# Appendix 4

Ardmore Park Quarry - Modification 3
Engineering Assessment of
the Culverts and Bridges on
the Product Delivery Route

prepared by

Bridge Designs Pty Ltd

(Total No. of pages including blank pages = 80)

September 2018

## **MULTIQUIP QUARRIES**

Ardmore Park Quarry Appendix 4 **RESPONSE TO SUBMISSIONS** 

PA 07\_0155 MOD3 Report No. 625/25

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#### **RESPONSE TO SUBMISSIONS**

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# MULTIQUIP QUARRIES Ardmore Park Quarry Appendix 4



PO Box 9140, Wyoming, NSW 2250 ph (02) 4322 0011 ABN 63 145 429 063

Multiquip

Attention: Steve Wall

B1833-R-01

03 September 2018

## Bungonia Culverts - Engineering Assessment

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Principal J. R. Alexander BE, MEngSci, MIEAust Associate D. O. Anabalon BE, ME, MIEAust





### 1 Introduction

Bridge Design were commissioned by Multiquip to assess ten (10) structures along the quarry haulage route on their suitability under General Mass Limit (GML) loading. The structures are listed in Table 1.1.

**Table 1.1: List of Structures** 

Crossing	Type	Road	Chainage
A (Marulan Creek)	1 x 2.1H x 3.1W box culvert	Jerrara Road	1333
В	3 x 1.8H x 1.9W box culvert	Jerrara Road	3161
C (Stony Creek)	2 x 2.1H x 2.1W box culvert	Jerrara Road	3430
D	1 x 2.7H x 3.3W box culvert	Jerrara Road	5130
E (Sawyers Creek)	1 span steel girder bridge	Jerrara Road	5940
F	1 x 1.8H x 2.1W box culvert	Jerrara Road	8370
G (Jerrara Creek)	2 span PSC bridge	Jerrara Road	9720
H (Springponds Ck)	5 x 1.2H x 2.1W box culvert	Jerrara Road	11916
I	2 x Ø1500 pipe culvert	Mountain Ash Rd	474
J (Woodwards Ck)	1 x Ø1500 pipe culvert	Oallen Ford Rd	N/A

The haulage route has been widened recently to improve access to and from the quarry. This involved widening a number of culverts and bridges along the route. Additional culvert units were added adjacent to most of the existing structures.

The bridge over Jerrara Creek (G) was widened by adding two new prestressed concrete girders on the eastern side of the existing bridge. These girders are supported by new steel headstocks which are bolted to the existing concrete headstocks. A concrete deck has been poured adjacent to the existing deck such that there is no load transfer between the two. The design for the widening of this bridge was undertaken by Bridge Design.

Two of the structures (C and D) are new culverts constructed as part of the road widening. These culverts were designed to SM1600 loading and are therefore suitable for GML loading.

#### 2 Condition Assessment

A level 2 inspection was performed on all ten structures. The reports for these inspections may be found in Appendix A.

The overall condition of the structures varied from good to fair. No condition 4 elements were identified as part of the assessments. The structural capacity of each of the structures is therefore not compromised by their defects.

The six culverts were determined to be safe to proof load (see Section 4).

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#### 3 Mass Limits

The structures were assessed for General Mass Limit (GML) loading. This refers to the allowable mass for of heavy vehicles which are permitted on the general road network.

The maximum permissible axle loads are 6.5t for a steer axle group with a FUPS bar fitted to the prime mover, 9.0t for a single axle, 16.5t for a double axle and 20.0t for a triple axle. The typical axle spacing is 1.25m.

For Concessional Mass Limit (CML) loading the corresponding limits are 6.5t, 9.5t, 17.0t and 21.0t respectively. For Higher Mass Limit (HML) loading the limits are 6.5t, 9.5t, 17.0t and 22.5t respectively.

The axles loads are critical for the culverts. For Bridge G the critical vehicles are a 26.5t rigid and a 42.5t semi-trailer.

## 4 Load Testing

The six culverts that were proof load tested were A, B, F, H, I and J.

The target load across the three axles was 31.2 tonnes, which is the 20 tonne GML triaxle load times a dynamic load factor of 1.3 and times a proof load factor of 1.2. The 31.2 tonne load represents and overload condition of 114% for CML loading and 107% for HML loading. The culverts were load tested incrementally with an initial load of 20.0 tonnes, an intermediate load of 26.0 tonnes, and a final load of 31.2 tonnes. The loads were measured using a weighbridge at the Multiquip quarry prior to load testing. Two separate vehicles were used for the testing; one with a 20 tonne triple bogey and another with a 26 tonne triple bogey to which an additional 5.2 tonnes was added to make 31.2 tonnes.

Deflections were measured at midspan using a dial gauge as shown in Figures 4.1 and 4.2. The dial gauge was secured to a ladder and positioned underneath the wheel path. The position of the dial gauge was kept the same for the three tests. Readings were taken before loading, under loading and after loading to determine the deflection and the return. The dial gauge was accurate to 0.01mm.

The axles were positioned as close as possible to the midspan of the culvert to generate the maximum bending in the slab. The same position was used for the three different loads.

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Figure 4.1: Test Setup at Culvert A



Figure 4.2: Dial Gauge

No visible distress was observed in any of the structures tested. The results of the testing can be found below.

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#### 4.1 Culvert A

Lane tested: Northbound

Cell tested: 1 of 1
Gauge position: Unit 5
Approximate fill height: 1.0m

Table 4.1: Culvert A results

	20t	26t	31.2t
Deflection under load	0.19	0.24	0.28
Return	0.18	0.23	0.26
Cracking unloaded	Nil	Nil	Nil
Cracking under load	Nil	Nil	Nil

#### 4.2 Culvert B

Lane tested: Northbound

Cell tested: 1 of 3

Gauge position: 2m from eastern edge

Approximate fill height: 0.3m above top of headwall

Table 4.2: Culvert B results

20t	26t	31.2t
0.01	0.02	0.02
0.01	0.02	0.03
Nil	Nil	Nil
Nil	Nil	Nil
	0.01 0.01 Nil	0.01 0.02 0.01 0.02 Nil Nil

### 4.3 Culvert F

Lane tested: Northbound

Cell tested: 1 of 1
Gauge position: Unit 13
Approximate fill height: 1m

Table 4.3: Culvert F results

	The second secon	The state of the s	-
	20t	26t	31.2t
Deflection under load	0.11	0.12	0.10
Return	0.14	0.14	0.10
Cracking unloaded	Nil	Nil	Nil
Cracking under load	Nil	Nil	Nil

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#### 4.4 Culvert H

Lane tested: Southbound

Cell tested: 3 of 5
Gauge position: Unit 2
Approximate fill height: 1.2m

#### Table 4.4: Culvert H results

	_	1	
	20t	26t	31.2t
Deflection under load	0.15	0.20	0.27
Return	0.16	0.20	0.25
Cracking unloaded	0.2mm @ 200mm	0.2mm @ 200mm	0.2mm @ 200mm
Cracking under load	0.2mm @ 200mm	0.2mm @ 200mm	0.2mm @ 200mm

#### 4.5 Culvert I

Lane tested: Eastbound turn lane

Cell tested: 1 (east) of 2
Gauge position: Unit 12
Approximate fill height: 2.0m

#### Table 4.5: Culvert I results

			T a
	20t	26t	31.2t
Deflection under load	0.00	0.00	0.00
Return	0.00	0.00	0.00
Cracking unloaded	0.1mm @ 75	0.1mm @ 75	0.1mm @ 75
Cracking under load	0.1mm @ 75	0.1mm @ 75	0.1mm @ 75

## 4.6 Culvert J

Lane tested: Southbound

Cell tested: 1 of 1
Gauge position: Unit 6
Approximate fill height: 2.5m

Table 4.6: Culvert I results

	Table 4.6: Culvert	j resuits	
	20t	26t	31.2t
Deflection under load	0.16	0.22	0.29
Return	0.19	0.22	0.28
Cracking unloaded	0.4-0.5mm	0.4-0.5mm	0.4-0.5mm
Cracking under load	0.4 <b>-</b> 0.5mm	0.4 <b>-</b> 0.5mm	0.4-0.5mm

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#### 4.7 Summary

AS5100.2 states that the maximum deflection under live load is span/600. The maximum culvert deflection observed was Culvert H which recorded a deflection under live load of span/7800 which is substantially less than the limit stated in AS5100.2.

All six culverts remained in the elastic range during testing with the deflection returning to effectively zero after the test. The maximum difference between the deflection before loading and after unloading was 0.02mm. This discrepancy is extremely small and could be attributed to the accuracy of the instrument or any movement in the apparatus.

The roof slabs of Culverts A, B and F were uncracked before loading and remained uncracked under the 31.2t load. Culverts H, I and J had cracks in the roof unloaded and these cracks did not widen under the 31.2t load.

These results suggest that all six culverts are capable of carrying GML loads. There was no discernible change in the crack widths and very minor deflections under the 31.2 tonne load which suggests there is sufficient additional capacity for CML and HML loading.

#### 5 **Load Rating**

### 5.1 Bridge E

The bridge over Sawyers Creek (E) consists of five steel beams which support steel plate decking and approximately 600mm of fill. The steel beams sit on masonry abutments and have a clear span of 4.4m.

The dimensions of the steel beams were measured on site and do not correspond to a standard section. The beams were not marked but the steel grade was assumed to be 250MPa.

The GML and HML axle loads were considered and were assumed to be distributed by the fill material. A dynamic load allowance (DLA) of 0.25 was adopted for the steel bridge as the depth of fill material allows for a reduced DLA.

