Information Brochure

Circular Materials Solutions and Recycling

Our Company

Boral is one of the largest integrated construction materials company in Australia, with a leading position underpinned by strategically located quarry reserves and an extensive network of operating sites.

Boral primarily services customers in residential, commercial and industrial development, civil works and major infrastructure projects. It is the only Australian company that can deliver total construction solutions with offerings across concrete, cement, asphalt, quarry materials, concrete placing, material testing, recycling and research and development.

Our activities and services are supported by an experienced management team of business, technical and research experts who are focused on providing results through the use of the latest processes, timely delivery and absolute accountability so our clients receive results that exceed their expectations.

National reach, local touch

- Striving for Zero Harm Today
- Developing sustainable solutions through innovation
- NATA-accredited laboratories
- Award-winning supporter of veterans' employment
- Fosters diversity, inclusion and workplace flexibility
- Sustainably procures goods and services
- Supports indigenous people, communities and businesses through our Reconciliation Action Plan

Proven Experience

In collaboration with our construction partners, we have successfully delivered on large scale projects across Australia and remotely. We routinely draw upon our vast pool of highly skilled people from across the country to assemble the best crews, technical specialists and project management teams. With strong peer networks, our experts have access to the latest techniques in construction and standards.

We constantly review our capabilities, capacity and technical requirements so we can align them with customer expectations, needs and delivery times and also understand any concerns. We have developed our capability, systems and procedures to deliver the best possible outcome in the safest possible way whilst managing risks and resources.

Our Business

4,749
employees[1]

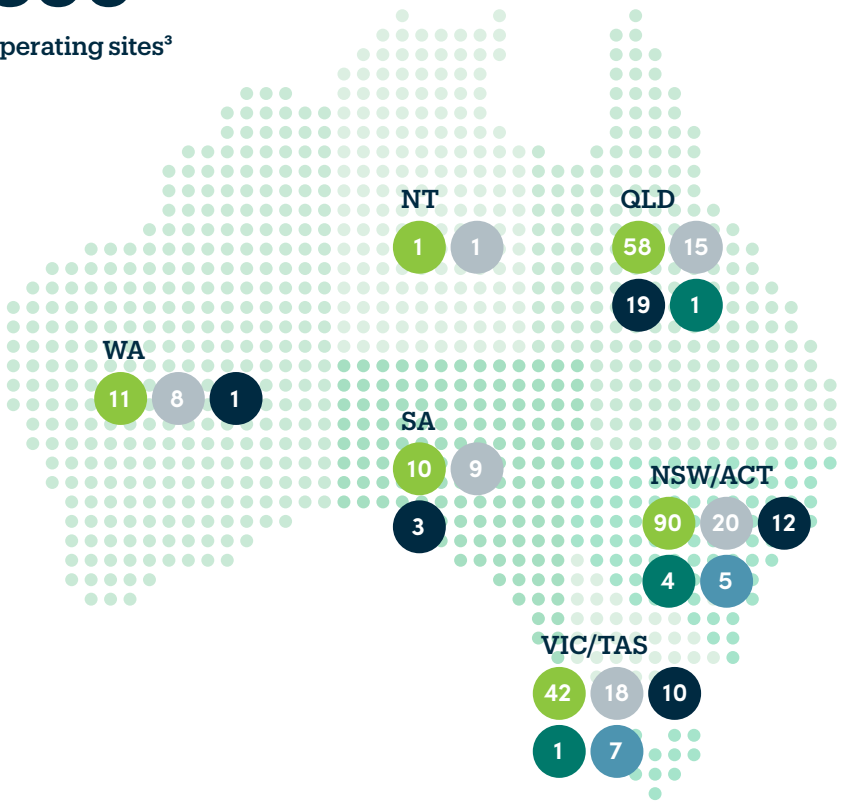
~4,400
contractors[1]

~3,500
heavy road vehicles[2]

~14,000
customers

Construction materials:
Leading integrated network

356
operating sites[3]



212	Concrete and Placing	6	Cement
71	Quarries	12	Recycling
45	Asphalt		

Property:
Maximising value creation from our surplus property assets

~30
surplus property assets

Totalling

~3,800
hectares

Valued at

$1.0b+[4]

Major surplus properties include:

Donnybrook, Vic
Scoresby, Vic
Waurn Ponds, Vic
Penrith Lakes, NSW[5]

1. Full-time equivalent (FTE) for continuing operations.
2. Managed or used by Boral.
3. Includes transport, fly ash and research and development sites. Concrete site definition has been revised, with restated comparable number of Concrete and Placing sites in FY2021 of 213.
4. Refer to footnote 1 on page 13.
5. 40% owned in joint venture with Holcim and Hanson.

