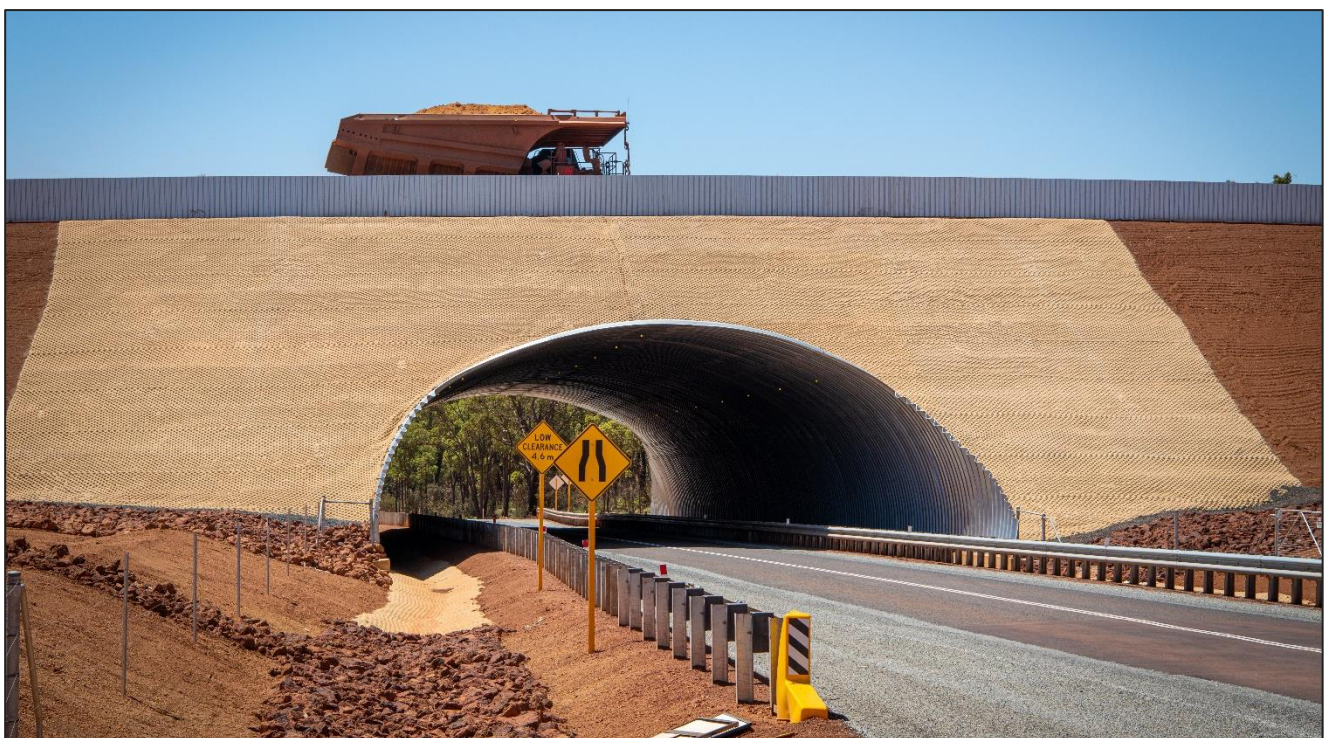


Bolted, corrugated plate structures – installations in Australia

Revised 14/2/2023.

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.



South 32, Lower Hotham Road, WA



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.



South 32 Easter Leases crossing, Groote Eylandt, NT



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 Slepiner LV Access Road - Mine Support Vehicles



Roy Hill Mine, WA 2020



Project:	North Parkes Escape tunnel extension
Year:	2020
Location:	Northparkes Mine, NSW
Project owner:	Northparkes Mines
Consultant:	GHD
Design standards:	AS / NZS 2041:1
Span:	2,339mm
Rise:	2,339mm
Length:	27.0m
Corrugation profile:	200 x 55mm
Live load:	Conveyor & Light Vehicle (Escape Tunnels)



North Parkes Escape tunnel extension



Project:	Nemingha Culvert extension
Year:	2020
Location:	Nemingha (461.579km)
Project owner:	John Holland
Consultant:	John Holland
Design standards:	AS / NZS 2041:6 2010
Span:	3,531mm
Rise:	2,983mm
Length:	6,7m
Corrugation profile:	200 x 55mm
Live load:	AS5100 Highway Loads



Nemingha Culvert extension



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



BHP Mining Area C stockpile tunnel



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



Mt Peter



Project:	FMG Tailings Dam B200
Year:	2020
Location:	Christmas Creek, Cloudbreak Access Road
Project owner:	FMG
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:1
Span:	3,500 mm
Rise:	1,602 mm
Length:	75.0m
Corrugation profile:	200x55mmx5.0mm complying with AS2041.6 2010
Live load:	2 x Lanes of Vehicle Live Load KOMATSU 930E



FMG Tailings Dam B200



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



FMG's Trinity Drive Overpass – assembled in 2 weeks.