Table 5.1: Bridge E Analysis Results

	GML Maximum Effect	HML Maximum Effect	<b>Estimated Capacity</b>
Girder Bending	174 kNm	184 kNm	186 kNm
Girder Shear	184 kN	201 kN	743 kN

The masonry walls showed no signs of distress and are assumed to capable of carrying the required loads.

The loads under GML and HML were less than the estimated capacity so Bridge E is therefore deemed to be capable of safely carrying GML, CML and HML loading.

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#### 5.2 Bridge G

The original design drawings for structure G were made available to Bridge Design during the bridge widening. The scan quality of these drawings is extremely poor and it is difficult to determine the details of the reinforcement.

The clear deck width of the original bridge is 6.45m which is wide enough to accommodate two 3.2m wide lanes. The new deck is not connected to the original deck so the analysis considered the case where two vehicles were supported entirely by the original structure, with a lane factor of 0.8 for the second lane. The dynamic load allowance (DLA) was taken as 0.3. Both the 26.5t rigid and 42.5t semi-trailer were modelled and the maximum effects are displayed in Table 5.2.

The girders contain eleven strands in the bottom layer, five in the middle and three in the top layer. These strands were assumed to be 3/8" (9.5mm) strands in line with other designs from the period. Shear reinforcement consists of two stirrups which were assumed to be 1/4" bars and spaced at 9" (225mm) in the critical shear zone.

The reinforcement in the abutment and pier headstocks consists of four straight bars in each face and four bars which are bent such that they are in the top face at the columns and in the bottom face in the middle. The bar size could not be definitively determined from the drawings but appear to be  $4 \times 7/8''$  bars and  $4 \times 9/8''$  bars. Shear reinforcement consists of four legs assumed to be 1/2'' bars. The bar spacing is 7.5'' (190mm) at the abutments and 6'' (150mm) at the piers.

#### Assumed material properties:

Concrete compressive strength
 20 MPa abutments, pier, deck

38 MPa girders

Steel yield strength 275 MPa

Strand yield strength 1050 MPa

Table 5.2: Bridge G Analysis Results

	GML Maximum Effect	HML Maximum Effect	Estimated Capacity
Girder Bending	310 kNm	329 kNm	427 kNm
Girder Shear	137 kN	145 kN	202 kN
Abutment Bending	+502 kNm / -214 kNm	+536 kNm / <b>-</b> 232 kNm	573 kNm
Abutment Shear	376 kN	399 kN	667 kN
Pier Bending	+422 kNm / -309 kNm	+435 kNm / -320 kNm	573 kNm
Pier Shear	449 kN	462 kN	796 kN

The loads under GML and HML were less than the estimated capacity so Bridge G (Jerrara Creek) is therefore deemed to be capable of safely carrying GML, CML and HML loading.

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#### 6 Conclusion

All ten structures are in good to fair condition with no defects sufficient to compromise their structural capacity.

Culverts C and D are assumed to be satisfactory due to their design codes. Culverts A, B, F, H, I and J were load tested and determined to be capable of carrying the required loads. Bridges E and G were analysed and determined to be capable of carrying the required loads.

Yours faithfully,

Mitchell Kramer

Bridge Engineer

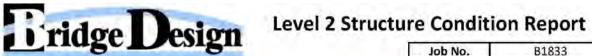
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#### MULTIQUIP QUARRIES Ardmore Park Quarry Appendix 4

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**Appendix A - Condition Assessment Reports** 

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ridge		-51	<b>5</b>				Job No.		B1833
							Page	1	of 6
LOCATION DETAILS									
Structure Name		(	Culvert	A		Structure ID		133	3.162
Road Name			errara F			Road Class			cal
Speed Limit (km/h)			80			Latitude		-34.	7417
Suburb		_ = 0	Marula	n		Longitude		149	.9762
LGA		Goulb	urn Mu	lwaree		Crossing		Marulan	Creek (A)
From			Marula	n		Catchment Na	me	N	I/A
То		E	Bungon	ia		Catchment Are	ea (km²)		N/A
Location Description	Chain	age 133	33.162						
STRUCTURE DETAIL	LS								
Culvert Type		pr	ecast b	юх	Skew			0	
Construction Material		_	concret		Numb	er of cells		1	
Construction Date					No. u	nits per cell		6	
Waterway area (m2)	line a		6.5604			ength (m)		2.5	
Cell height/diameter (	(m)		2.13		Overa	ll length (m)		15	
Cell width (m)			3.08		Clear	spacing (m)			
Height over culvert (m	1)		1		No. tr	affic lanes		2	
Wall thickness (mm)			125-17	5	Road	width (m)		9.7	
Roof thickness (mm)			190						
INSPECTION DETAI	LS								
nspected by		Mitchell	Krame	r	Last L	evel 2 Inspection	n -	unk	nown
Date of Inspection		8/06/	2018			evel 2 Inspectio		N	I/A
Time of Inspection			m			ure plans availa			no
Weather		ove	cast				A CALLAN	To all	JUS -
Tidal Conditions					Acces	s equipment req	uirea?	no	one
GENERAL COMME	NTS								
Some exposed reinfor	cement	at edge	s and c	orners o	of units				
Single 3mm crack in ba			2000						
No signs of flexural cra									
Signis of Hexural Cit	Citing II	. dilita							
OVERALL STRUCTU	RE CO	NDITIO	N RA	TING					
OVERMEESINGETO			-		1	Ť.			
	Good	Fair	Poor	Very	Close		Comm	ents	
	Ğ	122	ĕ	2 2	ū	-	1.11		
Overall Structure	1.736								
	X				1				
Condition Rating	100.0								

Bridge Design Pty Ltd A4-11 Appendix 4

			Level 2 Structure	2	tru	ctn	e e			Structure Name Cu	Culvert A
DI.J.	OP	ridge peron								Inspected by Mi	Mitchell Kramer
		- Constant	Condition Report	120	7	epc	ţ			ection	8/06/2018
8	mpon	Component Inventory and Condition Assessment	Condition	Asse	SSI	ent				Job No. B1833	Page 2 of 6
	MA		nent		1	Qua	Quantity in Condition Rating	ry in Conc Rating	dition	Comments	
Element Type	Code	Description	Environi	tinU	titnsuQ	н	7	m	4	- type of defect - location of defect - size and severity	
Concrete	CCUP	CCUP Precast Box Culvert	Σ		m2 110	0	100	10	0	- unit 1 (u1) taken as easternmost unit - u6n exposed reo at fillet, bars at 120 c u5s bottom - spall u2 top easr end, also west end - u3 top west end exposed reo 20 cover - roof free of cracks	<ul> <li>unit 1 (u1) taken as easternmost unit</li> <li>u6n exposed reo at fillet, bars at 120 ctrs, same at u4n u2n u1n u2s u3s u5s bottom</li> <li>spall u2 top easr end, also west end</li> <li>u3 top west end exposed reo 20 cover</li> <li>roof free of cracks</li> </ul>
Concrete	CCUL	In Situ Base Slab	Σ	m2	46	0	46	0	0	3mm crack in middle of base slab for length of culvert	for length of culvert
Miscellaneous	MAPP	Approaches	Σ	ea	7	2	0	0	0		
Railing	RMET	Steel Bridge Barrier	Σ	E	70	70	0	0	0		
					111	Ш					
					+ +				1		
									-		

Ardmore Park Quarry Appendix 4

Culvert A	Mitchell Kramer	8/06/2018	Page 3 of 6	Required Action	Monitor Repair Level 3 Inspection	×						
me		Date of Inspection	Job No. B1833			osed reinforcement at joints						
Level 2 Structure	The state of the state of	Condition Report	Required Maintenance Actions		Defect Description	Exposed reinforcement in corners of most units, spalling and exposed reinforcement at joints						
	5010	9	ired Maint	_	Condition State	3 Exposed						
	<u> </u>	1	Redu		Quantity	10						
	LIUGE				Element Description	Precast Box Culvert						



**PHOTOS** 

## **Level 2 Structure Condition Report**

	Structu	ıre Name	Culvert A			3 ,6
	Inspec	ted by	Mitchell Kram	ner		30.5
	Date o	f Inspection	8/06/2018			
Ioh	Nο	B1833	Page	Ι Δ	of	6



View of culvert from western side



Road level

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**PHOTOS** 

## **Level 2 Structure Condition Report**

	Struct	ure Name	Culvert A			2 6
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	8/06/2018			
oh	No	B1833	Page	5	of	6



**Exposed reinforcement at top corners** 



Exposed reinforcement and efflourescence in edge of culvert roof

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**PHOTOS** 

## **Level 2 Structure Condition Report**

S	tructu	re Name	Culvert A			2,7
Ī	nspect	ed by	Mitchell Kram	ner		
	ate of	Inspection	8/06/2018			
Job N	lo.	B1833	Page	5	of	6



