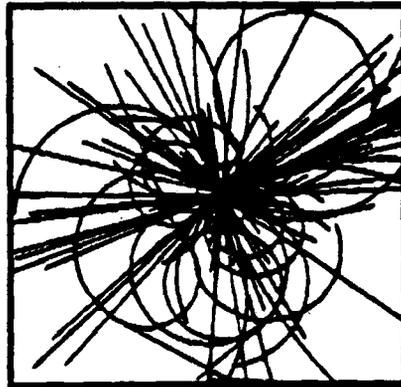


August 1989

GR-4

Data Report for Vibration Monitoring Holes VE9.3 and VE9.3A



Prepared by:  **The Earth Technology Corporation**
Long Beach, California

Prepared for: **RTK** a joint venture
Oakland, California

FOREWORD

The goal of the geotechnical studies at the Texas Superconducting Super Collider (SSC) site is to allow the geologist and engineer to build their level of knowledge and confidence about the geologic structures and geotechnical properties of the site materials to the point at which there remains only a realistically small risk of encountering geotechnical conditions during construction that would significantly increase construction costs or delay construction schedules. To do this, a characterization program has been designed to meet the following objectives:

- To confirm the site's suitability and optimize the ring location (the "footprint") and hall positions on the ring
- To provide data for a preliminary structural design
- To provide a rational framework within which construction contracts and schedules can be formulated
- To maximize the use of the site-specific data already gathered by the proposer.

The geotechnical program to meet these objectives has been divided into the following three phases of study:

- Footprint location data (the present phase)
- Global data (planned)
- Structure-specific data (planned).

The primary purpose of the present footprint location phase is to quickly assess whether individual components of the collider footprint, or the entire footprint, need to be relocated because of geotechnical constraints. Accordingly, the following areas have been assessed:

- Areas on the western side of the footprint where the geologic structure brings the Eagle Ford Shale close to the depth of the tunnel and experimental halls, thus presenting potential constraints due to weak, deformable rock.
- Areas where the tunnel placement is shallow and/or there are nearby sources of vibration such as major highways and railroads that may represent a problem due to unacceptable vibrations at tunnel depth.
- Zones of potentially poor rock quality and high water inflow in the rock that should be avoided for the experimental hall excavations.

This is one in a series of data reports prepared for the footprint phase of geotechnical characterization at the SSC site. Each data report includes the results of both field and laboratory tests for a specific drilling and sampling site. Interpretations of these data will be covered in topical reports, including three planned reports, as follows:

- Train-, traffic-, and quarry-caused vibrations
- Geomechanical properties of the Eagle Ford Shale
- Structure and stratigraphy of the near-cluster.

Future planned program phases--global and structure-specific data collection--will concentrate on (1) evaluating ring areas where few geotechnical data are currently available and (2) conducting more detailed studies at the sites of the injector and experimental halls.

DATA REPORT

Site Designator: VE9.3

Objective: To drill and case a boring to be used for monitoring vibration at tunnel depth due to traffic on Interstate Highway 35.

Hole No. VE9.3

Location: North ~ 212,781 feet

East ~ 2,193,347 feet

Surface Elevation ~ 526 feet

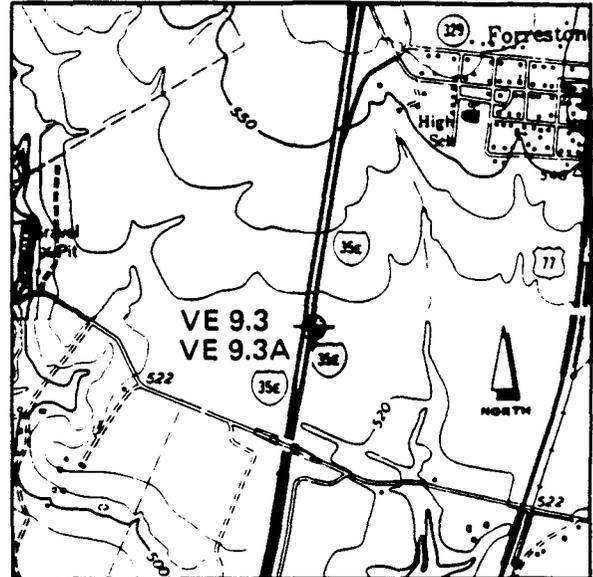
Hole No. VE9.3A

Location: North 212,767.4 feet

East 2,193,347 feet

Surface Elevation 526.9 feet

VE9.3 is located on the southern side of the ring, near Forrester, where the proposed collider tunnel passes beneath Highway I-35E



