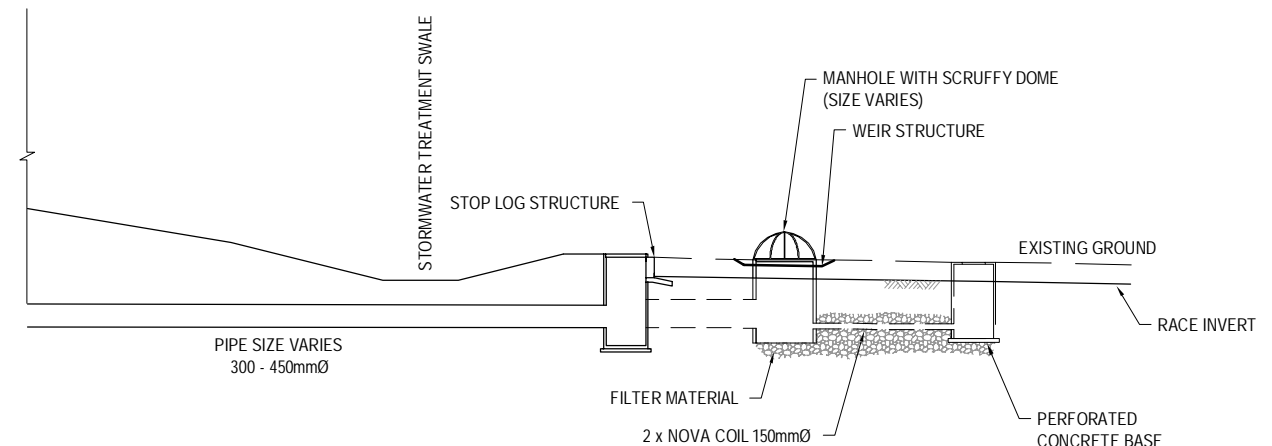
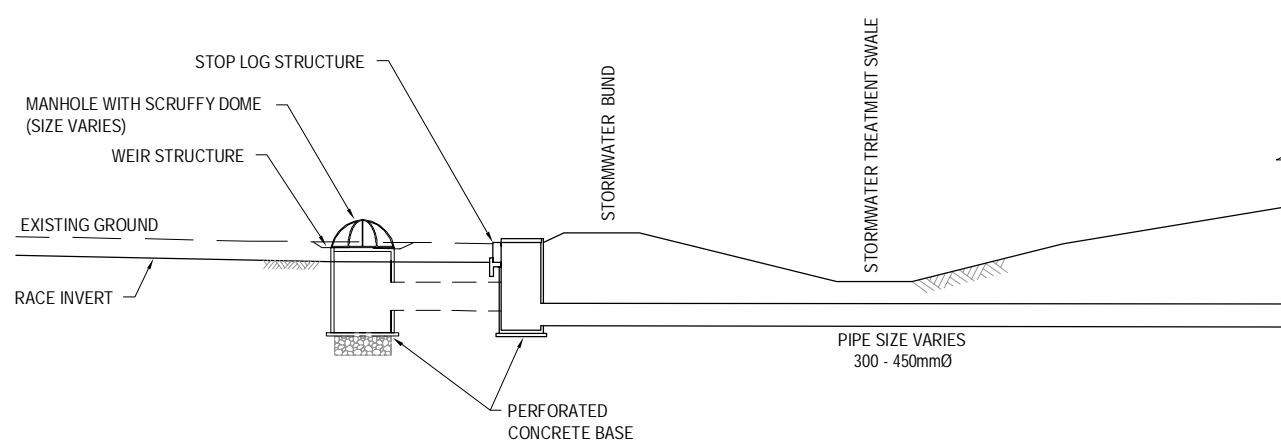


TYPICAL STOCKWATER RACE
SIPHON PLAN
SCALE 1:200 (A3)



A SIPHON CROSS SECTION
SCALE 1:200 (A3)

