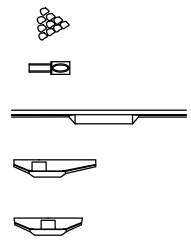


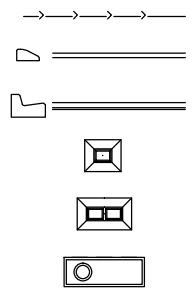
PLAN VIEW
SCALE 1:500

PROPOSED CONSTRUCTION

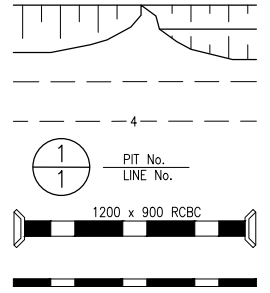
- GROUTED ROCK PITCHING
- PRECAST SLOPING HEADWALL
- KERB & CHANNEL CROSSOVER
- GULLY PIT ON GRADE
- GULLY PIT IN SAG



- OPEN CHANNEL DRAIN LINE
- KERB TYPE SM3
- KERB TYPE B1
- FIELD INLET TYPE 1 - SINGLE
- FIELD INLET TYPE 1 - DOUBLE
- ACCESS CHAMBER - CUSTOM SIZE



- EARTHWORKS BATTERS
- DESIGN CONTOURS MINOR (0.1m)
- DESIGN CONTOURS MAJOR (1.0m)
- DRAINAGE STRUCTURE NUMBER
- PROPOSED CULVERTS
- PROPOSED STORMWATER DRAINAGE



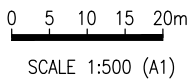
REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



SCALE 1:500 (A1)

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

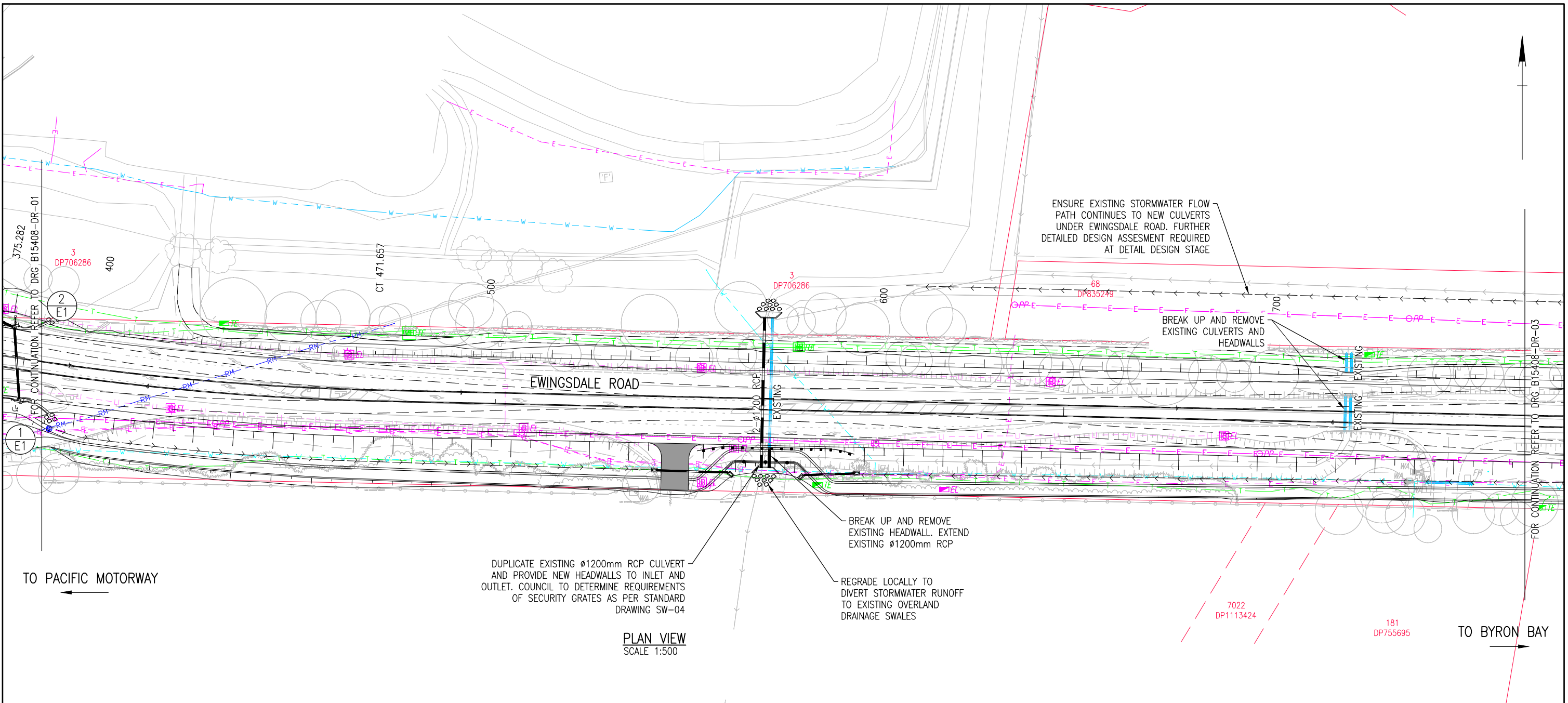
Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 1 OF 6)

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-01	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16		

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD

LOCATION: F:\Jobs\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-01\et1_A.dwg



DUPLICATE EXISTING 1200mm RCP CULVERT AND PROVIDE NEW HEADWALLS TO INLET AND OUTLET. COUNCIL TO DETERMINE REQUIREMENTS OF SECURITY GRATES AS PER STANDARD DRAWING SW-04

BREAK UP AND REMOVE EXISTING HEADWALL. EXTEND EXISTING 1200mm RCP

REGRADE LOCALLY TO DIVERT STORMWATER RUNOFF TO EXISTING OVERLAND DRAINAGE SWALES

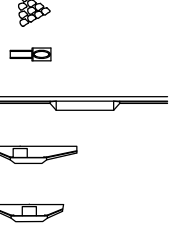
ENSURE EXISTING STORMWATER FLOW PATH CONTINUES TO NEW CULVERTS UNDER EWINGSDALE ROAD. FURTHER DETAILED DESIGN ASSESMENT REQUIRED AT DETAIL DESIGN STAGE

BREAK UP AND REMOVE EXISTING CULVERTS AND HEADWALLS

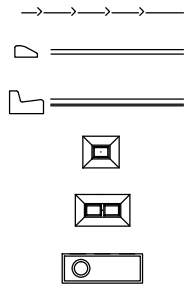
PLAN VIEW
SCALE 1:500

PROPOSED CONSTRUCTION

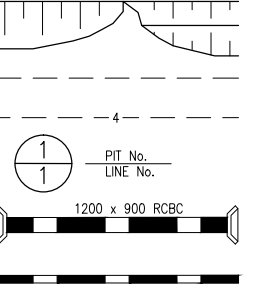
- GROUTED ROCK PITCHING
- PRECAST SLOPING HEADWALL
- KERB & CHANNEL CROSSOVER
- GULLY PIT ON GRADE
- GULLY PIT IN SAG



