



The reuse of recycled glass in civil construction is well underway and is supported by Department of Transport and Main Roads recently released MRTS36 specifications for recycled glass aggregate and parent technical specifications MRTS04 (general earthworks), MRTS05 (unbound pavements) and MRTS101 (aggregates for asphalt).

FNQROC support the use of recycled glass aggregate as a bedding material in the Regional Development Manual guidelines S5 Water Reticulation and S6 Sewerage Reticulation.

Recycled glass aggregate is manufactured locally in the Cairns Glass Processing Facility from recycled glass food and beverage bottles and containers collected through kerbside recycling bins and the container refund scheme. Each year the facility processes over 9,000 tonnes of glass into recycled glass aggregate – the equivalent of recycling around 45 million glass bottles.

Product Description

Recycled glass aggregate is a <4.75mm fine material and is suitable as a sustainable alternative to natural and quarried sand and aggregate products.

Benefits

The benefits for using recycled glass aggregate include:

- Locally sourced and manufactured
- Cost effective
- An alternative to mining natural sand
- Supports circular economy

Applications

Recycled glass aggregate can be used for applications such as:

- Asphalt
- Unbound pavements
- General earthworks
- Non-structural concrete
- Drainage
- Bedding and backfill



Safety

From a WHS perspective there are a number of perceived risks that arise from using recycled glass aggregate associated with breathing the dust from the glass and handling the glass particles.

Research and laboratory testing confirm that glass dust is an inert nuisance dust that has no significant biological effect. This is because the high temperatures used to make glass changes the crystalline structure of sand into amorphous silica which has no carcinogenic properties. There is a higher risk of inhaling respirable crystalline silica from handling natural sand than recycled glass aggregate.

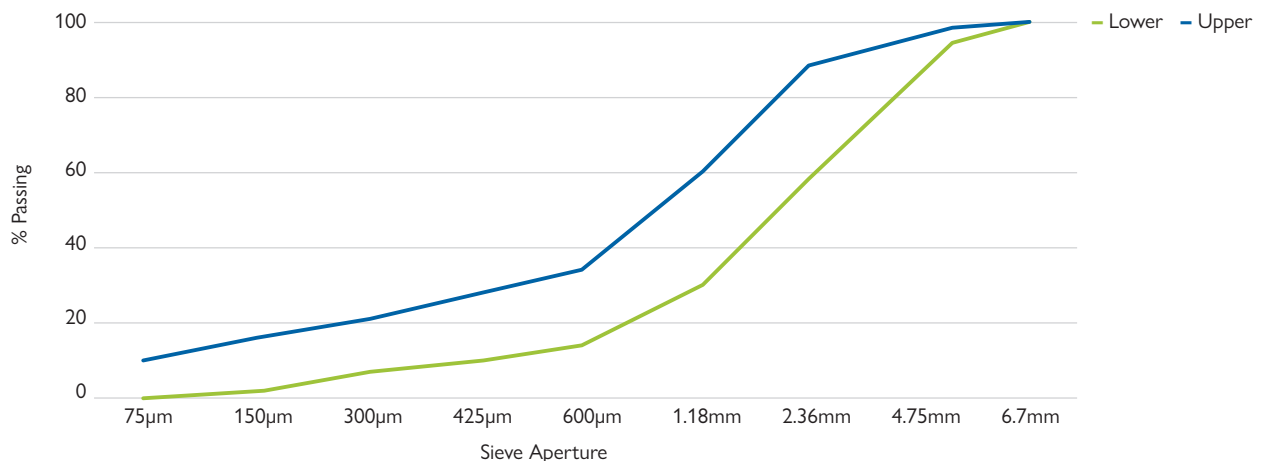
Anecdotal evidence from field trials suggest that recycled glass aggregate generated less dust than other materials normally used. Nevertheless, as applies to natural aggregates, dust suppression is recommended.

Handling recycled glass aggregate represents no greater hazard than conventional materials. However, because of its abrasive qualities the crushed glass can be a greater irritant to skin and eyes. The WHS risks associated with airborne glass dust and handling crushed glass can be avoided by the same protective measures that apply to natural crushed aggregates and are specified in the Recycled Glass Aggregate MSDS.



Particle Size Distribution

The actual particle size distribution (PSD) of recycled glass aggregate varies. PSD testing shows material is typically produced to the below gradings.* *Test results from July to November 2023.



Quality & Testing

The production of recycled glass aggregate is monitored throughout all stages of manufacturing. For quality assurance this process includes daily visual inspections for contaminants and sharpness and sieve tests on the material for product consistency.

Recycled glass aggregate is sampled and subjected to NATA accredited laboratory testing at monthly intervals. The table below shows the test results comply with the chemical and attribute maximum average concentration limits specified in MRTS36:

Property Tested	Result (5 most recent*)		MRTS36 Specification
	CRS Glass	MRF Glass	Maximum Average (5 most recent)
Electrical Conductivity	410.0	420.0	1000
Arsenic (As)	0.0	0.0	10
Cadmium (Cd)	0.1	0.2	0.5
Chromium (Cr)	1.3	2.2	20
Copper (Cu)	1.9	19.2	40
Nickel (Ni)	0.0	1.4	10
Lead (Pb)	1.9	20.9	50
Zinc (Zn)	28.2	48.6	100
Molybdenum (Mo)	0.0	0.0	5
Mercury	0.0	0.0	0.5
Total Organic Carbon	0.29%	0.77%	1%

*Test results to November 2023 – mg/kg 'dry weight' unless otherwise specified.

Links

- NSW Department of Environment & Climate Change – [Fact Sheet Recycled Glass for Pipe Embedment](#)
- Local Government NSW – [Recycled Materials in Roads and Pavements](#)
- Swinburne Research Bank – [Research paper on possible environmental impacts of recycled glass](#)
- Icon Water Case Study – [Recovered glass sand](#)
- Department of Sustainability, Environment, Water, Population and Communities – [Waverley Council: recycled glass in roads](#)