Exposed reinforcement and efflourescence in edge of culvert roof



0.3mm crack in base slab

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# Level 2 Structure Condition Report

ridge	_	CDL	<b>5</b> **				Job No	).	B1833
							Page		1 of (
LOCATION DETAILS	5								
Structure Name		(	Culvert	В		Structure ID			3161.622
Road Name			errara l	-		Road Class			local
Speed Limit (km/h)			80	-		Latitude			-34.7566
Suburb		- 8	Marula	n		Longitude			149.9700
.GA		Goulb	urn Mu	lwaree		Crossing		Unkr	nown Creek (B)
rom			Marula	n		Catchment Na	ame		n/a
Го		E	Bungon	ia		Catchment Ar	ea (km²)		n/a
Location Description	Cha	inage 31	61.622						
STRUCTURE DETAIL	LS	,					Ž.		
Culvert Type		ir	n situ b	OX	Skew			- 1	45°
Construction Material			concret	e	Numb	er of cells			3
Construction Date					No. u	nits per cell		1	n/a
Waterway area (m2)			10.5			ength (m)	4	.57m ne	w 9.2m old
Cell height/diameter (	(m)		1.8			ll length (m)		1.	3.77
Cell width (m)			1.94			spacing (m)			0
Height over culvert (m	1)	0.3m a	- V - V - V	eadwall		affic lanes			2
Wall thickness (mm)		4.1	115		Road	width (m)	1	15	9.0
Roof thickness (mm)			0 old, r inknow						
INSPECTION DETAI	LS								
nspected by		Mitchell	Krame	r	Last L	evel 2 Inspectio	n		unknown
Date of Inspection		7/06/	/2018		Next I	evel 2 Inspection	on		n/a
Time of Inspection		5p	m		Struct	ure plans availa	able?		no
Weather		ovei	rcast						3003
Tidal Conditions					Acces	s equipment re	quirea?		none
GENERAL COMME	NTS								
Only defect is 0.1mm	Vertica	l crack in	cell 3.						
Structure is in good co									
Ser acture is in good to	iditiol								
OVERALL STRUCTU	RE CC	NDITIO	N PA	TING					
O TENALE STRUCTO	74.5		-		1 0	T			
	Good	Fair	Poor	Very	Close		Com	ments	d.
Overall Structure									

Bridge Design Pty Ltd A4-17 Appendix 4

Component Inventory and Con  Code  CCUL In Situ Box Culvert - original  CCUL In Situ Box Culvert - new  MAPP Approaches  RMET Steel Bridge Barrier				Level 2 Structure	2 19	Sti	S	ure				Structure Name	Culvert B
Court   In Situ Box Culvert - original   M   m2   Steel Bridge Barrier   M   m   60   60   0   0   0   0   0   0   0		OP	Perion						19			Inspected by	Mitchell Kramer
Component Inventory and Condition Assessment   Component Inventory and Condition Assessment   Component Inventory and Condition   Component   Compon			-	5	aH	5	Ř	200	J			Date of Inspection	7/06/2018
CCUL   In Situ Box Culvert - original   M   m2   65   65   0   0   0   0   0   0   0   0   0	O	mpon	ent Inventory and Co	ondition	n As	ses	me	nt					2 of
COde   Description   Code					tuəi			uanti	ty in C	ondil			
Code   CCUL   In Situ Box Culvert - original   M m2 130   0 130   0 0	Clomont Tuno	RMS	Total Control of the		шu	3/6	Lλ	-	Katin			Comments	
ie CCUL In Situ Box Culvert - original M m2 130 0 130 0 0 0 annous MAPP Approaches M m 60 60 0 0 0 0 annous RMET Steel Bridge Barrier M m 60 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	element iype	Code	nescribilon		LOI			-				<ul> <li>type of defect</li> </ul>	
te CCUL In Situ Box Culvert - original M m2 130 0 130 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					ivn3				7	m	500	<ul> <li>location of defect</li> <li>size and severity</li> </ul>	
CCUL   In Situ Box Culvert - new   M m2   65   65   0   0   0	Concrete	CCUL						7.7	30	0		- Cell 1 taken as northernmost 0.1 mm vertical crack 5m from	eastern edge of Cell 3
AMAPP Approaches         M         ea         2         2         0         0           RMET Steel Bridge Barrier         M         m         60         60         0         0	Concrete	CCUL						55	0	0	1.0	No defects	
RMET       Steel Bridge Barrier       M       m       60       0       0         1       0	Miscellaneous	MAPP	Approaches					7	0	0	0		
	Railing	RMET			Σ				0	0	0		
							-						
					1		+		+				
					Ť								
							+						
					1		+	+	+				
							-			5			
										5			
				1									

Appendix 4

			9	5	Office								I
			of	Required Action	Level 3 Inspection								1
	<u>-</u>		3	Require	Repair					Ш			
18	Mitchell Kramer	2018	Page		Nonitor		1=						
Culvert B	Mitch	7/06/2018	_										
			B1833										
Name	þý	spection											
Structure Name	Inspected by	Date of Inspection	Job No.										
St	S	Da	o		5								
					Sescripti								
ture		Doc			Defect Description								
itruc	0	n Ke			100								
Level 2 Structure	1111	Condition Report	tions			No required maintenance actions							
Lev		5	nce Actions			ntenanc							
			tenar			ired ma							
I	5	0	Mair			No requ		-		-			
	E C		Required Maintena		Condition State						a		
		1	Red		Quantity	34							
	ridge				Element Description			7					
4	-									1 4-	las (		١



**PHOTOS** 

## **Level 2 Structure Condition Report**

Struc	ture Name	Culvert B			
Inspe	ected by	Mitchell Kram	ner		
Date	of Inspection	7/06/2018			
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Culvert from road level (facing south)



Culverts from western side (recent extension)

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**PHOTOS** 

## **Level 2 Structure Condition Report**

St	ructure Name	Culvert B			
Ir	spected by	Mitchell Kran	ner		
Б	ate of Inspection	7/06/2018			
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Culverts from eastern side (original)



Cell 3 from east

Bridge Design Pty Ltd A4-21



**PHOTOS** 

## **Level 2 Structure Condition Report**

Structu	ire Name	Culvert B			
Inspect	ted by	Mitchell Kram	ier		
Date o	f Inspection	7/06/2018			
No.	B1833	Page	4	of	6



Cell 1 from west



0.1mm vertical crack in Cell 3

A4-22 Bridge Design Pty Ltd

Ardmore Park Quarry Appendix 4



# Level 2 Structure Condition Report

ridge	_	-	<b>5</b> **				Job N	0.		B18	333	
							Page	9	1	0	f	5
LOCATION DETAILS												
Structure Name		(	Culvert	С		Structure ID			3	430		_
Road Name			errara F			Road Class				ocal		
Speed Limit (km/h)	-		80			Latitude			-34	.7590	)	
Suburb		1/4	Marula	n		Longitude			149	9.969		
.GA	-	Goulb	urn Mu	lwaree	9	Crossing		9	Stony (	Creek	(C)	
rom		- 13	Marula	n		Catchment Na	ame		1	n/a		
Го		E	Bungon	ia		Catchment Ar	ea (km²)			n,	/a	
Location Description	Chai	nage 34	30									
STRUCTURE DETAIL	LS											
Culvert Type		b	ox culve	ert	Skew				0			
Construction Material			concret	e		er of cells			2			
Construction Date						nits per cell			4			
Naterway area (m2)			8.7			ength (m)			2.45			
Cell height/diameter (	m)		2.07			ll length (m)			9.8			
Cell width (m)			2.1			spacing (m)			0			
Height over culvert (m	1)		0.3			affic lanes			2			
Wall thickness (mm)		215	top 100	base	Road	width (m)			9			
Roof thickness (mm)			205									
<b>NSPECTION DETAI</b>	LS											
nspected by	7	Mitchell	Krame	r	Last L	evel 2 Inspectio	n		unk	now	n	
Date of Inspection		8/06/	2018		Next	evel 2 Inspection	on			n/a		
Time of Inspection		2p	m		Struct	ure plans availa	able?		- T (1	no		
Weather		ovei	cast		1		mulus 42		4			
Tidal Conditions					Acces	s equipment re	quirear		n	one	- 1	
GENERAL COMME	NTS				-		- 0					
New culvert. No defec												
OVERALL STRUCTU	- Comp. 46		and the same			1						
	Poop	Fair	Poor	Very	Close		Cor	nmen	ts			
Overall Structure	х											

Bridge Design Pty Ltd A4-23

in Condition lating Comments  Comments  Comments  - type of defect - size and severity  0 0 Recent construction. No issues 0 0 Recent construction.				Level 2 Structure	7	Str	uct	Jre			Structure Name	Culvert C
Component Inventory and Condition Assessment   Component Inventory and Condition Assessment   Component Inventory and Condition Assessment   Component Inventory and Condition   Conditi	DIA.	90	Perion			Ž					Inspected by	Mitchell Kramer
The Component Inventory and Condition Assessment  RMS  Code		0	10	Cond	Ĭ	L	Rep	せる			Date of Inspection	8/06/2018
The Code Code Code Code Code Code Code Cod	3	mpon	ent Inventory and (	Condition	Ass	essi	men	44				Page 2 of
The Code Description of the Code Description of the Code of the Code of the Code of the Country of the Code of the Country of the Code of the Country of the		RMS		tuam	10000	^.		antity	in Col	nditio		
CCUP   Precast Box Culverts   M m2 150 150 0 0 0 0	Element Type	Code	Description	aoriva3			4		m		100	
MAPP Approaches         M         ea         2         2         0         0           RMET Steel Bridge Barrier         M         m         80         0         0         0           Approaches         M         m         80         0         0         0         0           Approaches         M         m         m         80         0	Concrete	CCUP		2		_		-	0			S
RMET Steel Bridge Barrier M m 80 80 0 0	Miscellaneous	MAPP		2					0			
	Railing	RMET	Steel Bridge Barrier	2					0		2.00	
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			30						4			
									1			