SCALE 1:24,000

1000 0 1000 2000 3000 FEET

CONTOUR INTERVAL 10 FEET

Scope and Schedule VE9.3:	Rotary Wash Boring	May 25, 1989
	Wire-line Logging	May 25, 1989
	Casing Installed	May 26, 1989
	Plugging and Abandonment	(pending)
VE9.3A:	Rotary Wash Boring	May 31, 1989
	Wire-line Logging	June 9, 1989
	Casing Installed	May 31, 1989
	Plugging and Abandonment	(pending)

Hole No. VE9.3

Conditions Encountered:

Total Hole Depth 172.0 feet

Soil 0 to 20 feet

Austin Chalk 20 to 172.0 feet
(see Lithologic Log for Hole 9.3A, Appendix A)

Note: Hole VE9.3 was partially plugged with grout during the casing installation and grouting process, necessitating the drilling and construction of VE9.3A for vibration monitoring, 14 feet to the south of VE9.3. No lithologic log was prepared for boring VE9.3A because of its proximity to VE9.3. Electrical, gamma, and sonic logs were run in boring VE9.3 before casing. A second sonic log was run in boring VE9.3A after cementing and casing to test the cement bond.

Geophysical Logging: (See wire-line logs, Appendix B)

Spontaneous Potential
Normal Resistivity (short)
Guarded Resistivity (long)
Natural Gamma
Compensated Density (caliper)
Sonic Velocity (full wave)

Hole Status: Casing cemented in and plugged with grout below 100 feet.
(See as-built drawing/cementing report, Appendix C)

Hole No. VE9.3A

Conditions Encountered:

Total Hole Depth 170.0 feet

Soil 0 to 20.0 feet

Austin Chalk 20.0 to 170.0 feet
(see Lithologic Log, Appendix A)

Hole Status: Casing cemented in, not yet plugged and abandoned.
(See as-built drawing/cementing report, Appendix C)

APPENDIX A
LITHOLOGIC LOG

LOG OF BORING

BORING NO: VE 9.3 PG 1 OF 5

PROJECT: TEXAS SSC SITE
 CLIENT: The Earth Technology Corporation
 TASK NO.: 11

LOCATION: N~212,781 feet
 E~2,193,347 feet
 GROUND EL: ~526 feet

DATE: 5/30/89 TYPE: Air/Water Rotary CASED TO: 25' CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	Groundwater encountered at 9.0' depth in original Boring VE 9.3 (14' north of Boring VE9.3A), see note at end of log
DESCRIPTION OF STRATUM										
		S1	0.0	1.5			8	6		CLAY, silty, dark brown
- 5		S2	5.0	6.5			8	10		CLAY, silty, embedded limestone fragments, tan
- 10		S3	10.0	11.5			10	15		CLAY, silty, trace sand, tan
- 15		S4	15.0	16.5			20	27		
- 20		S5	20.0	21.0			50			GRAVEL, medium to coarse, some sand, angular limestone fragments, tan to light brown
- 25										LIMESTONE (Austin Chalk), soft to medium, extremely weathered, tan
- 30										LIMESTONE (Austin Chalk), soft to medium, fresh, occasional shale layers, light gray to dark gray
- 35										
- 40										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A

LOG OF BORING

PROJECT: TEXAS SSC SITE
 CLIENT: The Earth Technology Corporation
 TASK NO.: 11

BORING NO: VE 9.3 PG 2 OF 5
 LOCATION: N~212,781 feet
 E~2,193,347 feet
 GROUND EL: ~526 feet

DATE: 5/30/89 TYPE: Air/Water Rotary CASED TO: 25' CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	(see page no. 1 of 5)
									DESCRIPTION OF STRATUM	
-45	[Brick Pattern]								LIMESTONE (Austin Chalk), soft to medium, fresh, occasional shale layers, light gray to dark gray	
-50	[Brick Pattern]									
-55	[Brick Pattern]									
-60	[Brick Pattern]									
-65	[Brick Pattern]									
-70	[Brick Pattern]									
-75	[Brick Pattern]									
-80	[Brick Pattern]									
	[Brick Pattern]									
	[Brick Pattern]									

