Draft

Flowchart for Aggregate Acceptance



Test Methods

NZS 4407:2015 Test 3.10, The crushing resistance of coarse aggregate under a specified load (230kN)

AS 1141.22—2008, Methods for sampling and testing aggregates - Wet/dry strength variation

NZTA T/?? Ethylene Glycol Test Method.

ASTM C295 ASTM C295 / C295M - 12 Standard Guide for Petrographic Examination of Aggregates for Concrete

Notes

- 1 Research indicates that aggregates with Crushing Resistances less than 5.0% @ 230kN are not prone to accelerated weathering.
- 2 Wet/Dry Strength variation testing can be used as alternative to crushing Resistance to determine acceptance of an aggregate.
- 3 Ethylene Glycol test is a weathering test that acts on the presence of clay and other potentially weak minerals contained within the aggregate to accelerate breakdown. Some clays, especially smectites, are prone to swelling when in contact with liquids such as ethylene glycol.
- 4 X-Ray Diffraction (XRD) results shall be used to assess the presence of clay minerals within the source rock. The person undertaking the review should be experienced and qualified to undertake a review.

XRD is primarily used to determine the types of crystalline minerals that are contained within a sample, not the quantity. Therefore petrographic analysis or another means of determining the quantity of clay minerals and any effects that these may have with in service performance will require additional assessment.

ASTM C295 ASTM C295 / C295M - 12 Standard Guide for Petrographic Examination of Aggregates for Concrete is a suitable guide for establishing criteria for any assessment.

- 5 When preparing the sample for ethylene glycol testing a representative subsample of not less than 100gm shall be set aside in the event that XRD testing is required. The whole sample shall be ground for the purposes of undertaking the X-Ray Diffraction. (XRD). Sample to be 100gm of 13.2mm to 9.5mm to be taken after washing of aggregate
- 6 In the event that an aggregate is intended to be modified to improve its performance properties in respect to be possible presence of clays or other minerals that may affect long term pavement performance, the supplier shall work with the pavement contractor to develop treatments for review by NZTA.

Where an aggregate has been modified by cement, lime, bitumen or a combination of the aforementioned to achieve the required level of in service performance, the supplier and contractor shall be able to demonstrate that these methodologies are successful and

pavement performance is sustainable. Where the supplier and/or contractor has undertaken analysis or a specification on treatment is acknowledged in the market as accepted practice, this information will form the basis of a review on acceptance.

Recommended suppliers:

Panda Geoscience Limited

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CRL Energy Ltd

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GNS Science

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