

AFCAP



Specifications and Design Manuals Workshop

Issues and Concerns

Addis Ababa
16/17 July 2014

General Comments



- Issues and concerns based on feedback and comments since 2009
 - Workshops & Peer Group meetings
 - Reviews and use in practice
 - General issues pre-2002
 - Ad hoc comments
- 2002 specifications
 - ASTM/AASHTO v BS v other
 - Move to African-specific specifications
 - SATCC specs (based on COLTO)
 - ORNs v TRHs
- Specs completed to a point
 - Consistency
 - Consolidation of best practice
- Programme structure



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Objectives of Workshop



- Like minded experts to obtain consensus of specific issues
- Provide agreement or a way forward
- Possible projects for AFCAP 2



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Gravel Roads Introduction



- LVR manual and Specs based on TRH 20 specs
- Asked to look at an unpublished TRL report from 2008 on Ethiopian Materials which contained derived specs from the research.
- Both specs based on similar parameters but different
 - Function of Grading and plasticity
- TRH 20 not referenced in TRL report
 - Was it considered?
- Kenneth to provide more background to the TRL work
- Phil to respond related to TRH 20



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Issues & Concerns



- What Specifications Limits should we use in Ethiopia for unpaved roads?
- Can we standardise on the parameters to measure the Material Quality Zones? If so which?
- Are the performance measure consistent in terms of gravel loss and roughness. What are the implications?
- How should we evaluate plasticity?
 - May need discussion on PI and LS first
- Do we need an aggregate strength test for gravel w/c and if so which test?



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Test Methods related to Gravel Road discussions



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Atterberg Limits



- Variation between BS LL (cone or Casagrande) related to ASTM/SANS.
 - $LL_{ASTM} = LL_{BS} - 4$
- Implications to PI < 6 spec
- Implications to other performance indicators such as Plasticity modulus or Plasticity product or DMI.
- Problems with PL
- Should we use one test eg LS. If so which method? Implication?
- Do we need a plasticity measure in specifications?



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Aggregate Strength & Durability



- Strength of Aggregates
 - ACV & AIV not appropriate for weaker aggregates
 - 10% FACT v modified AIV
 - Treton test advantages and disadvantages
 - Should we standardise on one test?
 - Implications to surfacing aggregates (covered under surfacing seals)
- Aggregate Durability
 - Do we need durability specs for natural gravel bases?
 - LAA v DMI (TBM) advantages and disadvantages
 - Is durability a problem if the base is kept dry?
 - What quality control measures should we use?



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Other Test Method Issues



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ASTM/AASHTO v BS v SANS

- Which test methods should we use?
- Variation of BS v ASTM/AASHTO
- SANS based on both plus some customised SA methods
- Do ERA need their own standard test methods to relate to the specifications?
- If yes, what are the implications?
 - ERA national standards?
 - Copyright?



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Sieve Analysis



- Which sieve sizes should be adopted?
 - Metric sizes?
 - Implication of conversions from imperial sieve sizes. Issue with Specs adopted from US.
 - ISO standard sieve sizes?
- Implication to grading envelopes
- What about the current sieves in laboratories that are not ISO compliant?
- Do sieve manufacturers and/or Equipment suppliers have the new sieve sizes?
- Feedback on SA approach shown in SAPEM



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Density Measurement



- Ethiopian reluctance to use nuclear gauges
- Sand replacement method still preferred
- MP to introduce



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CBR Testing



- How relevant is the CBR?
- What does it measure?
 - Not a shear test
 - Bearing capacity through a mini plate bearing test?
50mm plunger on 19mm down aggregate?
 - Aggregate strength??
- Precision limits
 - Originally developed for assessing clayey/fine grained sub-grades in the northern hemisphere
- Influence of oversize
 - How is it dealt with in individual labs?
- What other test are more appropriate for design and quality control during construction?



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Laterite and Bitumen Specifications



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Laterite Specifications



- What are the implications of adopting the Brazilian Specifications?
- How does affect the CBR limit with 56 blows/layer?
- Should we using LL and PI? Or LS?
- PP-G presentation



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Bitumen Specifications



- How relevant are the AASHTO specs?
- Performance Grading
- Are the SANS specs for bitumen still relevant?
- What binder should be used and specified in Ethiopia for seals and asphalt?
- Is TG 1 2007 still relevant and should it be included in Standard Specs?
- BV and DR to comment



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DCP Test Method and Design Issues

MP to introduce



Surface Seals



Coordination and Consolidation of Practice



- Is it feasible to consolidate practice based on ORN 3 and TRH 3? And/or other international practice?
 - GvZ to provide feedback
- What strength parameters should be adopted for chippings
 - ACV issues
 - 10% FACT limits
- How should we deal with the Figure for binder choice v surface temperature
 - JR to provide feedback
- Application of second seal
 - KM, GvZ and JR for initial comment
- Otta seal definition and terminology
 - AO to comments



Asphalt Design & Specifications



Asphalt Design



- What types of asphalt are suitable for African conditions?
- Marshall design has been retained as the definitive method in the various ERA documents
 - Feedback from practitioners re SuperPave or similar
 - Latest SA practice
- 50mm AC in design charts
- JR to expand on the issues with comment from BV.



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Geometric Design

MP to introduce and JH to comment
RG to comment on Design-by eye issues



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Summary



- General
 - Complete the 2014 version of the specs as soon as possible mainly based on existing changes
 - Projects to be identified through AFCAP 2 for additional inputs
 - Projects done by RRC with mentorship support from identified experts
 - Specs guideline
 - Some issues can be resolved during the finalisation of the LVR manual
- Gravel Roads
 - Not resolved. Two options.
 - Just specify three parameters (Hardness, Density, Max aggregate size)
 - Leave as is (strict SA specs) with allowance for relaxation on instruction



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Summary (cont..)



- Test Method
 - Ethiopian test methods booklet to be developed to tie into specs
 - Must agree on consistent parameters for design and quality control
 - Design manuals based on ORN 31 and BS test methods
 - Aggregate tests based on 10% FACT or mod AIV
 - Sand replacement retained for density. Other methods to calibrate
- Laterites
 - Retain current laterite specifications
 - Further investigation required of Brazilian method



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Summary (cont..)



- DCP Design
 - Both DCP/DN and DCP/CBR design methods to be included in revised LVR manual
 - Further comparison between methods (possible RRC project)
- Surface Seal Specifications
 - JR to modify surface temperature figure for PDM and surfacing guide (circulate addendum to users)
 - Aggregate strength limits based on 10% FACT to be introduced (LS to discussed of GvZ)
 - Application of second seal in double seals is binder dependant. (ie MC3000, 3-4 weeks, pen grades within 48 hours)
 - DR to send latest EN/SANS bitumen specs



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Summary (cont..)



- Otta Seals
 - Clause in specs should be graded seals
 - Sub-clauses for Otta seals and other graded seals
 - Sand seals a separate clause
- Asphalt Design
 - Specifications based on Marshall designs to remain
 - Noted that it is not suitable for very high volume roads
 - Capacity (human and equipment) required to introduce performance-based asphalt design method
- Geometric Design
 - Flexibility in movement between design classes



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