

DRAFT SPECIFICATION: RECLAIMED DEMOLITION MATERIALS FOR GRANULAR BASE IN FOOTPATHS AND SHARED PATHS

1 DESCRIPTION

This specification covers the requirements of 20 mm nominal size, crushed reclaimed demolition materials and plant mixed wet-mix crushed reclaimed demolition materials for granular base in footpaths and shared paths.

2 DEFINITIONS

For the purpose of this specification, the following definitions apply.

2.1 Crushed Reclaimed Demolition Materials (CRDM)

Crushed Reclaimed Demolition Material is composed of recycled crushed rock or recycled crushed concrete with or without crushed brick, fine glass cullet, sands and/or filler, produced in a controlled manner to the requirements of this specification.

2.2 Plant Mixed Wet-Mix Crushed Reclaimed Demolition Materials (PMWM-CRDM)

Plant mixed wet-mix reclaimed demolition materials is a mixture of CRDM, any granular additives and water, produced at a controlled mixing plant to close tolerances of grading and moisture content based on the optimum moisture content of the material relative to modified compaction.

2.3 Crushed Concrete

Crushed concrete is composed of rock fragments coated with cement with or without sands and/or filler, produced in a controlled manner to close tolerances of grading and minimum foreign material content.

2.4 Crushed brick

Crushed brick is composed of crushed fired clay brick or concrete blocks. Unfired clay brick or mud brick are not included.

2.5 Fine glass cullet

Fine glass cullet is composed of crushed food and drink glass containers, drinking glasses and window (or flat) glass. Glass from hazardous waste containers, reinforced and laminated glass, light bulbs, fluorescent tubes and cathode ray tubes shall not be included.

2.6 Footpath

Footpath is a pavement which is used mainly for pedestrian and driveway traffic.

2.7 Shared path

Shared path is a pavement which is used for bicycles and may carry infrequent light traffic loads (mowers - tractors - maintenance trucks -earthmoving equipment/fire fighting).

2.8 Granular base pavement

Granular base pavement is the layer directly beneath the bituminous or concrete surfacing and in the case of block paving, the layer directly below the bedding sand layer.

3 COMPONENTS

The components making up the product shall be a combination of:

- (a) crushed reclaimed concrete derived from crushing and screening;
- (b) crushed brick derived from crushing and screening;

- (c) sands and or fillers derived from natural sources or other crushing operations;
- (d) glass cullet shall be crushed to approximately the gradation shown in Table 1 with the material coarser than 4.75 mm containing not more than 1% window (or flat) glass.

Table 1 – Approximate Gradation for Glass Cullet

Particle Size (mm)	Percent Finer
9.5	100
4.75	70 - 100
2.36	35 - 90
1.18	15 - 45
0.30	4 - 15
0.075	0 - 5

4 MANUFACTURED PRODUCT

The product shall be manufactured by crushing and screening construction and demolition waste to the requirements of this specification.

- (a) The Product shall comply with the relevant requirements of Table 2.

Table 2 – Physical Properties

Physical properties	Test method	Test value	
		Foot Path	Shared Path
Plasticity Constants	Liquid Limit (AS1289 3.1.1)	Max 35%	Max 35%
	Plasticity Index (AS1289 3.3.1)	Max 10%	Max 10%
	Linear Shrinkage (AS1289 3.4.1)	Max 8%	Max 8%
Bearing Strength	California Bearing Ratio (AS1289 6.1.1)	Min 40% ⁽¹⁾	Min 40% ⁽¹⁾
Aggregate Hardness	Los Angeles Abrasion (AS1141.23)	Max 60%	Max 60%
Particle shape	Flakiness Index (AS 1141.15)	Max 35%	Max 35%

Notes: (1) Value applicable to material passing 19.0 mm sieve: initially at optimum moisture content and 90% of maximum dry density as determined by test using Modified compactive effort, but then soaked for 4 days prior to the CBR test.

- (b) Crusher fines from different material sources (crushed brick, fine glass cullet) in that fraction of the product retained on a 4.75 mm sieve shall not exceed the percentages by mass specified in Table 3. In no circumstances shall the product contain any asbestos or asbestos fibre.

Table 3 – Permissible Composition of Product

Material Type	Percentages by mass	
	Foot Path	Shared Path
Concrete	Up to 100%	Up to 100%
Brick	Up to 50%	Up to 50%
Metals, ferrous and non- ferrous	Less than 1%	Less than 1%
Glass cullet	Up to 30%	Up to 30%
Low density materials such as plastic, rubber, plaster, clay lumps and other friable material	3	3
Wood and other vegetable or decomposable matter	0.5	0.5

- (c) For PMWM-CRDM, the aggregates and water shall be mixed at a mixing plant by continuous or batch mixing.

5 WATER

Where it is specified that water shall be added to the crushed CRDM prior to delivery, such water shall be clear and substantially free from detrimental impurities such as oils, salts, acids, alkalis and vegetable substances.

6 GRADING OF UNCOMPACTED CRDM AND PMWMCC BASE BEFORE COMPACTION

After completion of production, but before compaction, crushed CRDM and PMWM-CRDM base shall comply with the relevant grading requirements of Table 4.

- (a) The Contractor shall aim to produce the crushed CRDM and PMWM-CRDM in such a way that the grading coincides with the relevant target grading specified in Table 4. The permitted ranges of grading in these tables provide for random fluctuations in the production process.
- (b) The crushed CRDM shall not be graded from near the coarse limit on one sieve to near the fine limit on the following sieve or vice versa.

Table 4 – Grading Requirements

Particle Size (mm)	Target grading	Percent Finer
26.5	100	100
19.0	100	90 - 100
4.75	55	40 – 65
2.36	20	10 - 30
0.075	9	5 - 15

7 STOCKPILING PRIOR TO DELIVERY

Crushed CRDM may be stockpiled prior to delivery provided the following requirements are

fulfilled:

- (a) the product, after recovery from the stockpile, complies with this specification;
- (b) the stockpile site is clean, adequately paved, and well drained;
- (c) if a stockpile is constructed in more than one layer, each layer is fully contained within the area occupied by the upper surface of the preceding layer;
- (d) no cementitious filler is used.

8 HANDLING OF CRUSHED RECLAIMED DEMOLITION MATERIALS

- (a) Handling of crushed CRDM, including the loading of trucks and stockpiling, shall be effected in such a manner as to minimise segregation.
- (b) Purchase of CRDM shall be accompanied by a Materials Safety Data Sheet supplied by the manufacturer.

9 QUALITY ASSURANCE

The manufacturer of CRDM shall provide quality assurance to the Principal suggesting:

- (a) compliance with the Waste Management of Australia (WMAA) National Construction and Demolition Division "Code of Best Practice for Waste Processing in the Construction and Demolition Industries";
- (b) quality systems accreditation to ISO 9001 series Quality Management or an equivalent.

Product compliance to this specification shall be demonstrated by the supplier providing supporting documentation including NATA (National Association of Testing Authorities) laboratory test certificates of product quality control.

FIELD COMPACTION

After completion of compaction of a layer, the compacted dry density shall be determined and shall be not less than 90% modified compaction.

11 TRIAL SECTIONS

Where field trials are proposed for different source materials, in addition to laboratory characterisation, field CBR determinations using the Clegg Impact hammer are suggested to confirm post compaction bearing strength in view of the particle breakdown which may occur under the maximum aggregate hardness (LA) specified.