



**ROAD PAVEMENTS
FORUM**

AGGREGATE SUPPLY CHAIN ON N2/N3 CORRIDOR



N2/N3 Corridor: KZN



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

N2 Upgrades

- 55km of upgrades
- From Lovu River on the South Coast, to uMdloti on the north coast.
- 11 work packages in total.
- 2 of 9 Packages currently in construction stage - R6,6billion
- Estimate- R19billion

N3 Upgrades

- 80km of upgrades
- From Pietermaritzburg to Durban.
- 15 work packages in total (Excl PMB RR).
- 9 packages currently in construction stage – R18,3billion
- Estimate R33 billion (Excl PMB RR)



ROAD PAVEMENTS
FORUM

SPONSORED BY



AfriSam Aggregate Operations-KZN



ROAD PAVEMENTS
FORUM

AGGREGATE / KWAZULU - NATAL

- 📍 COEDMORE
- 📍 VERULAM
- 📍 PIETERMARITZBURG
- 📍 UMILAAS ROAD

Base and Subbase

- G2 G4a
- G4 G5a
- G5
- G9



Plant Capacities

- Coedmore
+ 450 t/hr
- Verulam
+ 120 t/hr
- Pmb
+ 300 t/hr
- Umilaas Rd
+ 110 t/hr

Road Stone sizes

- 20mm Class 2
- 14mm Class 1&2
- 10mm Class 1&2
- 7.1mm Class 1&2

Concrete Stone sizes

- 28mm
- 20mm
- 14mm
- 10mm

Crusher Sands

- Crusher Sand for Readymix
- Crusher Sand for Ashphalter

SPONSORED BY



Aggregates Properties

Property	Test	Standard	Product	Criteria	
Hardness / Toughness	Fines aggregate crushing test: 10% FACT (kN)	SANS 3001-AG10	Sand skeletal mixes	≥ 160	
			Stone skeletal mixes	≥ 210	
	Aggregate crushing value (ACV)	SANS 3001-AG10	Sand skeletal mixes	≤ 25	
			Stone skeletal mixes	≤ 21	
Soundness	Magnesium sulphate soundness (%)	SANS 5839 SANS 3001-AG12	All	Rolled in chippings:	≤ 21
				12 - 20	
Durability	Methylene blue adsorption indicator	SANS 6243	All	≤ 5 > 5: additional testing and analysis needed	
Particle shape and texture	Flakiness index	SANS 3001-AG4	20 mm and 14 mm aggregate	$\leq 25^{*1}$	
			10 mm and 7,1 mm aggregate	≤ 30	
			Rolled in chippings	≤ 20	
	Polished stone value (PSV)	SANS 3001-AG11	Coarse aggregate for surfacing	$\geq 50^{*2}$	
Fractured faces	ASTM 5821	Sand skeletal mixes	At least 50 % of all particles should have three fractured faces		
		Stone skeletal mixes and rolled in chippings	At least 95 % of all particles should have 3 fractured faces		
Water absorption	% by mass	SANS 3001-AG20	Coarse aggregate (>5,0 mm)	$\leq 1,0$	
		SANS 3001-AG21	Fine aggregate (< 5,0 mm)	$\leq 1,5$	
Binder absorption	% by mass	SANS 3001-AS11	Coarse and fine aggregate	$\leq 0,5$	
		SANS 3001-AG5	Total fines fraction	≥ 50	
Cleanliness	Sand equivalency test	ASTM C142-97	Coarse and fine aggregate	$\leq 1,0$	
	Clay lumps and friable Particles (%)				

SPONSORED BY



Aggregate Properties

	Nominal maximum particle size (NMPS) (mm)											
	28,0		20,0		14,0		10,0		7,1		5,0	
Grading grade	1	2	1	2	1	2	1	2	1	2	1	2
Sieve size (mm)	Percentage passing sieve size by mass											
37,5	100	100	-	-	-	-	-	-	-	-	-	-
28,0	85-100	85-100	100	100	-	-	-	-	-	-	-	-
20,0	0-20	0-35	85-100	85-100	100	100	-	-	-	-	-	-
14,0	0-5	0-5	0-20	0-35	85-100	85-100	100	100				
10,0			0-5	0-5	0-20	0-35	85-100	85-100	100	100		
7,1					0-5	0-5	0-20	0-35	85-100	85-100	100	100
5,0							0-5	0-5	0-20	0-35	85-100	85-100

Once the target grading has been fixed for each individual coarse aggregate fraction, the allowable tolerances shall not exceed 10 % of that agreed for the target grading for each specific nominal maximum aggregate particle size. The Contractor shall note that commercial suppliers may not be able to consistently supply all the required nominal single size aggregate to the specified tolerances. In such instances additional on-site screening may be necessary, for which no additional payment shall be made. The use of run of crusher type materials shall not be permitted.