Ardmore Park Quarry Appendix 4

			2		Ofher	75							
			ot	ction	noitoaqenl								
			3	Required Action	Repair Level 3								
	amer			Req	Monitor								
Culvert C	Mitchell Kramer	8/06/2018	Page	H	actinoM								
Cul	Mit	8/0											
			B1833										
Name	by	spection											
Structure Name	Inspected by	Date of Inspection	Job No.										
Str	<u>II</u>	Da	io.		5								
					escripti								
ure	1	10			Defect Description								
Level 2 Structure	9	Condition Report			•	Н							
<b>12</b> St	1	ILIOL	ons			actions							
Leve	7	Cond	e Acti			No required maintenance actions							
_			nance			d maint							
Ì	E		lainte			require							
ľ	015		Required Maintenance Actions	-	State	ž					Ħ		t
	×	1	Redu	-	Quantity								
1	ridge Jesign												
,	ö	1			Element Description								
		(			E E		ļ						



**PHOTOS** 

## **Level 2 Structure Condition Report**

Structi	ure Name	Culvert C			
Inspec	ted by	Mitchell Kram	ner		
Date o	f Inspection	8/06/2018			
No	B1833	Page	1	of	5

View of culvert from side



**Culvert from road level** 

A4-26 Bridge Design Pty Ltd

PA 07\_0155 MOD3 Ardmore Park Quarry
Report No. 625/25 Appendix 4



**PHOTOS** 

# **Level 2 Structure Condition Report**

	Struct	ure Name	Culvert C			
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	8/06/2018			
ob	No.	B1833	Page	5	of	5



View of culvert from side



**Culvert cell** 

Bridge Design Pty Ltd A4-27

Appendix 4



ridge	_	-51	0				Job No.		B1833	3
							Page	1	of	III.
LOCATION DETAILS	5									
Structure Name		(	Culvert	D	_	Structure ID	1		5130	
Road Name			errara l			Road Class			local	
Speed Limit (km/h)	-		80			Latitude		-3	4.7736	
Suburb		9	Marula	n		Longitude		14	9.9640	
LGA			1 1 2 2 2 1 1 1 1	lwaree		Crossing			ned Ck (I	D)
From			Marula	n		Catchment Na	ıme		n/a	
То		E	Bungon	ia		Catchment Ar	ea (km²)		n/a	
Location Description	Chair	nage 51	30							
STRUCTURE DETAIL	LS									
Culvert Type			box		Skew			0		
Construction Materia	- = :		concret	e		er of cells		1		
Construction Date		1			No. u	nits per cell		4		
Waterway area (m2)		` -	8.9		Unit l	ength (m)		2.43	3	
Cell height/diameter	(m)		2.7			ll length (m)		9.72	2	
Cell width (m)		1	3.3			spacing (m)		0		
Height over culvert (m	1)		0		No. tr	affic lanes		2		
Wall thickness (mm)		_	unknow		Road	width (m)		9		
Roof thickness (mm)		46	50 at er	nds						
INSPECTION DETAI	LS									
Inspected by	4	Mitchell	Krame	r	Last L	evel 2 Inspectio	n	un	known	
Date of Inspection		8/06,	/2018		Next I	evel 2 Inspection	on		n/a	
Time of Inspection		2p	m		Struct	ure plans availa	ble?		no	
Weather	20	cle	ear		1	o o o ui o mont	nuirod2		none	
Tidal Conditions		- 1			Acces	s equipment re	quirear		none	
GENERAL COMME	NTS									
New culvert. No defec										
OVERALL STRUCTU		NDITIC			- au	1				
	Good	Fair	Poor	Very	Close		Comn	nents		
Overall Structure Condition Rating	x					1				

Ardmore Park Quarry Appendix 4

E			Level 2 Structure	7	Str	ncti	9			Structure Name	Culvert D
LIL	ge	ridge lesion								Inspected by	Mitchell Kramer
			Condition Report	Ě	L	Kep	10			Date of Inspection	8/06/2018
3	mpon	Component Inventory and Condition Assessment	ondition	As	essi	men	24			Job No. B1833	Page 2 of 5
	RMS		44000	10200	^.		antity	Quantity in Condition Rating	ditio	Comments	
Element Type	Code	Description	aosiva3	Environ	tinU Quantit		7	m	4	- type of defect - location of defect - size and severity	
Concrete	CCUP	Precast Box Culvert	_	Σ	m2 145	5 145	0	0	0	No defects	
Miscellaneous	MAPP	Approaches	2	Σ	ea 2	2	0	0	0		
Railing	RMET	Steel Bridge Barrier	2	Σ	96 E	06	0	0	0		
			T					1			
		lis s		-	-						
								M			
			Ī				1	17			
		, -						11			
								11.			
		~	Î						_ 1		
				1	1	1					

Required Maintenance Actions  Oundition  Condition  Defect Description  Monitorial Maintenance actions  Monitorial Moni				2		Ofher	75							
Condition Report  Condition Report  Condition Report  Defect Description  Tenance actions  Tenance actions  Defect Description  Tenance actions  Defect Description  Tenance actions  Defect Description  Tenance actions				Ξ,	on	1.79 4.74		-	1					L
Condition Report  Condition Report  Condition Report  Condition Report  Date of Inspected by Mitchell Kram Date of Inspection  Defect Description				oę	d Acti									
Condition Report  Condition Report  Condition Report  Defect Description  Tenance actions  Tenance actions  Tenance actions  Tenance actions  Tenance actions  Defect Description  Tenance actions  Tenance actions		ے		3	equire	Repair							Ė	
Condition Report  Condition Report  Condition Report  Defect Description  Defect Description  Defect Description  Defect Description	Culvert D	Mitchell Krame	8/06/2018	Page	-	Monitor								
Condition Report  Tenance actions  Defect Description  Defect Description				B1833										
	Level 2 Structure	trong a citizency	Collation Report	enance Actions		Defect Description	ed maintenance actions							
				Red		Quantity					ıā			
With a state of the state of th		ridge Jesign	0			Element Description								

Report No. 625/25



**PHOTOS** 

# **Level 2 Structure Condition Report**

Structu	ire Name	Culvert D			
Inspect	ted by	Mitchell Kram	ner		
Date of	f Inspection	8/06/2018			
No	B1833	Page	5	of	5



Road over culvert facing south



Side view of culvert

Bridge Design Pty Ltd A4-31



**PHOTOS** 

# **Level 2 Structure Condition Report**

Struct	ure Name	Culvert D			
Inspec	ted by	Mitchell Kram	ner		
Date o	f Inspection	8/06/2018			
b No.	B1833	Page	5	of	5



Inside the culvert facing west



Eastern edge of culvert from top

A4-32 Bridge Design Pty Ltd

Ardmore Park Quarry Appendix 4

rid	9	_	-51	8				Job N	No.	-1	B1833	
								Pag	e	1	of	7
LOCATION D	ETAILS											
Structure Nam	ie			Bridge	Ē		Structure ID			59	40	
Road Name			J	errara F	Rd		Road Class			loc	cal	
Speed Limit (k	m/h)			80			Latitude			-34.7	7806	
Suburb				Marula	n		Longitude			149.9	9613	
.GA			Goulb	urn Mu	lwaree		Crossing		Saw	yers (	Creek (E	)
rom				Marula	n		Catchment Na	me		n/	/a	
Го				Bungon	ia		Catchment Are	ea (km²)			n/a	
ocation Descr	ription	Chain	age 594	10					3,			
STRUCTURE	DETAILS	5						,				
Overall length	(m)			4.4 clea	r	Skew	angle			0		
Overall width	(m)		9	.2m tot	al	Struct	ure Type		br	idge		
Clear width (m	1)			8.6m		Const	ruction Date					
leight above g	ground (m	n)		1.2		Const	ruction Type					
No. of traffic la	anes			2		Const	ruction	stee	l beams,	masc	nry abu	ts,
Current load li	mit (T)	1		none		Mate	ials		concret	e cul	verts	
Span	No. o	of gird	ers	Ler	ngth		Span	No.	of girders		Leng	gth
1	1 x b	ox cul	vert	3	3.7							
1	5 ste	el giro	lers	4	.4							
1	2 x b	ox cul	vert	3	3.7			Ì				
INSPECTION	DETAILS	s										
nspected by			Mitchel	Krame	r	Last L	evel 2 Inspection	n I		unkn	iown	
Date of Inspec	tion			/2018			evel 2 Inspection			n/	270.7.31	
Time of Inspec				Opm			ure plans availa				0	
Weather				ear		0.75					61.5	
Tidal Condition	ns			÷ (		Acces	equipment rec	quired?		no	ne	
GENERAL CO		TS				1		-				
New box culve	rts added	to we			21000		had previously l section loss. Ma					
OVERALL ST	RUCTUR	-	NDITIO	ON RA	TING							
		Good	Fair	Poor	Very	Close		Co	mments			
Overall Stru			х									