FOR CONSENT

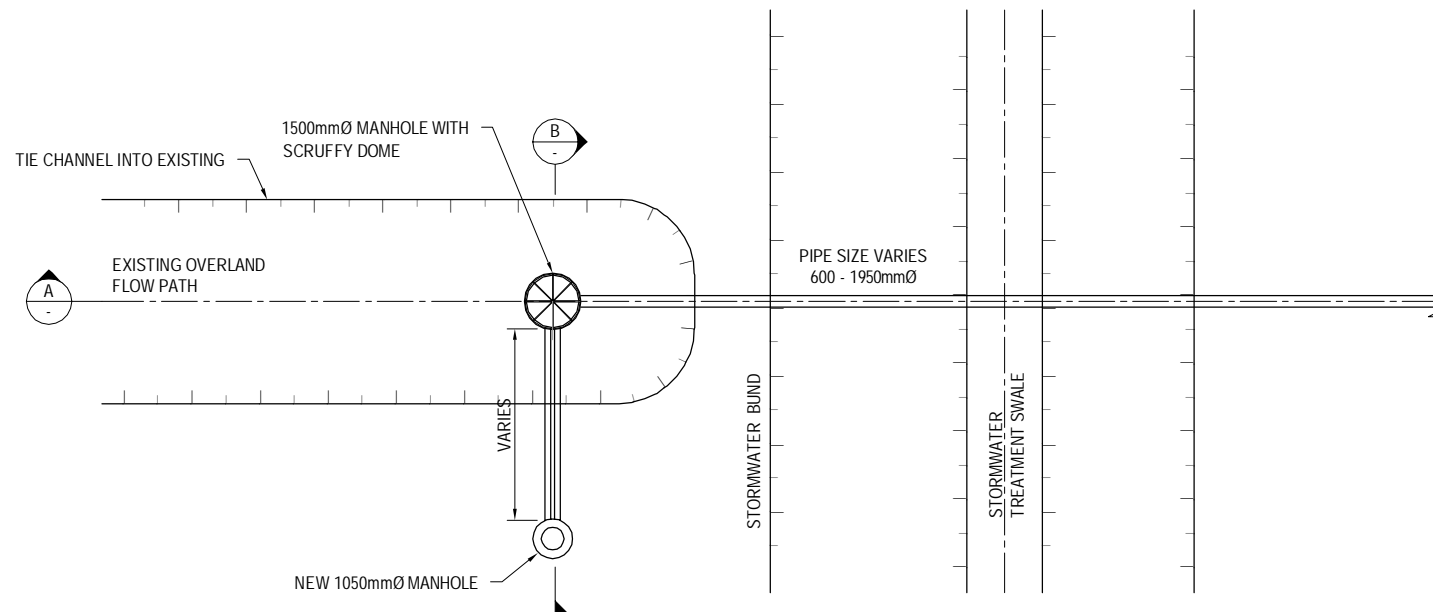
0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AW	TP	CMG	17.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



DO NOT SCALE
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person.
This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

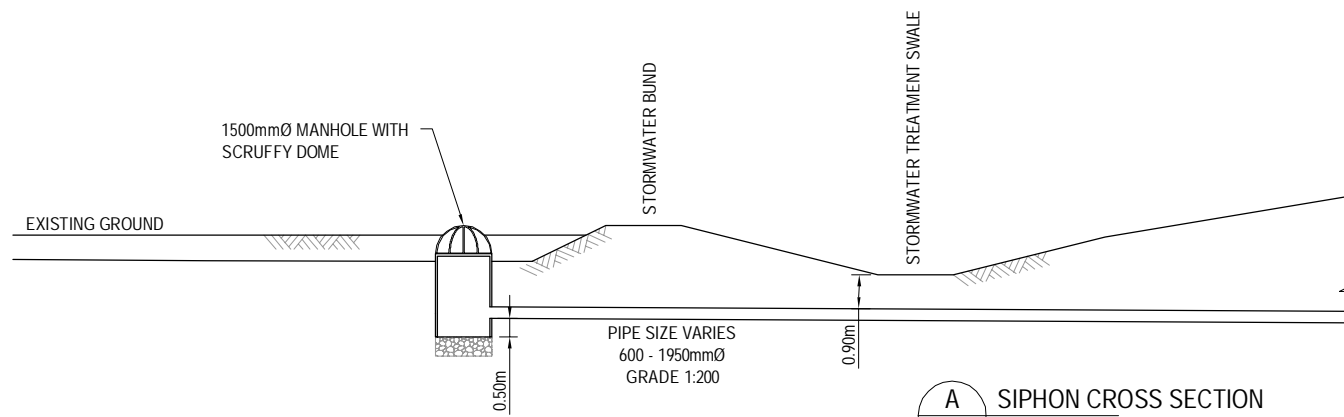
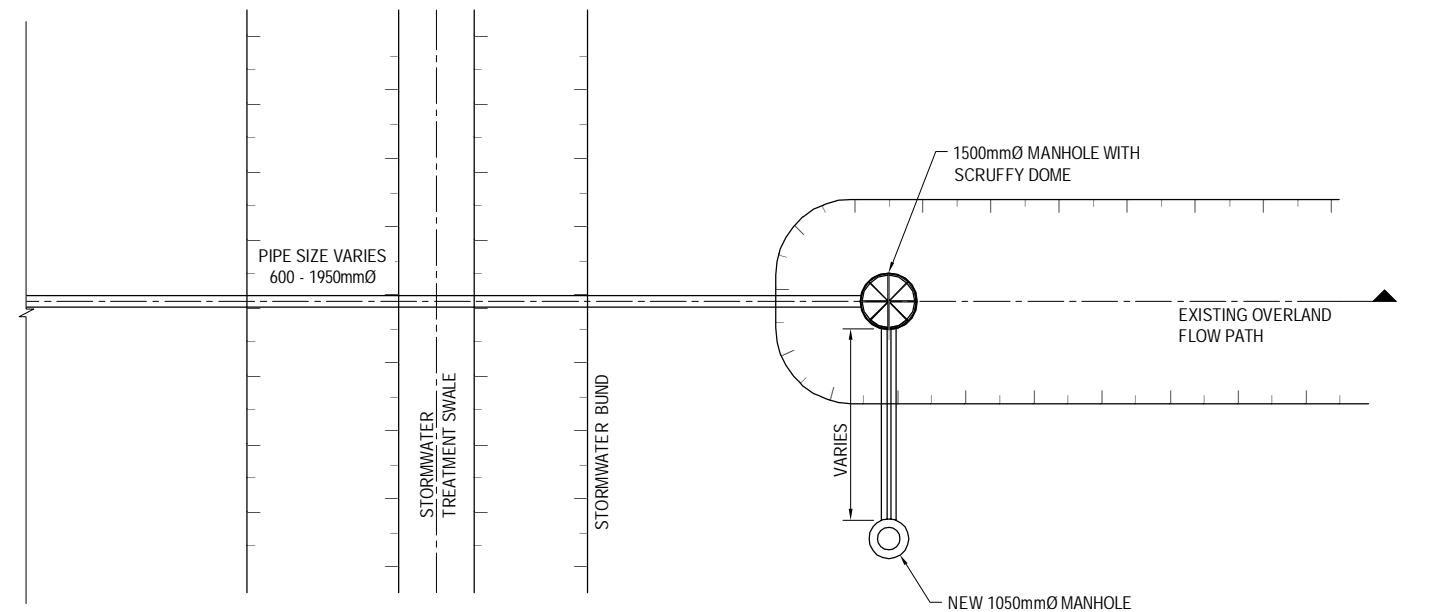
Drawn	AMW	Designed	TP
Drafting Check	NJD	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale			
A3 Scale	A3 HALF SIZE SHOWN		This Drawing must not be used for Construction unless signed as Approved