- OPEN CHANNEL DRAIN LINE
- KERB TYPE SM3
- KERB TYPE B1
- FIELD INLET TYPE 1 - SINGLE
- FIELD INLET TYPE 1 - DOUBLE
- ACCESS CHAMBER - CUSTOM SIZE



- EARTHWORKS BATTERS
- DESIGN CONTOURS MINOR (0.1m)
- DESIGN CONTOURS MAJOR (1.0m)
- DRAINAGE STRUCTURE NUMBER
- PROPOSED CULVERTS
- PROPOSED STORMWATER DRAINAGE



REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016

0 5 10 15 20m
SCALE 1:500 (A1)

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

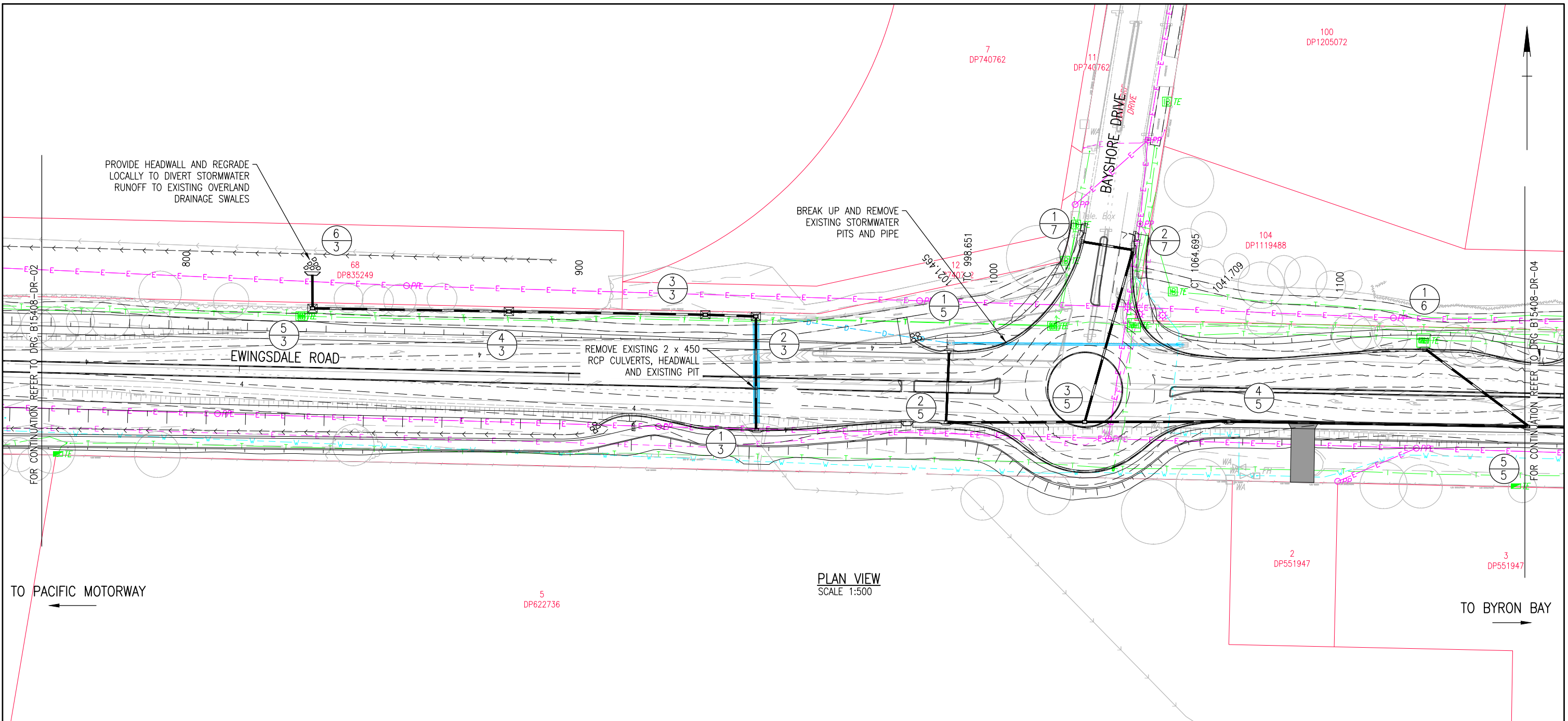
CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 2 OF 6)

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-02	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16		



PLAN VIEW
SCALE 1:500

PROPOSED CONSTRUCTION

- GRAouted ROCK PITCHING
- PRECAST SLOPING HEADWALL
- KERB & CHANNEL CROSSOVER
- GULLY PIT ON GRADE
- GULLY PIT IN SAG

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

- OPEN CHANNEL DRAIN LINE
- KERB TYPE SM3
- KERB TYPE B1
- FIELD INLET TYPE 1 - SINGLE
- FIELD INLET TYPE 1 - DOUBLE
- ACCESS CHAMBER - CUSTOM SIZE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

- EARTHWORKS BATTERS
- DESIGN CONTOURS MINOR (0.1m)
- DESIGN CONTOURS MAJOR (1.0m)
- DRAINAGE STRUCTURE NUMBER
- PROPOSED CULVERTS
- PROPOSED STORMWATER DRAINAGE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016

0 5 10 15 20m
SCALE 1:500 (A1)