Bridge Design Pty Ltd A4-33 Appendix 4

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7	2	widoo ooju	Level 2 Structure	25	1	cţŗ	e			Structure Name	Bridge E	i		
LILL	ני		Condition Report	rio	R	000	t			Inspected by	Witchell Kram	ē		
						2				Inspection	1/00/2018	Ľ	T.	
3	nodu	Component Inventory and Cond	Condition Assessment	Isse	ssm	ent				Job No. B1833	Page		7	to
			ţu			Quan	ity in	Quantity in Condition	tion					
100 COC COC. 100	RMS		әш		٨		Rating	gu.		Comments				
Element Type	Code	Description	Environ	tinU	titnsuQ	(H)	7	m	4	- type of defect - location of defect - size and severity				
Concrete	CCUP	Box Culvert (east)	Σ	m2	15	14	н	0	0	Single precast box culvert added adjacent to bridge. No base. Exposed reo north wall	ed adjacent to br	ridge.	No b	ise.
Steel	SBGI	Steel Girders	Σ	E 22	10	0	16	m	0	- 5 beams total. 2 edge beams sit 300mm higher than 3 inner beams. Top of edge beam is at culvert soffit.  - 305 deep, 160 x 15 flange, sit 300 higher than inner beams, 160-2x70= 20 web, no markings, 1.32m centres.  - Paint is largely intact although there are sections of corrosion particularly at the beam ends and along the top flanges.  - No apparent loss of section.	s sit 300mm highe t soffit. t 300 higher than entres. gh there are sectiv and along the top	er than inner ons of p flang	bear corr	ner beams ns, 160-2x
Steel	SBPD	Buckle Plate Decking	Σ	ω2	20	0	15	Ŋ	0	Steel decking betweem beams, bolted to top flanges Bolts corroded but present, loss of paints and corroslon of some sections particularly around joints. Unknown thickness.	s, bolted to top flass of paints and control of the paints and control of the paints. Unknown the paints of the pa	langes corros hickne	ion o	some
Concrete	CCUP	Box Culvert (west)	Σ	m2	32	32	0	0	0	3.67 wide, 1.52 high, 1.23 long each, 210 roof, 150-165 wall, base slab present. Road seal is 100mm over top of culvert	g each, 210 roof, over top of culver	150-1	65 W	all, base sk
Miscellaneous	MMAS	Masonry Abutments	Σ	mZ	16	16	0	0	0	no issues				
Miscellaneous	МАРР	Approaches	Σ	ea	2	2	0	0	0					
Railing	RMET	Steel Bridge Barrier	Σ	E	70	70	0	0	0					

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Appendix 4

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				Level 2 Structure	Structure Name		Bridge E			
ridge Jesion		PR	5		Inspected by		Mitchell Kramer	er		
-	1	3	0	Condition Report	Date of Inspection		7/06/2018			
	Req	uire	Required Maintenance	nance Actions	Job No.	B1833	Page	3	of	7
	L	L					ACT A POST	Require	Required Action	_
Element Description	Quantity	noitibnoD State		Defect Description	5		votinoM	Repair	Level 3 Inspection	Other
Steel Girders	3m²	m	Loss of paint coating	t coating and corrosion in some sections should be monitored.	oe monitored.		×			
Steel Buckle Plate Decking	5m²	m	Loss of paint	Loss of paint coating and corrosion in some sections should be monitored.	oe monitored.		×	31		
										L



#### **Level 2 Structure Condition Report**

s	tructu	re Name	Bridge E			
Ti-	nspect	ed by	Mitchell Kram	ner		
	Date of	Inspection	7/06/2018			
Job N	Vo.	B1833	Page	4	of	7

#### **PHOTOS**



View of culvert from road level facing south



View from eastern side (including northern abutment)

A4-36 Bridge Design Pty Ltd

PA 07\_0155 MOD3 Report No. 625/25 Appendix 4



**PHOTOS** 

## **Level 2 Structure Condition Report**

	Structu	ire Name	Bridge E				
	Inspec	ted by	Mitchell Kram	er			
	Date o	f Inspection	7/06/2018				
Job	No.	B1833	Page	5	of	7	



Southern abutment and beam 4



Southern abutment and beams 1 and 2



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Structu	ıre Name	Bridge E			
Inspect	ted by	Mitchell Kram	ier		
Date of	f Inspection	7/06/2018			
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Beams 1 and 2, steel decking and eastern culvert



Beams 2 and 3 and steel decking

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Ardmore Park Quarry Appendix 4



**PHOTOS** 

## **Level 2 Structure Condition Report**

	Structu	ıre Name	Bridge E			
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	7/06/2018			
ob	No.	B1833	Page	7	of	7



Corrosion of southern end of beam 4

Overall Structure **Condition Rating** 

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#### Level 2 Structure Condition Report

		esi	<b>5^^</b>				Job No.		B183	3
							Page	1	of	
LOCATION DETAILS										
Structure Name		(	Culvert	F		Structure ID		8	370	
Road Name			errara			Road Class	- 4114		ocal	
Speed Limit (km/h)			80			Latitude		-34	.8015	
Suburb		- 1	Marula	n		Longitude		149	.9563	
LGA		Goulb	urn Mi	ılwaree		Crossing		Unkn	own (F	)
From			Marula	in		Catchment Na	me	- 1	n/a	
То		E	Bungon	ia		Catchment Are	ea (km²)		n/a	
Location Description	Chain	age 837	70							
STRUCTURE DETAIL	.5									
Culvert Type		bi	ox culv	ert	Skew			0		
Construction Material		- (	oncret	te	Numb	er of cells		1		
Construction Date					No. ui	nits per cell	16	orig +1	new	
Waterway area (m2)			3.8553	3	Unit le	ength (m)		1.23		
Cell height/diameter (r	m)		1.81		Overa	ll length (m)		20.91		
Cell width (m)			2.13		Clear	spacing (m)		- 1		
Height over culvert (m	)	1	1		No. tr	affic lanes		2		
Wall thickness (mm)			135		Road	width (m)		9		
Roof thickness (mm)			150				-			
INSPECTION DETAIL	S							-		
Inspected by	7	Mitchell	Krame	er	Last L	evel 2 Inspection	1	unk	nown	
Date of Inspection		7/06/	2018			evel 2 Inspection		ď	1/a	
Time of Inspection			m			ure plans availa			no	
Weather			ear		7- 10.	300 W.O.	570.1			
Tidal Conditions					Acces	s equipment rec	juired?	0	one	
GENERAL COMMEN	ITS									
Spalled concrete and co spalling in walls is likely the units suggests they	due to	skewe	d braki	ng force	s pushi	ng the units tog	ether. No sign	of flex	ural cra	cking
OVERALL STRUCTU	RE CO	NDITIO	N RA	TING						
	Good		Poor	Very	Close					

Ardmore Park Quarry Appendix 4

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			Level	25	1	el 2 Structure	٥			Structure Name	Culvert F	Ĭ
	OPP	PCIOT	di di	Ņ.			R/S			Inspected by	Mitchell Kramer	
	2	- Suc	Condition Report	2	2	ebo	ť			Date of Inspection	7/06/2018	
S	mpon	Component Inventory and Condition Assessment	ondition !	Sse	ssm	ent				Job No. B1833	Page 2 of	f 7
	RMS		ţuəw		Å	Quan	rtity ir Rat	Quantity in Condition Rating	lition	Comments		
Element Type	Code	Description	Environ	JinU	titneuQ	H	2	m	4	<ul> <li>type of defect</li> <li>location of defect</li> <li>size and severity</li> </ul>		
Concrete	CCUP	Precast Box Culvert	Σ	m 2	130	15	100	10	n	<ul> <li>unit 1 taken as easternmost</li> <li>unit 2 south 1.3mm Vert crack next to unit 3 and spall</li> <li>us north exposed corroded reo at base - 6N16 vrtical, N16 horiz</li> <li>us north exposed vert reo, usn horiz reo, u11n-u13n spalled corner</li> <li>u14 spall mid top, u13 exposed reo mid, u11 spall corroded reo mid at u12 END 20 cover, 2N16 at 50 spacing, u10s spall end, u7s spall 2mm VC end, u4s 1mm vc end</li> <li>no cracking in roof of culverts</li> <li>cracking in walls likely due to braking forces on skew</li> </ul>	next to unit 3 and spall o at base - 6N16 vrtical, N16 h n horiz reo, u11n-u13n spallec d reo mid, u11 spall corroded pacing, u10s spall end, u7s sporaking forces on skew	noriz d corner reo mid at all 2mm VC
Miscellaneous	MAPP	Approaches	Σ	e	2	2	0	0	0			
Railing	RMET	Steel Bridge Barrier	Σ	8	100	100	0	0	0			
									1	11		

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		IIX 2	7			Other	U				I			rt No.	
			of		Required Action	Level 3 Inspection									
	ır		3		Rednire	Repair	×					1			
Culvert F	Mitchell Kramer	7/06/2018	Page			Monitor		×							
Structure Name	Inspected by	Date of Inspection	Job No. B1833			tion	uld be patched to prevent further								
Level 2 Structure		Condition Report	Required Maintenance Actions	Supplied Actions		Defect Description	Exposed and corroded reinforcement in walls and roof should be patched to prevent further deterioration	Vertical cracking and spalls in walls to be monitored.							
l	0	O	ie Mai			State									
	ď	5	mire	-	H	noitibno	4	3ء							ļ
		1	Ro	1		Quantity	5m²	10m <sup>2</sup>		Ш,					L
	ridge Jesion					Element Description	Precast Box Culvert	Precast Box Culvert							

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Ardmore Park Quarry Appendix 4



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Structu	ıre Name	Culvert F			
Inspec	ted by	Mitchell Kram	ier		
Date o	f Inspection	7/06/2018			
No.	B1833	Page	4	of	7



View of culvert from road level facing south



View from east (original side)



**PHOTOS** 

#### **Level 2 Structure Condition Report**

5	Structu	re Name	Culvert F			
Ī	nspect	ed by	Mitchell Kram	ier		
Ī	Date of	Inspection	7/06/2018			
ob N	Vo.	B1833	Page	5	of	7



Inside culvert facing west



View from west (new side)

A4-44 Bridge Design Pty Ltd

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Tidge Design

**PHOTOS** 

## **Level 2 Structure Condition Report**

- [	Structu	ire Name	Culvert F			
- 1	Inspect	ed by	Mitchell Kram	ner		
- 1	Date of	Inspection	7/06/2018		4 1 2	
oh	No	B1833	Page	6	of	7

