WANT TO LIST @4 ? (Y/N)
*N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
*TEN-TOM LOCK B SPILLWAY BORINGS
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
*Y
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
*0
DO YOU WANT THE GRID DRAWN ? (Y/N OR M IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
*Y
CHOOSE VERT SCALE )*1:      2000
CHOOSE HORZ SCALE )*1:      1000
*4800,4800
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
*M
MAKE COPY AND/OR HIT RETURN
*
```

(Continued)

(Sheet 15 of 21)

Table 9 (Continued)



DATA FILE - TENTOM2
RECORD - 1

NUM	BORID	BDM	BDDDD
1	BF-140-77	54	0.486
2	BF-141-76	55	0.487
3	0.550	56	0.488
4	0.551	57	0.489
5	0.552	58	0.490
6	0.553	59	0.491
7	0.554	60	0.492
8	0.441	61	0.493
9	0.442	62	0.494
10	0.443	63	0.495
11	0.444	64	0.496
12	0.445	65	0.497
13	0.446	66	0.498
14	0.447	67	0.605
15	0.448		
16	0.450		
17	0.451		
18	0.452		
19	0.453		
20	0.454		
21	0.455		
22	0.456		
23	0.457		
24	0.458		
25	0.459		
26	0.460		
27	0.461		
28	0.462		
29	0.463		
30	0.464		
31	0.466		
32	0.484		

(Continued)

(Sheet 16 of 21)

Table 9 (Continued)

Creation of Drum Plot File on Honeywell Computer System

```
TO DRUM NOW ? (Y/N)
•Y
ENTER IDENT CARD INFORMATION
FOR EXS: USERID,NAME
•R2QRCAC,GL-STROHM
INPUT STATION CODE FOR OUTPUT (00 IF NOT REMOTE)
•00
INPUT PRIORITY (5 OR 40)
•5
WANT DEFAULT SETTINGS (YES-OR-NO)
(PLAIN PAPER, PEN 1-BLACK BALL POINT,
 PEN 2-RED BALL POINT, PEN 3-GREEN BALL POINT,
 PEN 4-BLUE BALL POINT, REGULAR PEN SIZE)
•N
PLOT TAPE DESCRIPTION (12 CHARACTERS MAX)

CHAR 1 - X
CHAR 2 - C
CHAR 3 - PAPER (P-PLAIN, G-GRID, S-SPECIAL)
CHAR 4 - PEN 1 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 5 - PEN 1 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 6 - PEN 2 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 7 - PEN 2 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 8 - PEN 3 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 9 - PEN 3 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 10 - PEN 4 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 11 - PEN 4 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 12 - LIQUID INK PEN SIZE (R-REGULAR,F-FINE,X-EXTRA
                                                FINE

EXAMPLE - TYPING IN THE FOLLOWING YIELDS A PLOT TAPE WITH
          PLAIN PAPER AND PEN 1 BEING BLACK LIQUID INK

 XCPLB

ENTER DESCRIPTION
•XCPLU
```

Creation of Drum Plot File on CDC

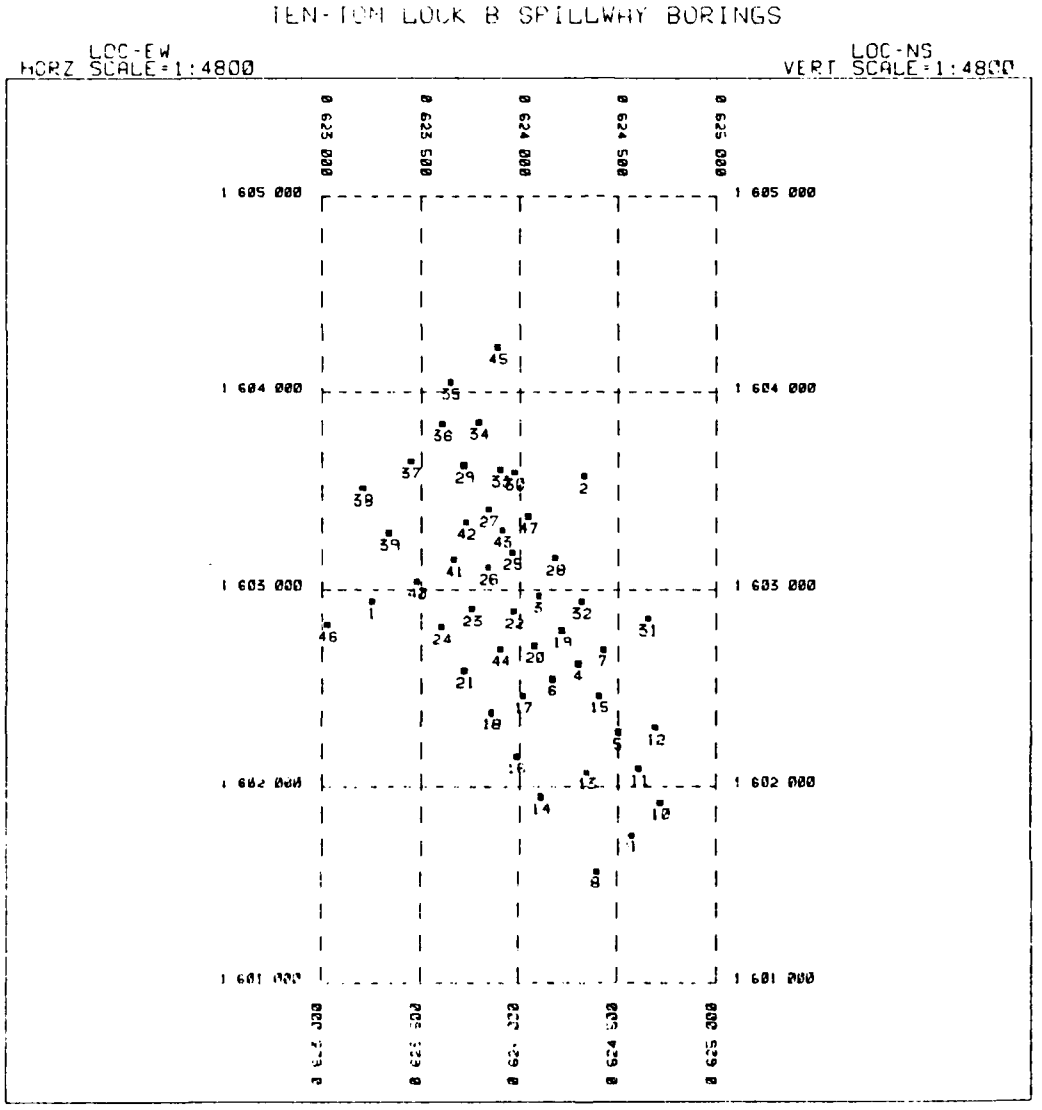
```
TO DRUM NOW ? (Y/N)
? Y
ENTER YOUR USER NUMBER
? CER0K2
```

Plot File Name is TAPE999

(Continued)

(Sheet 17 of 21)

Table 9 (Continued)



DATA FILE-- TENTOM2
RECORD-- 1

NUM	BORID
1	BF-190-77
2	BF-191-76
3	B-350
4	B 351
5	B 352
6	B-353
7	B-354
8	B 441
9	B-442
10	B-443
11	B-444
12	B-445
13	B-446
14	B 447
15	B-448
16	B 450
17	B 451
18	B-452
19	B 453
20	B-454
21	B-455
22	B-456
23	B 457
24	B-458
25	B-459
26	B-460
27	B-461
28	B 462
29	B 463
30	B-464
31	B-466
32	B-484
33	B-485
34	B-486
35	B-487
36	B 488
37	B-489
38	B-490
39	B 491
40	B 492
41	B 493
42	B-494
43	B 495
44	B 496
45	B 497
46	B-498
47	B 500

Copy of Drum Plot (Reduced to 42 percent)

(Continued)

(Sheet 18 of 21)

Table 9 (Continued)

```
 A RESPONSE OF R TO ANY Y/N QUESTION WILL
 REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

 DATAFILE NAME ?
   (ENTER 04 TO KEEP CURRENT FILE)
? TENTOM2
 RECORD # & # LINES TO BE PRINTED ?
   (ENTER 0,0 TO CHANGE DATAFILE)
   (ENTER -1,0 TO EXIT)
? 1,4
   BORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-NAME     FEAT-ELEV
 ***
 * BF-190-77       1602941.00       623252.00        230.70   EUTAW              208.20
 * BF-191-76       1603571.00       624324.00        232.30   EUTAW              208.30

 ------------------------------------------------------------------------
BORID         LOC-NS        LOC-EW        TOP-HOLE     FEAT-NAME    FEAT-ELEV
 1             2             3             4            5            6

 ------------------------------------------------------------------------
 IS THIS THE RECORD YOU WANT (Y OR N) ?
? Y
 ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
? 2,3
 ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
? N
 DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
? Y
 ENTER LAT (DDMMSS.SS) & LONG (DDDMMSS.SS)
 OF THE 1ST GIVEN NS & EW POINT IN RECORD
? 340420.2,882534.4
 WHICH COL IS THE DESCRIPTOR ?
 ZERO RESPONSE MEANS DESCRIPTOR WILL
 BE CREATED AS 1,2,3,....N
? 1
   47 DATA LINES WRITTEN ON 04
 DO YOU WANT TO LIST 04 ? (Y/N)
? Y
      318334.40       122660.20        -999.99     BF-190-77
      318321.59       122666.44        -999.99     BF-191-76
      318324.32       122660.49        -999.99     B-350
      318321.93       122657.07        -999.99     B-351
      318319.48       122653.63        -999.99     B-352
      318323.49       122656.33        -999.99     B-353
      318320.38       122657.81        -999.99     B-354
      318320.74       122646.63        -999.99     B-441
      318318.68       122648.46        -999.99     B-442
      318316.94       122650.09        -999.99     B-443
      318318.23       122651.81        -999.99     B-444
      318317.21       122653.85        -999.99     B-445
      318321.42       122651.63        -999.99     B-446
      318324.20       122650.39        -999.99     B-447
      318320.68       122655.49        -999.99     B-448
      318325.69       122652.43        -999.99     B-450
      318325.28       122655.48        -999.99     B-451
      318327.19       122654.63        -999.99     B-452
      318322.95       122658.75        -999.99     B-453
      318324.60       122657.99        -999.99     B-454
      318328.81       122656.76        -999.99     B-455
      318325.84       122659.70        -999.99     B-456
      318328.39       122659.81        -999.99     B-457
      318330.24       122658.90        -999.99     B-458
      318325.94       122662.67        -999.99     B-459
      318327.40       122661.90        -999.99     B-460
```

(Continued)

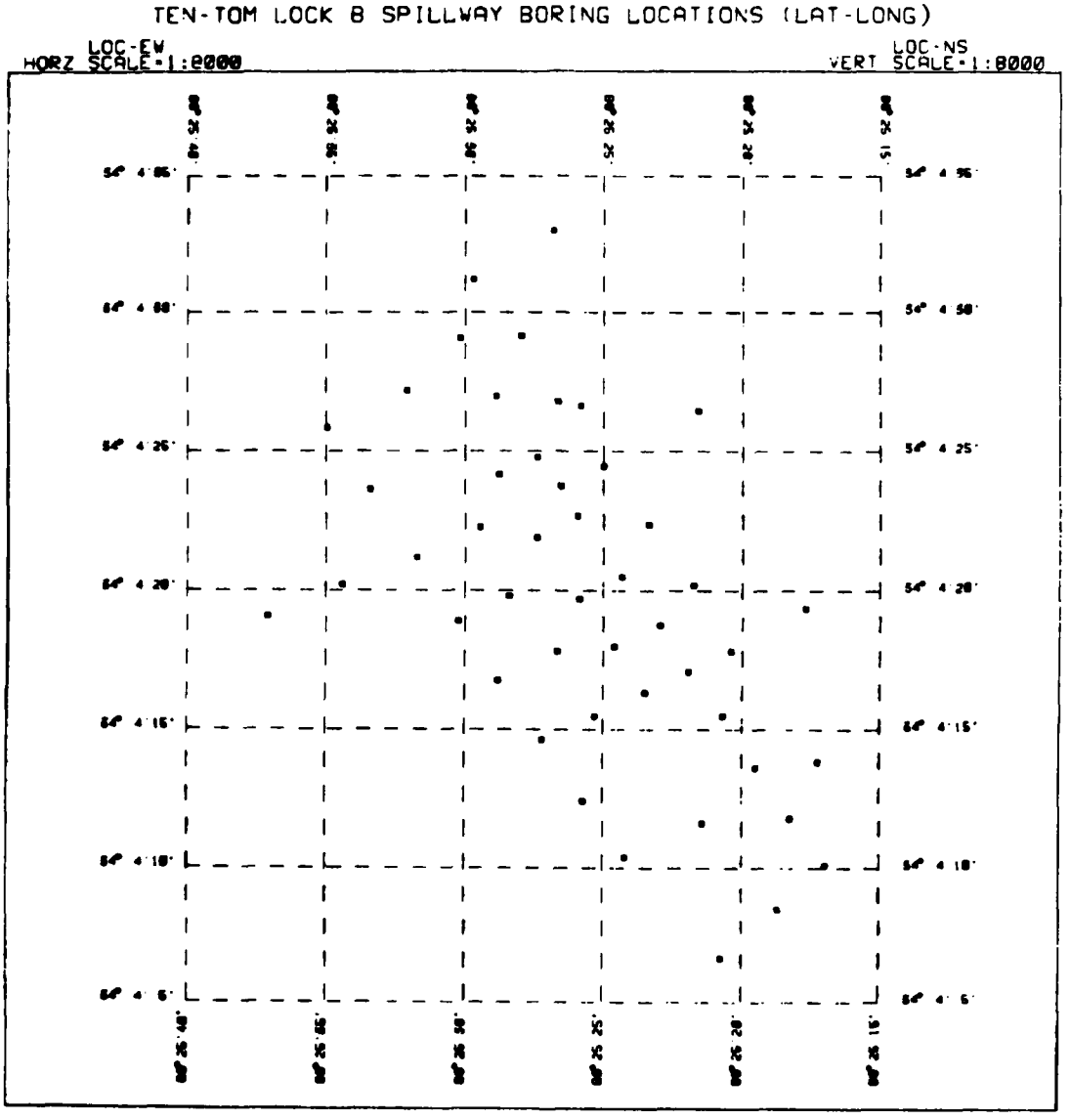
Table 9 (Continued)

```
      318327.37       122664.79        -999.99      B-461
      318323.37       122662.37        -999.99      B-462
      318328.87       122666.97        -999.99      B-463
      318325.82       122666.63        -999.99      B-464
      318317.69       122659.35        -999.99      B-466
      318321.75       122660.19        -999.99      B-484
      318326.65       122666.78        -999.99      B-485
      318327.97       122669.15        -999.99      B-486
      318329.70       122671.18        -999.99      B-487
      318330.18       122669.05        -999.99      B-488
      318332.09       122667.17        -999.99      B-489
      318334.96       122665.83        -999.99      B-490
      318333.41       122663.61        -999.99      B-491
      318331.73       122661.18        -999.99      B-492
      318329.46       122662.27        -999.99      B-493
      318328.75       122664.15        -999.99      B-494
      318326.53       122663.75        -999.99      B-495
      318326.65       122657.81        -999.99      B-496
      318326.83       122672.96        -999.99      B-497
      318337.11       122659.05        -999.99      B-498
      318324.98       122664.45        -999.99      B-505
 A RESPONSE OF R TO ANY Y/N QUESTION WILL
 REDIRECT CONTROL TO THE QUERY 'TITLE'

 PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
? TEN-TOM LOCK B SPILLWAY BORING LOCATIONS (LAT-LONG)
 DATA IS IN DEGREES--DO YOU WANT A
  POLYCONIC PROJECTION ? (Y/N)
? N
 BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
? N
 SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
? 0
 DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
  YOU WANT THE GRID TICLINES BUT NO LABELS)
? Y
 CHOOSE VERT SCALE >=1:      1515
 CHOOSE HORZ SCALE >=1:      1262
? 1600,1600
 ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
  Y/N/M--(M FOR MAYBE-GIVES PREVIEW ON SCREEN)
? N
 MAKE COPY AND/OR HIT RETURN
```

(Continued)

(Sheet 20 of 21)

Table 9 (Concluded)



(Sheet 21 of 21)

of coordinates, scale, grid display, and point reference number or symbol display. Additional prompts ask whether contouring is desired, what column combinations and factor (e.g., col 5 ± col 4 times a factor) are to be used for plotting, and what boundary elevation code to use for the border of the plot to prevent unrealistic contours at the limits of the data. A boring location plot is drawn first, and then contours are added. The program does not provide for blocking out of interior areas where contours are not wanted. For example, if water table contours were drawn for an area with a high, impervious ridge of rock through the middle of an area, contour for water table elevations would also be drawn through the ridge. One way to overcome this problem might be to outline the ridge with additional data points of the same elevation that is higher than any adjacent point outside the ridge. Contour plots can be displayed at the graphics terminal (Tektronix or equivalent), or directed to a flat bed plotter to produce a plot to a desired scale for use as an overlay on an existing map. The program at present is available only on the Honeywell computer system. Selection and use of scales is the same as for the BORMAP program.

BORCON data files

62. The data file for use with BORCON must be generated with the LIST command. The file is generated in the same manner as for the BORMAP program (paragraph 56). The file should contain the elevation or depth data needed for contouring. BORCON allows the use of a contour values derived from any column plus or minus any other column times a factor. Data files already generated that include desired data can be used, since the program displays the data groups and columns for selection of data by the user.

BORCON examples

63. Table 10 shows two examples of contouring plots on the Honeywell computer system. In the first example, one feature elevation (top of Eutaw formation) is plotted. In the second example, the thickness of alluvium is contoured. The four separate plots cost $35 on the WES Honeywell system.

Boring Log Plots

Capabilities

64. The boring log program, BORLOG, asks the user for a data file name, displays a summary of the data, and asks questions to set the plotting options.

Table 10

Examples of Contouring Subsurface Data Using Program BORCON

```
SOURCE LINE  19370
(W)1470 EQUALITY OR NON-EQUALITY COMPARISON MAY NOT BE MEANINGFUL I
N LOGICAL IF EXPRESSIONS
SOURCE LINE  22010
(W)1470 EQUALITY OR NON-EQUALITY COMPARISON MAY NOT BE MEANINGFUL I
N LOGICAL IF EXPRESSIONS
SOURCE LINE  46570
(W)1470 EQUALITY OR NON-EQUALITY COMPARISON MAY NOT BE MEANINGFUL I
N LOGICAL IF EXPRESSIONS
SOURCE LINE  52310
(W)1470 EQUALITY OR NON-EQUALITY COMPARISON MAY NOT BE MEANINGFUL I
N LOGICAL IF EXPRESSIONS
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*TENTOM2
RECORD $ & $ LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,3
  $ORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
$$$
$ BF-190-77      1602941.00       623252.00       230.70       208.20

-------------------------------------------------------------------
$ORID       LOC-NS      LOC-EW      TOP-HOLE    FEAT-ELEV
1           2           3           4           5

-------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*Y
ENTER X-COL$ & Y-COL$ (OR LAT$ & LONG$)
*2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
*N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
*N
DO YOU WANT TO CONTOUR SOMETHING CONTAINED IN THIS RECORD ? (Y/N)
*Y
YOU MAY CONTOUR THE RESULT OF
ANY COL +/- ANOTHER COL TIMES A FACTOR

TO SPECIFY, ENTER 3 NUMBERS. I.E., TO CONTOUR
COL$5-COL$3 TIMES 12, ENTER 5,-3,12. TO
CONTOUR ONLY COL$5, ENTER 5,0,1
*5,0,1
```

(Continued)

(Sheet 1 of 10)

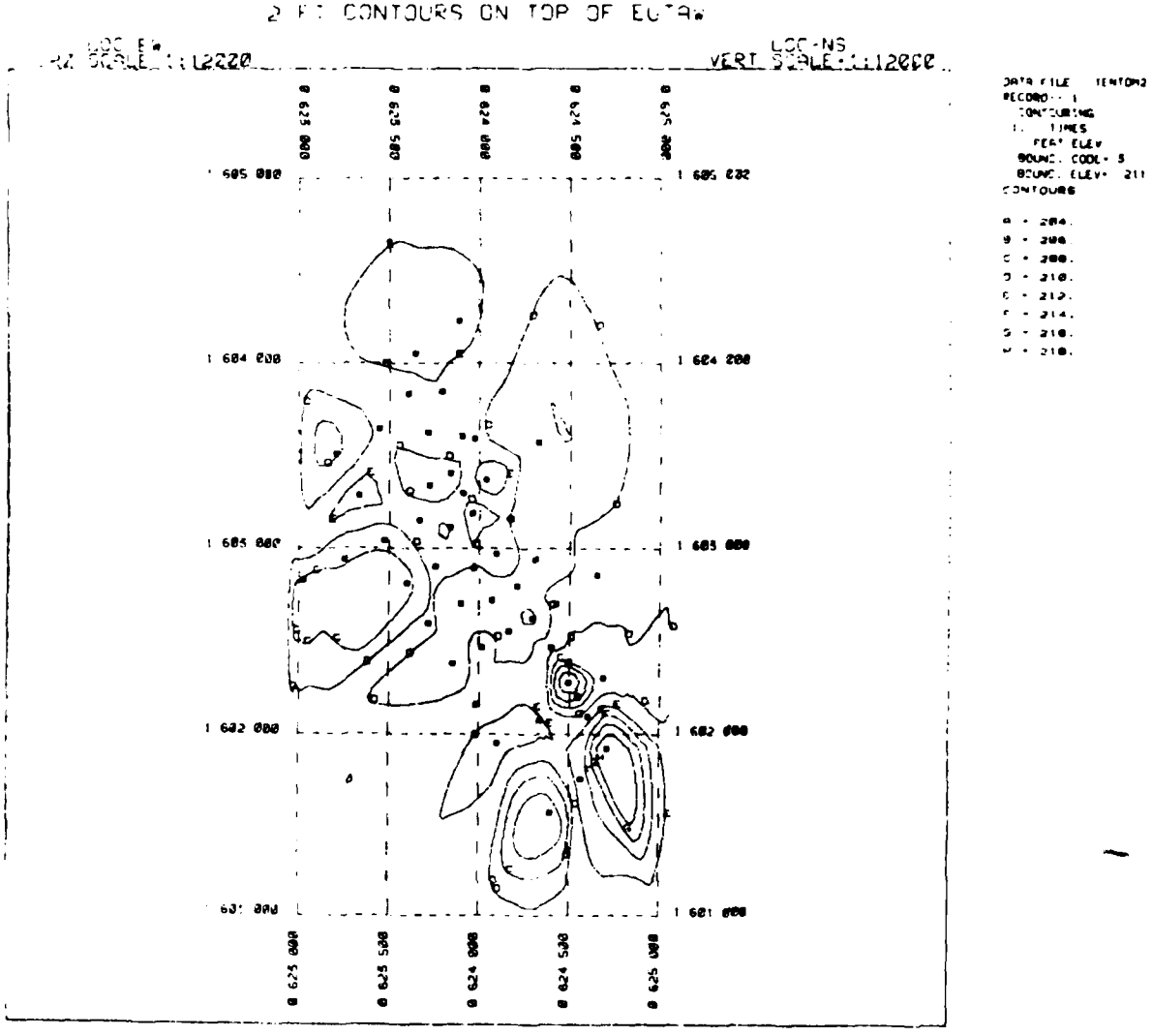
Table 10 (Continued)

```
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
•1
  47 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
•N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
•2 FT CONTOURS ON TOP OF EUTAW
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
•N
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
•0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
•Y
DO YOU STILL/NOW WANT TO INCLUDE CONTOURING ? (Y/N)
•Y
DO YOU WANT CONTOUR POINT VALUES PRINTED
 ON THE CONTOUR PLOT ? (Y/N)
•N
CHOOSE VERT SCALE >•1:     2000
CHOOSE HORZ SCALE >•1:     1000
•2400,2400
MIN EL•   203.00 MAX EL•   219.30
MIN CONTOUR AND CONTOUR INTERVAL ?
•204,2
BORDER ELEVATIONS MAY BE ESTABLISHED ALONG THE
OUTER GRID TICLINES.--- ASSIGNED AS:
  ENTER 0--DO NOT ASSIGN ELEVATIONS
        1--ASSIGN MINIMUM ELEV (FOR HILL)
        2--ASSIGN MAXIMUM ELEV (FOR VALLEY)
        3--ASSIGN (MIN+MAX)/2 (FOR HILL&VALLEY)
•3
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
•N
MAKE COPY AND/OR HIT RETURN
•
```

(Continued)

(Sheet 2 of 10)

Table 10 (Continued)



(Continued)

(Sheet 3 of 10)

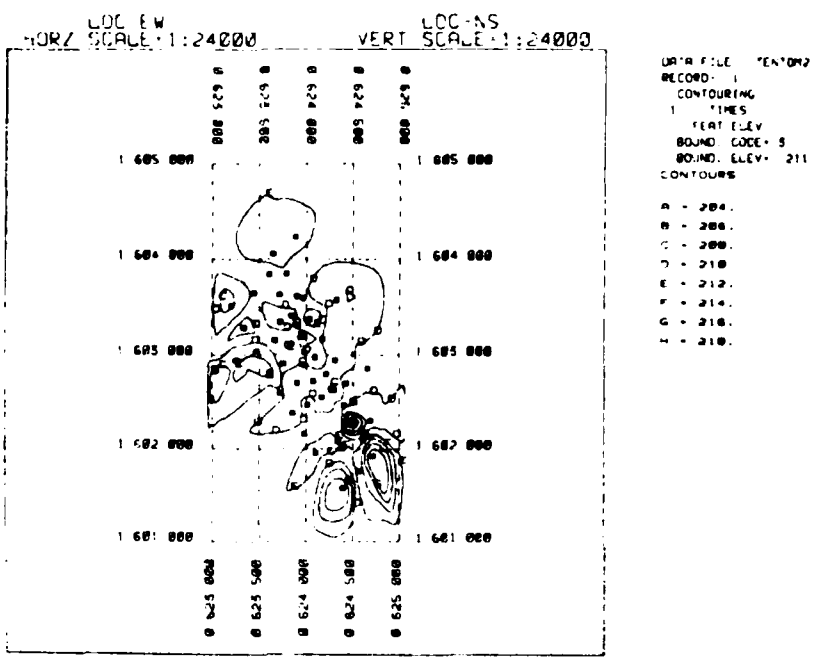
Table 10 (Continued)

```
DATAFILE NAME ?
•TENTOM8
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
•1,3
  BORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
###
# BF-190-77       1602941.00       623252.00       230.70       208.20

-------------------------------------------------------------------------
BORID         LOC-NS        LOC-EW        TOP-HOLE      FEAT-ELEV
1             2             3             4             5

-------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
•Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
•2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
•N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
•N
DO YOU WANT TO CONTOUR SOMETHING CONTAINED IN THIS RECORD ? (Y/N)
•Y
YOU MAY CONTOUR THE RESULT OF
ANY COL +/- ANOTHER COL TIMES A FACTOR

TO SPECIFY, ENTER 3 NUMBERS. I.E., TO CONTOUR
COL#5-COL#3 TIMES 12, ENTER 5,-3,12. TO
CONTOUR ONLY COL#5, ENTER 5,0,1
•5,0,1
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
•1
  47 DATA LINES WRITTEN ON 84
DO YOU WANT TO LIST 84 ? (Y/N)
•N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
•TENTOM LOCK 8 SPILLWAY CONTOURS TOP EUTAW
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
•N
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
•0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
•Y
DO YOU STILL/NOW WANT TO INCLUDE CONTOURING ? (Y/N)
•Y
DO YOU WANT CONTOUR POINT VALUES PRINTED
 ON THE CONTOUR PLOT ? (Y/N)
•N
CHOOSE VERT SCALE >•1:      2000
CHOOSE HORZ SCALE >•1:      1000
•4000,4000
MIN EL•   203.00 MAX EL•   219.30
MIN CONTOUR AND CONTOUR INTERVAL ?
•204,2
BORDER ELEVATIONS MAY BE ESTABLISHED ALONG THE
OUTER GRID TICLINES.--- ASSIGNED AS:
  ENTER 0--DO NOT ASSIGN ELEVATIONS
        1--ASSIGN MINIMUM ELEV (FOR HILL)
        2--ASSIGN MAXIMUM ELEV (FOR VALLEY)
        3--ASSIGN (MIN+MAX)/2 (FOR HILLS&VALLEY)
•3
ARE THE GRAPHICS TO GO TO THE DRY PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
•M
MAKE COPY AND/OR HIT RETURN
•
```

(Continued)

(Sheet 4 of 10)

Table 10 (Continued)



(Continued)

(Sheet 5 of 10)

Table 10 (Continued)

```
TO DRUM NOW ?(Y/N)
•Y
ENTER IDENT CARD INFORMATION
FOR WES: USERID,NAME
•R2GRCAC,GL-STROHM
INPUT STATION CODE FOR OUTPUT (00 IF NOT REMOTE)
•00
INPUT PRIORITY (5 OR 40)
•5
WANT DEFAULT SETTINGS (YES-OR-NO)
(PLAIN PAPER, PEN 1-BLACK BALL POINT,
 PEN 2-RED BALL POINT, PEN 3-GREEN BALL POINT,
 PEN 4-BLUE BALL POINT, REGULAR PEN SIZE)
•N
PLOT TAPE DESCRIPTION (12 CHARACTERS MAX)

CHAR 1 - *
CHAR 2 - C
CHAR 3 - PAPER (P-PLAIN, G-GRID, S-SPECIAL)
CHAR 4 - PEN 1 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 5 - PEN 1 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 6 - PEN 2 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 7 - PEN 2 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 8 - PEN 3 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 9 - PEN 3 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 10 - PEN 4 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 11 - PEN 4 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 12 - LIQUID INK PEN SIZE (R-REGULAR,F-FINE,X-EXTRA
                                                FINE