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

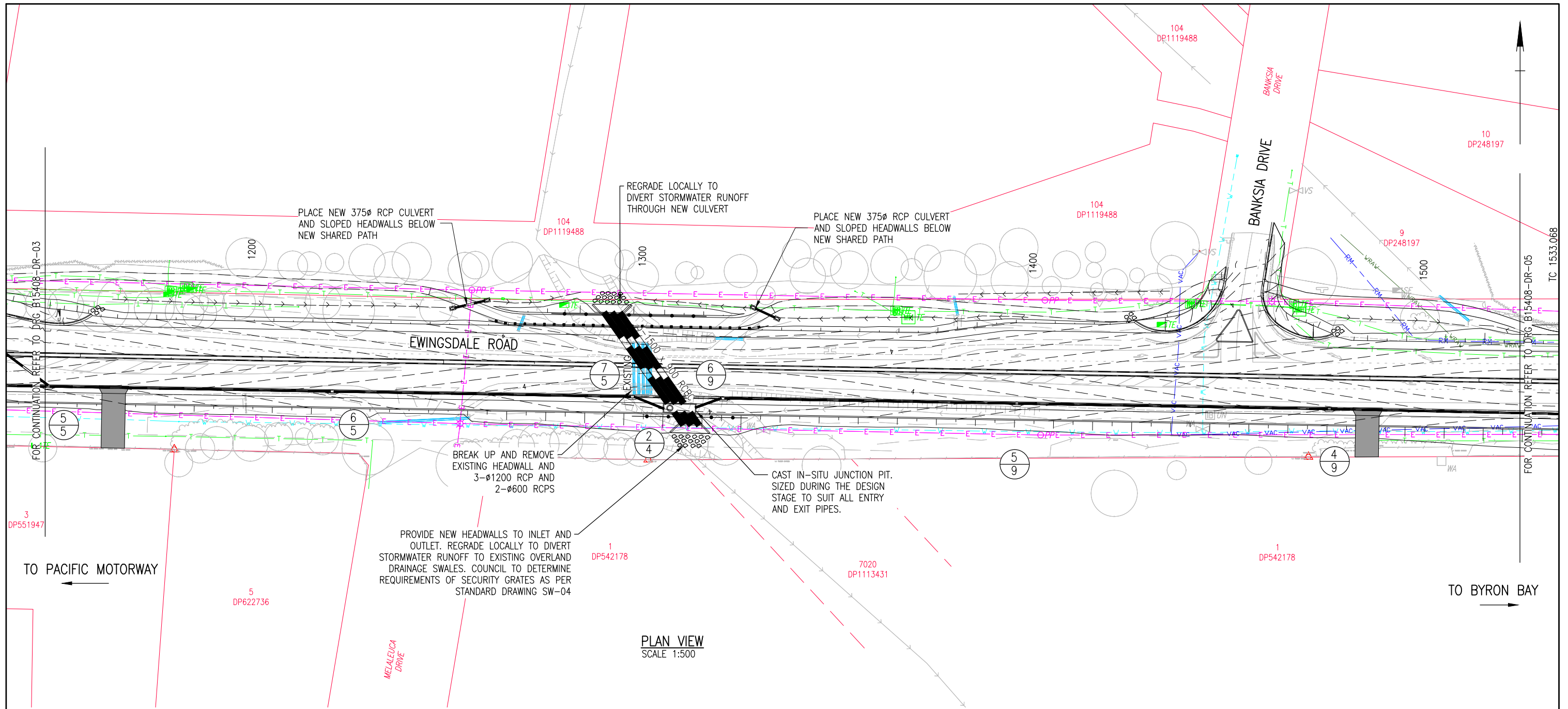
TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 3 OF 6)

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-03	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:	Scale: AS SHOWN	Date: 04/08/16

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-01to1_A.dwg



PLAN VIEW
SCALE 1:500

PROPOSED CONSTRUCTION

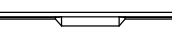
GROUTED ROCK PITCHING



PRECAST SLOPING HEADWALL



KERB & CHANNEL CROSSOVER



GULLY PIT ON GRADE

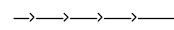


GULLY PIT IN SAG



REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

OPEN CHANNEL DRAIN LINE



KERB TYPE SM3



KERB TYPE B1



FIELD INLET TYPE 1 - SINGLE



FIELD INLET TYPE 1 - DOUBLE

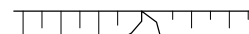


ACCESS CHAMBER - CUSTOM SIZE



REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

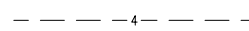
EARTHWORKS BATTERS



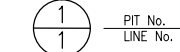
DESIGN CONTOURS MINOR (0.1m)



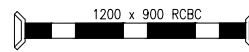
DESIGN CONTOURS MAJOR (1.0m)



DRAINAGE STRUCTURE NUMBER



PROPOSED CULVERTS



PROPOSED STORMWATER DRAINAGE



REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016

0 5 10 15 20m
SCALE 1:500 (A1)

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au



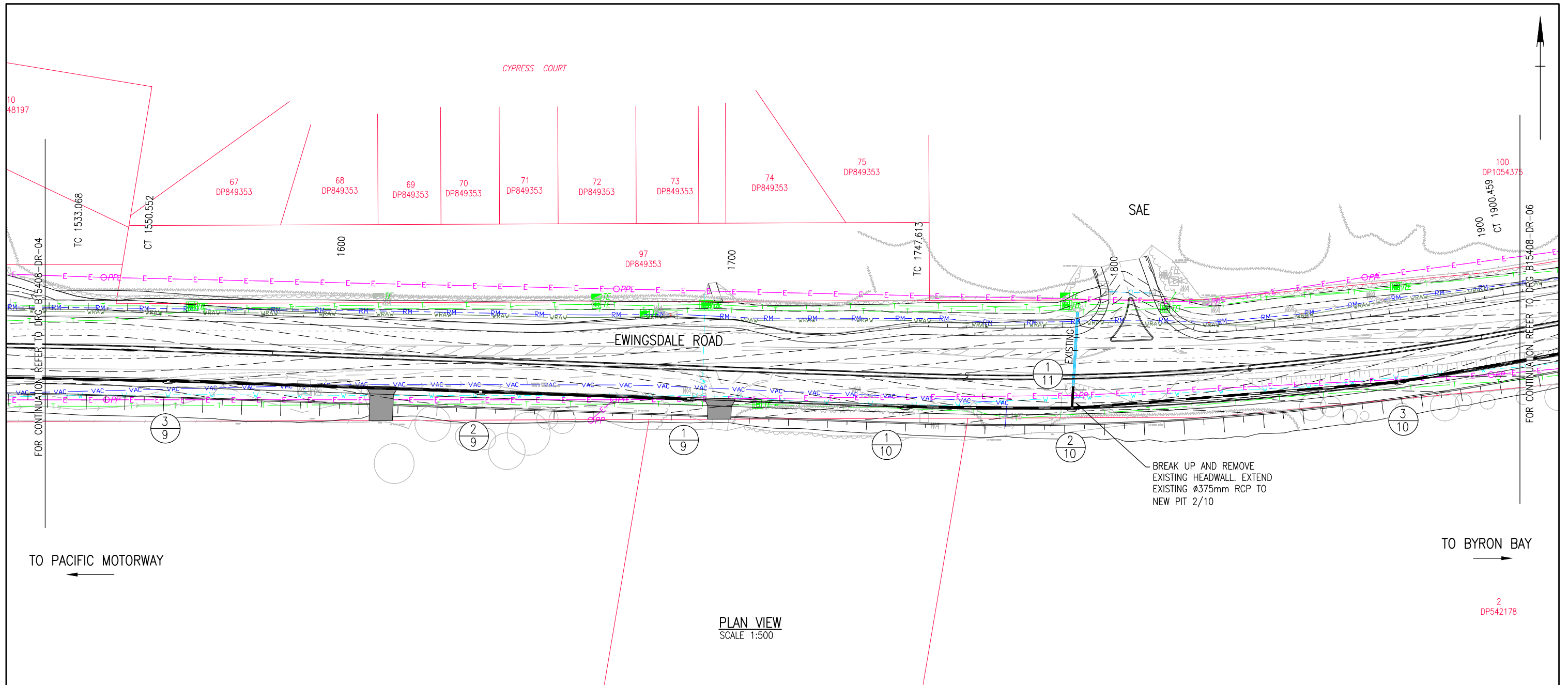
Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 4 OF 6)