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING
	TYPICAL DRAINAGE DETAILS - SHEET 1
Drawing No:	62236-A-C451
Rev:	0



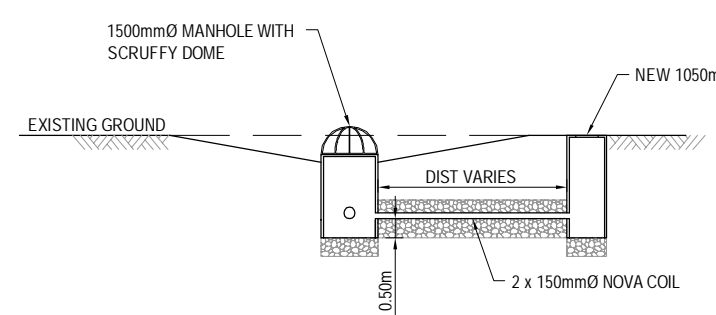
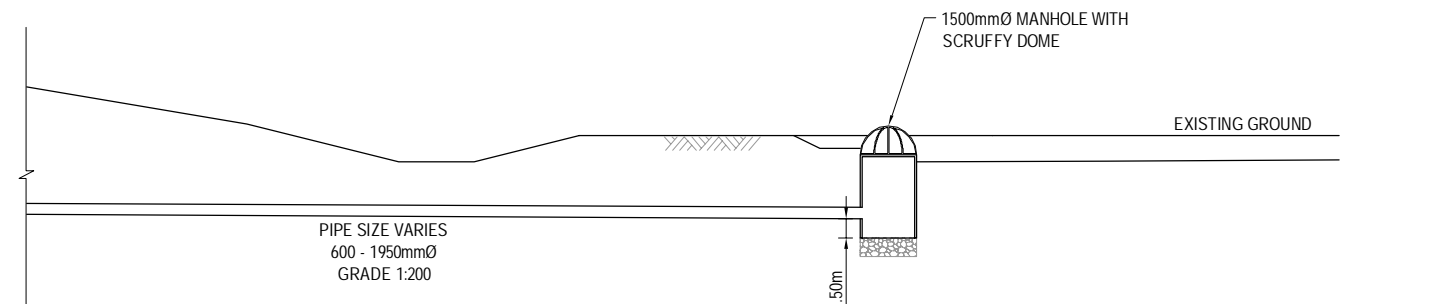
TYPICAL OVERLAND FLOW SIPHON PLAN

SCALE 1:200 (A3)



