

ZESCO Gravel Classification System (Based on TRH14 Classification System for Granular Materials, Gravels and Soils)

Groups	G1, G2, G3: Graded Crushed Stone			G4, G5, G6: Natural Gravels			G7, G8, G9, G10: Gravel Soil			
Description	G1 Crushed unweathered rock	G2, G3 Crushed rock, boulders or coarse gravel		Natural gravel; may be mixed with crushed rock such as boulders. May be cementitiously or mechanically modified.			Categorised in terms of properties below.			
Material Class	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
GRADING										
Sieve Size (mm)	Nominal max size 37.5 mm ¹	Nominal max size 28 (26.5) mm ¹			Max size 64 mm or two-thirds of compacted layer thickness, whichever is smaller.		Max size, in place, after compaction, shall not be greater than two-thirds of the layer thickness.	No grading requirements		
50 / 53	100			100						
37.5	100			85 – 100						
28 / 26.5	84 – 94	100		–						
20 / 19	71 – 84	85 – 95		60 – 90						
14 / 13.2	59 – 75	71 – 84		–						
5 / 4.75	36 – 53	42 – 60		30 – 65						
2	23 – 40	27 – 45		20 – 50						
0.425	11 – 24	13 – 27		10 – 30						
0.075	4 – 12	5 – 12		5 – 15						
Grading Modulus (min)	N/A			N/A	1.5	1.2	N/A			
Flakiness Index	Max 35% on weighted average of -28 (26.5) and -20 (19) mm fractions		N/A	N/A			N/A			
Crushing Strength	10% FACT (min) 110 kN or ACV (max) 29%		N/A	N/A			N/A			
ATTERBERG LIMITS										
Liquid Limit (max)	25	25		25	30	N/A	N/A	No Atterberg Limit requirements		
Plasticity Index, PI (max)	4	6		6	10	12 or 3 GM ² + 10	12 or 3 GM ² + 10			
Linear shrinkage, % (max)	4	3		3	5	N/A	N/A			
Linear shrinkage x -0.425 mm sieve (max) ³	N/A			170	170	N/A	N/A			
BEARING STRENGTH AND SWELL										
CBR, % (min) at MDD ⁴	N/A	80 at 98%		80 at 98%	45 at 95% ⁵	25 at 93%	15 at 93%	10 at in situ	7 at in situ	3 at in situ
Swell, % (max) at MDD	N/A	0.2 at 100%		0.2 at 100%	0.5 at 100%	1.0%	1.5%			
Material Class	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10

Notes:

- G1 adjustments to the grading can only be made using crusher dust or other fractions from the parent rock. Only in exceptional cases can a maximum 10% non-plastic fines be added. G2 and G3 materials may be a blend of crushed stone and other fine aggregate to adjust the grading.
- GM is the grading modulus (see Chapter 3, Section 2.3.2)
- Only applicable to nodular calcretes
- MDD is the maximum dry density determined by the modified AASHTO method.
- In dry areas (Weinert N > 10) and AADT < 300 vehicles per day CBR can be reduced to 25% @ 95% MDD if subbase cover is at least 150 mm.