Client: BYRON SHIRE COUNCIL

Draftsperson: BJA	Checked: SAW	Sheet Size: A1	Drawing No.:
Designer: BJA	Approved:	B15408-DR-04	
Scale: AS SHOWN	Date: 04/08/16	A	

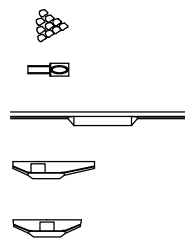
THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-04\11_A.dwg



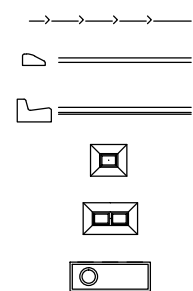
PLAN VIEW
SCALE 1:500

PROPOSED CONSTRUCTION

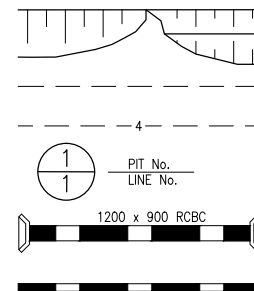
- GROUTED ROCK PITCHING
- PRECAST SLOPING HEADWALL
- KERB & CHANNEL CROSSOVER
- GULLY PIT ON GRADE
- GULLY PIT IN SAG



- OPEN CHANNEL DRAIN LINE
- KERB TYPE SM3
- KERB TYPE B1
- FIELD INLET TYPE 1 - SINGLE
- FIELD INLET TYPE 1 - DOUBLE
- ACCESS CHAMBER - CUSTOM SIZE



- EARTHWORKS BATTERS
- DESIGN CONTOURS MINOR (0.1m)
- DESIGN CONTOURS MAJOR (1.0m)
- DRAINAGE STRUCTURE NUMBER
- PROPOSED CULVERTS
- PROPOSED STORMWATER DRAINAGE



REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016

0 5 10 15 20m
SCALE 1:500 (A1)

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-01to11_A.dwg

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

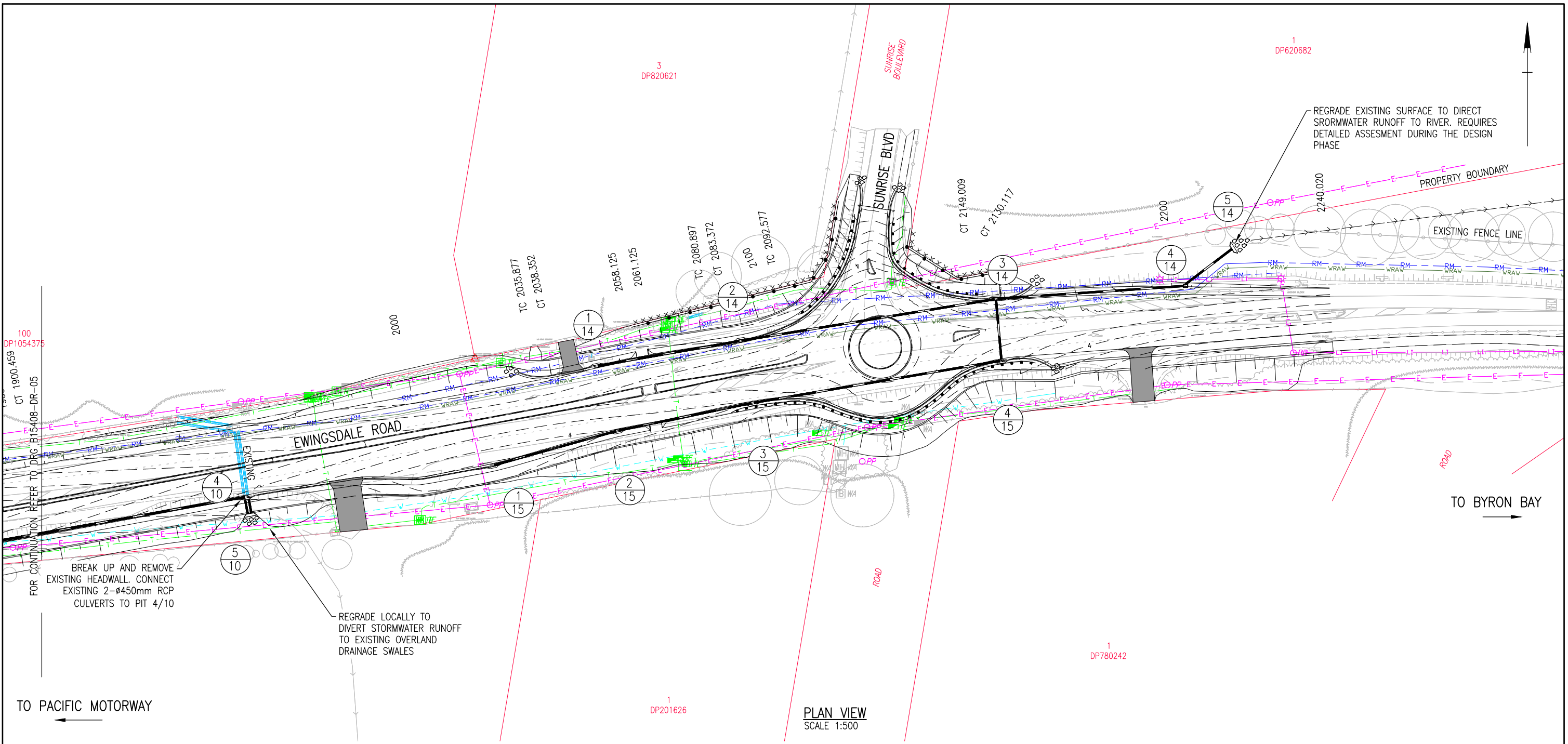
TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 5 OF 6)

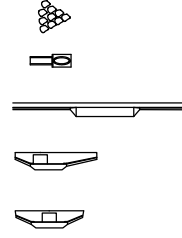
Client: BYRON SHIRE COUNCIL

Draftsperson: BJA	Checked: SAW	Sheet Size: A1	Drawing No.:
Designer: BJA	Approved:	B15408-DR-05	
Scale: AS SHOWN	Date: 04/08/16	A	

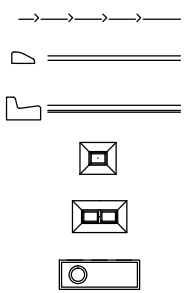


PROPOSED CONSTRUCTION

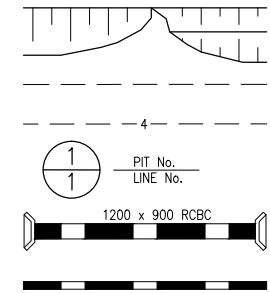
- GROUTED ROCK PITCHING
- PRECAST SLOPING HEADWALL
- KERB & CHANNEL CROSSOVER
- GULLY PIT ON GRADE
- GULLY PIT IN SAG



- OPEN CHANNEL DRAIN LINE
- KERB TYPE SM3
- KERB TYPE B1
- FIELD INLET TYPE 1 - SINGLE
- FIELD INLET TYPE 1 - DOUBLE
- ACCESS CHAMBER - CUSTOM SIZE