EXAMPLE - TYPING IN THE FOLLOWING YIELDS A PLOT TAPE WITH
          PLAIN PAPER AND PEN 1 BEING BLACK LIQUID INK

 *CPLB

ENTER DESCRIPTION
•*CPLU
```

Drum Plot Copy not Included

(Continued)

(Sheet 6 of 10)

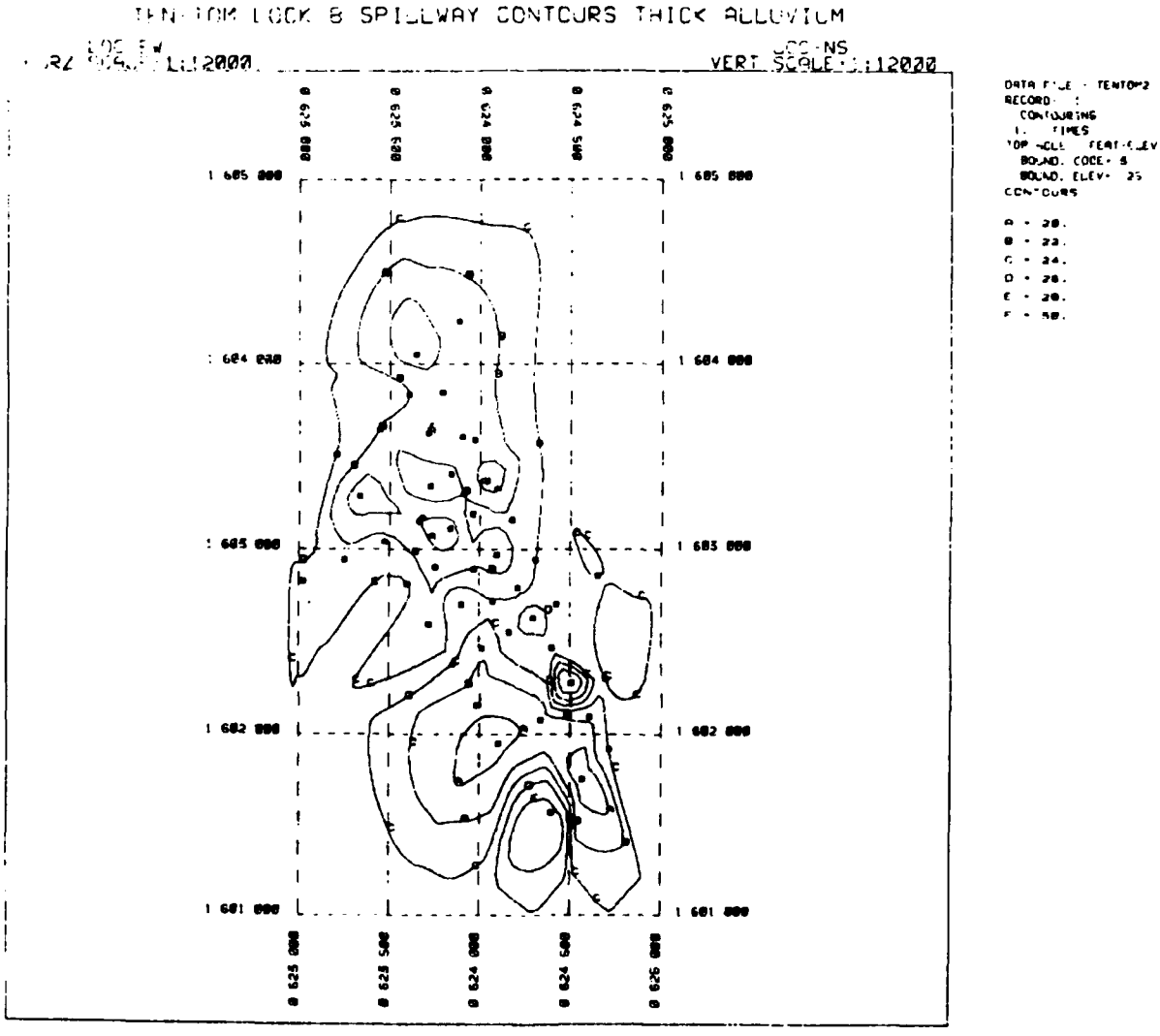
Table 10 (Continued)

```
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
*TENTOM2
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
*1,3
  BORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
###
# BF-190-77       1602941.00       623252.00       230.70       208.20

-------------------------------------------------------------------------
BORID        LOC-NS       LOC-EW       TOP-HOLE     FEAT-ELEV
1            2            3            4            5

-------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
*Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
*2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
*N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
*N
DO YOU WANT TO CONTOUR SOMETHING CONTAINED IN THIS RECORD ? (Y/N)
*Y
YOU MAY CONTOUR THE RESULT OF
ANY COL +/- ANOTHER COL TIMES A FACTOR

TO SPECIFY, ENTER 3 NUMBERS. I.E., TO CONTOUR
COL#5-COL#3 TIMES 12, ENTER 5,-3,12. TO
CONTOUR ONLY COL#5, ENTER 5,0,1
*4,-5,1
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
*1
  47 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
*N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
*TEN-TOM LOCK B SPILLWAY CONTOURS THICK ALLUVIUM
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
*N
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
*0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
*Y
DO YOU STILL/NOW WANT TO INCLUDE CONTOURING ? (Y/N)
*Y
DO YOU WANT CONTOUR POINT VALUES PRINTED
 ON THE CONTOUR PLOT ? (Y/N)
*N
CHOOSE VERT SCALE >=1:      2000
CHOOSE HORZ SCALE >=1:      1000
*2400,2400
MIN EL=    19.50 MAX EL=    31.50
MIN CONTOUR AND CONTOUR INTERVAL ?
*20,2
BORDER ELEVATIONS MAY BE ESTABLISHED ALONG THE
OUTER GRID TICLINES.---- ASSIGNED AS:
  ENTER 0--DO NOT ASSIGN ELEVATIONS
        1--ASSIGN MINIMUM ELEV (FOR HILL)
        2--ASSIGN MAXIMUM ELEV (FOR VALLEY)
        3--ASSIGN (MIN+MAX)/2 (FOR HILL&VALLEY)
*3
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
*Y
MAKE COPY AND/OR HIT RETURN
*
```

(Continued)

(Sheet 7 of 10)

Table 10 (Continued)



(Continued)

(Sheet 8 of 10)

Table 10 (Continued)

```
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'DATAFILE NAME'

DATAFILE NAME ?
•TEN$OM2
RECORD # & # LINES TO BE PRINTED ?
  (ENTER 0,0 TO CHANGE DATAFILE)
•1,3
  $ORID              LOC-NS          LOC-EW      TOP-HOLE    FEAT-ELEV
###
# BF-190-77       1602941.00       623252.00       230.70       208.20

-------------------------------------------------------------------------
BORID       LOC-NS      LOC-EW      TOP-HOLE    FEAT-ELEV
1           2           3           4           5

-------------------------------------------------------------------------
IS THIS THE RECORD YOU WANT (Y OR N) ?
•Y
ENTER X-COL# & Y-COL# (OR LAT# & LONG#)
•2,3
ARE LOC N-S & LOC E-W ALREADY IN DEGREES ? (Y/N)
•N
DO YOU WANT TO CONVERT TO LAT & LONG ?(Y/N)
•N
DO YOU WANT TO CONTOUR SOMETHING CONTAINED IN THIS RECORD ? (Y/N)
•Y
YOU MAY CONTOUR THE RESULT OF
ANY COL +/- ANOTHER COL TIMES A FACTOR

TO SPECIFY, ENTER 3 NUMBERS. I.E., TO CONTOUR
COL#5-COL#3 TIMES 12, ENTER 5,-3,12. TO
CONTOUR ONLY COL#5, ENTER 5,0,1
•4,-5,1
WHICH COL IS THE DESCRIPTOR ?
ZERO RESPONSE MEANS DESCRIPTOR WILL
BE CREATED AS 1,2,3,....N
•1
  47 DATA LINES WRITTEN ON 04
DO YOU WANT TO LIST 04 ? (Y/N)
•N
A RESPONSE OF R TO ANY Y/N QUESTION WILL
REDIRECT CONTROL TO THE QUERY 'TITLE'

PLOT TITLE ? (TYPE QUIT TO GET DATAFILE QUERY)
•TEN-TOM LOCK B SPILLWAY CONTOURS THICK ALLUVIUM
BORING DESCRIPTORS TO BE PRINTED ON PLOT ? (Y/N)
•N
SCALING OPTIONS. ENTER 0-AUTO
   1-SET MANUALLY  2-USE LAST SCALE
•0
DO YOU WANT THE GRID DRAWN ? (Y/N OR H IF
 YOU WANT THE GRID TICLINES BUT NO LABELS)
•Y
DO YOU STILL/NOW WANT TO INCLUDE CONTOURING ? (Y/N)
•Y
DO YOU WANT CONTOUR POINT VALUES PRINTED
 ON THE CONTOUR PLOT ? (Y/N)
•N
CHOOSE VERT SCALE >•1:     2000
CHOOSE HORZ SCALE >•1:     1000
•4800,4800
MIN EL•    19.50 MAX EL•    31.50
```

(Continued)

(Sheet 9 of 10)

Table 10 (Concluded)

```
MIN CONTOUR AND CONTOUR INTERVAL ?
•30,2
BORDER ELEVATIONS MAY BE ESTABLISHED ALONG THE
OUTER GRID TICLINES.--- ASSIGNED AS:
  ENTER 0--DO NOT ASSIGN ELEVATIONS
        1--ASSIGN MINIMUM ELEV (FOR HILL)
        2--ASSIGN MAXIMUM ELEV (FOR VALLEY)
        3--ASSIGN (MIN+MAX)/2 (FOR HILL&VALLEY)
•3
ARE THE GRAPHICS TO GO TO THE DRUM PLOTTER ?
 Y/N/M--(M for maybe-gives preview on screen)
•Y
MAKE COPY AND/OR HIT RETURN
•
ENTER IDENT CARD INFORMATION
FOR UES: USERID,NAME
•R0GRCAC,GL-STROHM
INPUT STATION CODE FOR OUTPUT (00 IF NOT REMOTE)
•00
INPUT PRIORITY (5 OR 40)
•5
WANT DEFAULT SETTINGS (YES-OR-NO)
(PLAIN PAPER, PEN 1-BLACK BALL POINT,
 PEN 2-RED BALL POINT, PEN 3-GREEN BALL POINT,
 PEN 4-BLUE BALL POINT, REGULAR PEN SIZE)
•N
PLOT TAPE DESCRIPTION (12 CHARACTERS MAX)

CHAR 1 - *
CHAR 2 - C
CHAR 3 - PAPER (P-PLAIN, G-GRID, S-SPECIAL)
CHAR 4 - PEN 1 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 5 - PEN 1 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 6 - PEN 2 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 7 - PEN 2 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 8 - PEN 3 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 9 - PEN 3 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 10 - PEN 4 TYPE (B-BALL POINT, L-LIQUID INK)
CHAR 11 - PEN 4 COLOR (R-RED,G-GREEN,B-BLACK,U-BLUE)
CHAR 12 - LIQUID INK PEN SIZE (R-REGULAR,F-FINE,X-EXTRA
                                                FINE

EXAMPLE - TYPING IN THE FOLLOWING YIELDS A PLOT TAPE WITH
          PLAIN PAPER AND PEN 1 BEING BLACK LIQUID INK

 *CPLB

ENTER DESCRIPTION
•*CPLU
$NUMB 6540F
```

Drum Plot Copy not Included

(Sheet 10 of 10)

Options include plotting of any or all elevation type data, drum plots, number of feet of log per frame (screen) or vertical scale for preview plots and profiles of logs, reference elevation, cutoff elevation, and horizontal scale for profiles. One or more plots will be generated per screen, depending on the plot width (number of different elevation data elements). Plots of single borings can be sent to the drum plotter for page size copies to be included in design or construction documents. Tall plots of single borings or of a series of borings at a specified vertical scale can also be directed to a drum plotter. Plots for drum plotting can be previewed at the graphics terminal before deciding whether a drum plot is desired. Previewed tall plots are drawn to a small size to show how they will fit on the drum plotter paper size. The small text characters on the screen will be the proper size on the drum plot.

BORLOG data files

65. A data file for use with BORLOG must be generated from the data base with the PRINT command (paragraph 43) and contain all boring information and data, including the SID number (paragraph 27). The data file can be generated using a special procedure file to ensure sequential ordering of elevation data and clean plots. The following command is used to enter the data base and save the generated report file of selected data:

```
BEGIN,,GETLOG
```

This command invokes System 2000 and the user types in the data base password and data base name as shown on the first sheet of Table 10. A special command file (BORORD) is then used to store retrieved data in a file called LOGFILE using a series of PRINT and COMMAND FILE statements also shown on sheet 1 of Table 11. After retrieving the desired data, the EXIT command is entered to close the data base. The user should then rename LOGFILE to a desired name for use with BORLOG with the following command:

```
CHANGE,NEWNAME=LOGFILE
```

If LOGFILE is not renamed and used with BORLOG, the next time the user issues the command, BEGIN,,GETLOG a message will appear that LOGFILE already exists and the user will have to delete the file using the command PURGE,LOGFILE. Alternatively, the user can rename LOGFILE to another name to save the data for later use.

BORLOG access and prompts

66. Access and execution of BORLOG is accomplished with the command:

```
BEGIN,,BORLOG
```

At the beginning of the program the response to the first prompts should be 0 as explained in paragraph 57. The user is then asked for the name of the data file. When the name is entered, a summary of the data is displayed (SID, BORING, PROJECT, TOP-ELEV, DEPTH) with column numbers and names of elevation type data elements and associated elements (Sheet 3 of Table 11). Subsequent prompts are explained below. After a response to a prompt, the return key is depressed. On CDC, care should be taken not to hit the return key more than once to avoid skipping a prompt.

```
SELECT SYS ID AND TOTAL # OF COLS TO BE PLOTTED.
(ENTER 0,0 TO CHANGE DATAFILE)
(ENTER -1,0 TO EXIT PROGRAM)
(ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
```

The SID for the desired boring and the total number of columns of data to be plotted are entered (e.g., 18,5). This prompt is repeated after each plot and the user can plot the same data for a different boring using the last option shown above.

```
ENTER COL #'S (I.E. 1,2,4,5,...ETC).
```

The column numbers for the data to be plotted are entered and need not be in numerical order.

```
TO DRUM?  (Y OR N OR P--TO PREVIEW DRUM PLOT).
```

If N is entered, the program skips to LENGTH OF HOLE prompt. If Y or P is entered the following prompt is displayed:

```
IS PLOT TO BE (S)SMALL-(8 1/2 X 14) OR (T)TALL?
(ENTER S OR T)
```

If S is entered the program skips to LENGTH OF HOLE prompt. If T is entered, the following two prompts are displayed.

```
HOW TALL?  (ENTER # INCHES OF HEIGHT--27 IN MAX)
```

The height for the vertical length of log per plot is entered. The program then asks:

```
DO YOU WANT THE SUBSEQUENT PLOT
SPACED FOR PROFILING?  (Y OR N)
```

If N is entered the following two prompts are issued.

```
LENGTH OF HOLE = 126.50 FT
ENTER SCALE--(1 IN=?? FT)
```

The vertical scale for feet per inch is entered (e.g., 10).

