

# GEOLOGY CORE LOGGING NOTES

(Generally based on the Guide by the Core Logging Committee,  
South Africa Section, AEG  
AEG Bulletin Vol XV, No. 3, pp 295-328)

## COLORS:

Predominant color is given using the Geological Society of America Rock-Color Chart (Hue - Value - Chroma)

- ♦ **BANDED:** approximately parallel bands of varying color
- ♦ **STREAKED:** randomly oriented streaks of color
- ♦ **BLOTCHED:** large irregular patches of color (>75-mm diameter)
- ♦ **MOTTLED:** irregular patches of color
- ♦ **SPECKLED:** very small patches of color (<10-mm diameter)
- ♦ **STAINED:** local color variations associated with other features; (i.e., bedding, joints, etc.)

## HARDNESS:

### *ROCK HARDNESS*

CLASSIFICATION	DESCRIPTION
Very Soft	Can be peeled with a knife.
Soft	Can be easily gouged or carved with a knife.
Medium soft	Can be readily scratched with a knife blade; scratch leaves heavy trace of dust and is readily visible after powder blown away.
Hard	Can be scratched with a knife with difficulty; scratch produces little powder and is often faintly visible.
Very hard	Cannot be scratched with a knife or can barely be scratched with a knife.

**WEATHERING:**

**DEGREE OF WEATHERING**

CLASSIFICATION	DIAGNOSTIC FEATURE				
	DISCOLORATION EXTENT	FRACTURE CONDITION	SURFACE CHARACTERISTICS	ORIGINAL TEXTURE	GRAIN BOUNDARY CONDITION
Unweathered	None	Closed or discolored	Unchanged	Preserved	Tight
Slightly weathered	<20% of fracture spacing on both sides of fracture	Discolored - may contain thin filling	Partial discoloration	Preserved	Tight
Moderately weathered	>20% of fracture spacing on both sides of fracture	Discolored - may contain thick filling	Partial to complete discoloration not friable except poorly cemented rock	Preserved	Partial opening
Highly weathered	Throughout	-	Friable and possibly pitted	Mainly preserved	Partial separation
Completely weathered	Throughout	-	Resembles a soil	Partly preserved	Complete separation

**TEXTURE:**

**GRAIN SIZE CLASSIFICATION**

CLASSIFICATION	SIZE (in mm)	RECOGNITION	EQUIVALENT SOIL TYPE
Very fine grained	<0.06	Individual grains cannot be seen with a hand lens	Clays and silts
Fine grained	0.06 to 0.2	Just visible as individual grains under hand lens	Fine sand
Medium grained	0.2 to 0.6	Grains clearly visible under hand lens; just visible to the naked eye	Medium sand
Coarse grained	0.6 to 2.0	Grains clearly visible to the naked eye	Coarse sand
Very coarse grained	>2.0	Grains measurable	Gravel

**BEDDING/FOLIATION CHARACTERISTICS:**

**THICKNESS**

CLASSIFICATION	THICKNESS
Massive	>4-ft
Thick	2 to 4-ft
Medium	2-inch to 2-ft
Thin	1/2 to 2-inch
Fissile	<1/2-inch

***INCLINATION***

<b>CLASSIFICATION</b>	<b>ATTITUDE</b>
Flat	0 to 5-degrees
Gently dipping	5 to 20-degrees
Moderately dipping	20 to 45-degrees
Steeply dipping	45 to 85-degrees
Very steeply dipping	85 to 90-degrees

**STRUCTURE (Fractures and Joints):**

Fracture is the general term for any mechanical discontinuity in the rock; it is therefore the collective term for joints, faults, cracks, etc.

Joint is a break of geological origin in the continuity of a body of rock occurring either singly, or more frequently in a set or system, but not attended by a visible movement parallel to the surface of discontinuity.