- EARTHWORKS BATTERS
- DESIGN CONTOURS MINOR (0.1m)
- DESIGN CONTOURS MAJOR (1.0m)
- DRAINAGE STRUCTURE NUMBER
- PROPOSED CULVERTS
- PROPOSED STORMWATER DRAINAGE



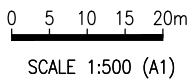
REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-01 SIDE ENTRY GULLY PIT AND ANTI PONDING PIT LIP IN LINE

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-02 MANHOLES, FIELD INLET PITS AND GRATED INLET / JUNCTION PIT DETAILS

REFER TO NORTHERN RIVERS STORMWATER STANDARD DRAWING SW-06 FOR PIPE INSTALLATION CONDITIONS

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



SCALE 1:500 (A1)

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au



Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LAYOUT PLAN
(SHEET 6 OF 6)

Client: BYRON SHIRE COUNCIL

Draftsperson: BJA	Checked: SAW	Sheet Size: A1	Drawing No.:
Designer: BJA	Approved:	B15408-DR-06	
Scale: AS SHOWN	Date: 04/08/16	A	

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-01to11_A.dwg

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016

STRUCTURE NAME	STRUCTURE DESCRIPTION
	1/1 STD BCC TYPE 'A' GULLY 2.4m Linel; Type 'S'; 130
	2/1 STD BCC TYPE 'A' GULLY 2.4m Linel; Type 'S'; 130
	3/1 HEADWALL

PIPE SIZEmm (Class)	375(2)	375(2)
PIPE GRADE %	0.91%	0.84%
PIPE SLOPE 1 in X	109.87	119.22
FULL PIPE FLOW VELOCITY (m/s)	0.45(0.28 1y)	
PART FULL FLOW VELOCITY (m/s)	1.12 (0.97 1y)	1.28 (1.12 1y)
DATUM RL -8.0		

WATER LEVEL IN STRUCTURE	2.856	2.856
HYDRAULIC GRADE LEVEL	2.842	2.838
PIPE FLOW (Cumecs)	0.027	0.049
PIPE CAPACITY AT GRADE (Cumecs)	0.167	0.160
DEPTH TO INVERT	0.972	1.097
INVERT LEVEL OF DRAIN	2.665	2.510
DESIGN SURFACE LEVEL	3.637	3.607
RUNNING CHAINAGE	0.000	17.030
SET-OUT E/N (CENTRE OF PIT)	556117.024	6832014.221

LINE

1

STRUCTURE NAME	STRUCTURE DESCRIPTION
	1/2 STD BCC TYPE 'A' GULLY 2.4m Linel; Type 'S'; 130
	2/2 STD BCC TYPE 'A' GULLY 2.4m Linel; Type 'S'; 130
	3/2 STD BCC MANHOLE 1050mm DIAMETER
	4/2 STD BCC TYPE 'A' GULLY 2.4m Linel; Type 'S'; 130
	CONNECT TO EXISTING NETWORK

PIPE SIZEmm (Class)	375(2)	375(2)	375(2)	EX 375(2)
PIPE GRADE %	0.50%	0.50%	0.50%	0.50%
PIPE SLOPE 1 in X	199.17	200.03	200.15	199.82
FULL PIPE FLOW VELOCITY (m/s)	0.44(0.28 1y)			
PART FULL FLOW VELOCITY (m/s)	0.82 (0.71 1y)	0.98 (0.87 1y)	0.98 (0.87 1y)	1.06 (0.94 1y)
DATUM RL -8.0				

WATER LEVEL IN STRUCTURE	2.489	2.489	2.333	2.311
HYDRAULIC GRADE LEVEL	2.456	2.429	2.333	2.299
PIPE FLOW (Cumecs)	0.019	0.038	0.038	0.049
PIPE CAPACITY AT GRADE (Cumecs)	0.124	0.124	0.124	0.124
DEPTH TO INVERT	1.474	1.463	1.329	1.274
INVERT LEVEL OF DRAIN	2.356	2.264	2.090	1.980
DESIGN SURFACE LEVEL	3.830	3.727	3.444	3.187
RUNNING CHAINAGE	0.000	18.324	24.804	33.888
SET-OUT E/N (CENTRE OF PIT)	556204.503	6832019.416	6832029.834	6832046.194

LINE

2

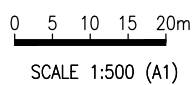
STRUCTURE NAME	STRUCTURE DESCRIPTION
	1/3 BCC KERB IN LINE GULLY (sag) K&C 2.4m Linel; Type D/E K&C
	2/3 FIELD INLET GULLY 1050mm x 750mm
	3/3 FIELD INLET GULLY 1050mm x 750mm
	4/3 FIELD INLET GULLY 1050mm x 750mm
	5/3 FIELD INLET GULLY 1050mm x 750mm
	6/3 HEADWALL

PIPE SIZEmm (Class)	375(2)	375(2)	375(2)	450(2)	450(2)
PIPE GRADE %	0.40%	0.43%	0.83%	0.37%	0.54%
PIPE SLOPE 1 in X	251.03	230.25	119.90	270.27	185.98
FULL PIPE FLOW VELOCITY (m/s)	0.81(0.47 1y)				
PART FULL FLOW VELOCITY (m/s)	1.07 (0.94 1y)	1.14 (1.00 1y)	1.57 (1.39 1y)		1.44 (1.26 1y)
DATUM RL -8.0					

WATER LEVEL IN STRUCTURE	3.121	3.121	2.968	2.552	2.280
HYDRAULIC GRADE LEVEL	3.082	3.032	2.968	2.536	2.280
PIPE FLOW (Cumecs)	0.073	0.083	0.114	0.128	0.153
PIPE CAPACITY AT GRADE (Cumecs)	0.111	0.115	0.160	0.173	0.209
DEPTH TO INVERT	0.975	1.005	1.115	1.122	0.976
INVERT LEVEL OF DRAIN	2.818	2.703	2.627	2.082	1.831
DESIGN SURFACE LEVEL	3.793	3.708	3.742	3.312	2.807
RUNNING CHAINAGE	0.000	28.868	41.762	50.000	85.551
SET-OUT E/N (CENTRE OF PIT)	556169.646	6831979.643	6832008.511	6832009.150	6832019.124

LINE

3



THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 1

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-07	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16		