```
TOP OF HOLE ELEV= 234.10
ENTER REF ELEV
```

The desired reference elevation is entered (e.g., 240). If Y is entered to the prompt for a subsequent plot spaced for profiling, the program returns to SELECT SYS ID AND TOTAL # OF COLS TO BE PLOTTED prompt. After the desired option (and additional prompts as appropriate are answered), the following prompt is issued.

```
DISTANCE BETWEEN BORINGS IS     253.57
ENTER # OF FT PER INCH FOR HORZ SCALE
ENTER -1 TO BYPASS THIS BORING
ENTER -2 TO SELECT/CHANGE DISTANCE
```

The distance shown is that between the last boring entered and the next boring specified (e.g., by entering 18,0 to the first prompt). The last option (-2) is to enter a distance if none is shown (data not in the file) or to change the shown distance if it is desired to reduce or expand the horizontal distance between the borings for a horizontal scale to be entered next, or if insufficient information does not permit the calculation of the distance between the borings. The horizontal scale is then entered (e.g., 20). The next prompt will be the first prompt (SELECT SYS ID AND TOTAL # OF COLS TO BE PLOTTED).

```
LENGTH OF HOLE=     100.50 FT
ENTER #FT/FRAME
```

This prompt is issued when the prompt TO DRUM? is answered with N, or S is entered for a plot to be tall or small. The number of feet of log per page (screen) is entered (e.g., 20).

```
TOP OF HOLE ELEV=    126.50 FT
DO YOU WISH TO SET A REF ELEV
DIFFERENT THAN ABOVE?  (Y OR N)
```

If Y is entered, the following prompt appears:

```
ENTER REFERENCE ELEVATION
```

The reference elevation for the top of hole is entered (e.g., 130).

```
DO YOU WISH TO CHOP OFF THE BOTTOM OF THE LOG
AT SOME SPECIFIC ELEVATION?  (Y OR N)
```

If Y is entered, this prompt allows the user to specify only a segment of a boring log to be plotted with the following prompt:

```
ENTER THE 'CHOP-OFF' ELEV
```

The cutoff elevation is entered (e.g., 120). The terminal then beeps to indicate the plot is ready to be drawn and the screen should be copied before hitting the return key. If N is entered, the terminal beeps to indicate the plot is ready to be drawn. After the log is plotted, the first prompt is displayed to restart the prompt sequence.

67. Whenever a preview plot is drawn under the TO DRUM? option of P, the program returns to the first prompt, but the user is not asked "TO DRUM NOW" as is done in the other programs. The user must respecify the plot after answering Y to the TO DRUM? option. In this case no plot is drawn at the terminal and the user is asked for user identification information on CDC and additional information on the Honeywell system (see Sheets 17 and 18 of Table 9).

BORLOG scales

68. All tall plots sent to the drum plotter are drawn to the specified engineering scale (e.g., 1 in. = 10 ft). However, boring logs plotted at the graphics terminal are drawn to a scale to fit the screen according to the user-specified number of feet of log per frame (screen). Thus, the actual scale on the hard copy is not set to any engineering scale. However, all logs are plotted with elevation scales on both sides of the plot. If hard copy plots are desired to match an engineering scale, the following procedure can be used:

a. Plot a simplified boring segment to three different feet of log per frame and measure the number of feet per inch on the hard copies.

b. Make a hand plot of entered feet per frame versus the measured scale to determine possible feet per page to obtain a desired engineering scale on subsequent plots.

This procedure is necessary for each graphics terminal, since the reduction ratio from screen to the hard copy machine may be different. The same procedure can be used for preview plots at the terminal by using different heights in answer to the TALL plot option in addition to different entered scales and plotting the results.

BORLOG examples

69. Table 11 shows examples of data file generation and use of the BORLOG program. Single boring logs are plotted first to illustrate formatting to a local standard, as shown in Figure 7, and the effect of using fewer data elements. A profile is then generated on CDC for drum plotting. Retrieval of a drum plot file for plotting is similar to that for BORMAP (paragraph 59). The cost of these example plots on CDC was about $24.

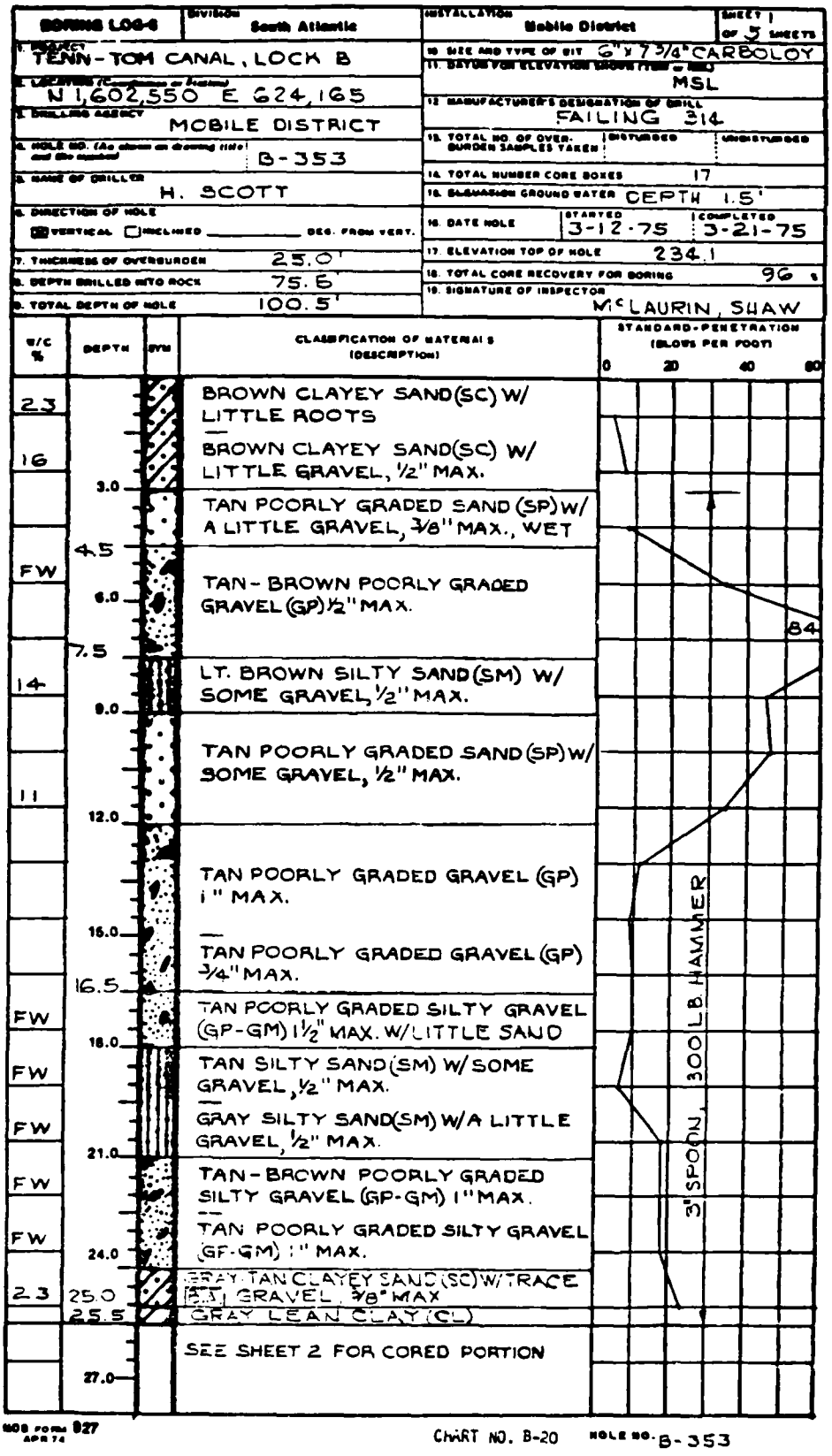


Figure 7. Boring log used for example plots

Table 11

Examples of Boring Logs Using Program BORLOG

```
BEGIN,,GETLOG

 "S2K 2.60F"

 84/04/25. 16.47.17. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
? USER,DLW;SHARED DBN IS BORDB;
 -556-   ASSIGNED   BORDB                    1    565 84/04.
 ---
? PR C1 WH C1 EQ B-353;
 1* B-353
 ---
? COMMAND FILE IS BORORD;
 ---
? PR C1 WH C1 EQ B-454;
 1* B-454
 ---
? COMMAND FILE IS BORORD;
 ---
? PR C1 WH C1 EQ B-456;
 1* B-456
 ---
? COMMAND FILE IS BORORD;
 ---
? PR C1 WH C1 EQ B-460;
 1* B-460
 ---
? COMMAND FILE IS BORORD;
 ---
? PR C1 WH C1 EQ B-494;
 1* B-494
 ---
? COMMAND FILE IS BORORD;
 ---
? EXIT;
```

(Continued)

Table 11 (Continued)

```
 -506-    CLOSED      BORDB                          :    565 84/04/2
 84/04/25. 16.50.29. END    SYSTEM 2000  VERSION 2.60F
$REVERT.CCL
/CHANGE,TENTOML=LOGFILE



 BEGIN,,BORLOG

  IF YOU WANT TO USE ORD (80 CHARACTER RECORDS)
  CALCOMP RJE PLOT ROUTINES, ENTER AN O.

  IF YOU WANT TO USE KANSAS CITY(132 CHARACTER RECORDS)
  CALCOMP RJE PLOT ROUTINES, ENTER A K.

 ? O
```

(Continued)

(Sheet 2 of 16)

Table 11 (Continued)

```
DATAFILE NAME ?
? TENTOML

 S-S ID     BORING      PROJECT      TOP-ELEV      DEPTH      1 FEAT   2 DESC   3 CTS   4 TCOL   5 SIZE   6 TEST   7 MAT   8 RES-1   9 RES-2   10 RES-3   11 RES-4

    14      B-353       TEN-TOM CA     234.10     100.50        64       64      17       20       20        6       6         6         6          6          5
    15      B-454       TEN-TOM CA     232.50     131.80        23       23      18       43       43        9       9         9         9          9          4
    16      B-456       TEN-TOM CA     232.00     150.50        20       20      15       30       30        6       6         6         6          6          3
    17      B-460       TEN-TOM CA     231.60     132.70        26       26      15       26       26        5       5         5         5          5          3
    18      B-494       TEN-TOM CA     232.00     126.50        29       29      17       44       44        8       8         4         8          8          6