A SIPHON CROSS SECTION

SCALE 1:200 (A3)



B SIPHON DISPOSAL SECTION

SCALE 1:200 (A3)

OVERLAND FLOW PATH SIPHON DETAIL

SCALE 1: AS SHOWN

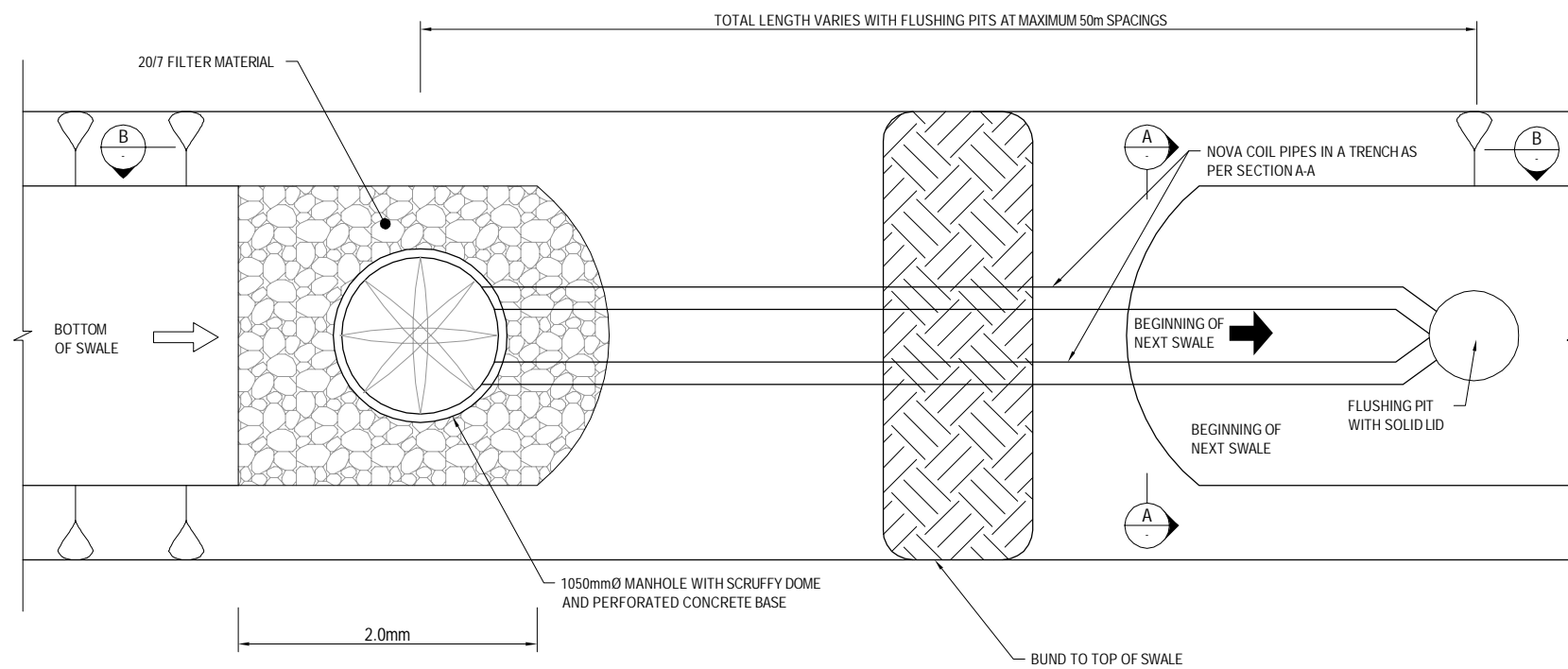
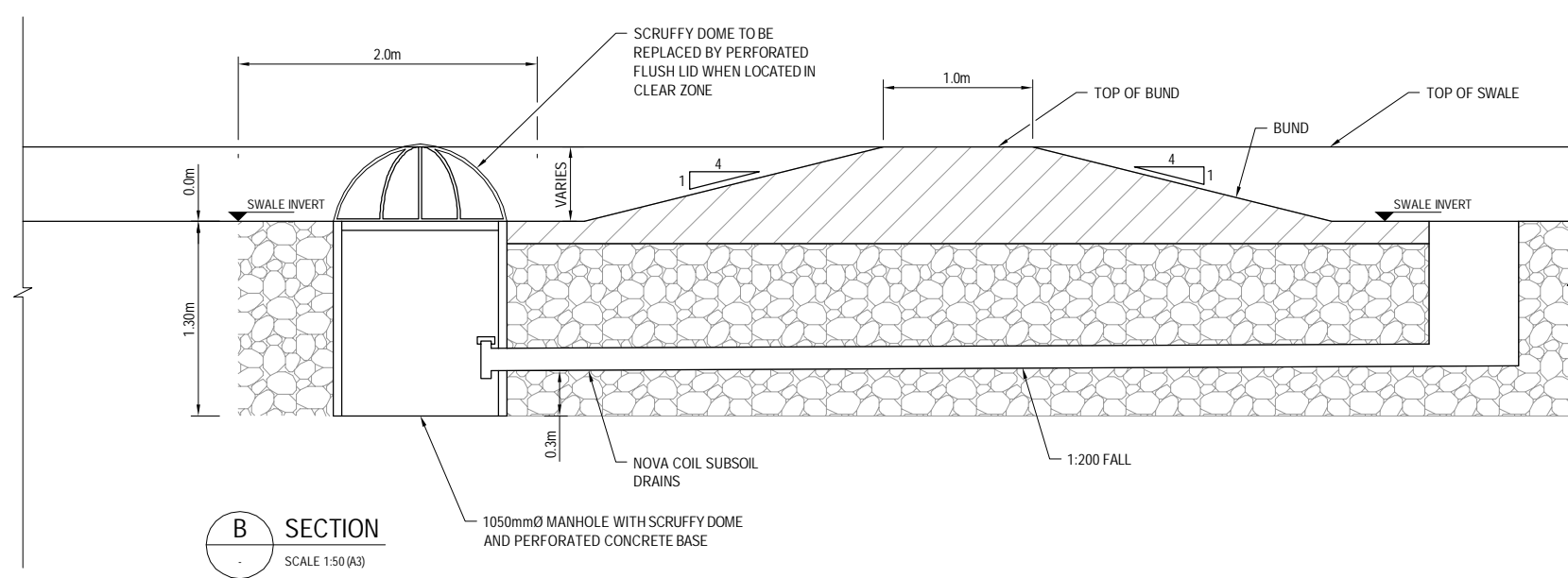
FOR CONSENT