***INCLINATION***

<b>CLASSIFICATION</b>	<b>ATTITUDE</b>
Flat	0 to 5-degrees
Gently dipping	5 to 20-degrees
Moderately dipping	20 to 45-degrees
Steeply dipping	45 to 85-degrees
Very steeply dipping	85 to 90-degrees

***FRACTURE SPACING***

<b>CLASSIFICATION</b>	<b>SPACING</b>	<b>EQUIVALENT ROCK MASS CLASSIFICATION</b>
Very wide	>10-ft	Solid
Wide	3 to 10-ft	Massive
Moderately close	1 to 3-ft	Blocky/seamy
Close	2-inch to 1-ft	Fractured
Very close	<2-inch	Crushed and shattered

***ROUGHNESS***

<b>CLASSIFICATION</b>	<b>DESCRIPTION</b>
Smooth	Appears smooth and is essentially smooth to the touch. May be slickensided.
Slightly rough	Asperities on the fracture surfaces are visible and can be distinctly felt.
Medium rough	Asperities are clearly visible and fracture surface feels abrasive.
Rough	Large angular asperities can be seen. Some ridge and high side angle steps evident.
Very rough	Near vertical steps and ridges occur on the fracture surface.

**SEPARATION**

CLASSIFICATION	SEPARATION (in mm)
Tight	none
Very narrow	0 to 0.1
Narrow	0.1 to 1.0
Wide	0.1 to 5.0
Very wide	5 to 25

**FILLING**

CLASSIFICATION	DESCRIPTION
Clean	No filling material
Stained	Coloration of rock surface only, no recognizable filling material
Filled	Fractured filled with recognizable filling material

**SOLUTION AND VOID CONDITIONS:**

**CONDITION**

CLASSIFICATION	CONDITION
Solid	no voids
Porous	voids <1.0-mm in diameter
Pitted	voids 1 to 6-mm in diameter
Vuggy	voids 6-mm to diameter of core
Cavity	voids greater than diameter of core

**RQD (Rock Quality Designation):** The RQD is a modified core recovery percentage in which all the pieces of sound core over 4-inches (100-mm) long are summed and divided by the length of the core run. The RQD is an index of rock quality in that problematic rock that is highly weathered, soft, fractured, sheared, and jointed is counted against the rock mass. Thus, it is simply a measurement of the percentage of "good" rock recovered from an interval of a borehole (reference: Stagg, K.G. and Zienkiewicz, O.C., (1968), Rock Mechanics in Engineering Practice, Wiley, N.Y., 442 pp.)

**FRACTURE FREQUENCY:** The number of natural discontinuities per length of coring run.

**FRACTURE DENSITY:** The spacing of all natural occurring discontinuities in the recovered core.

<PROJECT TITLE>  
<LOCATION>  
Subsurface Exploration Notes

1. Exploration was performed during the period DD-MMM-YYYY to DD-MMM-YYYY.
2. Drill holes (DH) were accomplished by standard penetration test procedure using a 1-3/8" ID x 2'-8" long split spoon. Sample spoons were advanced by a 140# hammer falling 30". These holes were power augered between samples. The first blow count in a given length of drive is for 0.5'; the second blow count is for 1.0', unless otherwise noted.

L.O.D. - Length of Drive

Rock was cored with an <<NQ, PQ, NWM, etc.>> series core bit.

3. Blow counts required to advance spoon are shown in column (a), except percent core recovery which is indicated where rock was cored.
4. The rock colors with letter/number designation are in accordance with the Munsell Color System and the "Rock Color Chart" distributed by the Geological Society of America. Those colors given are when core is <WET DRY>.
5. Column (b) shows the natural water contents in percent of dry weight of those samples tested and percent RQD where rock was cored. RQD is calculated as core pieces greater than or equal to 100-mm per run as drilled.
6. Depths below ground and soil descriptions are shown in column (c).
7. Descriptions:
  - A. Soil descriptions are laboratory classifications based on the Unified Soil Classification System (MIL-STD-619B) or ASTM D 2487, except those indicated thus \*, which are field inspectors' classifications.
  - B. Rock core logging are based on guidelines provided by HQ-USACE, AEG (S. Africa Section), and supplemental criteria provided by USACE - Baltimore District.
  - <<C. Saprolite on this project was highly weathered and discolored, friable rock with mica content, clay, original rock texture well preserved, very soft.>>
8. Groundwater depths are indicated on the logs as  $\dot{\bar{\cdot}}$  and are shown in column (d). Pertinent data for these readings are shown in the right hand margin under groundwater data. The actual groundwater level may vary depending upon seasons and amount of rainfall.
9. Elevations shown on the boring logs are ground surface elevations at the time of exploration and were determined by survey.
10. See boring plan for locations of drill holes.