 COPY THIS PAGE FOR REFERENCE


    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 54,5
 ENTER COL #'S (I.E. 1,2,4,5,...ETC)
? 1,2,3,4,5
 TO DRUM ? (Y OR N OR P--TO PREVIEW DRUM PLOT)
? N
 IS PLOT TO BE (S)SMALL-(8 1/2 X14)
 OR (T)TALL ? (ENTER S OR T)
? S
 LENGTH OF HOLE=   100.50 FT
 ENTER #FT/FRAME
? 25
 TOP HOLE ELEV=   234.10
 DO YOU WISH TO SET A REF ELEV
 DIFFERENT THAN ABOVE ? (Y OR N)
? N
 DO YOU WISH TO CHOP OFF THE BOTTOM
 OF THE LOG AT SOME SPECIFIC ELEV ? (Y OR N)
? N
```

(Continued)

(Sheet 3 of 16)

Table 11 (Continued)

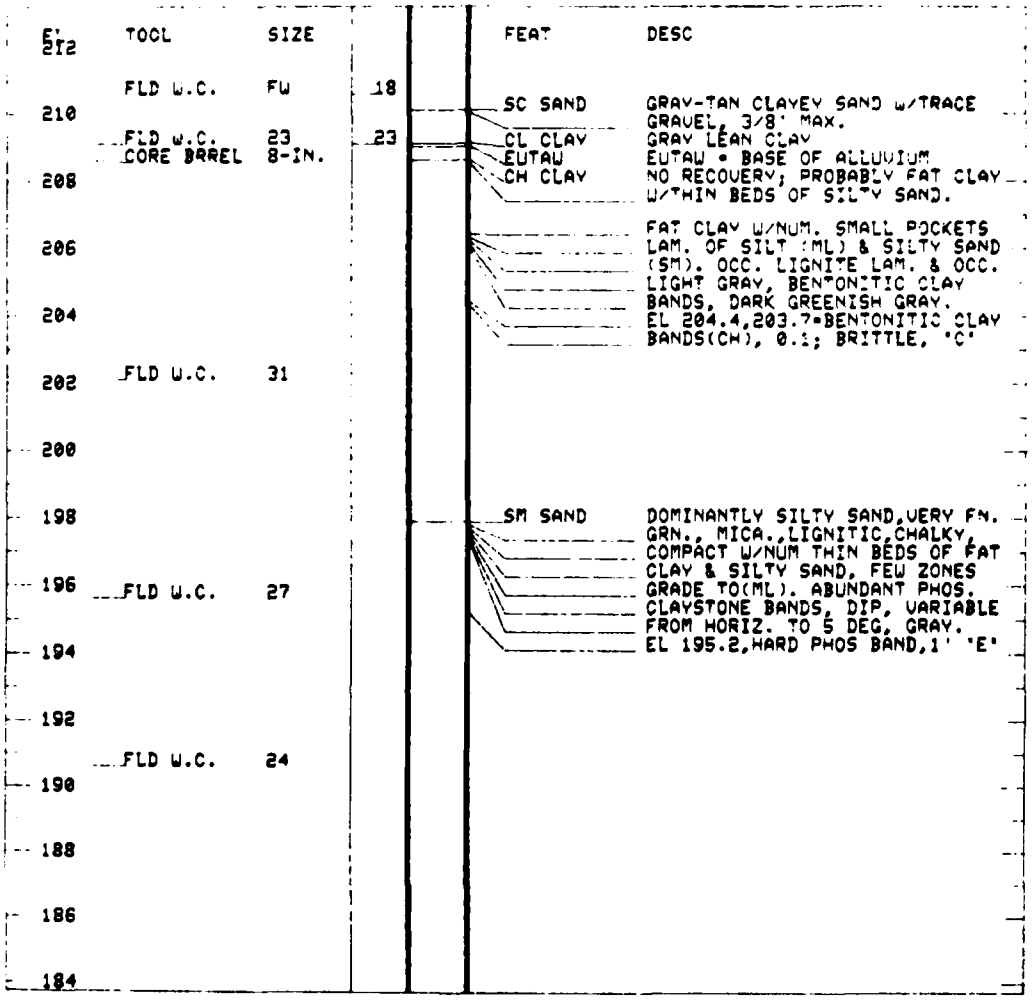
PROJ: TEN-TOM CANAL
SITE: LOCK B SPILLWAY, DM NO. 23
PURPOSE: FOUND INVEST
NS: 1602550.00 EW 624165.00 SID: 14

EL	TOOL	SIZE	CTS	BORID / FEAT	DESC
				B-353 -03/21/1975	
236					
234	SPLT SPOON	6-IN.		SC SAND	BROWN CLAYEY SAND W/ROOTS
	FLD W.C.	23	4		BROWN CLAYEY SAND W/GRAVEL
232	FLD W.C.	16	7	WT 03/12	GROUND WATER DEPTH, 3/12/75
				SP SAND	TAN POORLY GRADED SAND W/ A LITTLE GRAVEL, 3/8" MAX. WET
230			8	GP GRAVEL	TAN-BROWN POORLY GRADED GRAVEL
	FLD W.C.	FW	34		
228					
			84	SM SAND	LT. BROWN SILTY SAND W/ SOME GRAVEL, 1/2" MAX.
226	FLD W.C.	14	45	SP SAND	TAN POORLY GRADED SAND W/ SOME GRAVEL, 1/2" MAX.
224			46		
	FLD W.C.	11	34	GP GRAVEL	TAN POORLY GRADED GRAVEL 1"MAX
222			11		
220			9		TAN POORLY GRADED GRAVEL 3/4"
218			10	GP-GM GRAV	TAN POORLY GRADED SILTY GRAVEL 1 1/2" MAX W/LITTLE SAND.
	FLD W.C.	FW	10	SM SAND	TAN SILTY SAND W/SOME GRAVEL, 1/2" MAX.
216	FLD W.C.	FW	7		GRAV SILTY SAND W/ A LITTLE GRAVEL, 1/2" MAX.
214	FLD W.C.	FW	18	GP-GM GRAV	TAN-BROWN POORLY GRADED SILTY GRAVEL, 1" MAX.
212	FLD W.C.	FW	18		TAN POORLY GRADED SILTY GRAVEL 1" MAX
210				SC SAND	GRAY-TAN CLAYEY SAND W/TRACE

(Continued)

(Sheet 4 of 16)

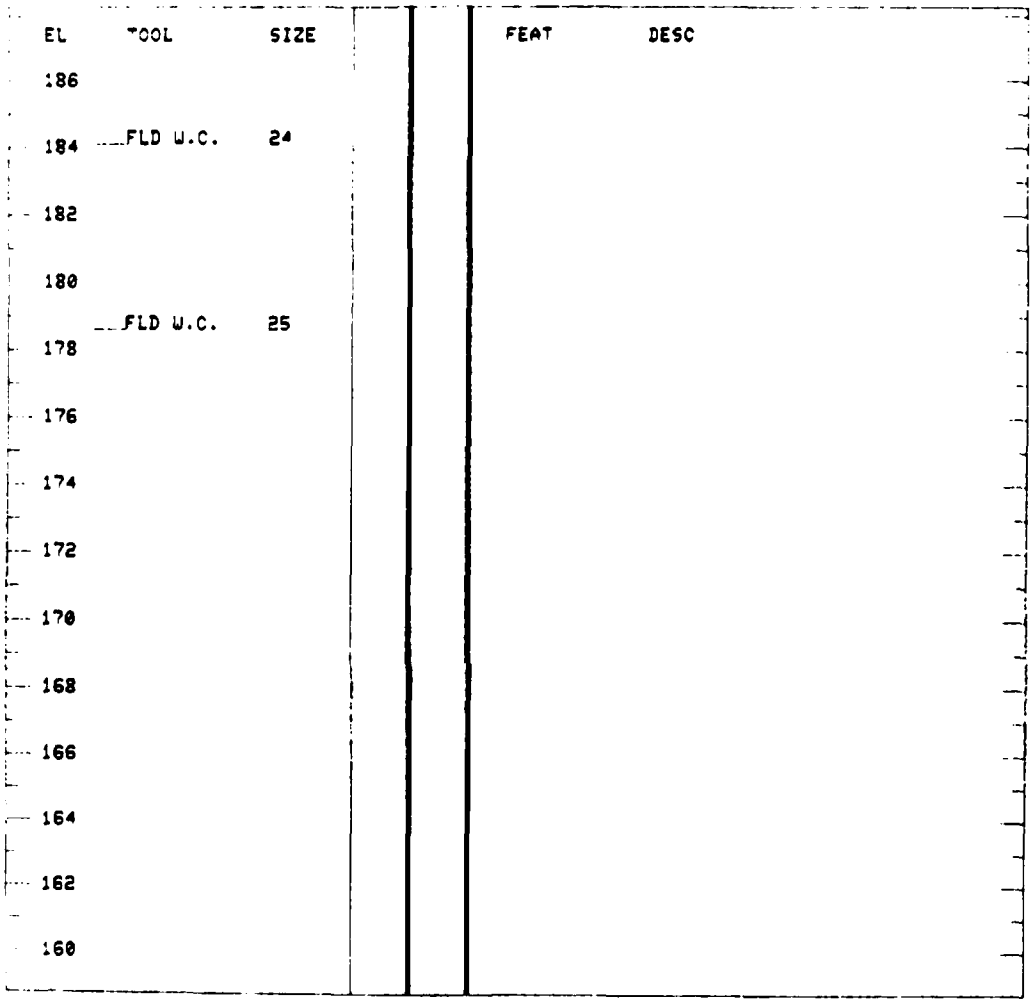
Table 11 (Continued)



(Continued)

(Sheet 5 of 16)

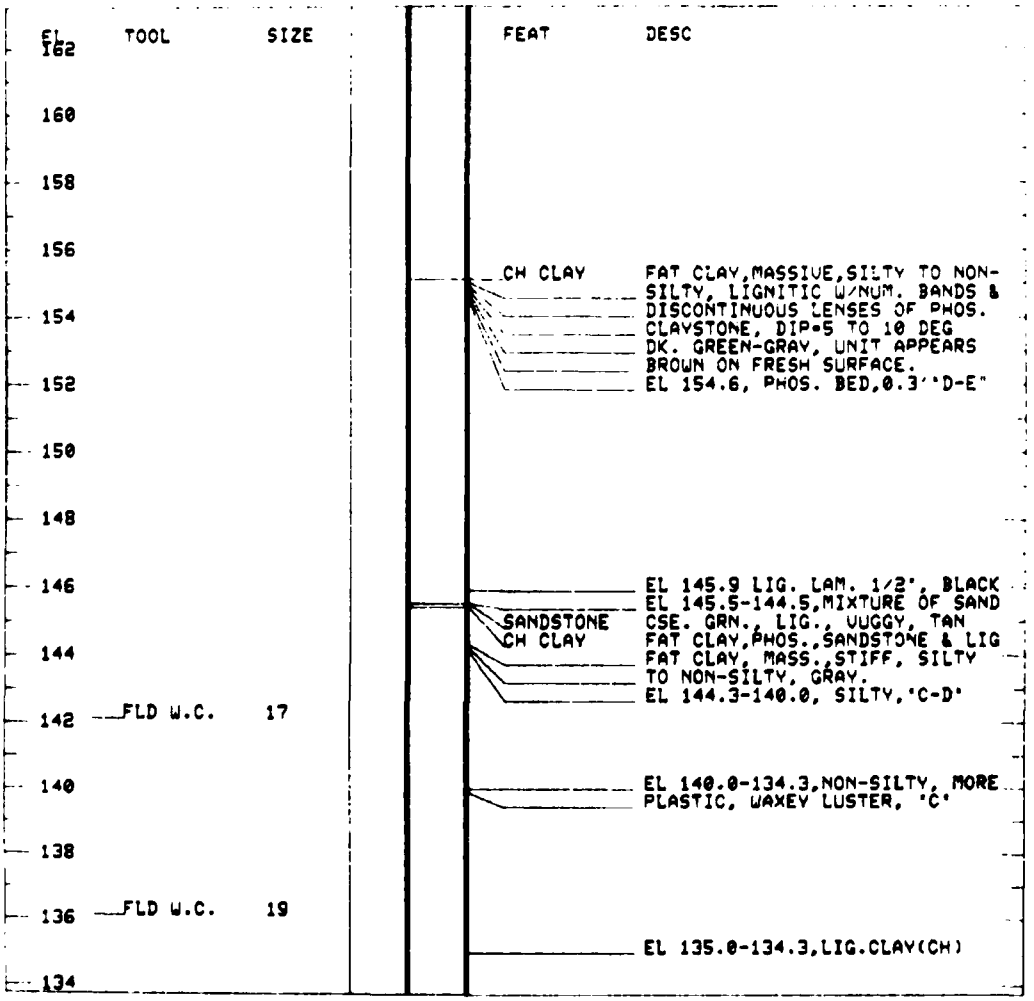
Table 11 (Continued)



(Continued)

(Sheet 6 of 16)

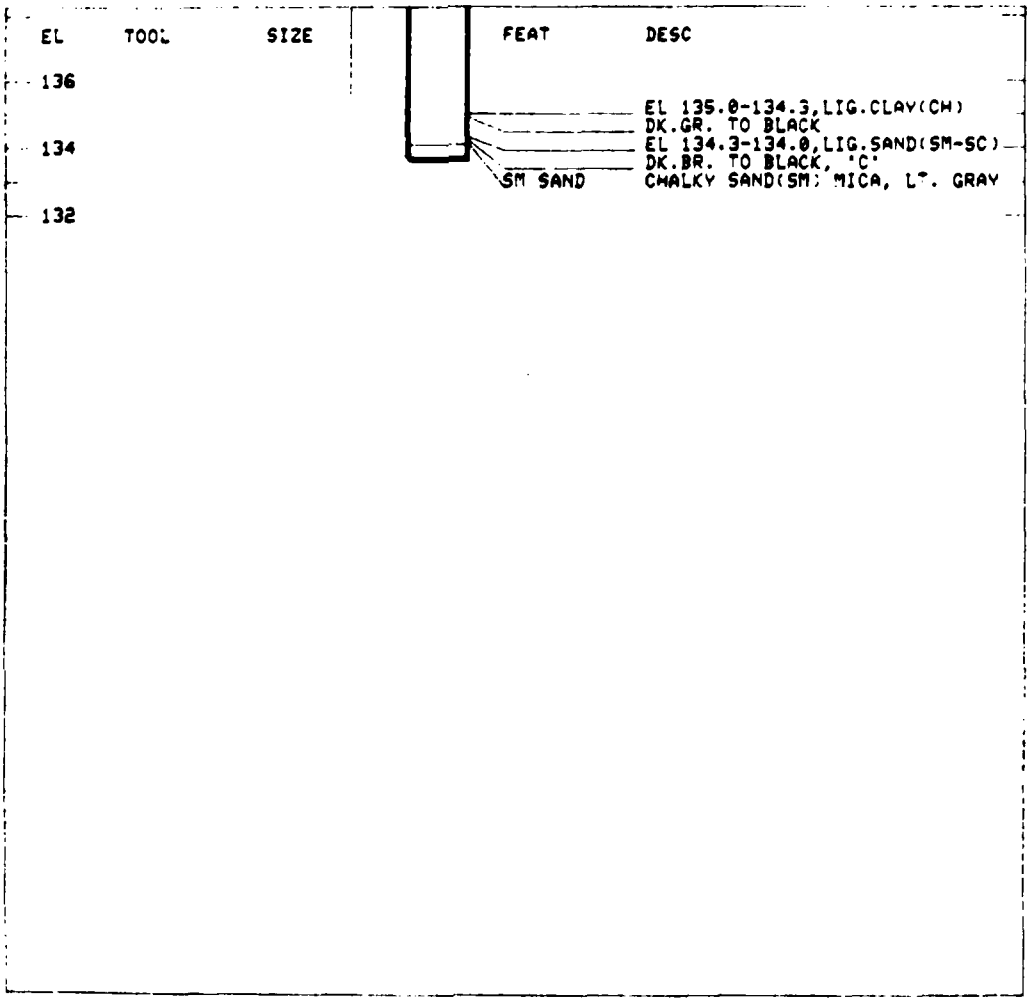
Table 11 (Continued)



(Continued)

(Sheet 7 of 16)

Table 11 (Continued)



(Continued)

(Sheet 8 of 16)

Table 11 (Continued)

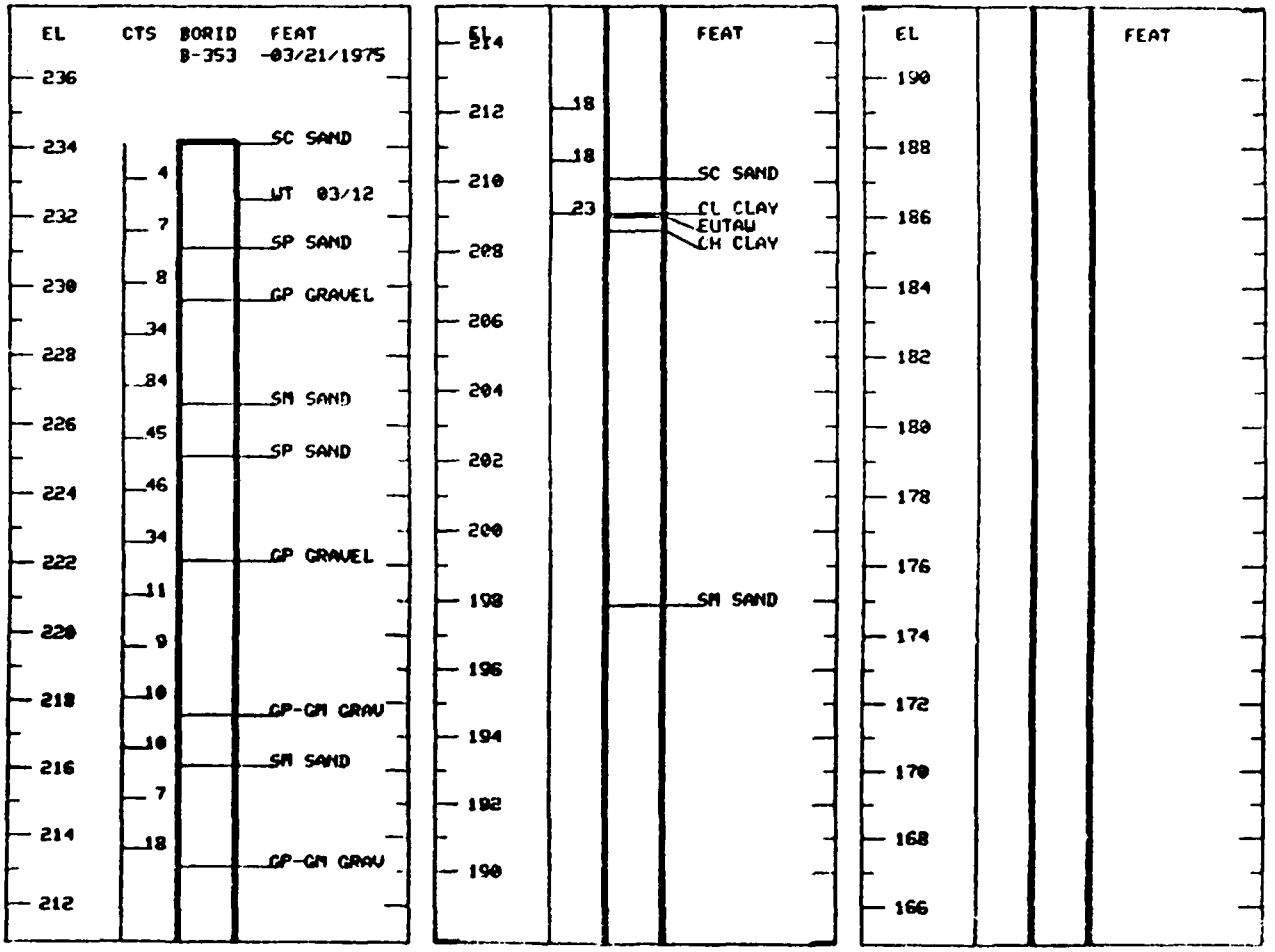
```
   SELECT SYS ID AND TOTAL # OF COLS TO BE
   PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
            (ENTER -1,0 TO EXIT PROGRAM)
            (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 14,2
 ENTER COL #'S (I.E. 1,2,4,5,...ETC)
? 1,3
 TO DRUM ? (Y OR N OR P--TO PREVIEW DRUM PLOT)
? N
 LENGTH OF HOLE=    100.50 FT
 ENTER #FT/FRAME
? 23
 TOP HOLE ELEV=    234.10
 DO YOU WISH TO SET A REF ELEV
 DIFFERENT THAN ABOVE ? (Y OR N)
? N
 DO YOU WISH TO CHOP OFF THE BOTTOM
 OF THE LOG AT SOME SPECIFIC ELEV ? (Y OR N)
? N
```

(Continued)

(Sheet 9 of 16)

Table 11 (Continued)

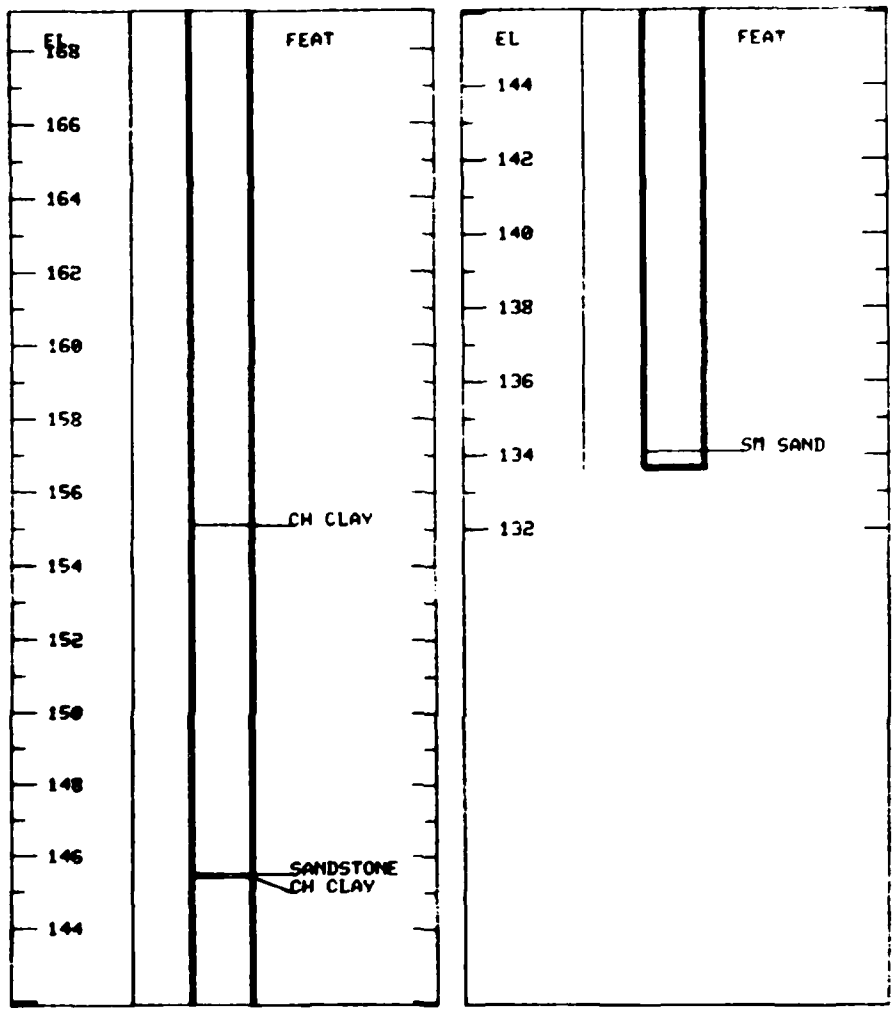
PROJ: TEN-TOM CANAL
SITE: LOCK B SPILLWAY, DM NO. 23
PURPOSE: FOUND INVEST
NS: 1602550.00 EW 624165.00 SID: 14



(Continued)

(Sheet 10 of 16)

Table 11 (Continued)



(Continued)

(Sheet 11 of 16)

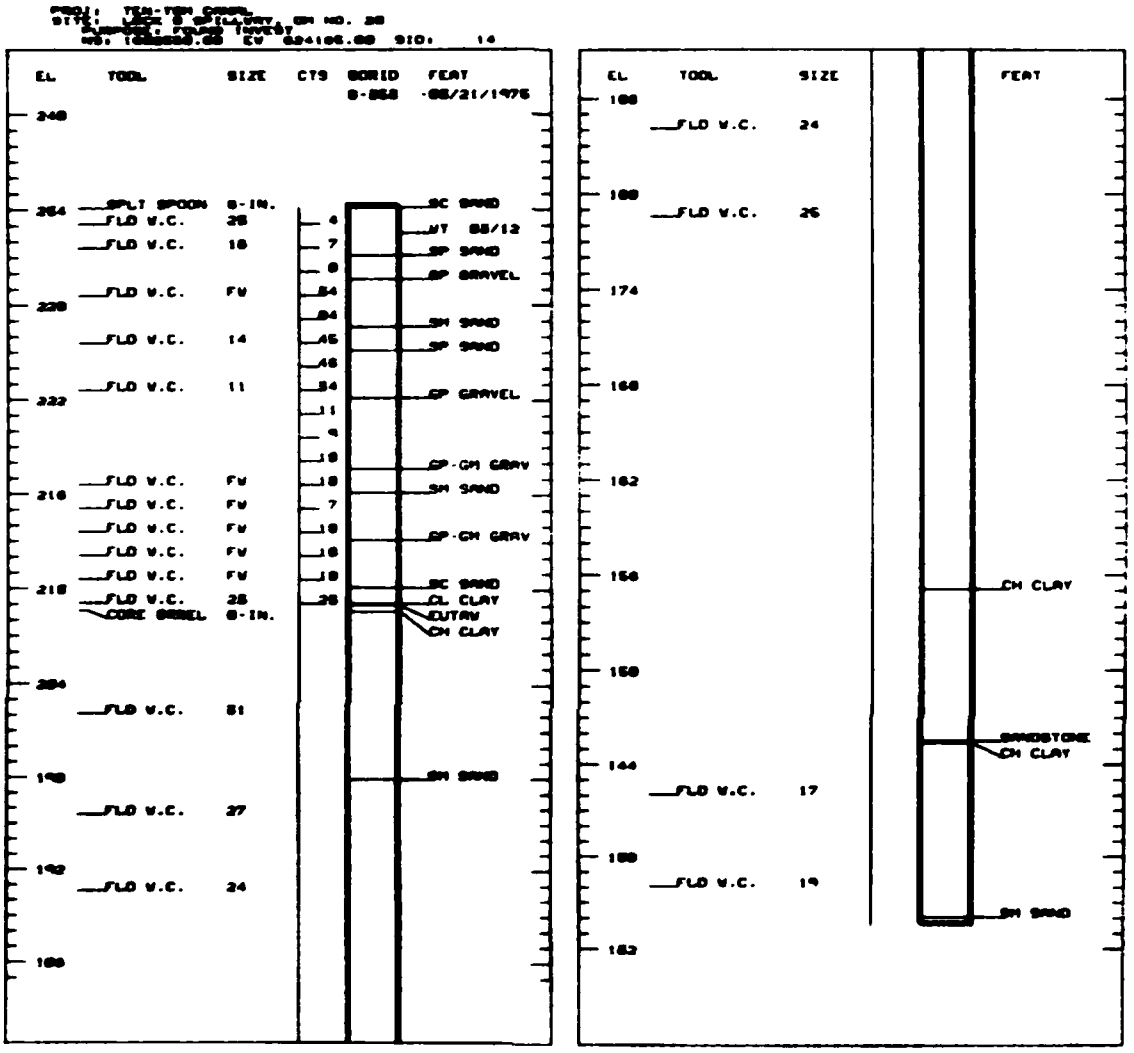
Table 11 (Continued)

