反発係数事例集

RN（鉛直）				RT（接線）				タイプ	検証方法	場 所
最小	最大	平均	標準偏差	最小	最大	平均	標準偏差			
0.370	0.420			0.870	0.920			Hard surface paving	Tested using simulated rockfalls of similar size and shape of a previous rockfall.	Glenwood Canyon, Colorado, USA
0.330	0.370			0.830	0.870			Bedrock or boulders with little soil or vegetation		
0.300	0.330			0.830	0.870			Talus with little vegetation		
0.300	0.330			0.800	0.830			Talus with some vegetation		
0.280	0.320			0.800	0.830			Soft soil slope with little vegetation		
0.280	0.320			0.780	0.820			Vegetated soil slope		
		0.315	0.064			0.712	0.116	Limestone face	Tested on restoration-blasting slopes made of four types of materials; blast-generated rock fragments, partially vegetated scree on berms, uncovered blast piles, and vegetated quarry waste.	Limestone quarry in England
		0.303	0.080			0.615	0.170	Partially vegetated limestone scree		
		0.315	0.064			0.712	0.116	Uncovered limestone blast pile		
		0.251	0.029			0.489	0.141	Vegetated covered limestone pile		
		0.276	0.079			0.835	0.087	Chalk face		Chalk quarry in England
		0.271	0.018			0.596	0.085	Vegetated chalk scree		
		0.384	0.133			0.687	0.130	Wood platform slope at 45 degrees was used as a control for the field tests they did.	Tested as control parameters	Western North Carolina for Interstate 40.
		0.200				0.530		Dolomitic limestone boulders on rocky surfaces and on talus desposits	Consisted of hand made throws and free fall tests by fragmentation of rock using explosives, of dolomitic limestone boulders on rocky surfaces and on talus deposit of the landslide fans. Also used back-analysis, and information from Urciuoli	Atrani, Campania, Southern Italy
		0.100				0.200		Remolded pyroclastic from the terraces situated at the base of the cliff		
		0.000				0.240		Impacts on detritus of the fans present at the foot of a rock cliff		
		0.393				0.567		Soil	Tested by dropping 3 to 5 cm cuboid and angular granite rock fragments onto slopes	Hong Kong
		0.453				0.737		Shotcrete		
		0.487				0.910		Rock slope		
		0.500				0.950		Bedrock	Referenced from tests carried out by Barbieri et al.	Italcementi works at Castellammare di Stabia(northern slope of the Sorrentine di Stabia(northern slope of the Sorrentine Peninsula), and the area of Atrani.
		0.350				0.850		Bedrock covered by large blocks		
		0.300				0.700		Debris formed by uniform distributed elements		
		0.250				0.550		Soil covered by vegetation		
		0.530				0.990		Clean hard bedrock 硬質岩の露岩部	Hoek, Evert.博士の研究成果 ROCFALLソフトウエアのデフォルト値として用いられている。	
		0.400				0.900		Asphalt roadway 道路のアスファルト		
		0.350				0.850		Bedrock outcrops with hard surface, large boulders		
		0.320				0.820		Talus cover 崖錐層		
		0.320				0.800		Talus cover with vegetation 植生の発達した崖錐層		
		0.300				0.800		Soft soil, some vegetation 軟らかい土壌		
0.370	0.420							Smooth hard surfaces and paving	Developed by observation and literature review	Colordado, USA
0.330	0.370							Most bedrock and boulder fields		
0.300	0.330							Talus and firm soil slopes		
0.280	0.300							Soft soil slopes		
				0.870	0.920			Smooth hard surfaces such as pavement or smooth bedrock surfaces		
				0.830	0.870			Most bedrock surfaces and talus with no vegetation		
				0.820	0.850			Most talus slopes with some low vegetation		
				0.800	0.830			Vegetated talus slopes and soil slopes with spares vegetation		
				0.780	0.820			Brush covered soil slope		
		0.530	0.040			0.990	0.040	Clean Hard Bedrock	a) rolled many rocks down the slope to verify used values b) comparison to historical rockfall events at site	Mountain road, near Bolzano, Sothtyrol, Italy
		0.350	0.040			0.850	0.040	Bedrock outkrop		

RN (鉛直)				RT (接線)				タイプ	検証方法	場 所
最小	最大	平均	標準偏差	最小	最大	平均	標準偏差			
		0.320	0.040			0.820	0.040	Talus cover		
		0.320	0.040			0.800	0.040	Talus with vegetation		
		0.400	0.040			0.900	0.040	Asphalt paving		
		0.530	0.040			0.990	0.040	Clean Hard Bedrock	default program values used	170m deep open pit, Tasmania, Australia (overall pit angle between 55 and 65 degrees)
		0.350	0.040			0.850	0.040	Bedrock outcrop		
		0.480	0.190			0.530	0.170	Concrete	inverse calculation of paths - standard deviations seemed to large	Takamatsu, Japan
		0.470	0.300			0.550	0.230	Weathered Rock		
		0.480	0.000			0.530	0.000	Concrete	inverse calculation of paths, roughness of 7.9 degrees for concrete, 9.3 for rock	
		0.470	0.000			0.550	0.000	Weathered Rock		
		0.850	0.000			0.530	0.000	Concrete	inverse calculation of paths	
		1.000	0.000			0.550	0.000	Weathered Rock		
		0.530	0.040			0.990	0.040	Bedrock	Estimation, block diameters 10 to 30 cm	Fjord valley, State of Sogn og Fjordane, Norway
		0.500	0.060			0.700	0.060	Blockfield		
		0.500	0.060			0.650	0.060	Blockfield with bushes and small trees		
		0.500	0.060			0.500	0.060	Blockfield with forest		
		0.300	0.060			0.800	0.060	Top-soil with vegetation		
		0.400	0.040			0.900	0.040	Asphalt paving		
		0.350	0.040			0.850	0.040	Gravel road		
		0.500				0.800		Sparsley forested slope is covered by a veneer of very fine weathered talus derived	Calculated from historic rockfall	Sunnybrae, (interior of)British Colombia, Canada
		0.500				0.800		Limestone on bare uniform talus slope formed of basalt fragments with a modal	Calculated from historic rockfall	Hedley, (southern interior of) British Colombia, Canada
		0.700				0.900		rectangular bolder of metamorphosed tuff on bare rock and a steep snow covered shelf.	Calculated from historic rockfall	Squamish Highway, north of Vancouver British Colombia, Canada

採用値

垂直反発係数		接線反発係数		摩擦角(度)		地表面の分類	
平均値	標準偏差	平均値	標準偏差	平均値	標準偏差		
Rn_mean	Rn_std_dev	Rt_mean	Rt_std_dev	Phi_mean	Phi_std_dev		
0.35	0.04	0.85	0.04	30	2	基盤	基盤岩(被覆層薄い場合)
0.32	0.04	0.82	0.04	30	2	土砂	崖錐層
0.53	0.04	0.99	0.04	30	2	岩	硬質岩の露岩部
0.40	0.04	0.90	0.04	30	2	ｱｽﾌｧﾙﾄ	アスファルト
0.32	0.04	0.80	0.04	30	2		植生発達した崖錐層
0.30	0.04	0.80	0.04	30	2		植生のある土壌