DRILLING GEOLOGIST S. Wood ASSISTANT N/A

LOG OF BORING

PROJECT: TEXAS SSC SITE CLIENT: The Earth Technology Corporation TASK NO.: 11	BORING NO: VE 9.3 PG 3 OF 5 LOCATION: N~212,781 feet E~2,193,347 feet GROUND EL: ~ 526 feet
---	--

DATE: 5/30/89 TYPE: Air/Water Rotary CASED TO: 25' CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT RQD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	(see page no. 1 of 5)
DESCRIPTION OF STRATUM										
85	[Brick pattern]									LIMESTONE (Austin Chalk), soft to medium, fresh, occasional shale layers, light gray to dark gray
90	[Brick pattern]									
95	[Brick pattern]									
100	[Brick pattern]									
105	[Brick pattern]									
110	[Brick pattern]									
115	[Brick pattern]									
120	[Brick pattern]									
	[Brick pattern]									
	[Brick pattern]									

DRILLING GEOLOGIST S. Wood ASSISTANT N/A

LOG OF BORING

BORING NO: VE 9.3 PG 4 OF 5

PROJECT: TEXAS SSC SITE

LOCATION: N~212,781 feet
E~2,193,347 feet
GROUND EL: ~526 feet

CLIENT: The Earth Technology Corporation

TASK NO.: 11

DATE: 5/30/89

TYPE: Air/Water Rotary CASED TO: 25'

CONTRACTOR: SWL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BOT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	(see page no. 1 of 5)
DESCRIPTION OF STRATUM										
-125	[Brick Pattern]									LIMESTONE (Austin Chalk), soft to medium, fresh, occasional shale layers, light gray to dark gray
-130	[Brick Pattern]									
-135	[Brick Pattern]									
-140	[Brick Pattern]									
-145	[Brick Pattern]									
-150	[Brick Pattern]									
-155	[Brick Pattern]									
-160	[Brick Pattern]									
	[Brick Pattern]									
	[Brick Pattern]									

DRILLING GEOLOGIST S. Wood ASSISTANT N/A

LOG OF BORING

PROJECT: TEXAS SSC SITE CLIENT: The Earth Technology Corporation TASK NO.: 11	BORING NO: VE 9.3 PG 5 OF 5 LOCATION: N~212,781 feet E~2,193,347 feet GROUND EL: ~526 feet
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DATE: 5/30/89 TYPE: Air/Water Rotary CASED TO: 25' CONTRACTOR: SwL (89-192)

DEPTH IN FEET	SYMBOL	SAMPLE TYPE & NUMBER	DEPTH RANGE		PERCENT REC.	PERCENT ROD.	STANDARD PENETRATION TEST PER 6 INCHES	HAND PEN. TSF.	SAMPLE LEGEND	WATER INFORMATION
			TOP	BQT.					S = SPLIT SPOON T = 2" THIN WALL TUBE U = 3" THIN WALL TUBE C = NX ROCK CORE	(see page no. 1 of 5)
									DESCRIPTION OF STRATUM	
-165	[Brick Pattern]								LIMESTONE (Austin Chalk), soft to medium, fresh, occasional shale layers, light gray to dark gray Bottom of Exploration at 172.0' NOTE: Boring VE 9.3A offset 14' south of original Boring VE 9.3 and redrilled due to grout backflow into original casing (believed to have resulted from faulty or blocked-open check valve) Soil samples and groundwater observations were taken in original boring.	
-170	[Brick Pattern]									
-175										
-180										
-185										
-190										
-195										
-200										