Upstream/Downstream Operations

Valuable upstream and downstream operations

Cement

Our Cement operations manufacture and import clinker, grind clinker into cement, and supply supplementary cementitious materials. Our 1.5 million–tonne clinker manufacturing plant is at Berrima, NSW.

Quarries (including Recycling)

Our hard rock and sand quarries supply about 30 million tonnes of materials annually to our Concrete and Asphalt operations and customers.

Our Recycling operations process more than 2.2 million tonnes of construction and demolition waste for reuse, helping supplement quarries' materials supply and supporting circular construction.

Bitumen

Our 50%-owned Bitumen Importers Australia joint venture supplies about 40% of Asphalt's operations bitumen needs.

Concrete and Placing

We supply 6–7 million m^3 of concrete annually, including advanced and lower carbon solutions, and are one of the largest concrete placing and pumping companies in NSW.

Asphalt

We produce and supply more than 2 million tonnes of asphalt annually, and spray seal and technical materials for the surfacing and maintenance of infrastructure networks.

Construction and demolition waste

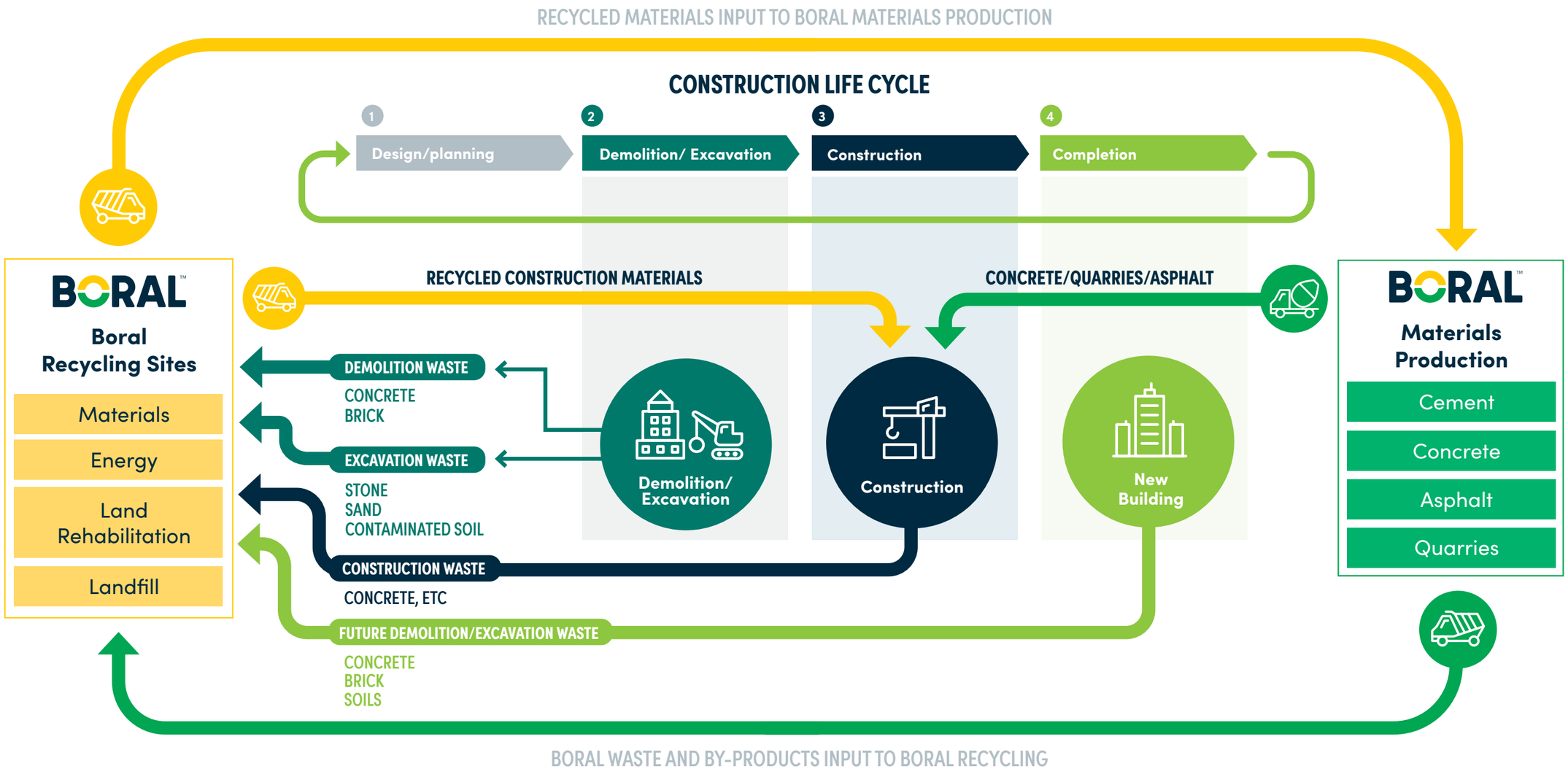
Our customers

We deliver products and solutions used for a range of applications, from homes and commercial buildings to infrastructure projects such as roads and highways.

We work with our customers to deliver more sustainable, high-performing and innovative solutions.

Circular Materials Solution Overview

Building on Boral's positions to deliver Customer value across the end-to-end construction value-chain



Circular Materials Solution Overview

A Project Design Phase

Customer engagement and design

Early engagement with our customers during the design phase enables:

- Identification of materials that can be recycled at our recycling facilities
- Identification of materials that can be used as part of Boral's land rehabilitation programs
- Specification of sustainable products for future supply into the project

B Pre-construction Phase

Project pre-construction phases – demolition and excavation

As civil contractors perform demolition and excavation phases of the project, the 'waste' materials are generated, e.g. concrete, brick, soils, etc..

Boral can play an active management role, ensuring these materials are sent for recycling at our recycling locations; providing full visibility on materials flow, maximising recycling rates, ensuring circular product development, and coupling all that with detailed reporting for sustainable outcomes to our customers.

C Construction Phase

Supply of recycled materials