0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AMW	BSE	CMG	17.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

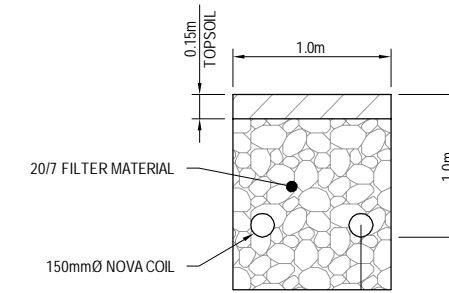


DO NOT SCALE	Drawn AMW	Designed TP
<small>This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.</small>	Drafting Check NJD	Design Check TM
	Approved CMG	
	Date 10.05.12	
A1 Scale	A3 HALF SIZE SHOWN	This Drawing must not be used for Construction unless signed as Approved

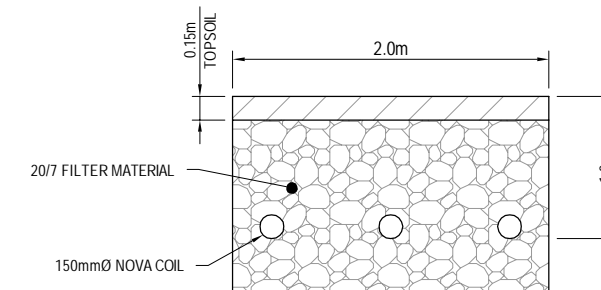
Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING TYPICAL DRAINAGE DETAILS - SHEET 2
Drawing No:	62236-A-C453
Rev:	0



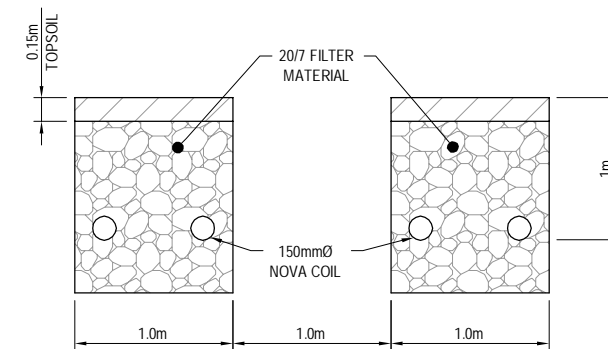
SOAK PIT DETAILS
WHERE FIRST FLUSH POND NOT REQUIRED
SCALE 1:50 (A3)



A SECTION
SCALE 1:50 (A3)
SUBSOIL DRAINAGE CROSS SECTION
2m WIDTH SOAKAGE AREA



A SECTION
SCALE 1:50 (A3)
SUBSOIL DRAINAGE CROSS SECTION
3m WIDTH SOAKAGE AREA



A SECTION
SCALE 1:50 (A3)
SUBSOIL DRAINAGE CROSS SECTION
4m WIDTH SOAKAGE AREA

FOR CONSENT

0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AMW	TP	CMG	AUG11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