STRUCTURE NAME
STRUCTURE DESCRIPTION

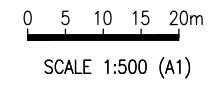
STRUCTURE NAME	STRUCTURE DESCRIPTION	PIPE SIZEmm (Class)	PIPE GRADE %	PIPE SLOPE 1 in X	FULL PIPE FLOW VELOCITY (m/s)	PART FULL FLOW VELOCITY (m/s)	DATUM	WATER LEVEL IN STRUCTURE	HYDRAULIC GRADE LEVEL	PIPE FLOW (Cumecs)	PIPE CAPACITY AT GRADE (Cumecs)	DEPTH TO INVERT	INVERT LEVEL OF DRAIN	DESIGN SURFACE LEVEL	RUNNING CHAINAGE	SET-OUT E/N (CENTRE OF PIT)
1/5	BCC KERB IN LINE GULLY	375(2)	0.40%	252.49	0.72	(0.63 1y)	RL -8.0	3.196	3.196	0.017	0.110	0.998	3.009	4.007	0.000	556818.293
2/5	BCC KERB IN LINE GULLY	375(2)	0.40%	248.61	1.06	(0.95 1y)		3.189	3.132	0.069	0.111	1.039	2.938	3.977	17.927	683999.474
3/5	STD BCC MANHOLE	450(2)	0.30%	335.76	1.05	(0.94 1y)		3.028	2.972	0.104	0.155	1.879	2.776	4.655	35.302	556853.288
4/5	BCC KERB IN LINE GULLY	525(2)	0.25%	398.93	1.02	(0.91 1y)		2.846	2.793	0.119	0.225	1.776	2.592	4.368	89.827	683981.663
5/5	BCC KERB IN LINE GULLY	600(2)	0.21%	478.72	1.05	(0.93 1y)		2.660	2.607	0.180	0.293	2.087	2.326	4.413	166.023	556866.070
6/5	BCC KERB IN LINE GULLY	600(2)	0.29%	350.70	1.21	(1.07 1y)		2.550	2.510	0.196	0.342	1.954	2.099	4.053	238.789	683980.442
7/5	BCC KERB IN LINE GULLY	600(2)	0.37%	270.24	1.37	(1.20 1y)		2.438	2.408	0.217	0.390	1.974	1.860	3.675	315.592	557115.616
2/4	CAST INSITU JUNCTION PIT							2.394	2.394			2.053	1.794	3.847	328.023	683977.812

LINE

1/7	BCC KERB IN LINE GULLY	375(2)	0.41%	246.45	0.78	(0.70 1y)		3.351	3.333	0.021	0.112	0.935	3.200	4.135	0.000	556865.543
2/7	BCC KERB IN LINE GULLY	375(2)	0.40%	250.66	0.94	(0.84 1y)		3.331	3.286	0.044	0.111	1.079	3.147	4.226	13.062	6832025.392
3/5	STD BCC MANHOLE							3.028	2.972			1.104	3.122	4.655	45.871	556853.288
1/6	BCC KERB IN LINE GULLY (sag)	375(2)	0.40%	249.96	1.09	(0.96 1y)		3.692	3.631	0.078	0.111	0.883	3.400	4.283	0.000	556839.813
5/5	BCC KERB IN LINE GULLY							2.660	2.607			1.144	3.269	4.413	32.745	6832000.008

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

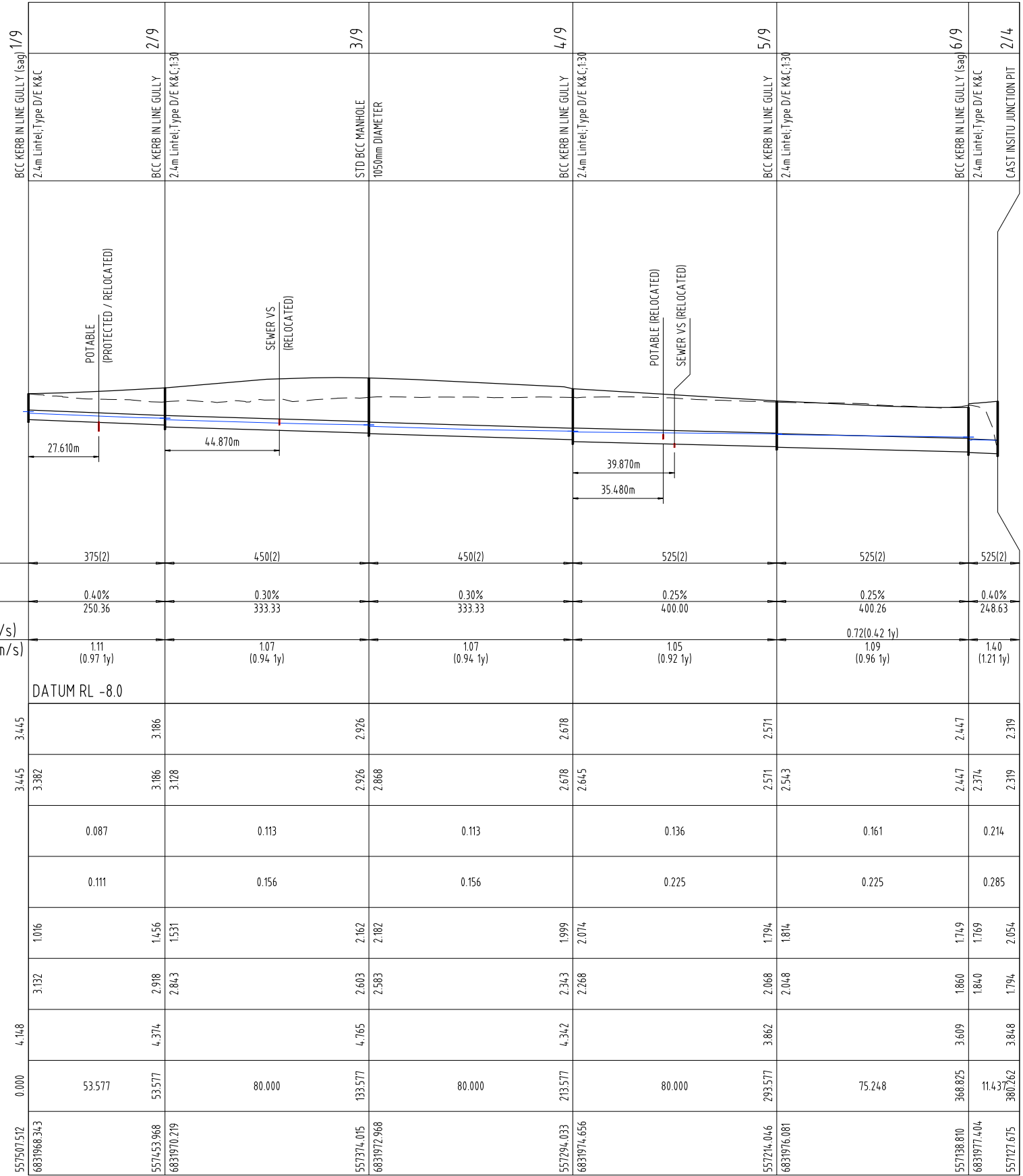
Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 2

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-08	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16	A	

THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-01to11_A.dwg

STRUCTURE NAME
STRUCTURE DESCRIPTION



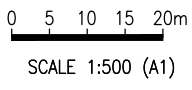
PIPE SIZEmm (Class)	375(2)	450(2)	450(2)	525(2)	525(2)	525(2)
PIPE GRADE %	0.40%	0.30%	0.30%	0.25%	0.25%	0.40%
PIPE SLOPE 1 in X	250.36	333.33	333.33	400.00	400.26	248.63
FULL PIPE FLOW VELOCITY (m/s)					0.72(0.42 1y)	
PART FULL FLOW VELOCITY (m/s)	1.11 (0.97 1y)	1.07 (0.94 1y)	1.07 (0.94 1y)	1.05 (0.92 1y)	1.09 (0.96 1y)	1.40 (1.21 1y)