```
    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 14,4
 ENTER COL #'S (I.E. 1,2,4,5,...ETC)
? 1,3,4,5
 TO DRUM ? (Y OR N OR P--TO PREVIEW DRUM PLOT)
? P
 IS PLOT TO BE (S)MALL-(8 1/2 X14)
 OR (T)ALL ? (ENTER S OR T)
? T
 HOW TALL ? (ENTER # INCHES OF HEIGHT--27 IN MAX)
? 9.2
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? N
 LENGTH OF HOLE=   100.50 FT
 ENTER SCALE--(1 IN=?? FT)
? 6
 TOP HOLE ELEV=   234.10
 DO YOU WISH TO SET A REF ELEV
 DIFFERENT THAN ABOVE ? (Y OR N)
? N
 DO YOU WISH TO CHOP OFF THE BOTTOM
 OF THE LOG AT SOME SPECIFIC ELEV ? (Y OR N)
? N
```

(Continued)

(Sheet 12 of 16)

Table 11 (Continued)



(Continued)

(Sheet 13 of 16)

Table 11 (Continued)

```
    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 14,4
 ENTER COL #'S (I.E. 1,2,4,5,...ETC)
? 1,3,4,5
 TO DRUM ? (Y OR N OR P--TO PREVIEW DRUM PLOT)
? Y
 IS PLOT TO BE (S)SMALL-(8 1/2 X14)
 OR (T)TALL ? (ENTER S OR T)
? T
 HOW TALL ? (ENTER # INCHES OF HEIGHT--27 IN MAX)
? 24
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? Y
 LENGTH OF HOLE=   100.50 FT
 ENTER SCALE--(1 IN=?? FT)
? 10
 TOP HOLE ELEV=   234.10
 ENTER REF ELEV
? 240

    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 15,0
 DISTANCE BETWEEN BORINGS IS     192.02
 ENTER # OF FT PER INCH FOR HORZ SCALE
 ENTER -1 TO BYPASS THIS BORING
 ENTER -2 TO SELECT/CHANGE DISTANCE
 #SBU LIMIT#
 ENTER S TO CONTINUE OR CR KEY TO STOP:
S
? 20
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? Y

    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 16,0
 DISTANCE BETWEEN BORINGS IS     201.85
 ENTER # OF FT PER INCH FOR HORZ SCALE
 ENTER -1 TO BYPASS THIS BORING
 ENTER -2 TO SELECT/CHANGE DISTANCE
? 20
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? Y

    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 17,0
 DISTANCE BETWEEN BORINGS IS     257.26
 ENTER # OF FT PER INCH FOR HORZ SCALE
 ENTER -1 TO BYPASS THIS BORING
```

(Continued)

(Sheet 14 of 16)

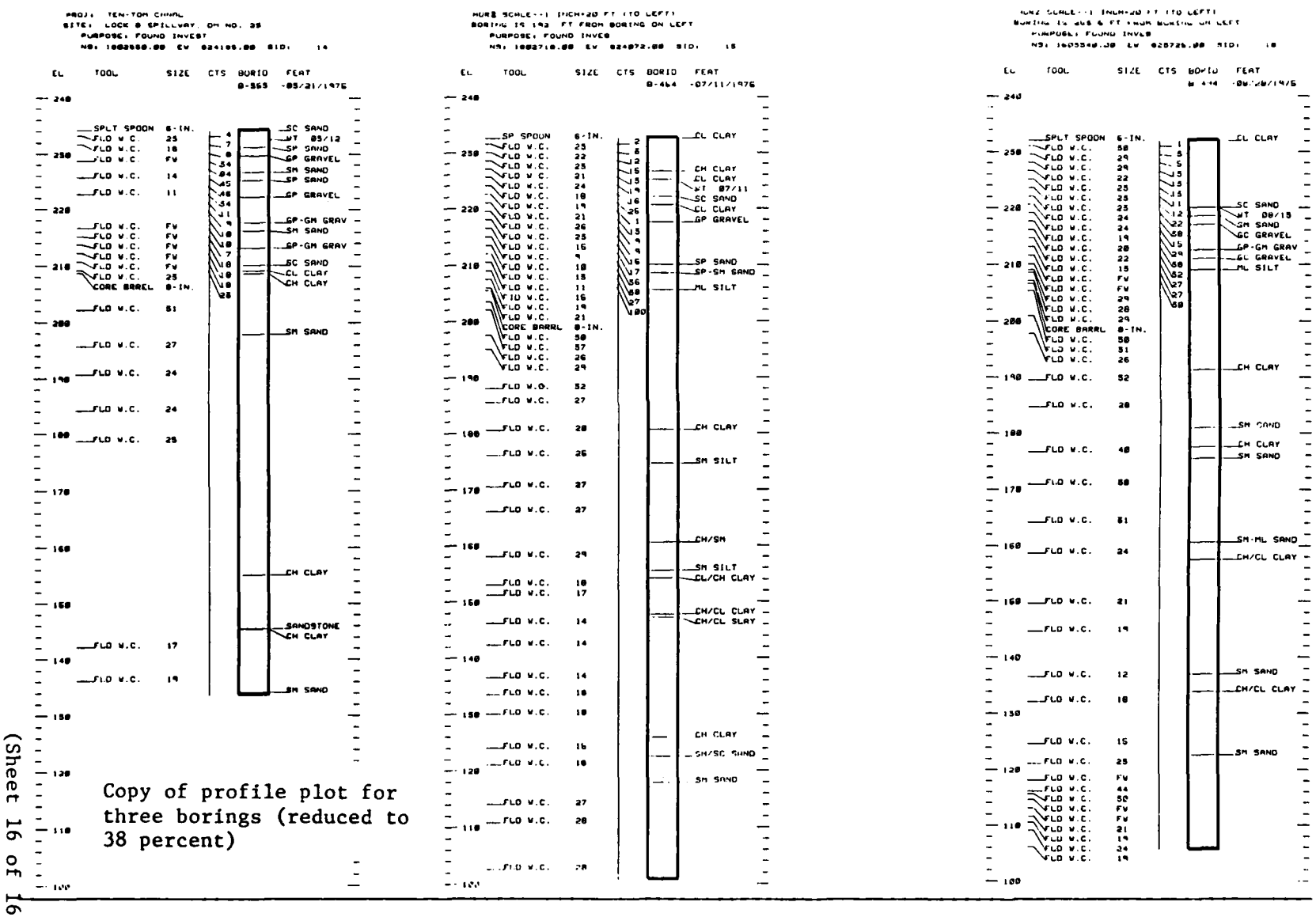
Table 11 (Continued)

```
 ENTER -2 TO SELECT/CHANGE DISTANCE
? 20
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? Y

    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? 18,0
 DISTANCE BETWEEN BORINGS IS      253.57
 ENTER # OF FT PER INCH FOR HORZ SCALE
 ENTER -1 TO BYPASS THIS BORING
 ENTER -2 TO SELECT/CHANGE DISTANCE
? 20
 DO YOU WANT THE SUBSEQUENT PLOT
 SPACED FOR PROFILING ? (Y OR N)
? N
 *SBU LIMIT*
 ENTER S TO CONTINUE OR CR KEY TO STOP:
S
 DO YOU WISH TO SPAWN THE DRUM
 PLOT(S) NOW ? (Y OR N)
? Y
 ENTER YOUR USER NUMBER
? CEP0K2
 TAPE99 ROUTED THRU JOB ABRZ305



