ASPASA feedback

COTO (G1 & RMC)
SANS 1083
SANS 3001

- 49th RPF
- 27th November 2025
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Discussion points

COTO

- G1 grading concerns
- Commercial concrete supplier requirements

SANS 1083

- Progress

SANS 3001

- Compaction issues – scalp / crush

COTO - G1 grading concerns

Colto G1 grading

Max nom size (mm)		37.5
Sieve Size (mm)	53.0	100
	37.5	100
	26.5	84 - 94
	19.0	71 - 84
	13.2	59 - 75
	4.75	36 - 53
	2.00	23 - 40
	0.425	11 - 24
	0.075	4 - 12

Range allowed 10 %

COTO G1 grading

Max nom size (mm)		37.5
Sieve Size (mm)	50.0	100
	37.5	100
	28	86 - 90
	20.0	73 - 80
	14	61 - 71
	5.00	37 - 49
	2.00	23 - 36
	0.425	11 - 20
	0.075	4 - 10

Range allowed 4 %

The question is …

Is the reduction in the grading envelop *practically* achievable for 28 mm fraction?

COTO
G1 grading concerns

- Why the drop for 10 % to 4 %?
- All other envelope revisions around 32%
  - 28 mm = 60% reduction
  - @ 30 % reduction = 7% envelope
  - 86% - 93%
- Practically not achievable @ 4%
  - If it's achieved, the fines fall out of spec
  - If the fines are in, the 28 mm falls out of spec.

- Various StDev from supplies & NLA-SA PTS values @ 28 mm
  - Supplier 1 91,6%
    - @ 1,6% (184#)
  - Supplier 2 89,3%
    - @ 3,6% (119#)
  - Supplier 3 92.2%
    - @ 1,3% (630#)
  - NLA-SA PTS 93.2%
    - @ 2.3% (98#)
- Made up from different geological material types
- Engineers approaches differ
  - Some apply a revision
  - Some refuse

COTO – Commercial concrete supplier requirements

A13.4.6 CONSTRUCTION EQUIPMENT

A13.4.6.1 General

Plant used to manufacture, transport, place and test concrete shall be based on proven technology within the industry, and shall be in good working order. The plant shall be inspected, serviced and calibrated at regular intervals and tested to ensure that the system functions efficiently and accurately, all to the satisfaction of the Engineer.

The plant and equipment utilised shall be selected to ensure that the peak output required by the approved construction programme can be achieved and maintained at all times.

A13.4.6.2 Commercially-sourced concrete

Where concrete is supplied by a commercial source outside the direct control of the Engineer, the concrete supplier shall ensure compliance with the requirements of SANS 50206 (SANS 878), and the Contractor shall have full responsibility to implement process acceptance control testing in accordance with the specification. Commercial concrete suppliers shall ensure that the plant, measuring, mixing, transport and associated processes are audited by a recognised independent body in accordance with the following requirements for commercially-sourced concrete:

a) ISO 9002 (standardisation);
b) ISO 14001 (environmental);
c) ISO 39001 (road transport safety management);
d) OHSAS 18001 (legal compliance); and
e) SANS 50206 (SANS 878), ISO 22965-2 or ISO 9001 (quality management system for concrete production)

The audit shall be valid for a period of no greater than 12 months.

- No commercial concrete suppliers currently comply with all these requirements - *A13.4.6.2 a) – e)*
- Are there registered independent bodies who can conduct these audits?
  - Registered with whom?
- Again, some Engineers insist on compliance while other waiver the requirements
- Basically, no commercial concrete supply is possible if this is to be enforced

SANS 1083 - Progress

- 2 working groups
  - Aggregates supply
  - Bituminous products
- 2 meetings held to combine the working groups sections
  - Aggregate supply
  - Asphalt & Seals stone
- Ready for final review for consistency

- Introduction to be added
  - Definitions
  - Abbreviations
- Submitted to SABS
- Explanatory document from industry
  - SANS 1083 implementation
  - When is advanced testing required/appropriate

SANS 3001 - Compaction issues scalp or crush

- This issue is related to all compaction relate methods
- Granular methods
  - SANS 3001 GR30 - MDD
  - SANS 3001 GR40 - CBR
- GR50 series – cement stabilised layers
  - GR50 & GR51 – design & lab sampling
  - SANS 3001 GR31 - MDD
  - SANS 3001 GR53 - UCS
  - SANS 3001 GR54 - ITS
- BSM compaction
  - TG2 BSM3 Vibrating hammer - ITS
  - SANS 3001 GR30 - MDD

SANS 3001 - Compaction issues Scalp or Crush

- Granular methods (GR30 - MDD & GR40 – CBR)
  - Scalp +37,5 mm
  - No crushing
- GR50 stabilised series – (GR31 – MDD, GR53 – UCS, GR54 – ITS)
  - Scalp +37,5 mm
  - No crushing
- BSM compaction (Vibrating hammer – ITS, GR30 – MDD)
  - Sieve off +20 & Crush
  - Reintroduce +14 mm
  - GR30 – scalp only

SANS 3001 - Compaction issues Granular methods GR30 - MDD GR40 – CBR

- G1 – G3
  - No issue as max size 37.5
- All other G4 & lower classifications with allowable +37,5 mm spec
- Coarse material lost
- Results in
  - Lower CBR’s
  - **Potential failure of previously acceptable material**
- Inconsistent ruling from Engineers
  - Some accept crushing similar to TMH1 methodology
  - Some reject material outright

SANS 3001 - Compaction issues GR50 stabilised series MDD/CBR UCS ITS

- G1 – G3
  - No issue as max size 37.5
- All other G4 & lower classifications with allowable +37,5 mm spec
- Coarse material lost
- Result in
  - Lower CBR's for initial acceptance
  - **Potential failure of previously acceptable material**
- Inconsistent ruling from Engineers
  - Some accept crushing similar to TMH1 methodology (CBR)
  - Some reject material

SANS 3001 - Compaction issues BSM compaction Vibrating hammer ITS Standard MDD

- ITS - +20 mm reintroduced after crushing for +14 mm fractions
  - Site testing or only for design?
- MDD
  - As per GR30, only scalping should be done
  - Also crush +20 mm to +14 mm which changes the MDD value
  - Some scalp, some crush
- Again, inconsistent rulings by Engineers
  - Leads to confusion
  - What is the correct practice ?
  - What produces the most accurate results for approval of work ?

SANS 3001 - Compaction issues Proposal for site/lab QC/QA testing

- All methods use the same crushing if not G1- G3
  - Prevents multiple applications on site labs which could be incorrectly done, leading to results that are questionable or construction that is below required standard.
  - +14 mm reintroduced ??
  - +20 mm reintroduced ??
- Remember GR30 is used for compaction approval!!
  - Lower MDD
    - Easier to achieve density in the field
    - Densities of 110 % which is highly questionable

SANS 3001 - Compaction issues Proposal for site/lab QC/QA testing

- Eng4.0 to investigate effects of the 2 proposed crushing methods & resultant variations.
  - RoadLab has conducted some testing with Power Construction which can be made available to Eng4.0
- Interim results need to be provided so that industry can implement revised proposal
- SABS revisions will take time (18+ months) & requires lab testing to validate the revisions
- Industry needs a revision ASAP so we are all moving in the same direction & using material that is acceptable

Many thanx for your time

- Proposal for 3 resolutions
- Revision to G1 28 mm grading envelope required
- Revisions to scalp / crush for all compactions
- Commercial concrete supplier compliance requirements

- All of the above issues are urgent as they are extremely costly to the industry