Cracking and spalling on sides of units



Exposed reinforcement (unit 3 north side)



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struct	ure Name	Culvert F			
Inspec	ted by	Mitchell Kram	ner		
Date o	f Inspection	7/06/2018			
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Exposed reinforcement (units 7 and 8 north side)



Spall and corroded reinforcement in top of unit 11

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> **Overall Structure Condition Rating**

#### Level 2 Structure Condition Report

	ge L		9				Job No.	5 -	B1833	
							Page	1	of	7
LOCATION DI	TAILS									
Structure Name	a		Bridge	G		Structure ID		9	720	
Road Name			Jerrara	Rd		Road Class		lo	ocal	
Speed Limit (kn	n/h)		80			Latitude		-34	.8127	
Suburb			Bungon	iia		Longitude		149	.9514	
LGA		Goult		ulwaree		Crossing		Jerrar	a Ck (G)	
From			Marula	n		Catchment Na	me	. 1	n/a	
То			Bungon	iia		Catchment Are	ea (km²)		n/a	
Location Descri	ption Chai	inage 97	20	7						
STRUCTURE I	DETAILS						_			
Overall length (	m)		21.2		Skew	angle		0		
Overall width (	m)		8.3		$\overline{}$	ure Type		Bridge		
Clear width (m)			8		Const	ruction Date		1960		
Height above g	round (m)		4.5		Const	ruction Type		Beam bri	dge	
No. of traffic la	nes		2		Const	ruction	Co	ncrete str	ucture.	
Current load lin	nit (T)		none		Mater	rials	Ne	w steel hea	dstocks	
Span	No. of gir	ders	Le	ngth		Span	No. of	girders	Len	gth
1 old	11		1	0.3						-
1 new	2		1	.0.3						
2 old	11		1	.0.3						
2 new	2		1	0.3		[X 1]				
INSPECTION	DETAILS		1						ь.	
Inspected by	JUANUS	Mitche	ll Krame	or .	Last L	evel 2 Inspection		unk	nown	
Date of Inspect	ion		/2018			evel 2 Inspectio			n/a	
Time of Inspect			0pm			ure plans availal			no	
Weather	3p. 99		lear		1000	77 77 75	2 20			
Tidal Condition	s		n/a		Acces	s equipment req	uired?	n	one	
GENERAL CO					1					
	S-BA-BS SHORE	naame u	upro ad	ded to t	ha eact	ern side of the b	ridge in 201	7 supports	ad by eta	al
						oproach surface				
	and the second second second					at the bridge. St			3 around	
Toomin nigher	man the bridg	se ievei	causing	a sudde	en urop	at the bridge. St	ructure is s	ouna.		
OVERALI STR	UCTURE CO	ITIONC	ON RA	TING						
O VEHICLE STI	Poop				Close					

Job No.

Inspected by Date of Inspection

Mitchell Kramer 7/06/2018 Page

Bridge G

Structure Name

**RESPONSE TO SUBMISSIONS** 

Ardmore Park Quarry Appendix 4

PA 07\_0155 MOD3 Report No. 625/25

# Level 2 Structure **Condition Report**

Flement Type   Code   Code	3	mpon	Component Inventory and Condit	ition Assessment	Isse	SSm	ent				Job No. B1833 Page 2 of 7
The Code   Description   Secription   Secription   Secription   Secription   Secription   Secription   Secription   Secription   Marcol   Secription   Secription		RMS	9	tuem	11 _	٨	Quar	Itity ir	Conc	lition	Comments
make         Approaches         M         ea         2         1         1         0         0           RMF         Steel Bridge Barrier         M         m         80         80         0         0         0           te         CDSL         Deck Concrete - original         M         m2         150         0         0         0           te         CDRG         Prestressed Girders - original         M         m2         132         132         0         0         0           te         CPRG         Prestressed Girders - new         M         m2         4         100         0         0         0           te         CPRG         Prestressed Girders - new         M         m2         x         x         x         x         x           te         CPRS         Pler Headstocks - original         M         m2         x         x         x         x           te         CPIR         Pier Headstocks - new         M         m2         x         x         x         x         x           te         CPIR         Pier Headstocks - original         M         m2         x         x         x         x         x	Element Type	Code		Environ	tinU	titnsuQ	H	2	m	4	- type of defect - location of defect - size and severity
RMET   Steel Bridge Barrier   M m m   80 80 0 0 0 0 0	liscellaneous	MAPP		Σ	ea	7	H	A	0	0	raised asphalt north right side 100mm
ete         CDSL         Deck Concrete - original         M         m2         150         0         150         0         0           ete         CDSL         Deck Concrete - new         M         m2         35         35         0         0         0           ete         CPRG         Prestressed Girders - original         M         m2         132         132         0         0         0           ete         CPRG         Prestressed Girders - original         M         m2         x	ailing	RMET		Σ	E	80	80	0	0	0	thrie beam new left, w beam old right
ete         CDSL         Deck Concrete - new         M         m2         35         35         0         0         0           ete         CPRG         Prestressed Girders - new         M         m2         132         132         132         0         0         0           ete         CPRG         Prestressed Girders - new         M         m2         x	oncrete	CDSL		Σ	т2	150		150	0	0	wear on top but no cracking
ete         CPRG         Prestressed Girders - original         M         m2         132         132         0         0         0           ete         CPRG         Prestressed Girders - new         M         m2         4         100         0         0         0           ete         CPHS         Pier Headstocks - original         M         m2         x         x         x         x         x           ste         CPHS         Pier Headstocks - new         M         m2         20         100         0         0           ete         CPIR         Pier Columns - original         M         m2         17         17         0         0         0	oncrete	CDSL		Σ	m2	35	35	0	0	0	No issues
ete         CPRG         Prestressed Girders - new         M         m2         4         100         0         0           ete         CABW         Abutment Headstocks - original         M         m2         x <th< td=""><td>oncrete</td><td>CPRG</td><td></td><td>Σ</td><td>m2</td><td>132</td><td></td><td>0</td><td>0</td><td>0</td><td>11 beams per span, 600 wide spaced together, some chips but no cracking or staining, 55 deep flange</td></th<>	oncrete	CPRG		Σ	m2	132		0	0	0	11 beams per span, 600 wide spaced together, some chips but no cracking or staining, 55 deep flange
ete         CABW         Abutment Headstocks - original         M         m2         x	oncrete	CPRG		Σ	m2	4	100	0	0	0	No issues
ete         CPHS         Pier Headstock - original         M         m2         5         x <t< td=""><td>oncrete</td><td>CABW</td><td></td><td>Σ</td><td>m2</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>obscured by steel headstocks</td></t<>	oncrete	CABW		Σ	m2	×	×	×	×	×	obscured by steel headstocks
SPGI         Steel Headstocks - new         M         m2         20         100         0         0           ete         CPIR         Pier Columns - original         M         m2         17         17         0         0	oncrete	CPHS		Σ	т2	Ŋ	יעו	×	×	×	615 wide , good condition under, sides obscured by steel headstocks
CPIR Pier Columns - original M m2 17 17 0 0 0	lee!	SPGI		Σ	m2	20	100	0	0	0	No issues
	oncrete	CPIR	Pier Columns - original	Σ	т2	17	17	О	0	0	615x615. No issues
								11			
					Щ						

Ardmore Park Quarry Appendix 4

Bridge G	Mitchell Kramer	7/06/2018	Page 3 of 7	Required Action	Monitor Repair Level 3 Inspection							
Structure Name Bridge			Job No. B1833		g							
Level 2 Structure	Condition Donort	Condition Report	Required Maintenance Actions		Defect Description	No required maintenance actions						
	ridge Jesign		Required Maint		Quantity Condition State	No requi						
	ridge				Element Description							



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	re Name	Bridge G			
- 1	Inspect	ed by	Mitchell Kram	ner		
	Date of	Inspection	7/06/2018			
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View of bridge from south



View of bridge from west

A4-50 Bridge Design Pty Ltd

Report No. 625/25

Ardmore Park Quarry Appendix 4



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structi	ure Name	Bridge G			
Ī	Inspec	ted by	Mitchell Kram	ner		
1	Date o	f Inspection	7/06/2018			
Job I	No.	B1833	Page	5	of	7



**Abutment A and girders** 



Pier from south west



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struct	ure Name	Bridge G			
Inspe	cted by	Mitchell Kram	ner		
Date o	of Inspection	7/06/2018			
ob No.	B1833	Page	6	of	7



View of pier from east



**Abutment B and girders** 

A4-52 Bridge Design Pty Ltd



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	ire Name	Bridge G			
	Inspect	ed by	Mitchell Kram	ner		
	Date of	Inspection	7/06/2018			
Job	No.	B1833	Page	7	of	7