Boral supplies sustainable product mixes with higher recycled content including: roadbase, aggregates, pipe bedding, sand, asphalt, concrete, and other recycled materials.

Boral also provides customers with detailed reporting on recycling rates, carbon content, material flows, and green credits or certifications.

Any waste generated through Boral's materials supply can be brought back to Boral recycling sites ensuring full circular outcomes for our customers.

D Materials Recycling

Materials recycling

Materials sent to Boral's recycling sites are:

- Reprocessed into construction materials
- Blended with Boral's virgin materials for development of new products
- Blended with externally sourced materials (e.g. glass, plastic, rubber) to develop new products

Circular Materials Solution – Design Phase

Early project engagement enabling offering of Boral's best solutions

A B C

A Design Phase

Pre-construction → Construction

Boral Recycling Solutions
Boral Product Solutions

- Primarily driven by Boral Recycling mapping the 'waste materials' generated through demolition and excavation phases of the project, the Boral sites they can be brought to and as such the circular materials management offering to the customer
- Supported by Boral Product Solutions aiming to value add the 'waste' materials through inclusion into Boral products

Boral Recycling Solutions
Boral Product Solutions

- Primarily driven by Boral Product Solutions, understanding the customer Performance and Sustainability requirements in order to present Boral's best suited product to deliver on those – engagement performed alongside DMG and Sales
- Supported by Boral Recycling by adding the Circular Materials Management solution to collect and recycle the waste from concrete supply, pump & place within Boral's recycling sites

Circular Materials Solution – Pre-Construction Phase

Maximising recycling and transparency on ‘waste’ materials management

A B C

B Pre-construction Phase

Pre-construction → **Construction**

Boral Recycling

- ✗ Demolition
- ✗ On-site sorting
- ✓ Manage waste and logistics from customer site to Boral site
- ✓ Recycling
- ✓ Developing new products

Materials in-scope within Boral sites:
Concrete, Brick and Steel

Boral Recycling

- ✗ Excavating
- ✗ Classifying on-site
- ✓ Manage waste and logistics from customer site to Boral site
- ✓ Recycling
- ✓ Developing new products

Materials in-scope within Boral sites:
Sandstone, Excavation Sand, Clean Fill, PASS

- ✓ Transparency on materials flow visibility
- ✓ Maximising recycling rates (90%++)
- ✓ Circular product development
- ✓ Safety, compliance and reliability

