



Technical Memorandum: TNZ TM 7001 v1

File: SP1 0004

27 April 2006

To: Dave Bates, Network Operations Manager

From: Greg Arnold and David Alabaster, Engineering Policy Section.

SUBJECT: Approval for Revised TNZ M/4 Specification for Basecourse Aggregate

Purpose

This memo requests approval to issue the attached revised 2006 version of the TNZ M/4 Specification for Basecourse Aggregate. Also attached is the final recommendation from Bartley Consultants and the consultation summary.

Reason For the Change

The April 2006 TNZ M/4 allows 5% by mass of glass cullet to be recycled into basecourse as a regional variant to M/4 (and also allows 5% glass in subbase). International research suggests that there are no particular advantages or disadvantages to using this product at the 5% level. Massachusetts and Minnesota DOTs allow up to 10% cullet, FHWA recommends up to 15% (30% in subbase applications) and California DOT allows up to 50% cullet. The change to TNZ M/4 was primarily made to encourage glass recycling and obtain some small savings in aggregate use. It will also assist local authorities in reducing glass stockpiles that would otherwise be dumped.

Consultation

The revised TNZ M/4 was submitted to industry for comment with response invited from Roading New Zealand, the Aggregate and Quarry Association, the Ministry for the Environment and the Packaging Council. Only minor comments were received and a summary of the comments received is attached.

Implementation

TNZ M/4:2006 will not cost more than TNZ M/4:2005. The requirement to use glass in basecourse is not mandatory and it will compete with existing aggregate

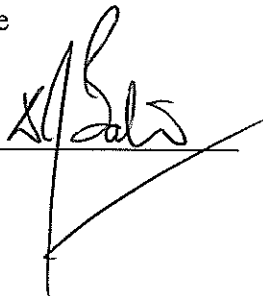
products. Equally savings are not likely as the 5% limit on glass in basecourse will not significantly alter prices.

It is planned to have this specification in all new Transit contracts. The new specification will be issued by posting it on the Transit website.

Recommendation

That you approve the attached revised TNZ M/4:2006 for issue.

This is hereby agreed by Mr Dave Bates for the BPG AM:

Name	Date	Signature
	<u>27/4/06</u>	<u>Dave Bates</u>

30 March 2006

Transit New Zealand
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CHRISTCHURCH

Attention: Mr David Alabaster



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Dear David

Amend the Transit NZ M/4 Specification to Accommodate the Use of Crushed Glass in Basecourse Aggregate

I have received feedback on the draft additions to M/4 from most of the people involved in the "Glass Aggregate Group" meeting.

One of the deliverables of the project is to provide a summary of the feedback and my responses to each reviewer. Please find attached a table that fulfils this task.

You will see that a small number of changes have been suggested. However, I have resisted making many changes because the proposed specification has been based on overseas literature and I think we need to gain some experience working with the specification before departing from the best international practice.

Yours sincerely,



Dr Ross Peploe
Bartley Consultants Limited

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Respondent	Date	Comments	Responses
Bruce Taylor <i>AGA rep</i> <i>from FH</i>	13 March, 2005	Bruce has discussed the draft with five colleagues & has no issues with any of the proposed amendments. Bruce suggests that fine-tuning may be necessary in time as experience grows.	Excellent, no changes necessary.
Josh Gluckman <i>MFE</i>	17 March, 2005	Josh is keen to get a good balance between technical viability & cost-effective production, with key issues most likely being particle size distribution & contamination levels. Josh questions whether more recyclers should be involved in the review process.	Agreed, no changes necessary. Agreed, I am sure that the document will be fine-tuned as recyclers gain experience with producing suitable cullet. No changes considered necessary. Would be good but I consider the current document to be a reasonable starting point & it will develop further with time. No changes considered necessary.
David Hutchison <i>Reading NE rep.</i>	28 March, 2005	David suggests that the 1 st & 3 rd paragraphs in the Definition section should be removed & put in the M/4 Notes section. David suggests that the "Reclaimed Glass Source" criteria should be placed in the comments section. David states that in the test frequency clause, the word "should" should be replaced with "shall".	Disagree, while the text may not be strictly part of a definition, it is useful to have some background information in the specification. Some readers may not look at the M/4 Notes section. No changes considered necessary. Disagree, I believe that the source criteria are integral to the requirements of the specification. No changes considered necessary. Agreed, change has been made.
Grant Bosma <i>FH</i>	23 March, 2005	Grant recommends that the contamination limits should be established in terms of volume rather than mass. This is to take into account the differences in density of various contaminants. Grant suggests that the grading criterion should be non-mandatory but if the cullet falls outside the grading envelope then the cullet / aggregate blend should be subjected to increased testing requirements. Grant states that the elongation test ASTM D4791 is only for particles retained on the 9.5 mm sieve and he suggests that an elongation requirement is not needed with the 5% dosage limit.	I tend to agree with David's argument, however I have adopted the RTA contamination test procedure to be consistent with M/4's requirements for crushed concrete. The jury seems to be out on this issue in the international literature. While the RTA test procedure may have weaknesses, the volumetric test is based on visual assessment & therefore could be open to interpretation. The other redeeming factor for the RTA test is that the influence of contamination at a 5% cullet proportion should be minimal. No changes considered necessary. Disagree, all overseas specifications have a grading requirement. The cullet crushed by FH recently just misses the specified envelope on the 300 micron sieve, but with experience, the grading should be achievable. If difficulties are experienced we can fine-tune the criterion in the future. No changes considered necessary. It does appear that the wording of the proposed clause should be changed to reflect the test process being performed on the fraction of cullet retained on the 4.75 mm sieve rather than the 9.5 mm sieve as per the ASTM test procedure. I do consider that an elongation criterion is necessary even with a 9.5 mm maximum particle size. Change made.

5/10 ✓

Grant made by right but leave the document ✓

Stephen Davis - did not comment
Teresa Abiva.