

Project Profile

Orora Glass Expansion Warehouse Siteworks and Stormwater



Client	Pike Construction
Location	Adelaide, South Australia
Duration	October 2018 to September 2019
Contract	Lump Sum Construct Only
Cost	\$5.5 million

Project Overview

Orora is an international manufacturer and supplier of packaging products including glass bottles, aluminium cans, closures and caps, boxes and cartons, point of purchase displays, packaging equipment, recycled paper, rigid and flexible packaging, bags and sacks, and packing materials and supplies. They employee approximately 7,000 people worldwide operating predominately in Australasia and North America.

In 2018, Orora embarked on an upgrade to their warehouse facilities situated 50km north of Adelaide near outer suburb of Gawler. The new AG5 warehouse facility was for the expansion of their glass packaging operations. Principal construction contractor Pike Constructions engaged McMahon Services to undertake earthworks, civil and concrete works for the new warehouse.

McMahon Services

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The facility runs 24/7, 365 days a year and features automated guided vehicles (AGVs), robotic vehicles that replace the functions of forklifts drivers and people in one of their storage facilities. McMahon Services were required to plan for the continuous and automated operations on site while undertaking construction works.

Scope of Work

"I've been doing this for the best part of 25 years and the way you guys go about it is as good as I've seen, super impressed with what your team and my team have achieved in the first stage of the AG5 project." – Phillip Pike, Managing Director, Pike Constructions

The civil works package included bulk earthworks up to 4.5m cut with Level 1 geotechnical supervision, pavement construction for bitumen areas utilising 1% cement treated PM2/20 and PM1/20 layers, pavement construction for heavy and light duty concrete areas including a 1% cement treated PM2/20 layer, landscape excavations, retention basin extension works including mounds and batters, excavation and backfill for a new retaining wall, a carpark and new office building.

Road works including construction of new link roads on the west, east and north sides with new kerb and gutter, Level 1 geotechnical and pavement construction, 50mm AC10M C320 asphalt, new stormwater infrastructure and service relocations. Other works included earthworks and pavements for automatic guide vehicle (AGV) tracks.

Civil infrastructure works undertaken on site comprised of 155,000m³ of earthworks, 1300m of stormwater, 1100m of kerbing and 550m of road. The warehouse pad totalled 32,000m² comprised of a heavy-duty pavement with 28,000m³ of rubble base and 4500m³ of concrete works.

Innovations

Complex Staging of Works to Accommodate Automated Guided Vehicles

Earthworks and pavements required additional planning and staging of the works to accommodate the continuous operations of the automated guided vehicles (AGV) track, as the facility runs on a non-stop basis. This required that the track remained accessible at all times and added an extra level of complexity in the program not normally applicable to projects of similar size and scope. Despite these staging challenges, works were completed within the required delivery time frame.

GPS Earthworks Control and Stakeless Excavation

The project utilised land plane scraper system tractors featuring Trimble Dual GPS dual control systems that allowed for stakeless excavation. The tractors required only an operator and eliminated the need of an onsite surveyor. The machines were able to strip thin layers of material across large sites and operate on slopes to create the required mounds and batters. Two land planes allowed for rapid progression of the works.

Project Challenges

Cost Savings in Earthworks Delivery

A requirement of the project was to utilise site-won material for all earthworks. The project team achieved this by testing all existing materials then developing a staged methodology whereby site-won material could achieve Level 1 geotechnical engineered fill requirements. This process resulted in a cost saving of over \$1 million had imported fill been sought instead.

Once construction commenced, it was quickly identified that an alternative delivery methodology that involved doubling the number of civil and earthmoving plant would complete the works at a significantly faster rate while also reducing the overall costs despite the increase in resources. This proved correct and the client was able to commence the next stage of their works early.

The site also contained an environmentally sensitive basin with birds, vegetation and marine plants and animals which collected water used in Orora's manufacturing operations. Earthwork methodologies were developed so that the basin was never impacted during the works and continued to provide the required water resources at all times.

Future Proofing Pavement Works

The project team consulted with Pike Construction and Orora Glass on the design of the pavements and identified design improvements that would future proof their whole-of-life durability and allowed for future construction works. This included provisions for future road tie in-works, and new pavements to accommodate heavy vehicle movements for future civil works when required.

As works were delivered within an operational site this required careful planning of civil and earthmoving equipment. Plant and equipment utilised on site included D9 dozers, 140M graders, Skid Steers, PC300 excavators, 40t dump trucks, 12,000L water truck and Moxy watercart for dust management, pumps, land plane scraper system tractors, compactor and 10t rollers.

Two Indigenous personnel were employed on the project achieving a 21% Indigenous participation rate. All subcontractors, suppliers, materials, plant and labour were sourced from the northern suburbs of Adelaide and Barossa Region to support local industry.



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