Circular Materials Solution – Construction Phase

Ensuring Concrete is managed sustainably through its full life-cycle

A B C

C Construction Phase

Supply → Pumping/Placement → Concrete Waste Management

Boral Concrete

- Quality
- Performance
- Lower Carbon

Boral-DMG

- Service
- Reliability
- Experience

Boral Recycling

- Materials flow visibility
- Recycling rate max & CO2 reduction
- Circular product development

- Boral's proven supply, pump & place model
- Materials quality, performance and sustainability, combined with Pump & Place service reliability

- Boral's Circular Materials Management solution
- Replaces traditional costly waste management model
- Delivers/reports on all the above

Boral Circular Materials Solution – Value Overview

Enabled by early project engagement it delivers value in sustainability, performance and costs

Boral offerings

Products

- Co-development of product specs to meet performance and sustainable outcomes
- Supply of sustainable product mixes – lower carbon and recycled inclusion

Services

- Mapping of optimal management for demolition and excavation materials coming from project
- Collection, transport and recycling of material streams from demolition and excavation
- Provision of reports w/ clarity on materials flows, recycling rates and products developed with the 'waste' materials from the project
- Collection, transport and recycling of Concrete waste from Concrete supply activity – along with materials mgmt. reporting

Customer
Value to customer

- Early understanding of offers enabling optimisation on
  - **Quality & Performance**
  - **Sustainability targets** (Products & Services)
  - **Ops efficiency**
- Improved sustainable outcomes and materials flow visibility
  - **Higher recycling rates**
  - **Diversion from landfill**
  - **Stronger ability to report on improved outcomes**
- Maximise use of available sustainable products and services
  - **Higher use of recycled content**
  - **Lower CO2 emissions**
  - **Improved circular economy** outcomes with concrete waste

Value
Pricing approach overview

- **No Cost to Customers**
  - Boral to engage aiming to have early ability to influence product specification and 'circular materials solution' approach to project
- $/t fee for transport of material from project to recycling facility
- $/t fee for tipping of material – varying per material type
- All reports included as part of offer
- $/t fee to collect and transport concrete waste from project to recycling site + $/t tipping fee
- $/t and/or $m3 if materials are supplied to project

Customer Cases Studies

Overview on projects where solution has been implemented

Boral offerings and value to customer

Cases Studie and Deep Dives

Mirvac, 55 Pitt Street

- Boral peer reviewed Demolition materials management approaches
- Identified gaps to be closed within offerings and materials for recycling optimisation
- Customer was able to reduce demolition costs and clarify understanding of rates per material

Laing O'Rourke, IMR5

- Boral reviewed bill of materials coming from demolition and excavation
- Boral presented integrated offer to customer managing construction 'waste' volumes from project for recycling and supplying sustainable Concrete, Quarries and Asphalt to it
- Customer / project benefited from circular economy outcomes and project management efficiency

Meriton, Pagewood

- Boral directly managed the collection, transport and recycling of excavation sand from the project (200kt+)
- Customer enjoyed lower integrated costs and full recycling outcomes
- Boral brought materials to its Emu Plains site and upcycled into Concrete

CPB / John H., WCX3B

- Boral used its Dunmore site to accept PASS vols from project (90kt+)
- Customer benefited from full visibility of materials flow and end-use as well as cost savings diverting from Landfill
- Boral managed safe material end-use

Melbourne Excavation Stone

- Boral solved customers' pain points by accepting vols at D. Park (150kt+)
- Civil contractors' excavation stone recycled for high value aggs