WATER LEVEL IN STRUCTURE	3.445	3.186	2.926	2.678	2.571	2.447
HYDRAULIC GRADE LEVEL	3.445	3.186	2.926	2.678	2.571	2.447
PIPE FLOW (Cumecs)	0.087	0.113	0.113	0.136	0.161	0.214
PIPE CAPACITY AT GRADE (Cumecs)	0.111	0.156	0.156	0.225	0.225	0.285
DEPTH TO INVERT	1.016	1.456	2.162	1.999	1.794	1.749
INVERT LEVEL OF DRAIN	3.132	2.918	2.603	2.343	2.068	1.860
DESIGN SURFACE LEVEL	4.148	4.374	4.765	4.342	3.862	3.609
RUNNING CHAINAGE	0.000	53.577	80.000	133.577	80.000	293.577
SET-OUT E/N (CENTRE OF PIT)	557507.512	557453.968	6831970.219	557294.033	6831974.656	557244.046
	6831968.343	6831970.219	6831972.968	6831974.656	6831976.081	6831977.404
						6831974.794

LINE

PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 3

Client: BYRON SHIRE COUNCIL

Draftsperson: BJA	Checked: SAW	Sheet Size: A1	Drawing No. B15408-DR-09
Designer: BJA	Approved:	Scale: AS SHOWN	Date: 04/08/16

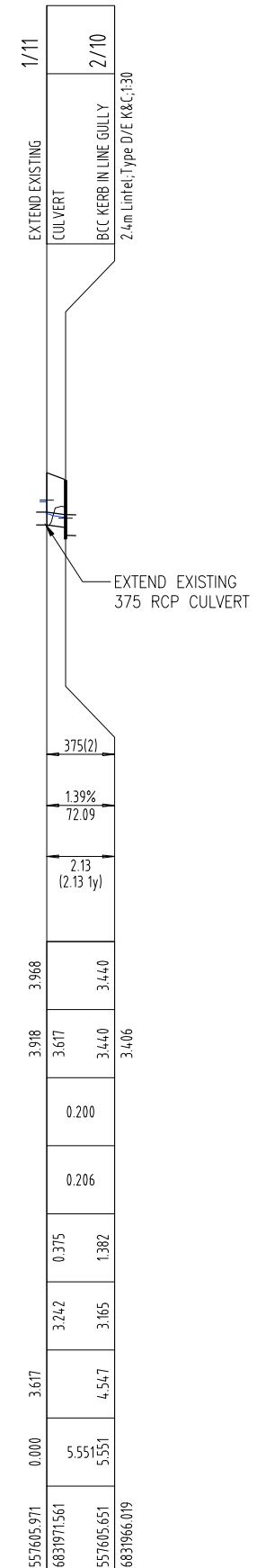
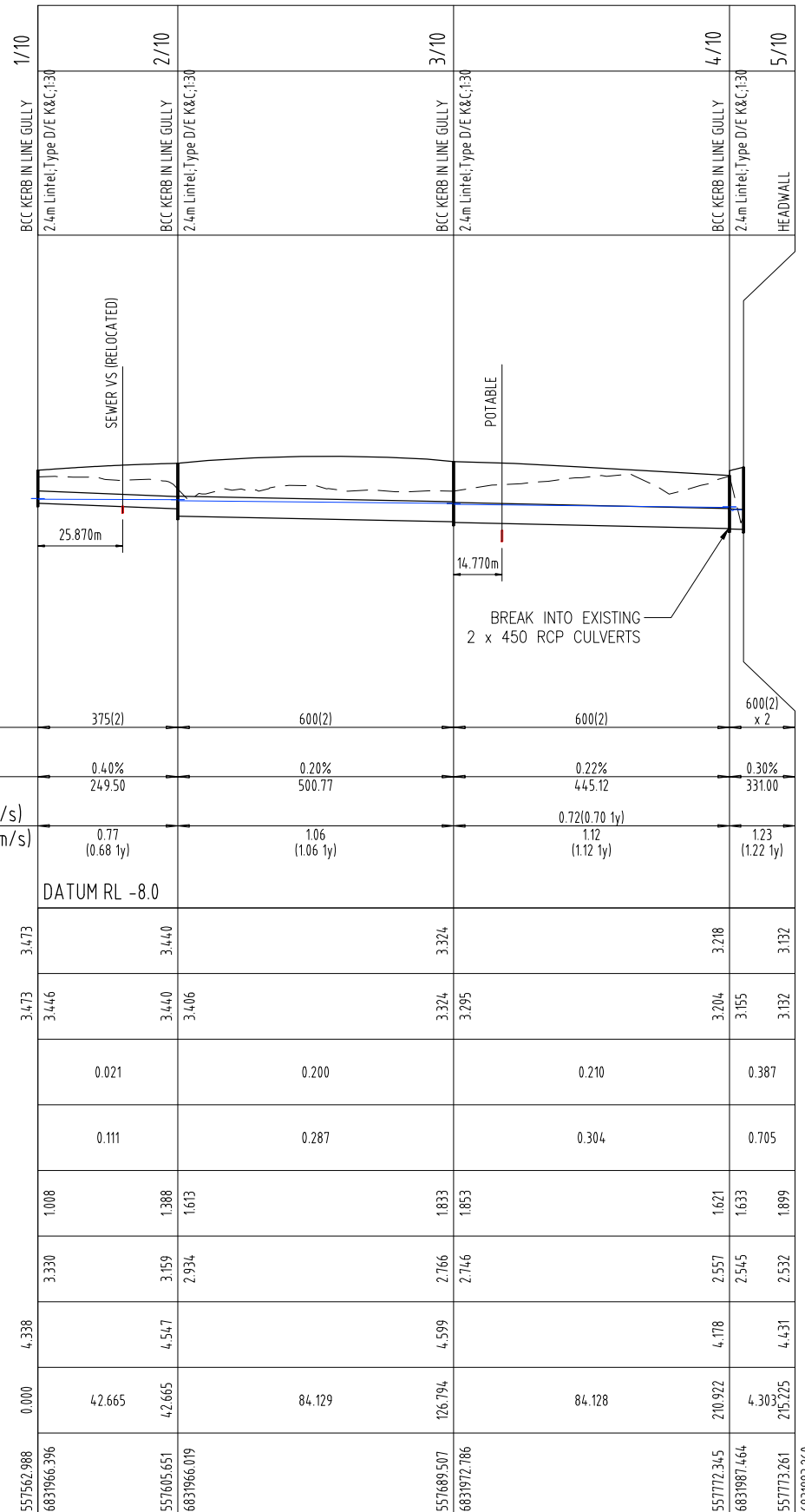
THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-011e11_A.dwg

