

Bolted, corrugated plate structures – installations in Australia

The following pages highlight some of the bolted, corrugated steel arch projects successfully completed by Roundel in recent years:

Project:	Lower Hotham Road underpass, WA
Year:	2021
Location:	Lower Hotham Road, WA
Project owner:	South 32
Consultant:	BGE Resources
Design standards:	AS / NZS 2041:6
Span:	17,167mm
Rise:	6,777mm
Length:	70.88m
Corrugation profile:	381 x 140mm
Live load:	Bosich 220T + CAT777, Low loader + Hitachi EX2600 plus various secondary live loads.



Project:	GEMCO Eastern Leases, Groote Eylandt.
Year:	2022
Location:	Groote Eylandt, NT
Project owner:	GEMCO, South 32
Consultant:	Red Earth Engineering.
Design standards:	AS / NZS 2041:6
Span:	15,959mm
Rise:	5,449mm
Length:	73.990m
Corrugation profile:	381 x 140mm
Live load:	CAT739D + Bosich RAX 410 + Hitachi EX3600.



Project:	Roy Hill Mine, WA
Year:	2020
Location:	Roy Hill Mine, WA
Project owner:	Roy Hill
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:6
Span:	10,981mm
Rise:	5,227mm
Length:	2 structures: 121.m and 81.0m
Corrugation profile:	381 x 140mm
Live load:	Haul Road - Hitachi EX8000 and Hitachi EX5600 on Sleipner LV Access Road - Mine Support Vehicles



Project:	CPB BHP Mining Area C stockpile tunnel
Year:	2019
Location:	BHP Mining Area C
Project owner:	CPB Contractors
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:1
Span:	3,500mm
Rise:	2,757mm
Length:	57.439m
Corrugation profile:	381 x 140mm complying with AS2041.6 2010
Loads:	I25m Iron Ore Stockpile



Project:	Mt Peter, Cairns Regional Council
Year:	2018
Location:	Mt Peter
Project owner:	Cairns Regional Council
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:1
Diameter:	4,500mm
Length:	18.40m
Corrugation profile:	200 x 55mmx3.0mm thick complying with AS2041.6 2010
Live load:	SM1600 in accordance with AS5100



Project:	FMG Solomon Mine – Trinity Drive Overpass Arch
Year:	Dec 2015- Jan 2016
Location:	Solomon Mine site, Pilbara, WA
Project owner:	Fortescue Metals Group
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:1
Span:	11,400mm
Rise:	7,276mm
Length:	81.10m
Corrugation profile:	381 x 140mm complying with AS / NZS2041.6.
Live load:	Dual Komatsu 930E Haul Trucks, Liebherr R 996B Excavator



Project:	Baralaba Haul Road Crossing, Moura
Year:	2012
Location:	Moura, QLD
Project owner:	Anglo-American Coal / Dawson Coal
Main Contractor:	Georgiou
Consultant:	Arkhil Engineers
Design standards:	Canadian Highway Bridge Design Code ('CHBDC') and ASTM A761A
Span:	13,000mm
Rise:	7,350mm
Length:	86.50m
Materials:	400mm x 150mm corrugation profile, 8.0mm materials with 8.0mm external ribs
End treatment:	1:1.5 end bevels
Live load:	Dual Caterpillar 797B Haul Trucks – 624t payload capacity
Overview:	Haul road extension required over public road for Dawson Coal. Overpass required to maintain public access to Baralaba Road



Project:	Dilston Bypass
Year:	2010
Location:	Launceston, Tasmania
Project owner:	Main Roads
Main Contractor:	Shaw Contracting Pty Ltd
Consultant:	Pitt & Sherry
Design standards:	AS2041
Span:	The project consisted of a total of seven arch and underpass type structures with various dimensions.
Rise:	
Length:	
Materials:	200mm x 55mm corrugation profile, 5.0 – 7.0mm materials
End treatment:	Various step-bevelled ends
Live load:	Highways loading – AS5100
Overview:	New bypass highway.



Project:	Marradong Trafficable Tunnels, Worsley Efficiency & Growth Project
Year:	2010 – 2011
Location:	Worsley Alumina Mine site, Marradong, WA
Project owner:	Worsley Alumina, BHP
Main Contractor:	Bechtel Australia Pty Ltd
Design standards:	Canadian Highway Bridge Design Code ('CHBDC') and ASTM A761A
Span:	15,280mm
Rise:	6,740mmmm
Length:	22.80m
Materials:	400mm x 150mm corrugation profile, 7.0mm materials.
Live load:	Dual Caterpillar 785C Haul Trucks – 150t payload capacity
Overview:	One of three trafficable tunnels required - Tunnel 442Q



Project:	Marradong Stockpile Tunnels, Worsley Efficiency & Growth Project
Year:	2010 – 2011
Location:	Worsley Alumina Mine site, Marradong, WA
Project owner:	Worsley Alumina, BHP
Main Contractor:	Bechtel Australia Pty Ltd
Design standards:	Canadian Highway Bridge Design Code ('CHBDC'), ASTM A761A and extensive 3D FEA modelling analysis
Span:	6,580mm
Rise:	5,351mm
Tunnel lengths:	Escape tunnel = 70.65m Reclaim tunnel = 58.00m
Materials:	CBS system, 400mm x 150mm corrugation profile, 7.0mm & 8.0mm materials, concreted CBS ribs at various centres.
Stockpile load:	Stockpile height = 28.0m, stockpile density = 27kN/m ³
Live load:	Caterpillar 993 Wheel Loader – 195t payload capacity
Overview:	Two tunnels required under bauxite stockpile. Both feature the CBS rib system. Extensive design analysis through 3D FEA modelling due to potential ground settlement of 200mm.



Project:	Gibihi Road Overpass – CIV 27
Year:	2007
Location:	Moura, QLD
Project owner:	Anglo American Coal / Dawson Coal
Main Contractor:	Ostwald Bros. Qld.
Consultant:	Parsons Brinkerhoff
Design standards:	Canadian Highway Bridge Design Code ('CHBDC') and ASTM A761A
Span:	13,000mm
Rise:	7,350mm
Length:	86.50m
Materials:	400mm x 150mm corrugation profile, 8.0mm materials with 8.0mm external ribs
End treatment:	1:1.5 end bevels
Live load:	Dual Caterpillar 797B Haul Trucks – 624t payload capacity
Overview:	Haul road extension required over public road for Anglo Coal. Overpass required to maintain public access to Gibihi Road



Project:	Yandi Junction South East Expansion Project – Heavy Vehicle Access Rd
Year:	2006
Location:	Yandi Mine site, Pilbara, WA
Project owner:	Hamersley Iron / Rio Tinto
Consultant:	Calibre Projects
Design standards:	Canadian Highway Bridge Design Code ('CHBDC') and ASTM A761A
Span:	9,400mm
Rise:	6,900mm
Length:	60.0m
Materials:	400mm x 150mm corrugation profile, 7.0mm materials.
Live load:	Dual Komatsu 930E Haul Trucks – 292t payload capacity