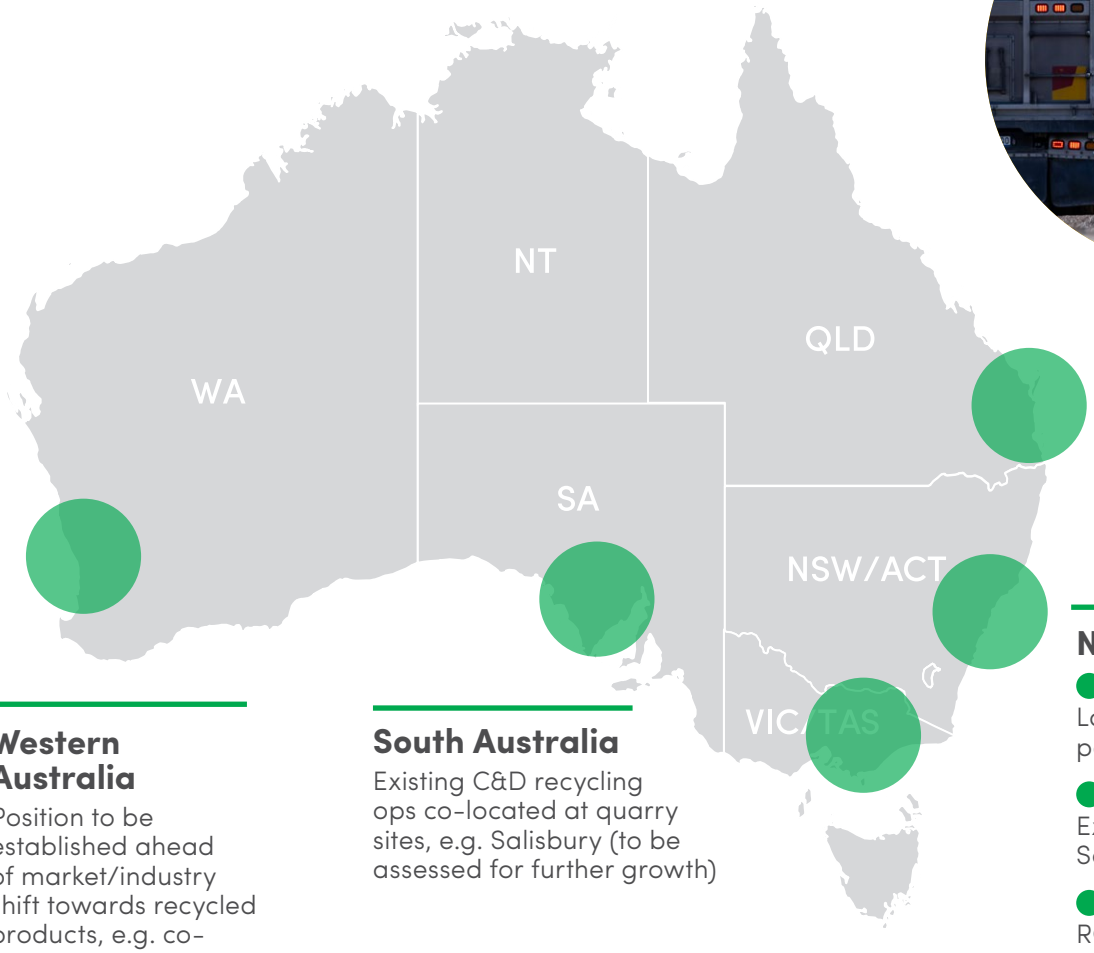
Mirvac, Green Square

- Boral offered direct management of concrete supply waste on-site – placing skip bins and transporting to Widemere recycling (over 300 tons Concrete waste recycled)
- Customer benefited from lower costs to manage such waste as well as increased Recycling rates and full visibility of materials flow and end-use

Multiplex, W. Sydney Airport and Mirvac, Waverley

- Both with a similar offering / solution as described on the Green Square example above – with circa 10km3 of Concrete volumes on each project and same benefit streams to customers

Recycling Operations



South East Queensland

New Stapylton site to be operational within FY23

New South Wales

Widemere
Largest C&D Recycling position – 1mt pa capacity

Emu Plains
Excavation Sand and Sandstone focus

Eraring
ROS Ash position

Kooragang
C&D Recycling

Mugga
Quarry co-located position, non-operational and to be re-established

St Peters
Sydney CBD position recently closed – to be replaced

Western Australia

Position to be established ahead of market/industry shift towards recycled products, e.g. co-location at Orange Grove

South Australia

Existing C&D recycling ops co-located at quarry sites, e.g. Salisbury (to be assessed for further growth)

Victoria

Wollert
Boral/Delta JV co-located at Boral Quarry

Lysterfield
Boral/Delta JV co-located at Boral Quarry

Coldstream
Boral / Delta JV co-located at Boral Quarry

Waurn Ponds
Boral/Delta JV located at Boral site

Sunshine
Boral/Delta JV located at Delta site

Deer Park
Boral Excavation Stone recycling ops

- Green are Boral sites operating
- Gray are Boral sites non-ops (from a Recycling perspective)
- Yellow are Boral sites included in JV with Delta Group
- Blue is Delta site included in JV with Boral

