

IPWEA/WALGA GUIDANCE NOTE

Guidance note for the use of road making aggregates sourced from by-products of the construction and demolition industry

1 General

The working of roadbase sourced from demolition materials containing significant amounts of crushed concrete varies marginally from the methods required for conventional roadbase. However the material does have a tendency to bind due to the rehydration of the cement content in the roadbase, and becomes considerably stronger than conventional roadbase very early in the dryback process. The material is referred to as Reclaimed Concrete Roadbase (RCC).

2 Layer thickness and shrinkage

RCC has residual uncured cement and this will commence rehydration and strength gain immediately on completion of the pavement, and this strength gain will continue, initially at a rapid rate, but the rate of strength gain will reduce with time, but may continue gradually for many years.

RCC will, unless containing very large amounts of non pozzolanic material, become liable to fatigue if used in thin layers. Ideally RCC should be used for the full pavement profile. Experience has shown that in thick layers, when provided with good dryback and a primer seal, minor transverse cracking in the asphalt surface may occur; however due to its great inherent strength, asphalt fatigue life will be extended considerably.

However if used as a thin base layer, under heavy traffic, fatigue of the bound layer may occur, and block cracking may be evident.

For this reason, RCC when used in lightly trafficked roads will provide an excellent subbase, but may be covered with a 100mm granular roadbase to prevent shrinkage cracking in surfacing asphalt.

3 Moisture content and density

RCC has a lower density and higher optimum moisture content than Crushed Granite Roadbase (CRB). Due to the lower density, the additional water required for compaction of RCC is greater than that for CRB, but not as much as would be suggested by the laboratory OMC. However for dust control purposes, the supplier may have already added some of this moisture, and the water requirements on site may be minimal.

4 Delivery and compaction

There are several manufacturers RCC; some of those manufacturers produce a high quality well graded and consistent material, others may just crush and use your road to dispose of the material in an attempt to avoid the landfill levy.

Materials should only be sourced from suppliers who have an Asbestos Management Plan and have been assessed by Department of Environmental Regulation as having systems in place to meet the Reduced Sampling Criteria as described in *Guidelines for managing asbestos at construction and demolition waste recycling facilities*

The IPWEA/WALGA specification for Reclaimed Concrete Roadbase has strict requirements for sampling and testing for material conformance. Users of this material should ensure that the facility that supplies the material can demonstrate consistency, and like any other construction material, random audit testing should be undertaken to ensure compliance with the specification.

On delivery of the first loads, and randomly throughout the period of supply, the material delivered to site should be laid out and visually inspected to ensure any undesirable materials are limited.

The material should be laid out in layers according to the pavement design. For residential streets where the base may be less than 250mm, one layer may be sufficient with suitable roller size and number of passes.

Over 250mm thick pavement should be constructed in two layers, the subbase layer being thicker, and the base layer not being less than 100mm. This is consistent with any other pavement material. Generally a vibratory roller on high amplitude low frequency is used for initial compaction, followed by a rubber tyre roller for finish rolling. Where structures such as high pressure gas pipelines, sensitive water mains or in cases close to existing houses, a static roller may be required, with thinner layers compacted, or a greater number of passes.

5 Finishing

Due to the potential for rehydration of the cement component, it is important to finish to final levels before dryback, as it may become harder to cut. However the time available is still considerable, and operators should be aware that the time available is more than adequate, however where with CRB, sections may be left high to account for traffic damage, this should not be undertaken with RCC.

6 Ravelling under traffic

RCC is extremely resistant to ravelling from traffic once compacted and dryback has commenced. The RCC is considerably better than CRB where turning traffic is required to use a partially completed surface. Therefore the material should be completed to design levels and not left high to allow for damage from traffic.

7 Shrinkage during dryback

During the dryback process, rehydration of the cement does result in some minor shrinkage cracking, and allowance for this phenomena should be made. It is preferable to allow the material to dryback for at least 5 days, preferably longer, before sealing although research is still underway to determine the optimum period.

8 Primer seal

Good practice for any road pavement is a well constructed primer seal. In the case of emulsion based primer seals, a two coat application is essential. A 10/5 aggregate combination with a total residual bitumen rate of 1.5l/m² is required.

9 Asphalt surfacing

Asphalt surfacing may be carried out the next day after primer sealing as normal. Where RCC is used as a base in low volume roads, consideration should be given to a Stone Mastic Asphalt instead of a Dense Grade Asphalt.