SPONSORED BY



Aggregate Properties- C/Sand

Table A9.1.5-4: Fine aggregate grading limits for relevant mix type

Grading Grade	Grade 1	Grade 2	Stockpile Tolerance
	Percentage passing by mass		
Sieve Size (mm)	Class 1 Percent Passing	Class 2 Percent Passing	
	Stone skeletal mixes as defined	Sand skeletal mixes as defined	
7,1	100	85 - 100	5 %
5	90 - 100	70 - 90	5 %
2	65 - 90	45 - 70	5 %
1	45 - 70	28 - 50	5 %
0,6	30 - 50	19 - 34	5 %
0,3	18 - 30	12 - 25	4 %
0,15	10 - 21	7 - 18	3 %
0,075	5 - 15	5 - 15	2 %

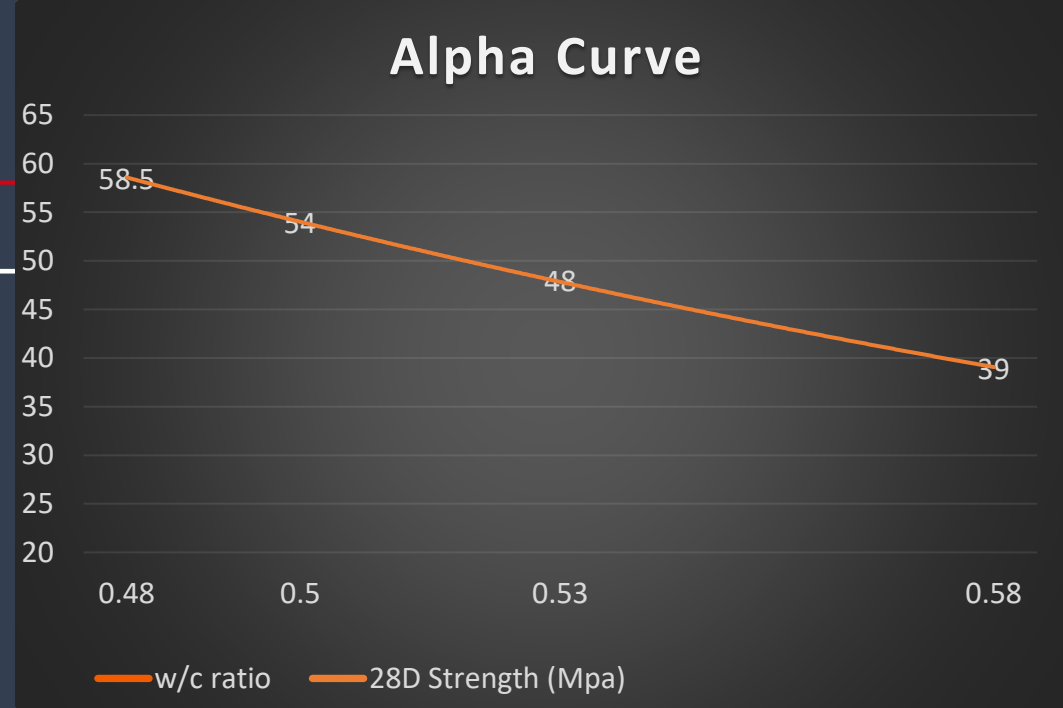
When determined in accordance with SANS 3001-AG1, the Fineness Modulus (FM) of both the crushed and natural fine aggregates shall not deviate by greater than 0,2 from that determined on the fine aggregate incorporated in the approved design mix.

SPONSORED BY

CONCRETE LAYER

Requirements

- Max w/c ratio 0.53
- Min Cementitious 320kg/m³
- *Specified strength -highest of:*
 - (i) 35MPa @ 28 day
 - (ii) 85% of comp str corresp 4.5MPa FS
 - (iii) 85% of comp str corresp to 0.53 w/c
 - (iv) 85% of comp str corresp 320kg/m³



Typically Asphalt layer is used to improve ridability-

SPONSORED BY