Bridge deck from north east



Northern approach

Ardmore Park Quarry Appendix 4 PA 07\_0155 MOD3 Report No. 625/25



## Level 2 Structure Condition Report

ridge	_	-	<b>5</b>				Job No	).		B183	33	
							Page	- 1	1	of		7
LOCATION DETAILS									-			
Structure Name		(	Culvert	н		Structure ID			1191	6.038		
Road Name			errara l			Road Class				cal		_
Speed Limit (km/h)			80			Latitude			-34.	8312		
Suburb			Bungon	ia		Longitude			149	9528		=
LGA		Goulb	urn Mı	ilwaree		Crossing		Spr	ingpo	nds C	k (H)	
From			Marula	n		Catchment Na	me		n	/a		
То			Bungon	ia		Catchment Are	ea (km²)			n/a		
Location Description	Chair	nage 11	916.03	8								
STRUCTURE DETAIL	.s											
Culvert Type			box		Skew				0			
<b>Construction Material</b>			concret	e	Numb	er of cells			5			
Construction Date		20	0/02/19	980		nits per cell			4			
Waterway area (m2)			12.9			ength (m)			2.5			
Cell height/diameter (ı	m)		1.21			ll length (m)			10			
Cell width (m)			2.13	1		spacing (m)			0			
Height over culvert (m	)	0.	8m / 1.	4m	No. tr	affic lanes			2			
Wall thickness (mm)			115		Road	width (m)						
Roof thickness (mm)			170		11							
INSPECTION DETAIL	S											
Inspected by	- 1	Mitchel	Krame	er	Last L	evel 2 Inspection						_
Date of Inspection		7/06	/2018		Next	evel 2 Inspectio	n		n	/a		
Time of Inspection		1r	om		Struct	ure plans availa	e plans available? no					
Weather		cle	ear							55		
Tidal Conditions			-		Acces	s equipment red	uirear		no	ne		
GENERAL COMMEN	ITS											
Spalled concrete and e but not sufficient to co					e walls	. Flexural crackir	ng present	in the	roof c	f mos	t cu	ve
OVERALL STRUCTU	-	NDITIO	ON RA	TING								
	Good	Fair	Poor	Very	Close		Com	ments	4.1			
Overall Structure Condition Rating	x											

A4-54 Bridge Design Pty Ltd

Ardmore Park Quarry Appendix 4

PA 07\_0155 MOD3 Report No. 625/25

Compone Compone Code CCUP CCUP	Level 2 structure	7	ギ	달	ē			Structure Name	Culvert H
		:	2	è	1			Inspected by	Mitchell Kramer
,	Condition Report	3		da	110			Date of Inspection	7/06/2018
te CCUP Precast Box	nd Conditio	Ass	essn	n Assessment				Job No. 81833	Page 2 of 7
te CCUP Precast Box			٨		ntity i	Quantity in Condition Rating	ditio	Comments	
te CCUP	ofion Environ	tinU	titnsuQ	H	7	æ	4	<ul> <li>type of defect</li> <li>location of defect</li> <li>size and severity</li> </ul>	
aneous MAPP	Σ	E E	360	340	10	10	0	- Cell 1 is north, unit 1 is east - 1980 construction - 900 high headwall left, 300 right, fill is 500 above headwall - 0.1mm vertical cracks mid length of units Cell 2, 3,4,5 all ur and exposed corroded reo in most - cell 3 unit 1 south side has 0.2mm vertical crack mid length horiz crack at 150mm from top - 0.2mm cracks in roof, cell 3 unit 2,3,4. From south wall at 500,800,1000	- Cell 1 is north, unit 1 is east  - 1980 construction  - 900 high headwall left, 300 right, fill is 500 above headwall  - 0.1mm vertical cracks mid length of units Cell 2, 3,4,5 all units, spalling and exposed corroded reo in most  - cell 3 unit 1 south side has 0.2mm vertical crack mid length to 0.2mm horiz crack at 150mm from top  - 0.2mm cracks in roof, cell 3 unit 2,3,4. From south wall at
-	Σ	ea	2	7	0	0	0		
Kalling KMEI Steel Bridge Barrier	Σ	Ε	100	100	0	0	0		
				Į.					
			14						
					1				The state of the s

**RESPONSE TO SUBMISSIONS** 

Ardmore Park Quarry Appendix 4 PA 07\_0155 MOD3 Report No. 625/25

		IIX 4	7	Ī	Other						100	T NO.	
			of	Action	Level 3								
	- 2		3	Required Action	Repair	×							
Culvert H	Mitchell Kramer	7/06/2018	Page	_	Monitor	×							
3	Mit	1/0	4				П						
Je		tion	B1833										
Structure Name	Inspected by	Date of Inspection	Job No.		9	nould be patched.							
Level 2 Structure		Condition Report	Required Maintenance Actions		Defect Description	Spalled concrete in some walls and exposed reinforcement should be patched. Monitor cracking.							
	6	b	Mainte			Spalled concrete i Monitor cracking.							
	8	3	ired		Condition State	m		H					
		1	Regi	1	Quantity	10m²							
	ridge Jesion				Element Description	Concrete Box Culvert							

Appendix 4

PA 07\_0155 MOD3 Report No. 625/25



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	re Name	Culvert H			
- [	Inspect	ed by	Mitchell Kram	ner		
- 1	Date of	Inspection	7/06/2018			
Job	No.	B1833	Page	4	of	7



View of culvert at road level facing north



View from south western corner



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	ire Name	Culvert H			
	Inspect	ted by	Mitchell Kram	ner		
	Date of	Inspection	7/06/2018			
Job	No.	B1833	Page	5	of	7



View from south eastern corner



**Construction date** 

A4-58 Bridge Design Pty Ltd

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**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struc	ture Name	Culvert H			
Inspe	cted by	Mitchell Kran	ner		
Date	of Inspection	7/06/2018		4 - 4	
Job No.	B1833	Page	6	of	7



**Exposed reinforcement in culvert wall** 



0.2mm horizontal cracking at top of wall and vertical cracking in middle of unit



**PHOTOS** 

## **Level 2 Structure Condition Report**

	Structu	ire Name	Culvert H				
	Inspect	ted by	Mitchell Kram	ner			İ
	Date of	Inspection	7/06/2018				i
Job	No.	B1833	Page	7	of	7	ı



**Exposed reinforcement in culvert wall** 



0.2mm transverse cracking in roof

A4-60 Bridge Design Pty Ltd

**MULTIQUIP QUARRIES** Ardmore Park Quarry Appendix 4

PA 07\_0155 MOD3 Report No. 625/25

ridge	_	-554	<b>0</b>				Job N	0.		B183	3	
							Page	2	1	of	1	8
LOCATION DETAILS												
Structure Name			Culvert	1		Structure ID		M	ountaii	n Ash	474	
Road Name		Mou	ntain A	sh Rd		Road Class			lo	cal		_
Speed Limit (km/h)			80			Latitude			-34.	3522		Ξ
Suburb			Bungon	ia		Longitude			149.	9415		Ξ
LGA		Goulb	urn Mu	lwaree		Crossing		- 4	Jnknov	vn Ck	(1)	
From			Bungon	ia		Catchment Na	me		n	/a		
To		(	Soulbu	n		Catchment Ar	ea (km²)			n/a		
Location Description	Chair	nage 47	4. Just	west of	junctio	n with Jerrara R	F. 12					
STRUCTURE DETAIL	LS											
Culvert Type			pipe		Skew	السمائيا			0			
Construction Material		14	concret	e	Numb	er of cells	1		2			
Construction Date			1953			nits per cell	ji =		old 3 n			
Waterway area (m2)	L  1		1.8			ength (m)		1.2m	old 2.4	5 new	Đ.	
Cell height/diameter (	m)	1.5	old 1.4	new	Overa	ll length (m)			22.95	_		
Cell width (m)			n/a		Clear	spacing (m)			700			
Height over culvert (m	1)		2.0-3.0	)	No. tr	affic lanes	1		2			
Vall thickness (mm)			70		Road	width (m)						
oof thickness (mm)			-									
INSPECTION DETAI	LS											
Inspected by	1	Mitchell	Krame	r	Last L	evel 2 Inspectio	n		unkr	own		
Date of Inspection		8/06,	/2018		Next I	evel 2 Inspection	on		n,	/a		
Time of Inspection		12	pm		Struct	ure plans availa	ble?		n	0		
Weather		ove	rcast		Access equipment required?			none				
Tidal Conditions					Access equipment required?				none			
GENERAL COMME	VTS											
Original pipes are in go southern side. There is repaired.	a spall	with co	rroded	reinfor								ie
OVERALL STRUCTU		NDITIO	N RA	TING		_						
	Good	Fair	Poor	Very	Close		Cor	nment	s			
Overall Structure Condition Rating	х											

Ardmore Park Quarry Appendix 4 PA 07\_0155 MOD3 Report No. 625/25

DIM.	go	ridge esion	Level 2 Structure	2 3	1	ct	ē .			Structure Name Inspected by	Culvert I Mitchell Kramer	Tit'
	20	- S-C	Cond	Ę	n R	ndition Report	ť			Date of Inspection	8/06/2018	
3	mpon	Component Inventory and Conditi	ondition	Asse	SSIT	ion Assessment				Job No. B1833	Page 2 of	00
	RMS		Tuəmi		, A	Quar	Quantity in Condition Rating	Cond	ition	Comments		
Element Type	Code	Description	Environ	tinU	titneuQ	н	2	m.	4	- type of defect - location of defect - size and severity		
Concrete	CCUP	CCUP   Precast Pipe Culvert (original)	(le	E 2	96	06	4	0	0	- Cell 1 is east, unit 1 is south - Bases of original culverts silted with stagnant w - 0.1mm cracks in top of original culverts - Spall and exposed reo cell 1, north eastem side	<ul> <li>Cell 1 is east, unit 1 is south</li> <li>Bases of original culverts silted with stagnant water through most</li> <li>O.1mm cracks in top of original culverts</li> <li>Spall and exposed reo cell 1, north eastern side</li> </ul>	
Concrete	CCUP	Precast Pipe Culvert (new)	Σ	m2	100	66	0	H	0	- Spall and exposed reo cell 1 unit 16, north eastern side	nit 16, north eastern side	
Miscellaneous	MAPP	Approaches	Σ	ea	7	2	0	0	0			
Railing	RMET	Steel Bridge Barrier	Σ	ε	9	09	0	0	0			
				= 1	111							
								Ш				
							JII.					
				Ε1				1				
							-					