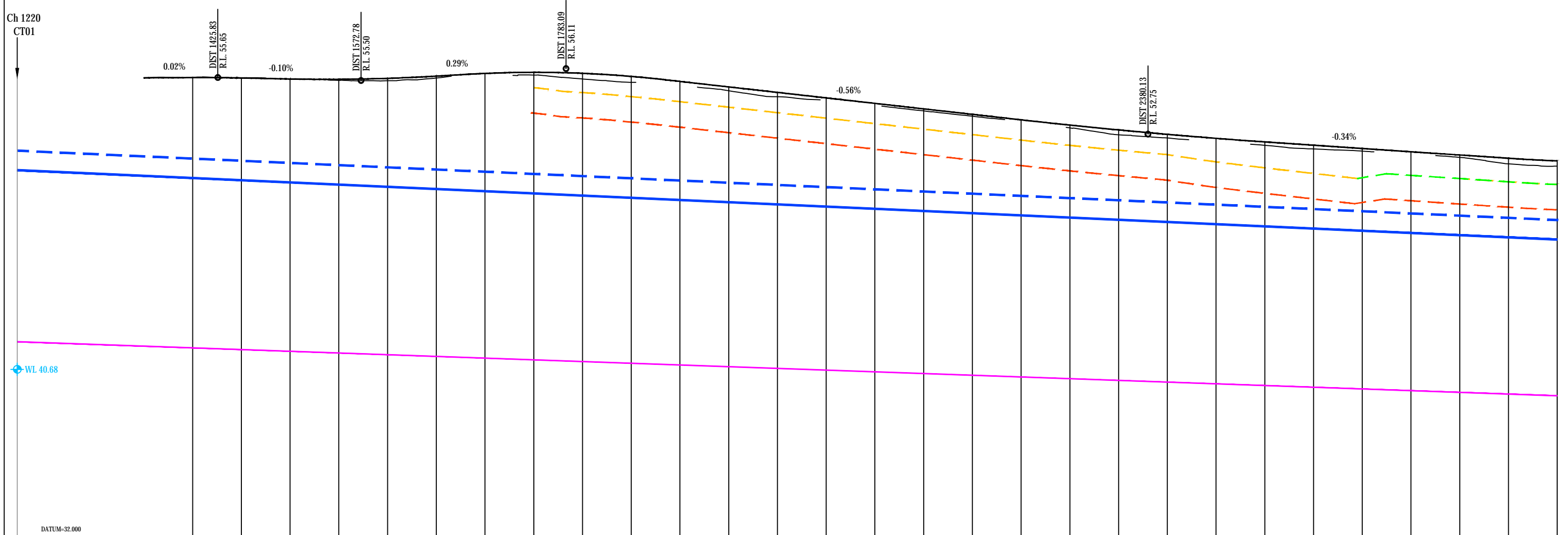
DO NOT SCALE

This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfill a legal requirement.

Drawn	AMW	Designed	TP
Drafting Check	NJD	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale	A3 HALF SIZE SHOWN	This Drawing must not be used for Construction unless signed as Approved	
A3 Scale			

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING
	TYPICAL DRAINAGE DETAILS - SHEET 3
Drawing No:	62236-A-C454
Rev:	0

Ch 1220
CT01



DESIGN SURFACE LEVELS	55.64	55.65	55.63	55.58	55.56	55.61	55.73	55.86	55.92	55.87	55.74	55.45	55.17	54.89	54.61	54.33	54.05	53.76	53.48	53.21	52.97	52.74	52.53	52.35	52.18	52.01	51.85	51.68	51.51	51.37			
EXISTING SURFACE LEVELS	55.64	55.67	55.64	55.59	55.51	55.49	55.63	55.80	55.78	55.58	55.41	55.27	54.98	54.67	54.49	54.24	53.94	53.67	53.40	53.07	52.72	52.55	52.32	52.17	51.99	51.88	51.72	51.56	51.23	51.10			
DISTANCE	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800			
VERTICAL SCHEMATIC	[Vertical schematic showing parabolic curves with radii: R=38986.58 L=153.66, R=23451.03 L=200.00, R=117225.19 L=267.06]																																
HORIZONTAL SCHEMATIC	[Horizontal schematic showing grades: D=207.99, R=1200.00 L=164.81, D=589.63, P=-0.56% L=363.50, D=604.76, P=-0.34% L=233.24]																																