STRUCTURE NAME
STRUCTURE DESCRIPTION

PIPE SIZEmm (Class)	375(2)	600(2)	600(2)	600(2) x 2	375(2)
PIPE GRADE %	0.40%	0.20%	0.22%	0.30%	1.39%
PIPE SLOPE 1 in X	249.50	500.77	445.12	331.00	72.09
FULL PIPE FLOW VELOCITY (m/s)	0.77 (0.68 1y)	1.06 (1.06 1y)	0.72(0.70 1y) 1.12 (1.12 1y)	1.23 (1.22 1y)	2.13 (2.13 1y)
PART FULL FLOW VELOCITY (m/s)					

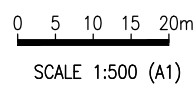
WATER LEVEL IN STRUCTURE	3.473	3.440	3.324	3.218	3.132
HYDRAULIC GRADE LEVEL	3.473 3.446	3.440 3.406	3.324 3.295	3.204 3.155	3.132 3.106
PIPE FLOW (Cumecs)	0.021	0.200	0.210	0.387	0.200
PIPE CAPACITY AT GRADE (Cumecs)	0.111	0.287	0.304	0.705	0.206
DEPTH TO INVERT	1.008	1.388	1.833	1.621	0.375
INVERT LEVEL OF DRAIN	3.330	3.159	2.766	2.545	3.242
DESIGN SURFACE LEVEL	4.338	4.547	4.599	4.178	4.547
RUNNING CHAINAGE	0.000	42.665	84.129	84.128	155.1
SET-OUT E/N (CENTRE OF PIT)	557562.988 6831966.396	557605.651 6831966.019	557689.507 6831972.786	557772.345 6831987.464	557855.261 6831993.260

LINE



PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

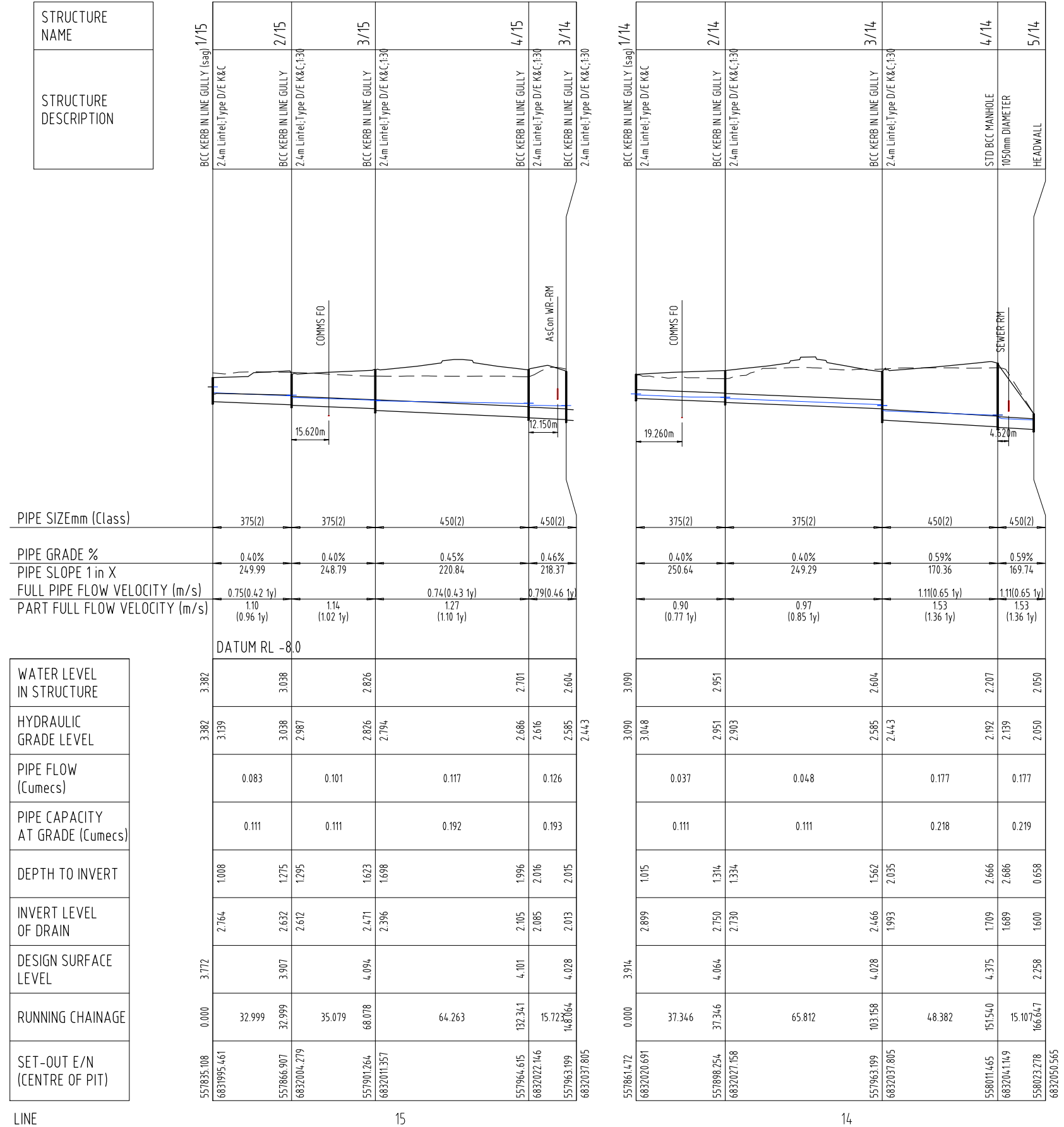
Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 4

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-10	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16		

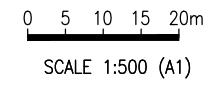
THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-011e11_A.dwg

STRUCTURE NAME
STRUCTURE DESCRIPTION



PRELIMINARY
20 September 2016

NOT FOR CONSTRUCTION
20 September 2016



THIS DESIGN AND DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF LAMBERT AND REHBEIN PTY LTD
LOCATION: F:\Jobs\B15408\Drawings\Infrastructure\Drawings\DR - Drainage\B15408-DR-011e11_A.dwg

No.	Date	By	Amendment	Checked
A	21/09/16	BJA	ISSUED FOR COUNCIL REVIEW	

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

CBD HOUSE
LEVEL 3, 120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
P.O. BOX 112 FORTITUDE VALLEY QLD 4006
A.C.N. 010 451 902

TELEPHONE (07) 3250 9000
FACSIMILE (07) 3250 9001
EMAIL mail@lar.net.au

Project: EWINGSDALE ROAD UPGRADE WORKS
CONCEPT DESIGN PHASE

Title: STORMWATER DRAINAGE
LONGITUDINAL SECTIONS
SHEET 5

Client: BYRON SHIRE COUNCIL		Drawing No. B15408-DR-11	
Draftsperson: BJA	Checked: SAW	Sheet Size: A1	
Designer: BJA	Approved:		
Scale: AS SHOWN	Date: 04/08/16	A	