Circular Materials solution – Materials in Scope

Inbound Wastes	Recycling Processes	End Products
Construction and demolition (Brick and concrete)	Crush and Screening Process	Aggregates and specified roadbase.
Reclaimed asphalt profiling's (RAP)	Crush and Screening Process	Recycled Roadbase blends & RAP for reuse back into asphalt production
Excavation sand	Wash and/or screen process	Concrete sand, asphalt sand & earthworks compaction sands
Sandstone and tunnel spoil	Crush and Screening Process	Specified select fill, subgrade replacement.
Potential acid sulphate soils (PASS)	Apply in revegetation applications	
Other waste streams Eg: Asbestos, restricted wastes, steel, VENM, ENM, General Solid Waste, etc.	Disposed or recycled at licensed facilities in accordance with their specific classification	

Circular Materials solution – Materials in Scope

Inbound and Outbound Materials in Scope

	SYDNEY	MELBOURNE	NEWCASTLE	CANBERRA	BRISBANE	ADELAIDE	PERTH
Inbound Materials							
Concrete / masonry	●	●	●	●	○	●	○
Brick / tiles	●	●	●	●	○	●	○
Asphalt	●	●	●	●	●	●	○
Contaminated soils	● CT1	○	● CT1				
Sandstone	●	●	●	●	○		
Excavation sand	●	●	●	●	○		
Excavation stone	●	●	●	●	○		
Potential acid sulphate soils	●	○	○		○		
Tunnel spoil	●	●					
Earth Exchange	●	●			●	●	
Outbound Materials (Recycled Products)							
Specified recycled roadbase	●	●	●		●	●	○
Unspecified recycled roadbase	●	●	●	●	●	●	○
Recycled sub-base	●	●	●	○	●	●	○
Recycled general & select fill	●	○	●	○	●	●	
Recycled non-spec aggregates	●	●	●		○	●	
Recycled sand / pipe bedding	●	●	●		○	●	
Stabilised recycled roadbase	●	●	○				
Stabilised recycled sand / pipe bedding	●						
Recycled glass sand	●	○	●	●	●	●	
Recycled content inclusion in Concrete and Asphalt mixes	●	●	●	●	●	●	●

● Current capability ○ Capability in development

Summary of Customer Value Proposition – Sustainability + Performance + Availability

	Customer Value		
Quarry Products	**SUSTAINABILITY FEATURES**	**PERFORMANCE FEATURES**	**AVAILABILITY**
Road base	Up to 100% Recycled C&D – diversion of volumes from landfill	Equivalent to Virgin materials with lower density, where specifications allow use	QLD / NSW / VIC
Pipe Bedding			QLD / NSW / VIC
Drainage Aggregates			QLD / NSW / VIC
High Grade Compaction Sand	100% Recycled, including Glass, Sandstone and Excavation Sand	Meets specification for natural sand – e.g. Sydney Water spec	NSW
Glass Sand	Diversion of glass fines from landfill	Partially replaces natural sand in Concrete and Asphalt	NSW
Excavation Sand	100% repurposed excavation material	Partially replaces natural sand in Concrete	NSW
Sandstone Select Fill	100% repurposed excavation	Equivalent to virgin materials	NSW
Excavation Stone	Natural stone repurposed from civil construction	Equivalent to virgin materials	VIC
ROS Ash	100% recycled Ash, partially replacing Cement in Concrete (lower carbon)	Maintains Concrete performance meeting specs	NSW
Bottom Ash Sand	100% recycled Ash	Light weight sand and aggregate	NSW
Concrete Products			
Envisia	Lower carbon due to higher inclusion of Slag and Fly Ash in product mix – e.g. up to 50kg carbon offset per m^3 of Concrete	Special shrinkage (S) infrastructure (I) & aesthetic (A) properties Meets early age strength needs for construction Higher durability	National
Envirocreteplus	Lower carbon due to higher inclusion of Slag and Fly Ash in product mix – up to 80kg/m^3 of carbon offset	Matches Standard concrete	National
Envirocrete	Lower carbon due to higher inclusion of Slag and Fly Ash in product mix – up to 100kg/m^3 of carbon offset	Non valued added attributes removed to reduce carbon & costs	National
Asphalt			
Innovo (system)	Circular economy benefits through inclusion of multiple alternative materials to the product mix – e.g. RAP, Slag, Glass, Rubber, Plastic,...	Matches traditional product mixes and in some cases improves for particular uses	National *specific availability to be confirmed case by case

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For further information on Boral products go to:

www.boral.com.au

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