Ardmore Park Quarry
Appendix 4

ï			∞		Other							100	T	
			of	Action	Level 3 Inspection						1			
	ı.		3	Required Action	Repair	×					1			
ī	Mitchell Kramer	8/06/2018	Page		votinoM									
Culvert	Mitch	/90/8						П				П		
		uc	B1833											
e Name	d by	nspection				patched.								
Structure Name	Inspected by	Date of I	Job No.			eyonid be								
					ription	ding and								
re		בה			Defect Description	ch is corro								
Truct	The state of the s	п кер			ă	Spall in cell 1 has exposed reinforcement which is corroding and should be patched.								
7 Jel 2		סוזוםר	ctions			ed reinfor								
é		5	Required Maintenance Actions			has expos								
1	_	1	inten			l in cell 1								
	013	0	ed M	-	ətstč	3 Spal								H
	٩	1	eauir	-	Quantity	1m <sup>2</sup>								H
	0		~	-		п	1				-			
	ridge Jesign	0			Element Description	Precast Pipe Culvert								
	-				75	recast								



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struct	ure Name	Culvert I			
Inspec	ted by	Mitchell Kran	ner		
Date o	f Inspection	8/06/2018			
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View at road level facing north



Southern (original) side

A4-64 Bridge Design Pty Ltd

Report No. 625/25

Ardmore Park Quarry Appendix 4



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Struct	ure Name	Culvert I			
Γ	Inspec	ted by	Mitchell Kram	ner		
Ī	Date o	f Inspection	8/06/2018			
ob	No. B1833		Page	5	of	8



Inside culvert looking north



Northern (new) side



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struct	ure Name	Culvert I			
Inspe	ted by	Mitchell Kram	ner		
Date o	of Inspection	8/06/2018			
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Cell 1 looking south (spall on left)



Spall in new section of cell 1

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**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	ıre Name	Culvert I			
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	8/06/2018			
ob	No. B1833		Page	7	of	8



**Construction date** 



Pipe class noted as S and Y



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Struct	ture Name	Culvert I			
Inspe	cted by	Mitchell Kram	ner		
Date	of Inspection	8/06/2018			
b No.	B1833	Page	8	of	8



**Original pipes** 



**Cell 2 looking south** 

A4-68 Bridge Design Pty Ltd

## Tridge Design

#### Level 2 Structure Condition Report

ridge		-534	0				Job N	0.	B1833		
							Page		1 of 9		
LOCATION DETAILS											
Structure Name			Culvert	J		Structure ID			Oallen Ford		
Road Name		Oal	len For	d Rd		Road Class			local		
ipeed Limit (km/h)			80			Latitude			-34.8745		
Suburb		E	ungon	ia		Longitude			149.9381		
.GA		Goulb	urn Mu	lwaree		Crossing		Wo	oodwards Creek (J)		
rom		E	Bungon	ia		Catchment Na	me		n/a		
0		W	indella	ma		Catchment Ar	ea (km²)		n/a		
ocation Description	2km so	uth of B	lungoni	ia							
STRUCTURE DETAIL	LS										
Culvert Type			pipe	-	Skew				0		
onstruction Material	+ =	- 0	oncret	е	Numb	er of cells			1		
Construction Date			1955			nits per cell	i/		12		
Naterway area (m2)	I.A. 1		1.8			ength (m)			1.23		
Cell height/diameter (	m)		1.53		-	ll length (m)			22.95		
Cell width (m)			n/a			spacing (m)			0.7		
leight over culvert (m	1)		2.50			affic lanes			2		
/all thickness (mm)			75	-	Road	width (m)			8.25		
oof thickness (mm)			-								
NSPECTION DETAI	LS					The same					
nspected by	- 1	Mitchell Kramer			Last L	evel 2 Inspection	n		unknown		
Date of Inspection		8/06/2018			Next I	evel 2 Inspection	n		n/a		
'ime of Inspection		2:30pm			Struct	ble?	ole? no				
Weather		over	cast		Access equipment required?				none		
idal Conditions					Acces	Hone					
GENERAL COMME	NTS										
Cracking is present in i					ected	for 60+ year old	structure.	Culve	ert is structurally		
OVERALL STRUCTU		NDITIC	N RA	TING	1	-					
	Good	Fair	Poor	Very	Close		Con	nmen	ts		
Overall Structure Condition Rating		x									

#### **RESPONSE TO SUBMISSIONS**

Ardmore Park Quarry Appendix 4

PA 07\_0155 MOD3 Report No. 625/25

			Level 2 Structure	25	1	당	a			Structure Name	CulvertJ			
	90	Trid ore	4		•					Inspected by	Mitchell Kramer	_		
	0	1	Condition Report	8	Y	ebo	۲			Date of Inspection	8/06/2018			
8	mpon	Component Inventory and Cor	Condition Assessment	Asse	ssm	ent				Job No. B1833	Page	2	ō.	6
			1u			Quan	tity in	Quantity in Condition	ition					
j	RMS	100000000000000000000000000000000000000	əw		٨		Rating	ing		Comments				
Element Type		Description	noviron	tinU	titnsuO	н	2	m	4	<ul> <li>type of defect</li> <li>location of defect</li> <li>size and severity</li> </ul>				
Concrete	con	Precast Pipe Culvert	Σ	<b>2</b>	110	0	105	Ŋ	0	- unit 1 easternmost.  - unit 1 horizontal crack in roof 0.3mm middle to 1.5mm contiunuing east and west.  - 0.1mm cracks in top of Units 2,4,10 and 12.  - 0.2mm cracks in top of units 3, 5 and 11.  - 0.4mm crack in top of units 6.  - 0.3mm crack in top of units 7 and 9.  - 0.5mm crack on northern side of units 6 to 8, 300mm long.  - 0.5mm crack in top of unit 8 along entire length.  - 1mm crack base of unit 11 westward running for 300mm.	0.3mm middle to 0.3mm middle to 2,4,10 and 12 i. 5 and 11 and 9 i. of units 6 to 8, 30 long entire length stward running fo	1.5mm 00mm 1 1	ong	grind
Concrete	CCNL	Culvert Headwall and Slab	Σ	m2	40	38	2	0	0	- New headwall and slab constructed on western side - 0.3mm vertical crack in west headwall	ucted on western neadwall	side		
Miscellaneous	MAPP	Approaches	Σ	ea	7	7	0	٥	0					
Railing	RMET	Steel Bridge Barrier	Σ	Ε	100	100	0	o	0					
			1											

Ardmore Park Quarry
Appendix 4

î			6	1	Other	T)	Ĩ				F ,						
			of	Required Action	Level 3 Inspection					1							
	it		3	Requirec	Repair					1							
η.	Mitchell Kramer	2018	Page		Nonitor	×											
Culvert J	Mitch	8/06/2018					П				M						
		_	B1833														
Name	by	spectio	H														
Structure Name	Inspected by	Date of Inspection	Job No.														
S	드	۵	3		tion												
		20		Ī		Defect Description	Ы										
cture		epor			Defec	Monitor											
Level 2 Structure		TION	SU	g.		Cracking in top and sides of most units. Monitor											
Level	-	Cond	e Actions			d sides of											
			enanc			in top and											
l	E	1	Maint	Required Maint	Required Maint	Required Maintenance	required infaint		Cracking								
I	8	ì	ired						Condition State	m	1	H					
		١	Regu					Quantity	5m²								
	ge				. E	ert											
	ridge legion				Element Description	Precast Pipe Culvert											



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Structu	tructure Name espected by Pate of Inspection	Culvert J			
Inspect	ed by	Mitchell Kram	ner		
Date of	Inspection	8/06/2018			
b No.	B1833	Page	4	of	9



Road level looking south



Pipe inlet (western side)

A4-72 Bridge Design Pty Ltd



**PHOTOS** 

## **Level 2 Structure Condition Report**

Structu	re Name	Culvert J				
Inspect	ed by	Mitchell Kram	ner			Ī
Date of	Inspection	8/06/2018				i
Job No.	B1833	Page	5	of	9	Ī



Pipe inlet (western side)



0.3mm crack in headwall at inlet



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structure Name Inspected by Date of Inspection No. R1833	Culvert J				
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	8/06/2018			
Job	No.	B1833	Page	6	of	9



Inside pipe



Pipe outlet (eastern side)

A4-74 Bridge Design Pty Ltd

Report No. 625/25



**PHOTOS** 

#### **Level 2 Structure Condition Report**

	Structu	ıre Name	Culvert J			
	Inspec	ted by	Mitchell Kram	ner		
	Date o	f Inspection	8/06/2018			
ob	No.	B1833	Page	7	of	9



Cracking in side of unit 1 northern side



0.5mm cracking in pipe



**PHOTOS** 

#### **Level 2 Structure Condition Report**

Stru	cture Name	Culvert J			
Insp	ected by	Mitchell Kran	ner		
Date	of Inspection	8/06/2018			
Job No.	B1833	Page	8	of	9



Cracking in top of pipe



**Construction date** 

A4-76 Bridge Design Pty Ltd



**PHOTOS** 

## **Level 2 Structure Condition Report**

Struc	ture Name	Culvert J			
Inspe	cted by	Mitchell Kran	ner		
Date	of Inspection	8/06/2018			
Job No.	B1833	Page	9	of	9



Pipe class 'XY'



Pipe class 'Y'

MULTIQUIP QUARRIES Ardmore Park Quarry Appendix 4 RESPONSE TO SUBMISSIONS
PA 07\_0155 MOD3

Report No. 625/25

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A4-78 Bridge Design Pty Ltd