LONGITUDINAL SECTION ON CONTROL STRING MC10
SCALE HORIZ=1:2000 VERT=1:100 @ A1
SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND			
	EXISTING GROUND		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUND WATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100l/s
	DESIGN ROAD CENTRELINE		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		50% PREDICTED GROUND WATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
	SWALE INFILTRATION (1.3m)		STORMWATER POND *
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		STOCKWATER / DRAINAGE SIPHON *
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		OVERLAND FLOW SIPHON *
	1m CLEARANCE FROM HIGH WATER TABLE		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)



* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE

FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12

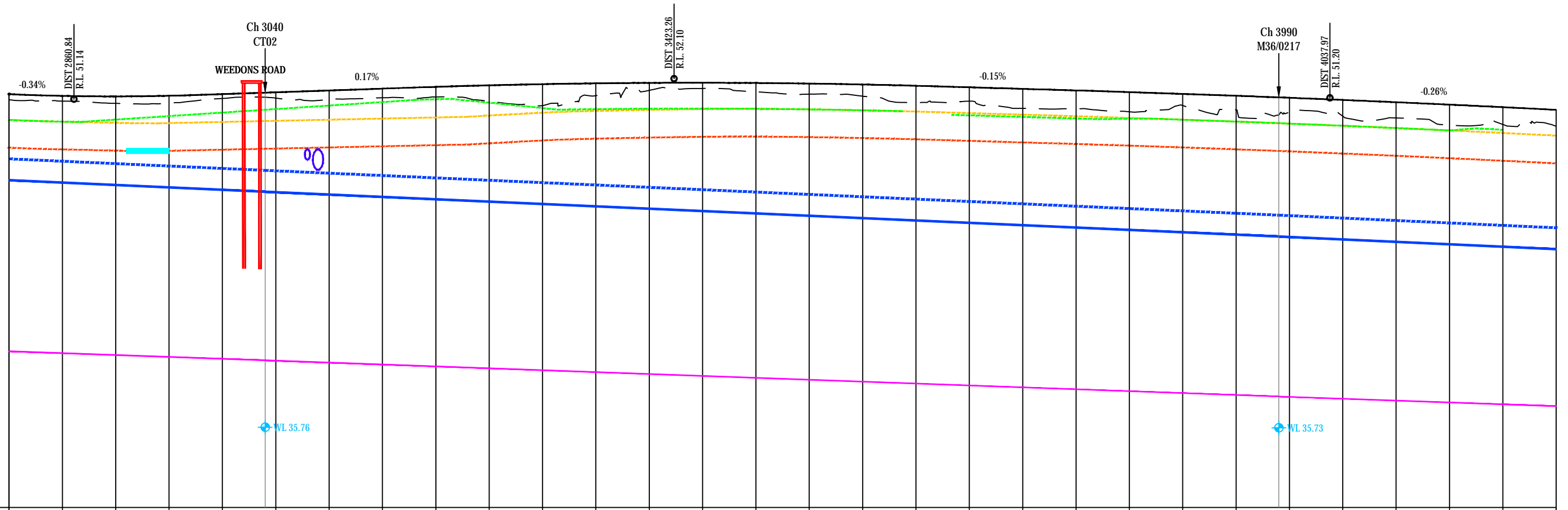


DO NOT SCALE	Drawn A. PORTEOUS	Designed K. ATKINS
<small>This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.</small>	Drafting TM	Design Check TM
	Approved GAP	
	Date 16.10.12	
	A1 Scale	This Drawing must not be used for Construction unless signed as Approved
	A3 Scale H. 1:4000, V.1:200	

Client **NEW ZEALAND TRANSPORT AGENCY**
Project **SH1 REGION 11 RP350/3.92 TO RP365/2.11**
Title **MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS**

Drawing No: **62236-A-C461**

Rev: 1



DESIGN SURFACE LEVELS	51.37	-51.29	-51.27	-51.30	-51.38	-51.46	-51.55	-51.63	-51.72	-51.79	-51.84	-51.88	-51.90	-51.91	-51.90	-51.87	-51.83	-51.77	-51.69	-51.62	-51.55	-51.47	-51.39	-51.30	-51.20	-51.10	-50.99	-50.88	-50.76	50.84
EXISTING SURFACE LEVELS	51.10	51.05	50.94	50.95	51.17	51.19	51.12	51.21	51.24	51.04	50.84	51.31	51.55	51.64	51.49	51.37	51.28	50.98	51.04	50.71	50.68	50.55	50.84	50.63	50.54	50.34	50.26	49.92	49.95	49.87
DISTANCE	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250
VERTICAL SCHEMATIC	R=45038.55 L=227.89		P=0.17% L=203.93														R=154144.74 L=489.07		L=120.17		R=426092.98 L=500.00									
HORIZONTAL SCHEMATIC	D=604.76		R=1200.00 L=244.79														D=1357.69		R=426092.98 L=500.00											