DRILLING GEOLOGIST S. Wood ASSISTANT N/A

APPENDIX B

WIRE-LINE LOGS

WIRE-LINE LOGGING PARAMETERS

Hole No. VE9.3 and
VE9.3A

Log Measured From: Ground level

Drilling Parameters

Depth 169 feet
Bit Diameter 6.75 inches

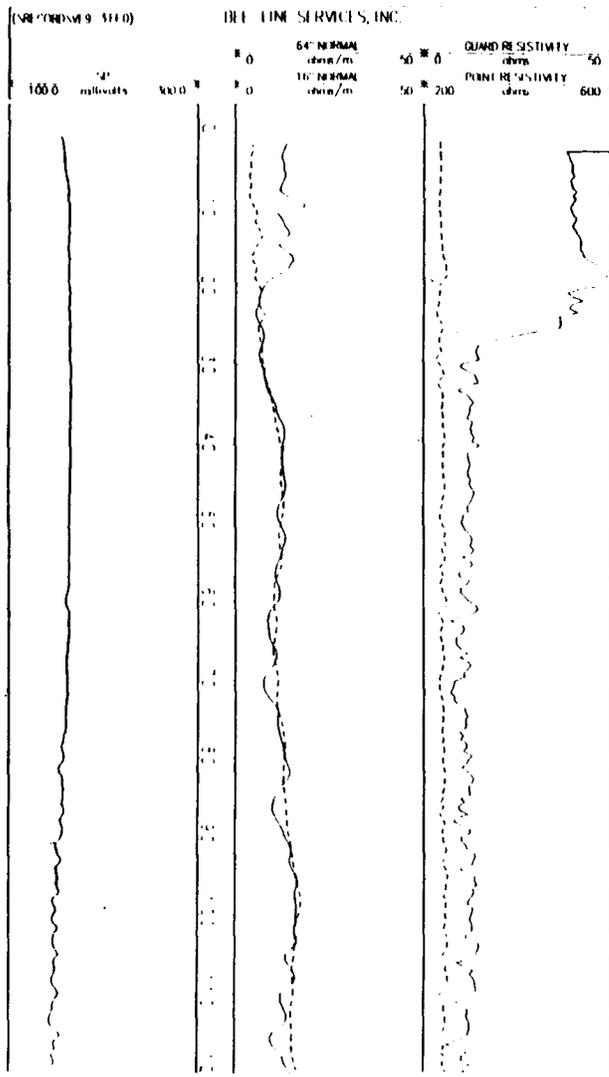
<u>Logging Parameters</u>	<u>Electrical Log</u>	<u>Gamma Log</u>	<u>Sonic Log</u>	<u>Sonic Log*</u>
Date	May 25, 1989	May 25, 1989	May 25, 1989	June 9, 1989
Bottom Log Interval	169 feet	168 feet	164.5 feet	163.4 feet
Top Log Interval	surface	surface	surface	surface
Type of Fluid in Hole	boring fluid	boring fluid	boring fluid	water
Time Since Circulation Stop	1 hour	1 hour	30 minutes	--
Probe Type/S.N.	ALP-4979	XAP-4383	CLP-4877A	CLP-4877A
Module Type/S.N.	ALM-4979	XAM-4383	CLM-4877A	CLM-4877A
Logging Speed	18 feet/min.	18 feet/min.	7 feet/min.	8 feet/min.
Sample Interval	0.5 feet	0.5 feet	0.5 feet	0.5 feet

* The electrical, gamma, and initial sonic logs were run in boring VE9.3 on May 25, 1989. A second sonic log was run in boring VE9.3A on June 9, 1989, after setting and cementing the casing.

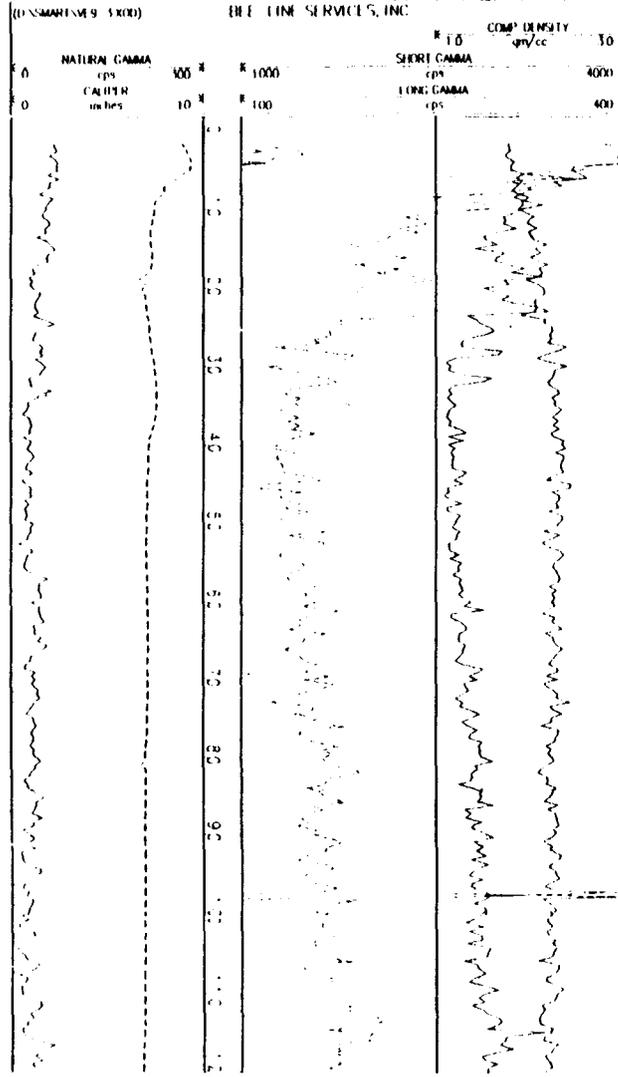
Logged by: BEE-LINE SERVICES, INC.
P.O. Box 2096
Corsicana, TX 75151