    SELECT SYS ID AND TOTAL # OF COLS TO BE
    PLOTTED. (ENTER 0,0 TO CHANGE DATAFILE)
             (ENTER -1,0 TO EXIT PROGRAM)
             (ENTER 'ID',0 TO USE PREVIOUS COL SEQ)
? -1,0
```

(Continued)

(Sheet 15 of 16)

Table 11 (Concluded)



Copy of profile plot for three borings (reduced to 38 percent)

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APPENDIX A

EXAMPLE OF DETAILED INSTRUCTIONS FOR DATA ENTRY USED BY ONE DISTRICT

Introduction

1. The Boring and Subsurface Data Package uses a number of "key words" related to the various aspects of a data storage system in order to provide a flexible means of data input and data manipulation. A complete boring log and associated test data are defined by means of:

   a. General boring log information. This portion should be complete prior to data entry.

   b. Repeating group for feature. This segment is repeated for each individual feature (i.e., CL, ML, SM, WT, ML, etc.).

   c. Repeating group for boring tool. This group should be repeated for each different type of tool or device used to take the particular boring.

   d. Repeating group for lab/field test. This group should be repeated for each type of test performed on materials from or at the boring. (As an example, CS-1 had a total of three moisture contents for all samples taken, therefore, input three moisture contents.)

   e. Repeating group for test results. This group is repeated for each test. Actual test data for this boring is input. (As an example, an R-Test is performed, input the cohesion (c) and the phi (Ø).)

   f. Repeating group for blow counts. This group is repeated for each blow count taken.

General Boring Data

2. The following notes apply to general boring data:

   a. Element numbers preceded by an asterisk are key elements and can be used to sort by (the right side of the WHERE (WH) command within an executable statement).

   b. Use the element numbers in the execution statements. (An example is LIST C1, C2 WH C25 EQ 100.0).

   c. Input data convention given. Where free format is allowed, input information using abbreviated symbols as given in Table A1.

   d. The information in parenthesis below the variable name is the computer name for that element.

Element Number	Variable Name	Explanation or Data Convention
* C1	BORID (10 char)	Input actual boring number
* C2	TYPE OF DATA (10 char) (CLASS)	

Symbol	Definition
AP	Power Auger
AH	Hand Auger
CS	Continuous SS
SS	Incremental SS
CB	Core Barrel
VC	Vibracore
PT	Penetrometer
RB	Rock Bolt
FT	Fishtail
TP	Test Pit

NOTES: 1. Use one symbol or a combination thereof to accurately describe the boring. (An example is 10' Auger and 5' core; input AP, CB).

2. If a type is encountered that is not listed, contact DB Manager immediately.

*C3	COMMENTS (40 char) (REMARKS)	General comments for particular boring log. Use abbreviations as per Table A1.
*C4	OFFICE ENGINEER OR GEOLOGIST (10 char)	Project Engineer or Geologist (use last name only).
*C5	PROJECT NAME (40 char)	

Symbol	Definition
HP1	Hospital 1-3 stories
HP2	Hospital 4 stories and up
SHC	Shopping Center
GYM	Gymnasium
LIB	Library
WTP	Water Treatment Plant
STP	Sewage Treatment Plant
COS	Commissary
CHA	Chapel
THE	Theater
BAR	Barracks (EM)
CLP	Chiller Plant
BWA	Bowling Alley
BST	Booster Station
MTS	Maintenance Shop
MTP	Motor Pool
TES	Tactical Equipment Shop
DTC	Dental Clinic

BOQ	Barracks (OFF)
ESC	EM Service Club
OSC	Officers Service Club
CEP	Central Energy Plant
ADS	Admin and Supply
SCH	School
FAH	Family Housing
DIF	Dining Facility
HIG	Highways, Roads,
RUN	Runways
BRI	Bridge
TOW	Control Tower
BOR	Borrow Area
RAN	Range
PUM	Pump Station
PTO	Post Office
PIP	Pipe Line
MIS	Missile Magazine
COM	Communication Fac.
WRK	Washrack

Element Number	Variable Name	Explanation or Data Convention

NOTES: 1. Use one or a combination thereof to sufficiently identify the project. Any project not found, contact DB Manager Immediately.

*C6 SITE NAME (40 char) — Input the base or location of the project.

Symbol	Definition
(Army Bases)	
BEN	Ft. Bennings, Ga.
BRG	Ft. Brass, N.C.
CAD	Charleston Army Depot
FIS	Ft. Fisher, N.C.
GIL	Ft. Gillem, Ga.
GOR	Ft. Gordon, Ga.
HUN	Hunter AA, Ga.
JAX	Ft. Jackson, S.C.
MCP	Ft. McPherson, Ga.
STW	Ft. Stewart, Ga.
SUP	Sunny Point, N.C.
(Air Force Bases)	
DOB	Dobbins AFB, Ga.
MDY	Moody AFB, Ga.
POP	Pope AFB, N.C.
ROB	Robins AFB, Ga.
SEJ	Seymour Johnson AFB, N.C.

	SHA	Shaw AFB, S.C.
	SIM	Simmons AFB, N.C.
(Navy Bases)	KGB	Kings Bay, Ga.
(Army Reserve Centers)	ARG	Army Reserve Center, Ga.
	ARN	Army Reserve Center, N.C.
	ARS	Army Reserve Center, S.C.
(Misc. Military Project)	BUR	Burlington, N.C.
	STA	Statesboro, Ga.
	THO	Thomasville, Ga.
	BSN	Benson, N.C.
	JED	Jedburg, S.C.

NOTES: 1. All Army Reserve Centers will be classed together by state.

Element Number	Variable Name	Explanation or Data Convention
*C7	LI, FY (25 char) (PROJ-DESC)	a. Input the line item number and fiscal year for military projects.
	example a. Given: LI-344, FY-82 Input: LI344, FY82	
	b. Given: FY-82 Input: FY82	
*C8	LATITUDE (8 digit decimal)	Input degrees, minutes, seconds (DDMMSS.SS)
*C9	LONGITUDE (9 digit decimal)	Input degrees, minutes, seconds (DDMMSS.SS)

Element Number	Variable Name	Explanation or Data Convention
C10	ACCURACY (1 char)	Input relative accuracy of C8 and C9 by using one of the following descriptive classes:

Class	Description
1	Survey Professional
2	Survey Other
3	Computer conversion from surveyed state coordinates
4	Computer conversion from estimated state coordinates
5	Estimate from map or plate

*C11	NAME OF QUAD SHEET (REFERENCE) (15 char)	Input plate or quad sheet number on which the latitude and longitude are shown.
*C12	LOCAL N-S COORDINATE (LOC-NS)(9 digit dec)	Input local state north-south coordinate. (y-coordinate)
*C13	LOCAL E-W COORDINATE (LOC-EW)(9 digit dec)	Input local state east-west coordinate. (x-coordinate)
C14	ACCURACY (1 char)	Input relative accuracy of C12 and C13 by using one of the following descriptive classes:

Class	Description
1	Survey Professional
2	Survey Other
3	Computer conversion from surveyed latitude and longitude coordinates
4	Computer conversion from estimated latitude and longitude coordinates
5	Estimate from map or plate

Element Number	Variable Name	Explanation or Data Convention
*C15	LOCAL REFERENCE (10 char)	Input symbol of state or local coordinate system used in C12 and C13.

Symbol	State
GA	Georgia
SC	South Carolina
NC	North Carolina
USGS	U.S. Geological Survey

*C16	DATE COMPLETE (DATE)(10 char)	Input date in the folowing format: MM/DD/YYYY
	example Given: 31 July 1983 Input: 07/31/1983	
*C28	NO. OF DAYS(3 digits) (DAY-Drill)	Input the number of days required to drill the hole. Round the number up. One day is the minimum time.
	example Given: 3.5 days drilling Input: 4	
*C17	DRILLER NAME(21 char) (DRILLER)	Input last name of driller.
	example Given: John Smith Input: SMITH	
*C18	INSPECTOR(15 char) (INSP)	Input last name of inspector. Similar to C17.
C19	LOC-BORLOG (10 char)	Input the office symbol followed by the file number. Use the office symbols below. (This is for final boring logs.)

Symbol	Office
GM	Geotechnical and Materials Branch
GS	Soils Section
GG	Geology Section
GD	Site Development Section
GB	Survey Section
RH	Record Holding

example Given: Soils Section, File 27a(1)
Input: GS27A1

Element Number	Variable Name	Explanation or Data Convention
C20	LOC-DRILLOG (10 char)	Input the office symbol and file number as described in C19 above for location of field log or notes.
C21	LOC-STOR-SAMP (20 char)	Free format element. Input location of stored samples, abbreviation where possible.
*C22	DATA-STATUS (DATA-STAT) (10 char)	Symbol: C — Definition: Complete. Boring log has all data and is ready for transmittal to S2K main storage system. Symbol: W — Definition: Wait. Boring log is not complete. Additional information is required before transmission to S2K.
*C23	HOLE-STATUS (10 char) (HOLE-STAT)	Input the symbol representing the current status of the boring hole.

Symbol	Status
IC	Inclinometer
GH	Grout Hole
MI	Misc. Instr
BF	Backfilled
(Wells)	
PZL	Piezometer Live
PZD	Piezometer Dead
MWL	Monitoring Well Live
MWD	Monitoring Well Dead
DW	Dewatering Well
WW	Water Well
WI	Injection Well
(Pump Test Only)	
PW	Pump Test Well
OW	Observation Well
PWP	Pump Test Well Connected to PZ
OWP	Observation Well Connected to PZ

Element Number	Variable Name	Explanation or Data Convention
*C24	PURPOSE(20 char)	Input symbol of purpose of boring as shown below.

Symbol	Definition
PE	Preliminary (General Site) Exploration
FE	Foundation (Site Specified) Exploration
DR	Dredging
GW	Groundwater Study
PT	Pumping Test
GR	Grouting

*C25	TOP-HOLE-ELEVATION (TOP-HOLE)(6 digit decimal)	Input top of hole elevation.
	NOTES: 1. The top of hole elevation must be input into the system.	
C26	ELEV-ACCURACY (EL-ACCUR)(1 digit)	Input relative accuracy of C25 using one of the following classifications:

Class	Description
1	Surveyed MSL
2	Surveyed MLW
3	Estimated from map MSL
4	Estimated from map MLW

*C27	DEPTH HOLE (6 digit (DEPTH) decimal)	Input depth of boring. This is the distance from top of hole to bottom of hole.
*C28	NO. OF DAYS	
	NOTES: 1. Element C28 is input after Element C16.	
*C29	SID (5 digits)	This number is assigned to the boring log by the computer. It is unique and makes it possible to retrieve boring information using only the SID number. The user does not input this number.

Feature Repeating Group

3. The following instructions apply to the feature repeating group.

a. This repeating group is used to input any or all soil and rock classifications. The computer will prompt the user for the feature name and its characteristics, then prompt for the next feature name.

b. An input run for one feature constitutes answering questions C41 thru C46.

c. The user may use elevations or depths to input data, but must be consistent for a particular repeating group (i.e., use all elevations or all depths). If depths are used, the computer will automatically convert them to elevations.

d. If the user is uncertain about input symbols, contact DB Manager or Project Engineer (Geologist) responsible for the data.

Element Number	Variable Name	Explanation or Data Convention
C40	(FEATURE)	Title of the repeating group. This element can be used with the PRINT command only. This element alone prints all information in this repeating group within the limits described.
*C41	TYPE-FEATURE (FEAT-NAME)(10 char)	Input feature symbol(s) below.

	Symbol	Description
(General)	WT	Water Table
	BH	Bottom of Hole
(Soil)	GW	Well Graded Gravel
	GP	Poorly Graded Gravel
	GM	Silty Gravel
	GC	Clayey Gravel
	SW	Well Graded Sand
	SP	Poorly Graded Sand
	SM	Silty Sand
	SC	Clayey Sand
	ML	Low Plasticity Silt, Silty or Clayey Sand
	CL	Low Plasticity Clays, Silty Clays

Element Number	Variable Name	Explanation or Data Convention	
		Symbol	Description
		OL	Organic Silts and Clays with Low Plasticity
		MH	Highly Plastic Silts or Micaceous Soils
		CH	Highly Plastic Clays
		OH	Organic Silt and Clay with High Plasticity
		PT	Peat, Fibrous, Organic Material
	(Rock)	COG	Conglomerate
		SAN	Sandstone
		GRA	Graywacke
		ARK	Arkose
		SIL	Siltstone
		CLA	Claystone
		SHA	Shale
		COA	Coal
		LIM	Limestone
		DOL	Dolomite
		GNE	Gneiss
		SCH	Schist
		QUA	Quartzite
		MAR	Marble
		SOA	Soapstone & Serpentine
		SLA	Slate
		GRN	Granite
		GAB	Gabbro
		DIO	Diorite
		RHY	Rhyolite
		PHY	Phyllite
		AND	Andesite
		BAS	Basalt
		DIA	Diabase
		DAC	Dacite
		PEG	Pegmatite
		COQ	Coquina
		BRE	Breccia
		MRL	Marl
		CON	Concrete
		ASP	Asphalt

NOTES: 1. Only when WT is input will the computer prompt for a date - Element C45.

Element Number	Variable Name	Explanation or Data Convention
		2. Must input the bottom of hole, BH, as a feature.
		3. Field classifications and lab classifications are separate features and require a separate input run. For the input of laboratory classifications move cursor to the right 4 spaces and place the symbol in brackets.
		example Given: lab class is an SC Input: ␣␣␣␣[SC]
		4. In naming compound or complex soil or rock types, use combinations of above symbols with prefixes or modifying terms as necessary.
		example Given: Metadacite Input: METDAC Given: Poorly graded silty sand Input: SPSM
*C43	FEATURE-ELEV (FEAT-ELEV) (6 digit decimal)	Input elevation or depth of top of feature.
		NOTES: 1. If depths are used, the value for the top feature will be zero (0).
C45	FEATURE-DATE (FEAT-DATE) (10 char)	Input date as follows: MM/DD/YYYY
		NOTES: 1. This feature is used only for the water table feature.
		2. Both during drilling and 24-hour water table readings will be input.
C46	FEATURE-DESC (FEAT-DESC) (30 char)	General comments for particular feature. Use abbreviations as per Table A1.
		NOTES: 1. For the water table, input during drilling and 24-hour readings as follows:
		example Given: During drilling Input: DD Given: 24-hour Input: 24HOUR

Repeating Group for Boring Segments

4. The following instructions apply to the boring segment repeating group:

a. This repeating group is used to input the type of boring tool and/or procedure used for this particular boring.

b. An input run for one boring segment constitutes answering questions C51 thru C55.

c. The user may use elevations or depths to input data, but must be consistent for a particular repeating group (i.e., use all elevations or all depths). If depths are used, the computer will automatically convert them to elevations.

d. If the user is uncertain about input symbols, contact DB Manager or Project Engineer (Geologist) responsible for the data.

Element Number	Variable Name	Explanation or Data Convention
C50	(BORINFO)	Title of the repeating group, This element can be used with the PRINT command only. This element alone prints all information in this repeating group within the limits described.
*C51	TYPE OF HOLE (BOR-TOOL)(10 char)	Input procedure and/or tool symbol for specified segment:

Symbol	Description
AH	hand Auger
AS	Spiral Auger
AB	Square Auger (Box Auger)
SS	Splitspoon
FT	Fishtail
RB	Rockbit
CB	Core Barrel
ST	Shelby Tube
JT	Jetting
VC	Vibracore
PT	Penetrometer
BH	Backhoe, Gradeall or similar
PB	Probe

Element Number	Variable Name	Explanation or Data Convention
*C53	SIZE OF HOLE (BOR-SIZE) (5 digit decimal)	Input size in inches. If 1-3/8-inch splitspoon is used, input STD.
	NOTES: 1. The input dimension shall be the hole size for non-sampling tools or procedures and sample diameter for sampling tools or procedures.	
*C55	ELEVATION (BOR-ELEV) (6 digit decimal)	Input the elevation or depth of the top of the particular boring segment.

Repeating Group for Lab/Field Test

5. The following instructions apply to the lab/field test group:

   a. This repeating group is used to input the type of tests and the quantity of those test that were performed on the particular boring. This group is set up for use in statistical and managerial reports.

   b. An input run for one type of test constitutes answering questions C61 thru C65.

   c. The user may use elevations or depths to input data, but must be consistent for a particular repeating group (i.e., use all elevations or all depths). If depths are used, the computer will automatically convert them to elevations.

   d. If the user is uncertain about input symbols, contact DB Manager or Project Engineer (Geologist) responsible for the data.

Element Number	Variable Name	Explanation or Data Convention
C60	(TYPTESTS)	Title of the repeating group. This element can be used with the PRINT command only. This element alone prints all information in this repeating group within the limits described.
*C61	TYPE OF TESTS (TYP-NAME) (10 char)	Input the laboratory test number for the particular test performed. For all SAD tests not listed herein, consult Appendix C (omitted). For all tests not performed at SAD Lab consult DB Manager.

Element Number	Variable Name	Explanation or Data Convention	
		SAD Lab No.	Test
	(Soils)	SI 101	Limits, 1 pt.
		SI 102	Limits, 3-5 pts.
		SI 201	MA & Hydrometer
		SI 206	MA & 6-Sieve
		SI 304	Water Content
		SI 105	% Water/Unit Wt.
		SI 401	Specific Gravity
		SE 300	4" Std. Compaction
		SE 303	CE-55 Compaction
		SE 600	Consolidation w/ Curves
		SE 601	Consolidation w/o Curves
		SE 800	Direct Shear
		SE 900	S Triaxial
		SE 901	R Test
		SE 902	R Test Saturated
		SE 903	Q Test
		SE 905	Q Test Saturated
		SE 931	Pore Pressure
		SE 500	CBR
		WB 004	LOI
		WY 006	pH Determination
	(Rock)	RH	Rockwell Hardness (psi)
		US	Unconfined Compressive Strength (psi)
		SS	Shear Strength (psi)
		RS	Residual Shear Strength (psi)
		TS	Tensile Strength (psi)
		AS	Axial Strain (μin.)
		LS	Laterial Strain (μin.)
		FL	Failure Load (lb)
		MR	Modulus of Rupture (psi)
		YM	Young's Modulus (psi)
		PR	Poisson's Ratio
		IF	Internal Friction Angle (phi degrees)
		CO	Cohesion
		HC	Horizontal Hydraulic Conductivity (gpd/sf)

Element Number	Variable Name	Explanation or Data Convention	
		VC	Vertical Hydraulic Conductivity (gpd/sf)
		TR	Transmissivity (gpd/sf)
		SC	Storage Coefficient
		PO	Porosity (%)
		WT	Water Take (gal)
		SG	Specific Gravity
		UW	Unit Weight (pcf)
		WC	Water Content (%)
		DS	Degree of Saturation (%)
		VR	Void Ratio
		AB	Absorption (%)
	(General)	TV	Torvane (tsf)
		PP	Pocket penetrometer (tsf)
*C63	NUMBER-TESTS (TYP-NUM) (3 digit)	Input the total number of a particular type of test performed on this boring.	
C65	LOCATION OF TEST RESULTS (FILE NO.) (TYP-LOC) (10 char)	Input office symbol followed by the file number. Use office symbols below:	
		Symbol	Office
		GM	Geotechnical and Materials Branch
		GS	Soils Section
		GG	Geology Section
		GD	Site Development Section
		GB	Survey Section

Repeating Group for Test Results

6. The following instructions apply to the test result repeating group:

a. This repeating group is used to input the actual test result.

b. An input run for entering the results for one particular test consists of answering questions C71 thru C85.

c. The user may use elevations or depths to input data, but must be consistent for a particular repeating group (i.e., use all elevations or all depths). If depths are used, the computer will automatically convert them to elevations.

d. If the user is uncertain about input symbols, contact DB Manager or Project Engineer (Geologist) responsible for the data.

Element Number	Variable Name	Explanation or Data Convention
C70	(TEST-RESULT)	Title of the repeating group. This element can be used with the PRINT command only. This element alone prints all information in this repeating group within the limits described.
*C71	TYPE OF TEST (TEST-NAME) (10 char)	Input the laboratory test number as described in Element C61. NOTES: 1. If input of more than four test results are desired, then element C71 thru C85 must be repeated.
*C73	DATE PERFORMED (TEST-DATE) (10 char)	Input date using numeric format. MM/DD/YYYY example Given: 31 July 1983 Input: 07/31/1983
*C75	TYPE OF MATERIAL (TEST-MAT)(10 char)	Input material on which test was performed. See Element C41 for symbols.
*C77	ELEV OF TEST (TEST-ELEV)(6 digit decimal)	Input the elevation or depth at which the test material was taken.
*C79	TEST RESULT 1 (15 char)	Input the actual test result by using the symbol and the value.

Symbol	Description
PH	Phi (Ø)
C	Cohesion
GD	Dry Unit Wt.
GM	Moist Unit Wt.
GS	Saturated Unit Wt.
W	Water Content (%)
NP	Non-Plastic
1/	#10 Sieve
2/	#20 Sieve
4/	#40 Sieve
6/	#60 Sieve
C/	#100 Sieve
T/	#200 Sieve

Element Number	Variable Name	Explanation or Data Convention
		example Given: Ø = 28.5 Input: PH28.5 Given: dry unit wt. = 110.3 pcf Input: GD110.3 NOTES: 1. The units for the test results will be the same as that shown on the actual test form. 2. Sieve Analysis results are input using % passing. example Given: 10% passing 100 sieve Input: C/10.0
*C81	TEST RESULT 2 (TEST-RESULT 2) (10 char)	Refer to Element C79.
*C83	TEST RESULT 3 TEST-RESULT 3) (10 char)	Refer to Element C79.
*C85	TEST RESULT 4 (TEST-RESULT 4) (10 char)	Refer to Element C79.

Repeating Group for Blow Counts

7. The following instructions apply to the blow count repeating group:

a. This repeating group is used to input the results from the Standard Penetration Test (i.e., blow counts from splitspoon borings).

b. An input run consists of entering the results for one test. (one blow count) The first blow count must be input with the corresponding elevation for that blow count. This elevation should be the top of hole elevation minus 1.5 ft. The computer will calculate the elevations for the remainder of the values to be input.

c. The user must input the elevation of the first blow count.

d. If the user is uncertain about input, contact DB Manager or Project Engineer (Geologist) responsible for the data.

Element Number	Variable Name	Explanation or Data Convention
C90	(BLOW-TEST)	Title of the repeating group. This element can be used with the PRINT command only. This element alone prints all information in this repeating group within the limits described.
*C91	ELEV OF 1ST BLOW CT (BLOW-ELEV) (5 digit decimal)	Input the elevation of the first blow count only.
	NOTES: 1. The computer will calculate the remaining elevations and display it at the terminal. The user should use this to assure the blow counts are being input at the correct elevations.	
*C93	NUMBER OF BLOWS (Blow-CTS)(4 digit)	Input the blow count for the particular elevation.
*C95	REMARKS(20 char) (BLOW-REMARKS)	Input any explanations that may help to clarify unusual values.

Table A1

Selected Abbreviations

Colors

Item	Abbreviation	Item	Abbreviation
Black	BK	Purple	PUR
Blue	BL	Red	R
Brown	BR	Rust	RUS
Cream	CRE	Tan	T
Dark	D	White	WH
Gray	GR	Yellow	Y
Green	GN	Light Gray	LGR
Light	L	Dark Gray	DGR
Mottled	MOT	Brownish-Gray	BRGR
Orange	OGN	Grayish-Brown	GRBR
Pink	PIN	Blue-Green	BLGN

Note: Combinations can be made to fit the job. New colors should be brought to the attention of the DB Manager.

Descriptions

Item	Abbreviation	Item	Abbreviation
Alternating	ALT	Crumbly	CRM
Angular	ANG	Dense	DEN
Argillaceous	ARG	Dump	DMP
Bed, Bedded	BDD	Dolomitic	DOL
Bedrock	BDR	Extremely	EXT
Blocky	BKY	Fine, Finely	FIN
Boulder	BLD	Iron	FE
Breccia	BRE	Filled	FLD
Coarse	CSE	Firm	FRM
Calcareous	CALC	Fossil(iferous)	FOS
Carbonaceous	CARB	Fractures(ed)	FRAC
Cavity	CAV	Fragments(ed)	FRAG
Cobble	CBL	Friable	FRI
Chert	CHT	Fissile	FSL
Circulation	CIRC	Grain(ed)	GRN
Clay, Clayey	CL, CLY	Gradation	GRA
Cemented	CMTD	Gravel(ly)	GRV
Columar	COL	Gypsum	GYP
Concretions	CONC	Hard	H

(Continued)

Table A1 (Concluded)

Descriptions

Item	Abbreviation	Item	Abbreviation
High	H	Roots	RTS
High Angle	HA	Round(ed)	RND
Horizontal	HOR	Rotten	ROT
Interbedded	INBD	Sand(y)	SD(Y)
Inclusions	INCL	Saturated	SAT
Interlaminated	INLAM	Scattered	SCAT
Irregular	IRR	Seam	SEM
Joint(s)	JT(S)	Shells	SHL
Laminated(ae)	LAM	Siliceous	SLCS
Layer(s)	LAY(S)	Silt(y)	SI(Y)
Leached	LEA	Slickensides	SLKS
Lean	LFN	Slightly	SL
Lignite	LIG	Soft	SFT
Loose	LSE	Solution	SOL
Lost Core	LC	Stained(ing)	ST
Lost Drillwater	LDW	Sticky	STKY
Low Angle	LA	Stiff	STF
Massive	MSS	Styolitic	STY
Material	MTL	Vertical	VERT
Matrix	MTX	Vug(gy)	VG(Y)
Medium	MED	Water	WTR
Micaceous	MIC	Weathered	WEA
Moderate(ly)	MOD	With	W/
Moist	MST	Wood	WD
Mottled	MOT		
Nodules	NOD		
Numerous	NUM		
Occasional(ly)	OCC		
Open	OPN		
Organic	ORG		
Parting(s)	PTG(S)		
Pitted	PIT		
Plane	PLN	Cross-bedded	X-BDD
Plastic	PLS	Crystalline	XLN
Platy	PLA	Decomposed	DEC
Pockets	POC	Oxidized	OX
Poorly Graded	PRG	Trace	TR
Quartz	QTZ	Shell Fragments	SLF

APPENDIX B

USE OF TEXT EDITORS ON CDC AND HARRIS COMPUTER SYSTEMS

Editing Files on CDC

1. Instructions for use of the Corps of Engineers editor or the NOS XEDIT utilities on CDC are described below.

   a. The version of COEDIT on CDC is available during a field test period until installation of the final version on or about 1 January 1985. Information on use of COEDIT is obtained with the following commands.

      ```
      GET,COEDIT/UN=LIBRARY
      COEDIT,DUMMY
      ```

   b. An alternative is to use the NOS system XEDIT (see Cybernet Services, NOS XEDIT, Extended Text Editor, Reference Card, Publication No. 84000 680). Instructions can be obtained by entering the following command.

      ```
      EXPLAIN,XEDIT
      ```

Editing Files on the Harris Computer

2. On the Harris computer, enter the following command to obtain instructions for the Corps of Engineers editor (COED).

   ```
   DI,*COEDW
   ```

APPENDIX C

PROCEDURES FOR BACK-UP COPY OF DATA BASE

1. Two procedures are available to back up or copy the data base for reloading in case the data base is damaged. The first procedure creates a permanent report file of the data in the data base and the second automatically creates a binary file when data is loaded to the data base under "UPDBORb" (batch load command file). The two procedures are described below.

Report File Back Up

2. Enter the data base mode on CDC by typing in -GETDB. After entry to the data base mode, type the following commands:

