

Bebo Arch v's Conventional Prestress Concrete Bridge Structure

Application of Bebo Arches in Rail, Infrastructure, Mining, Fauna Crossings, Sub-divisions



Humes Bebo Arch v's Conventional Bridge Design

Project

Mining Applications for Conveyor Tunnels

Construction

The Humes Single & Two Piece Arch Systems offer significant advantages over conventional beam solutions particularly in cases where there is a high embankment condition. Material costs are lower. Installation costs are lower - installation is considerably faster, often a matter of days compared to weeks or months with using traditional systems including RE Walls.

Asset Owner

No maintenance on expansion joints.

No maintenance on bearings.

Improvement of ride, no thump because transition slab is eliminated.

Improved aesthetics – arches look better!

Life Cycle Assessment on Maintenance Costs over a 100 yr design period

Inspection Type	Level 1 Inspection / Span	Level 2 Inspection / Span	Concrete Structure Servicing / Span	Deck Joint Maintenance / Span (estimate)	Bearing Replacement Per Span (estimate)	Total Maintenance Cost / Span per 100 year Life
Frequency	Yearly	Every 4 Years	Yearly	Every 20 Years	Every 50 Years	
Single Span Arch	\$100.00	\$2000.00	\$1000.00			\$160,000.00
Deck Unit Bridge / 1 to 3 spans long / Span Length 10 to 20m	\$100.00	\$2000.00	\$1000.00			\$160,000.00
Deck Unit Bridge / 4 spans or more / Span Length 15 to 25m	\$100.00	\$2000.00	\$1000.00	\$20,000.00	\$1,500,000.00	\$3,260,000.00
Super Tee Girder Bridge / any no of spans / Span Lengths 25 to 35m	\$100.00	\$2000.00	\$1000.00	\$20,000.00	\$2,500,000.00	\$5,260,000.00

Costs Comparison

Costs comparison using design drawings from a 21m span prestressed concrete deck units with 17m prestressed concrete octagonal piles V's

25800T Bebo Arch structure

A 26% saving in the precast concrete Arch costs.

Note: This doesn't include any in-situ concrete works for abutments and headstocks for the prestressed bridge structure OR In-situ concrete footing for the Arch structure

Profile	Dimensions					No. of pieces	Unit mass (t)	Total Mass (t)
	Internal Span 'S'	Internal Height 'H'	Dimension 'A'	Thickness 'T'	Unit Length (mm)			
6210S	6.0	2.1	0	200	2,500	One	11.9	11.9
6310S	6.0	3.1	1.0	200	2,500	One	13.2	13.2
9300S	9.0	3.0	0	250	1,800	One	14.2	14.2
9400S	9.0	4.0	1.0	250	1,800	One	16.5	16.5
12300S	12.0	3.0	0	250	1,800	One	16.8	16.8
12400S	12.0	4.0	0	250	1,800	One	18.9	18.9
15500T	15.0	5.0	0	350	1,800	Two	15.6	31.1
18600T	18.0	6.0	0	350	1,800	Two	18.8	37.6
21700T	21.0	7.0	0	350	1,800	Two	22.7	45.3
25900T	25.6	9.0	1.0	450	1,200	Two	25.5	50.1

Humes

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