VE 9.3 Wire-line logs run May 25, 1989. Surface elevation 526.9 feet.

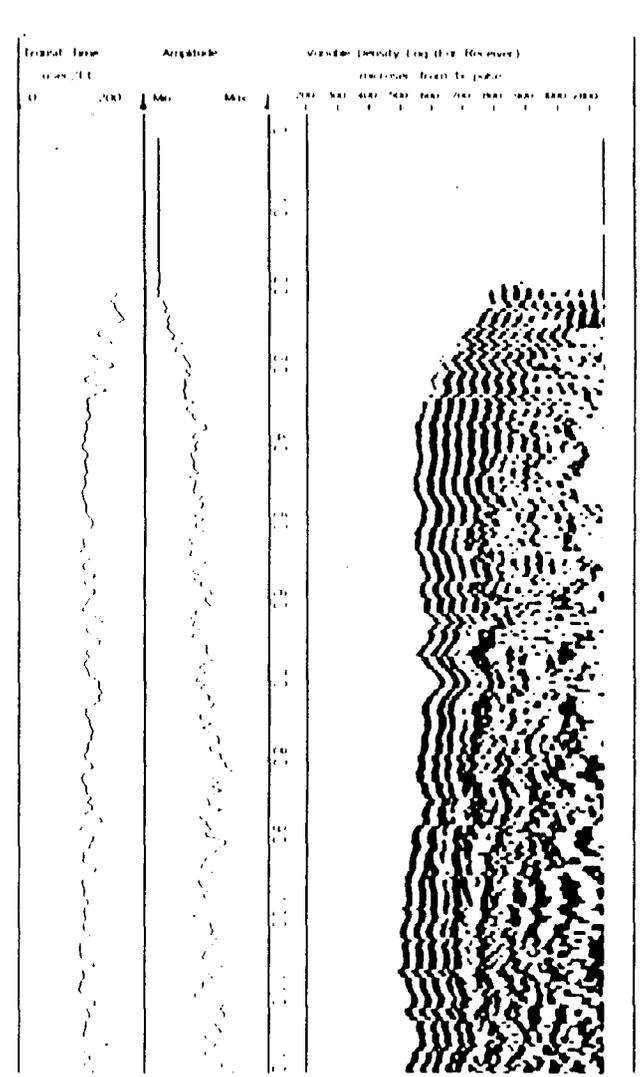
ELECTRICAL LOG



GAMMA LOG

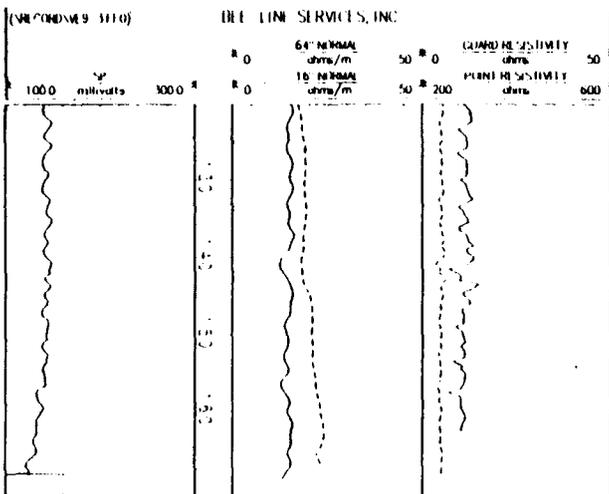


SONIC LOG

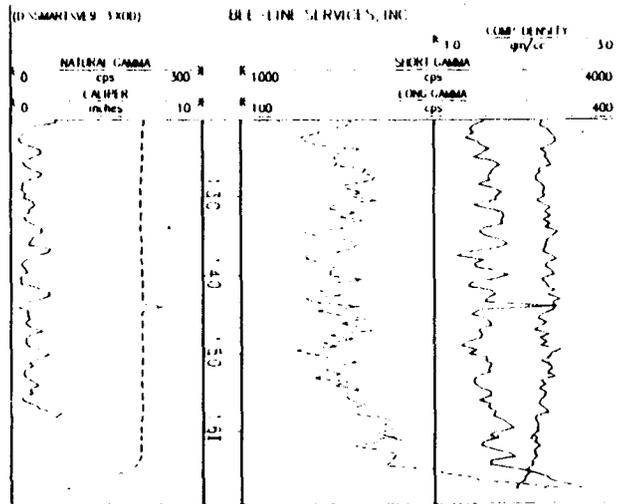


VE 9.3 Wire-line logs run May 25, 1989. Surface elevation 526.9 feet.

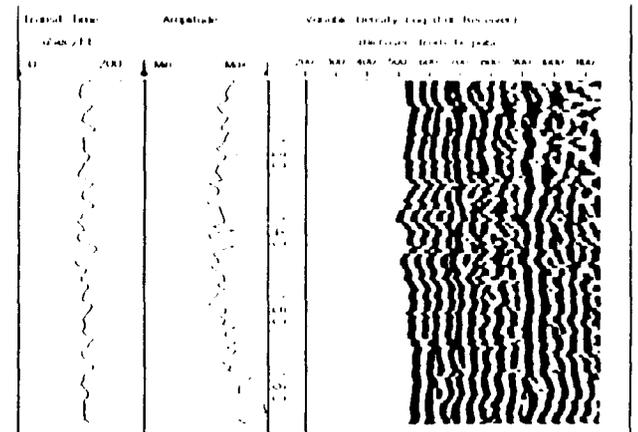
