

Input parameter ratings or values to Q, RMI and RMR classification systems

PARAMETER		APPLICATION					
		in the Q system		in the RMI support method		in the RMR system	
Rock	Rock strength	-	-	σ_c	uniaxial compressive strength	A1	uniaxial compressive strength or point load strength
Jointing	Degree of jointing	RQD	rock quality designation	Vb	block volume	A2	RQD
	Joint sets (pattern)	Jn	joint set number	Nj	joint set factor	A3	joint spacing
	Joint character	Jr	joint roughness number	jR	joint smoothness and waviness factor	-	-
	Joint coating or infilling	Ja	joint alteration number	JA	joint condition factor (filling, alteration)	A4	joint roughness
	Joint size	-	-	jL	joint length and continuity factor		joint infilling, gouge
	Joint separation	-	(partly in Ja)	-	(partly in JA)	joint weathering	
	Joint orientation	-	-	Co	joint orientation factor	A6	joint length, persistence
Water	Ground water	Jw	joint water reduction factor	GW	effect of groundwater	A5	groundwater leakage condition
Stress	Rock stresses	SRF	stress reduction factor	SL	stress level factor	-	-
Tunnel	Tunnel dimensions	Dt	span	Dt	span or diameter	-	-
		Wt	wall height	Wt	wall height		
		ESR	excavation support ratio	-	-		
Rockmass	Rockmass compressive strength (approximate)	-		$RMi = 0.2 \sigma_c \times jC^{0.5} \times Vb^D$ or $RMi \approx 0.5\sigma_c$ (for massive rock)		-	
	Rockmass competency	-		$Cg = RMi / \sigma_c$		-	
Ground	Ground quality (in roof)	$Q = RQD/Jn \times Jr/Ja \times Jw/SRF$		$Gc = RMi \times SL \times GW$		RMR = A1+A2+A3+A4+A5+A6	
	Ground quality (in wall)	$Q_{wall} = Q \times K$		$Gc_{wall} = RMi \times SL \times GW \times C$			
	Size ratio or Dimension ratio	$De = \text{span or wall height}/ESR$		$Sr_{roof} = (Dt/Vb^{1/3})(Co/Nj)$		-	
				$Sr_{wall} = (Wt/Vb^{1/3})(Co/Nj)$		-	
K = adjustment of Q-value for walls. It varies with the Q-value; C = adjustment factor for walls (and for all inclinations of the tunnel surface) in RMI system $D = 0.37 jC^{-0.2}$ $jC = jR \times jL / jA$							