

TABLE 3.1
CLASSIFICATION OF ROCK MATERIAL BASED ON UNCONFINED COMPRESSIVE STRENGTH
(STAPLEDON AND ISRM)

Term for Uniaxial Compressive Strength	Symbol	Strength (MPa)	Ranges for some Common Rock Materials				
			Granite, Basalt, Gneiss, Quartzite, Marble	Schist Sandstone	Limestone, Siltstone	Slate	Concrete
Extremely Weak	EW	0.25 - 1		**	**		
Very weak	VW	1 - 5		**	**	**	**
Weak	W	5 - 25		**	**	**	**
Medium Strong	MS	25 - 50	**		**	**	
Strong	S	50 - 100	**				
Very Strong	VS	100 - 250	**				
Extremely Strong	ES	>250	**				

The uniaxial compressive strength (UCS) can be easily predicted from point load strength index tests on rock cores and rock lumps right at the drilling site because ends of rock specimens need not be cut and lapped. UCS is also found from Schmidt's rebound hammer

RQD-by D. U Deere, 1964.

The RQD is a modified per cent core-recovery which incorporates only sound pieces of core that are 100 mm (4 inch.) or greater in length along the core axis,

$$\text{RQD} = \frac{\text{sum of core pieces} \geq 10 \text{ cm}}{\text{total drill run}} \cdot 100, \quad \%$$

TABLE 4.1
CORRELATION BETWEEN RQD AND ROCK MASS QUALITY

S. No.	RQD (%)	Rock Quality
1	<25	Very poor
2	25-50	Poor
3	50-75	Fair
4	75-90	Good
5	90-100	Excellent

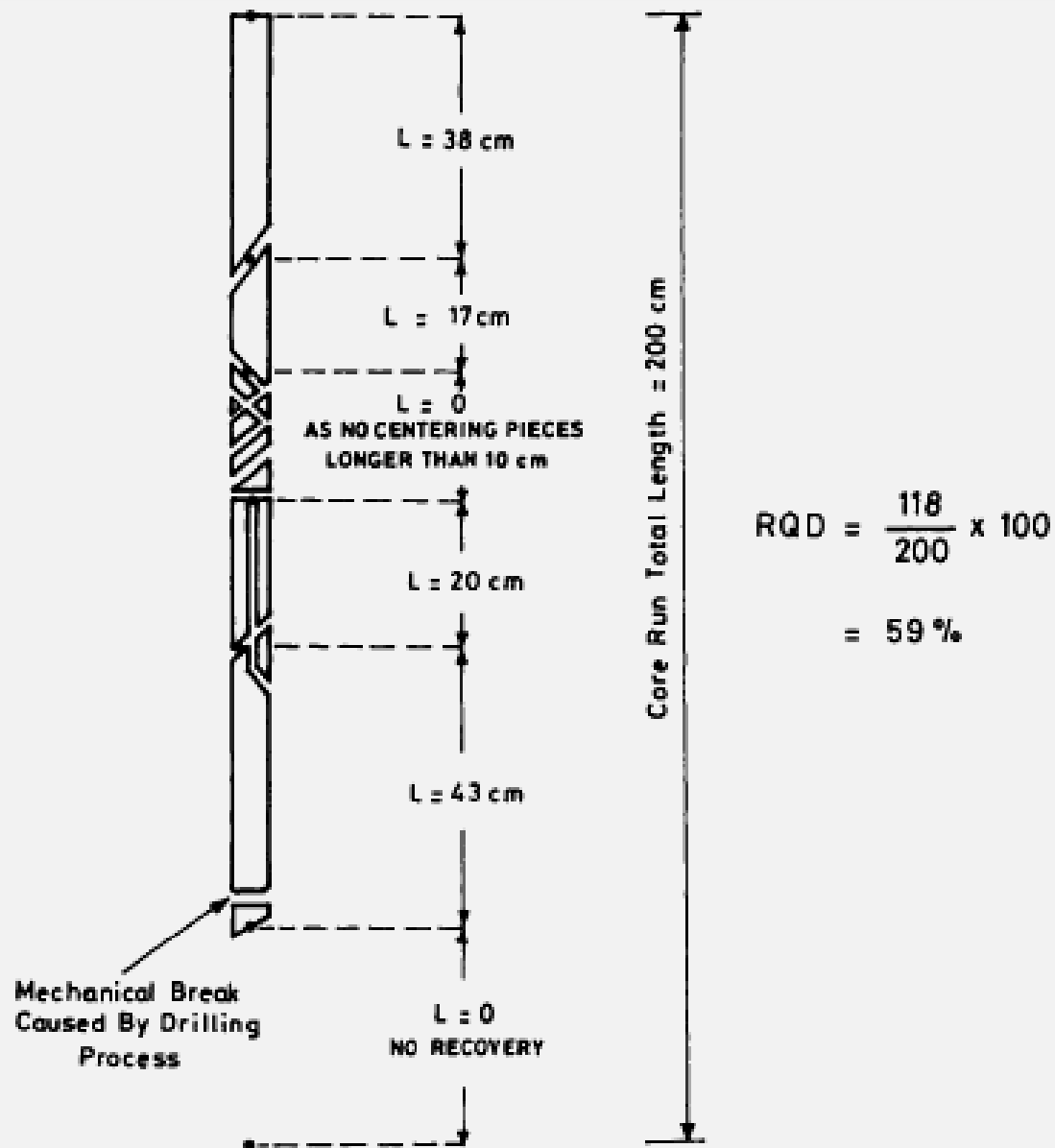


Figure 4.1: Procedure for measurement and calculation of rock quality designation RQD (Deere, 1989)

Seismic method for RQD

$$\text{RQD (\%)} = \text{Velocity ratio} \\ = (V_p/V_i)^2 \cdot 100$$

where V_p is insitu compressional wave velocity, and V_i is compressional wave velocity in intact rock core.

Volumetric joint count

$$\text{RQD} = 115 - 3.3 J_v$$

where J_v represents the total number of joints per cubic meter or the volumetric joint

TABLE 4.2

CLASSIFICATION OF VOLUMETRIC JOINT COUNT J_v (PALMSTROM, 1982 & 1996)

S. No.	Term for Jointing	Term for J_v	J_v
1.	Massive	Extremely low	<0.3
2.	Very weakly jointed	Very low	0.3 - 1.0
3.	Weakly jointed	Low	1 - 3
4.	Moderately jointed	Moderately high	3 - 10
5.	Strongly jointed	High	10 - 30
6.	Very strongly jointed	Very high	30 - 100
7.	Crushed	Extremely high	>100

Though the RQD is a simple and inexpensive index, when considered alone it is not sufficient to provide an adequate description of a rock mass because it disregards joint orientation, joint condition, type of joint filling and stress condition.