ELECTRICAL LOG CONTINUED



GAMMA LOG CONTINUED

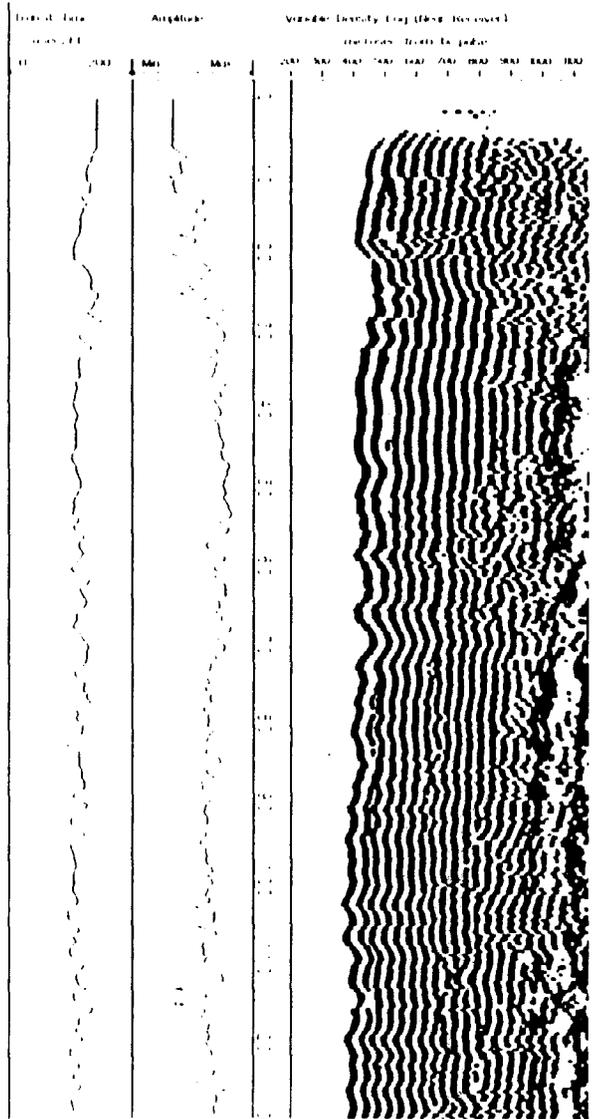


SONIC LOG CONTINUED

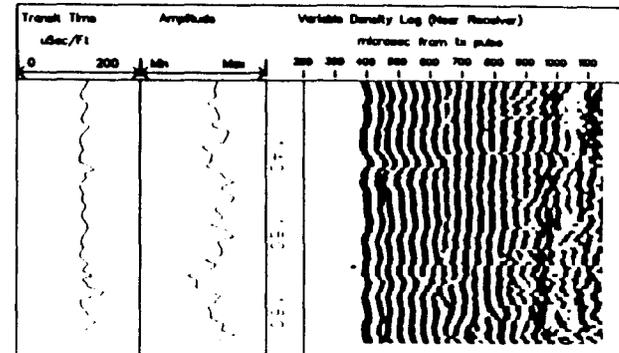


VE 9.3A Wire-line log run June 9, 1989 (The sonic log was run on June 9 after the casing was cemented in to test the cement bond.)
 Surface elevation approximately 526 feet.

