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## Boring Log Interpretation

**Course Number:** GE-02-102

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## Module 4: Boring Log Preparation

### Learning Objectives

By the end of this section, you will be able to:

- **Identify** the essential technical components required for professional boring, core, and test pit logs.
- **Select** appropriate soil and rock classification systems based on project requirements and material types.
- **Evaluate** subsurface conditions using field index tests and standardized visual-manual description procedures.

### Design Fundamentals

The boring log is the fundamental record of geotechnical exploration, providing a detailed account of work performed and investigation findings. It serves as the primary data source for selecting test specimens, establishing groundwater elevations, and defining site stratigraphy.

*Executive Summary:* A boring log is a comprehensive description of exploration procedures and subsurface conditions encountered during drilling, sampling, and coring that must be completed in the field to ensure technical fidelity.

Professional boring logs must include the following critical data points:

- **Topographic Data:** Boring location, surface elevation, and benchmark datum.
- **Material Identification:** Identification of subsoils and bedrock including density, consistency, color, moisture, and geologic origin.
- **Sampling Metrics:** Sampler type, depth, penetration resistance (blow counts/hydraulic pressure), and recovery ratios.
- **Hydrogeology:** Water level observations and potential variations due to environmental factors like tides.
- **Drilling Parameters:** Rig type, hammer specifications (weight/drop), and drilling fluid loss.



## Boring Log Interpretation

<b>Project:</b> <b>Project Location:</b> <b>Project Number:</b>		<h3 style="margin: 0;">Log of Boring</h3> <p style="margin: 0;">Sheet 1 of</p>	
Date(s) Drilled	Logged By	Checked By	
Drilling Method	Drill Bit Size/Type	Total Depth Drilled (meters)	
Drill Rig Type	Drilled By	Hammer Weight/ Drop (N/m)	
Apparent Groundwater Depth -- m ATD -- m after -- hrs -- m after -- hrs		Surface Elevation (meters)	
Comments		Elevation Datum	

Depth, meters	SAMPLES				MATERIAL DESCRIPTION and other remarks	Elevation, meters	Pocket Pen., kPa	Water Content, %	Liquid Limit	Plasticity Index	Other Tests
	Location	Type	Number	Sampling Resistance							
0											
1											
2											
3											
4											

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**Figure 1-1.** Representative Boring Log Form.



<b>Project:</b> <b>Project Location:</b> <b>Project Number:</b>	<b>Log of Core Boring</b> ____ Sheet 1 of ____
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Date(s) Drilled	Logged By	Checked By
Drilling Method	Drill Bit Size/Type	Total Depth Drilled (meters)
Drill Rig Type	Drilled By	Inclination from Vertical/Bearing
Apparent Groundwater Depth ____ m ATD ____ m after ____ hrs ____ m after ____ hrs		Approx. Surface Elevation (meters)
Comments		Borehole Backfill

Depth, meters	Elevation, meters	ROCK CORE							MATERIAL DESCRIPTION	Pecker Tests	Laboratory Tests	Drill Rate, meters/hour	FIELD NOTES
		Run No.	Box No.	Recovery, %	Frac. Freq.	R Q D, %	Fracture Drawing/Number	Lithology					
0													
1													

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Figure 1-2. Representative Core Boring Log.



<b>Project:</b> <b>Project Location:</b> <b>Project Number:</b>					<b>Log of          Exploration Pit ____</b>		
Date(s) Excavated		Logged By		Checked By			
Approximate Length (meters)		Approximate Width (meters)		Approximate Depth (meters)			
Excavation Equipment		Excavation Contractor		Approximate Pit Trend			
Groundwater Level (meters)		Date Measured		Approx. Surface Elevation (meters)			
Comments							

  

Depth, meters	Elevation, meters	Sample Type and Number	Pocket Pen., kPa	Graphic Log	MATERIAL DESCRIPTION and other remarks	Water Content, %	Other Tests
0							
1							
2							
3							
4							

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Figure 1-3. Representative Exploration Pit Log.



<b>Project:</b> <b>Project Location:</b> <b>Project Number:</b>	<b>Key to Soil Symbols and Terms</b> Sheet 1 of 2
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Depth, meters	SAMPLES			MATERIAL DESCRIPTION and other remarks	Elevation, meters	Pocket Pen., kPa	Water Content, %	Liquid Limit	Plasticity Index	Other Tests
	Location	Type	Number							
0										
		<b>DESCRIPTIONS OF SAMPLER AND FIELD TEST CODES.</b>								
1	S	1	15	The number of blows (15) of a 63.6 Kgr hammer falling 750 mm used to drive a 50 mm O.D. split-barrel sampler for the last 300 mm of penetration.						
2	S	2	50/150	Number of blows (50) used to drive the split-barrel a certain number of millimeters (150).						
3	P	3	1724	Thin-wall tube pushed hydraulically, using a certain pressure (1,724 kPa) to push the last 150 mm.						
4	A	4		<b>SAMPLER CODES</b> P - Thin-wall tube sample. C - Denison or Pitcher-type core-barrel sample. P <sub>s</sub> - Piston sample. A - Auger sample. BS - Bulk sample. SS - Standard spoon sample. CL - California liner sample.						
5	NX 65	5	40	BX - Rock cored with BX core barrel, which obtains a 41 mm-diameter core. NX - Rock cored with NX core barrel, which obtains a 53 mm-diameter core. 65 - Percentage (65) of rock core recovered. 40 - Rock Quality Designation (RQD) percentage (40).						
6	S			Sample recovered: indicated by blackened box in "Location" column.						
7	NR			Sample not recovered: indicated by vertical bar in "Location" column and "NR" (no recovery) in "Type" column.						
		<b>OTHER FIELD TEST DESIGNATIONS</b>								
				FV - Field vane shear test. PMT - Pressuremeter test. DMT - Dilatometer test. BHS - Borehole shear test.						
		<b>ABBREVIATIONS FOR "OTHER TESTS" COLUMN</b>								
				C - Consolidation and specific gravity tests. D - Maximum and minimum density. DS - Direct shear test. G - Specific gravity test. K - Permeability test. M - Mechanical (sieve or hydrometer) analysis. T - Triaxial compression test. TV - Torvane shear test. U - Unconfined compression test. W - Unit weight and natural moisture content. X - Special tests performed - see laboratory test results.						

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Figure 1-4. Proposed Key to Boring Log



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