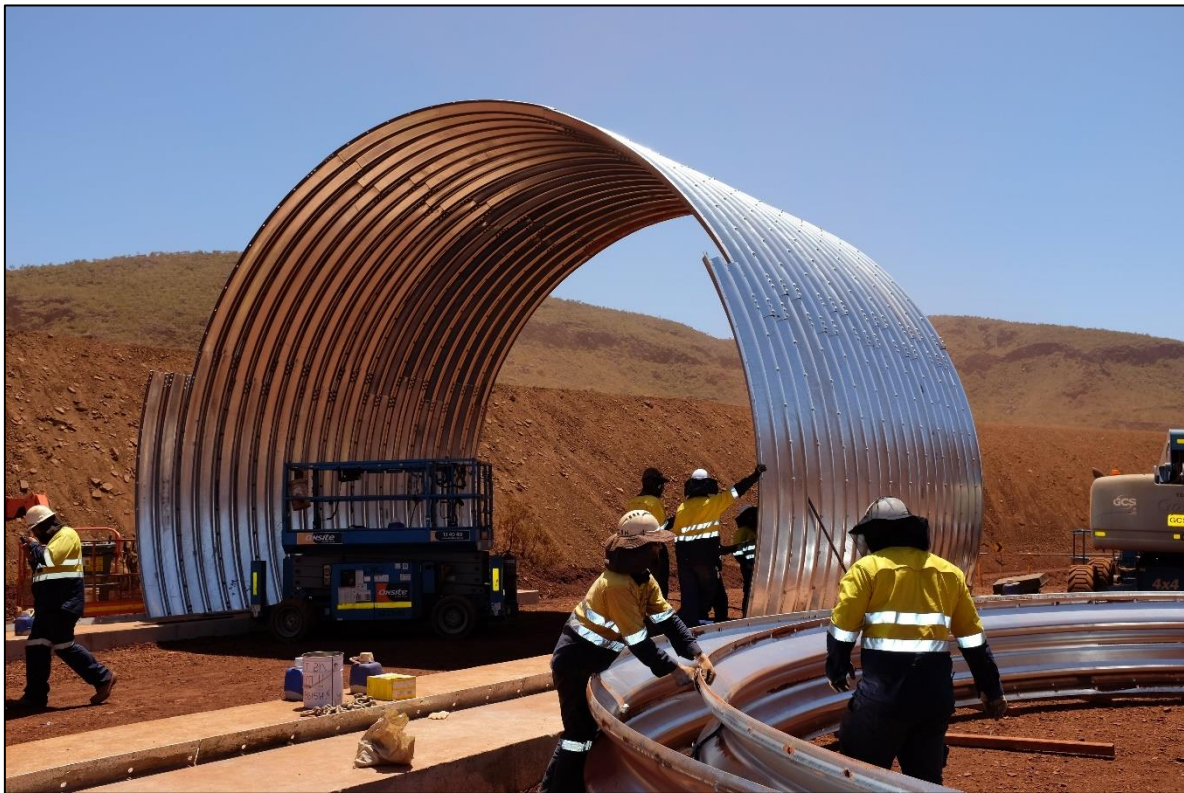
Project:	Moolarben Haul Road Underpass / Conveyor Tunnel
Year:	2015
Location:	Moolarben Coal Mine, NSW
Project owner:	Yancoal, Moolarben Coal Operations
Consultant:	WML Consultants (for Roundel Civil Products)
Design standards:	AS / NZS 2041:1
Span:	7,600mm
Rise:	4,718mm
Length:	72.500m
Corrugation profile:	381 x 140mm complying with AS / NZS2041.6.
Live load:	Komatsu 830E Haul Trucks



Moolarben Coal – Conveyor Tunnel / Haul Road Underpass 2015



Project:	FMG Solomon Mine – Simpson’s Overpass Arch
Year:	Dec 2014 – Jan 2015
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:	10,400mm
Rise:	6,935mm
Length:	71.235m
Corrugation profile:	381 x 140mm complying with AS / NZS2041.6.
Live load:	Dual Komatsu 930E Haul Trucks



FMG’s Simpson’s Overpass - 2015



Project:	Baralaba Haul Road Crossing, Moura
Year:	2012
Location:	Moura, QLD
Project owner:	Anglo-American Coal / Dawson Coal
Main Contractor:	Georgiou
Consultant:	Arkhill 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



Large – span arch at Baralaba Road, Anglo American Coal, Dawson Mine site, QLD – during construction and during backfilling



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.



Dilston Bypass, Launceston, Tasmania



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



Trafficable Tunnel 442Q – Worsley Efficiency & Growth project, Marradong Mine site, WA – during construction



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:	13,130mm
Rise:	5,985mmmm
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 442T



Trafficable Tunnel 442T – Worsley Efficiency & Growth project, Marradong Mine site, WA – during construction



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:	13,130mm
Rise:	5,985mmmm
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 442L



Trafficable Tunnel 442L – Worsley Efficiency & Growth project, Marradong Mine site, WA – during construction



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.



410E Stockpile Tunnels – Worsley Efficiency & Growth project, Marradong Mine site, WA – during construction.

The reinforced, concreted CBS rib system detailed below.



Project:	Yandicoogina Service Corridor / Main Access Rd Realignment
Year:	2009
Location:	Yandi Mine site, Pilbara, WA
Project owner:	Hamersley Iron / Rio Tinto
Consultant:	Langkildy Engineering Services
Design standards:	Canadian Highway Bridge Design Code ('CHBDC') and ASTM A761A
Span:	9,400mm
Rise:	6,900mm
Length:	66.0m
Materials:	400mm x 150mm corrugation profile, 8.0mm materials.
Live load:	Dual Komatsu 930E Haul Trucks – 292t payload capacity
Overview:	Duplication of the original Yandi Bridge-Plate for Rio Tinto



Duplicate large – span arch at Hamersley Iron / Rio Tinto's Yandi Mine site, WA – during construction



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



Large – span arch at Gibihi Road, Moura, Qld, AngloAmerican Coal, Dawson Mine site – during construction



Detail of external ribs – Gibihi Road, Qld



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



Large – span arch at Hamersley Iron / Rio Tinto’s Yandi Mine site, WA.