SONIC LOG

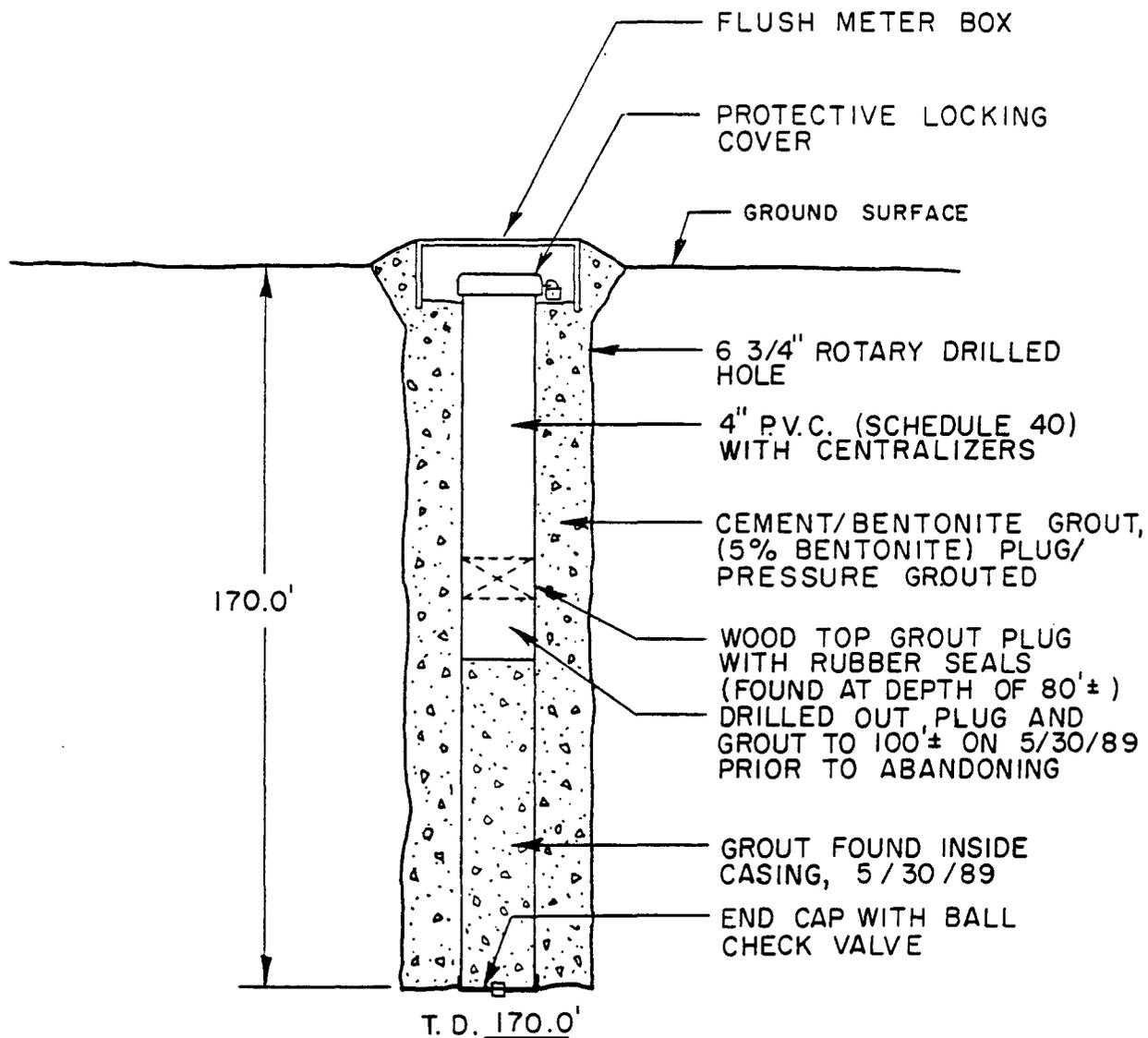


SONIC LOG CONTINUED



APPENDIX C

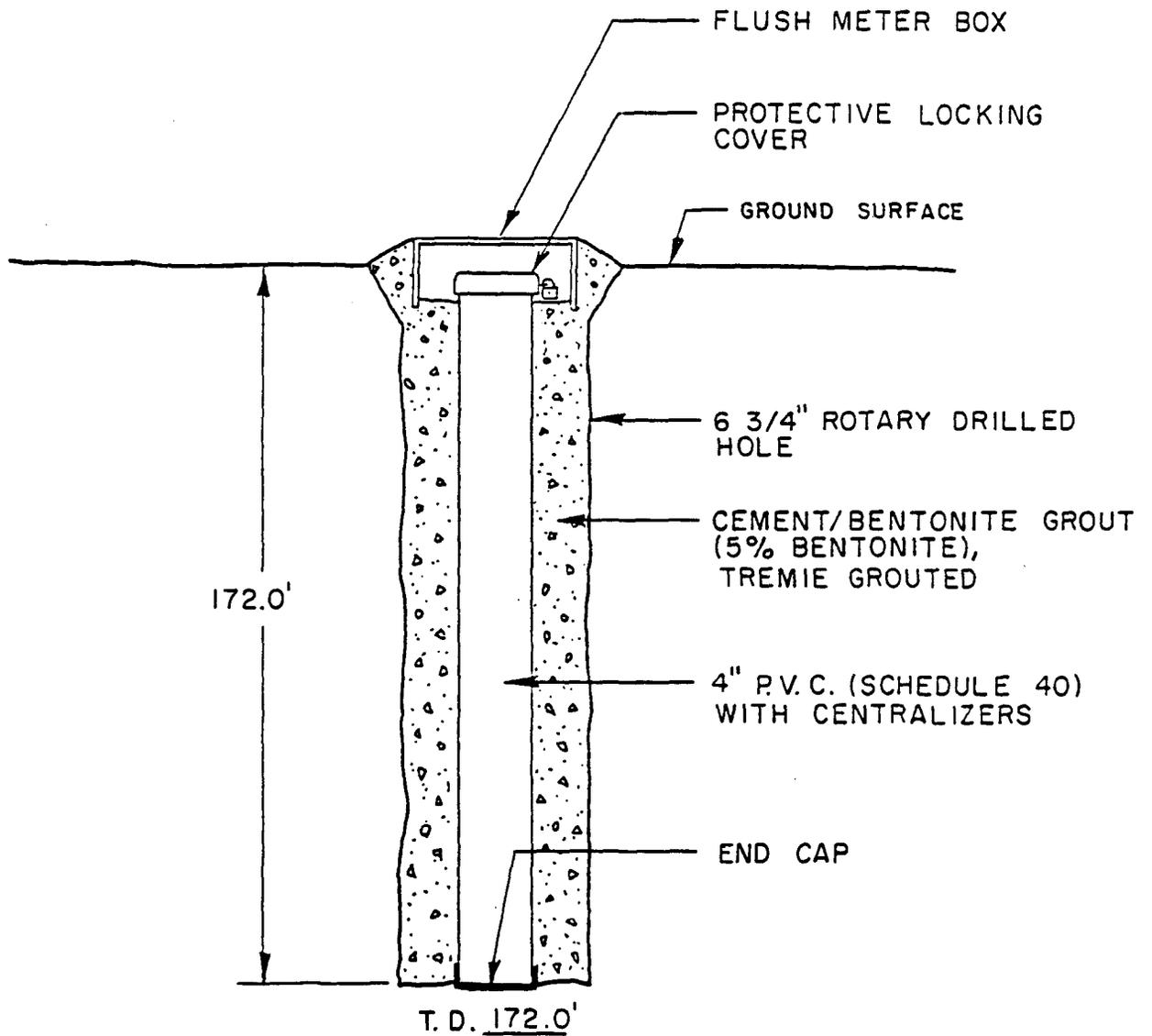
AS-BUILT DRAWINGS AND BOREHOLE PLUGGING REPORTS



BORING NO. VE 9.3

AS - BUILT
CASING INSTALLATION
DIAGRAM

SWL 89 - 192 (R)



BORING NO. VE 9.3 A

AS-BUILT
CASING INSTALLATION
DIAGRAM

SWL 89 - 192(R)