```
USER,XXX;DBN IS BORDB;     (XXX is the user password)
REPORT FILE IS BORDBSV;    (or other file name)
UNLOAD BY CO,CO WH C1 EXISTS OR C1 FAILS;
  (to ensure all data with or without C1 values are unloaded)
EXIT;
```

After exiting the data base mode, save the report file.

```
SAVE,BORDBSV
```

If the data base is damaged later, the data can be reloaded from the permanent file BORDBSV. However, any data loaded after saving BORDBSV would be lost. To reload the data base, the user's data base administrator should be contacted. The advantage of this procedure is that the report file can be saved on a reclaim tape to reduce storage costs.

Binary Back Up

3. The automatic back up on a binary file uses procedures in the UPDBORB file to create a TAPE999 local file that is saved to a permanent file called BORTAPE. A copy of the file UPDBORB is listed below:

```
.PROC,UPDBORB,DATBOR.
SUBMIT,JOBFIL,N.
$REVERT.
.DATA,JOBFIL.
/JOB
JOB,CM200000,T2000,P5.
/USER.
/CHARGE.
MAP,OFF.
GET,SUMFLE.
```

```
GET,S2KGET/UN=CECE2K.
GET,DRVBOR/UN=CEROK2.
GET,DATBOR.
GET,BRMUCK/UN=CEROK2.
BRMUCK.
REPLACE,SUMFLE.
ATTACH,S2K/UN=CECE2K.
S2K,C=INPUT,M=DUMMY,TP.
RENAME,BORTAPE=TAPE999.
REPLACE,BORTAPE.
RETURN,TAPE999.
REPLACE,OUTPUT=BORDAY.
REPLACE,DUMMY.
RETURN,A,S2K.
EXIT.
DAYFILE,ERRLIST.
SAVE,ERRLIST.
/EOR
USER,DLW;DBN IS BORDB;
CONTROL;
ECHO ON;
REWIND TAPE999;
SAVE DATA BASE ON TAPE999;
EXIT;
/EOF
```

An alternative is to save the data base while in the data base with the following commands:

```
CONTROL;
SAVE DATA BASE ON TAPE999;
EXIT;
```

After exiting the data base, save the local file TAPE999 to the desired file name, as follows:

```
SAVE,TAPE999
RENAME,BORTAPE=TAPE999
```

To reload a damaged data base, the data base administrator should be contacted. The saved data file cannot be stored on a reclaim tape. However, less disk storage space is required than for the report file back up and on-line storage costs less.

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