LONGITUDINAL SECTION ON CONTROL STRING MC10

SCALE HORIZ=1:2000 VERT=1:100 @ A1
SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND			
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
	DESIGN ROAD CENTRELINE		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100l/s
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	SWALE INFILTRATION (1.3m)		AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		STORMWATER POND *
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		STOCKWATER / DRAINAGE SIPHON *
	1m CLEARANCE FROM HIGH WATER TABLE		OVERLAND FLOW SIPHON *
	BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)		

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE

This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn A. PORTEOUS

Designed K. ATKINS

Drafting TM

Design Check TM

Approved GAP

Date 16.10.12

A1 Scale

A3 Scale H. 1:4000, V.1:200

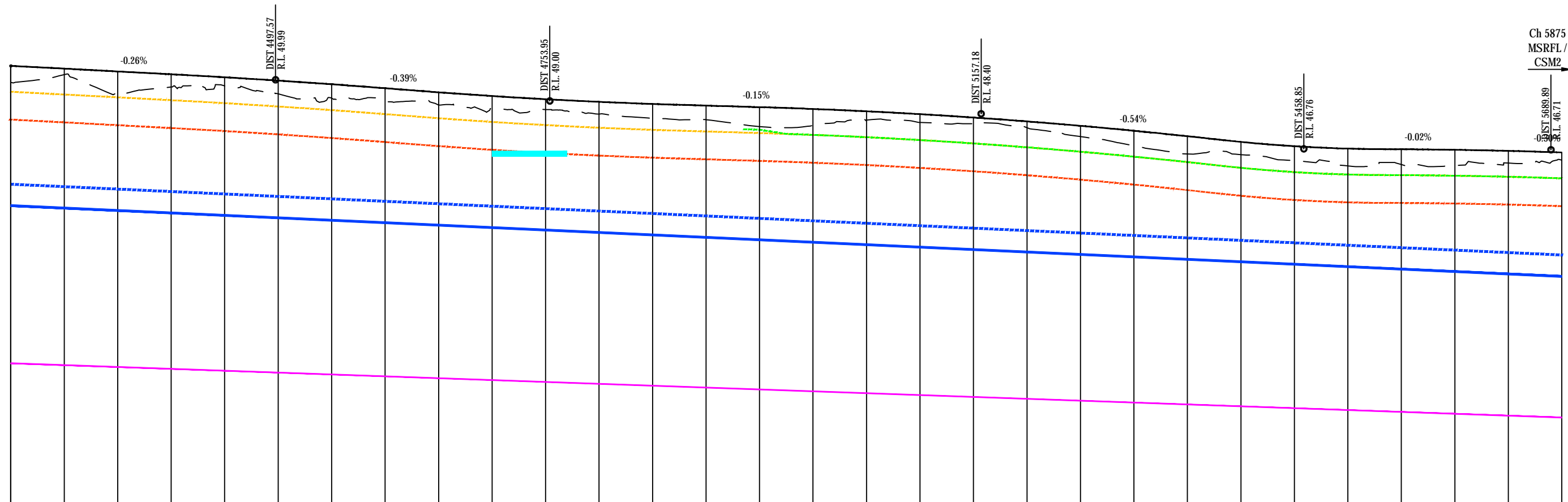
This Drawing must not be used for Construction unless signed as Approved

Client **NEW ZEALAND TRANSPORT AGENCY**
Project **SH1 REGION 11 RP350/3.92 TO RP365/2.11**
Title **MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS**

Drawing No: **62236-A-C462**

Rev: 1

Ch 5875
MSRFL /
CSM2



DESIGN SURFACE LEVELS	50.64	50.51	50.38	50.25	50.10	49.95	49.78	49.59	49.40	49.23	49.08	48.96	48.86	48.78	48.71	48.62	48.52	48.38	48.22	48.04	47.84	47.61	47.35	47.08	46.88	46.77	46.74	46.72	46.67	46.59			
EXISTING SURFACE LEVELS	49.87	50.23	49.29	49.65	49.70	49.33	49.13	48.99	48.80	48.66	48.60	48.39	48.19	48.12	47.80	47.86	48.11	47.99	47.93	47.75	47.34	46.90	46.52	46.49	46.21	45.96	46.03	45.98	46.10	46.23			
DISTANCE	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700			
VERTICAL SCHEMATIC																																	
HORIZONTAL SCHEMATIC																																	

LONGITUDINAL SECTION ON CONTROL STRING MC10
 SCALE HORIZ=1:2000 VERT=1:100 @ A1
 SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND			
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
	DESIGN ROAD CENTRELINE		STORMWATER POND *
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100l/s
	SWALE INFILTRATION (1.3m)		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		OVERLAND FLOW SIPHON *
	1m CLEARANCE FROM HIGH WATER TABLE		STOCKWATER / DRAINAGE SIPHON *

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



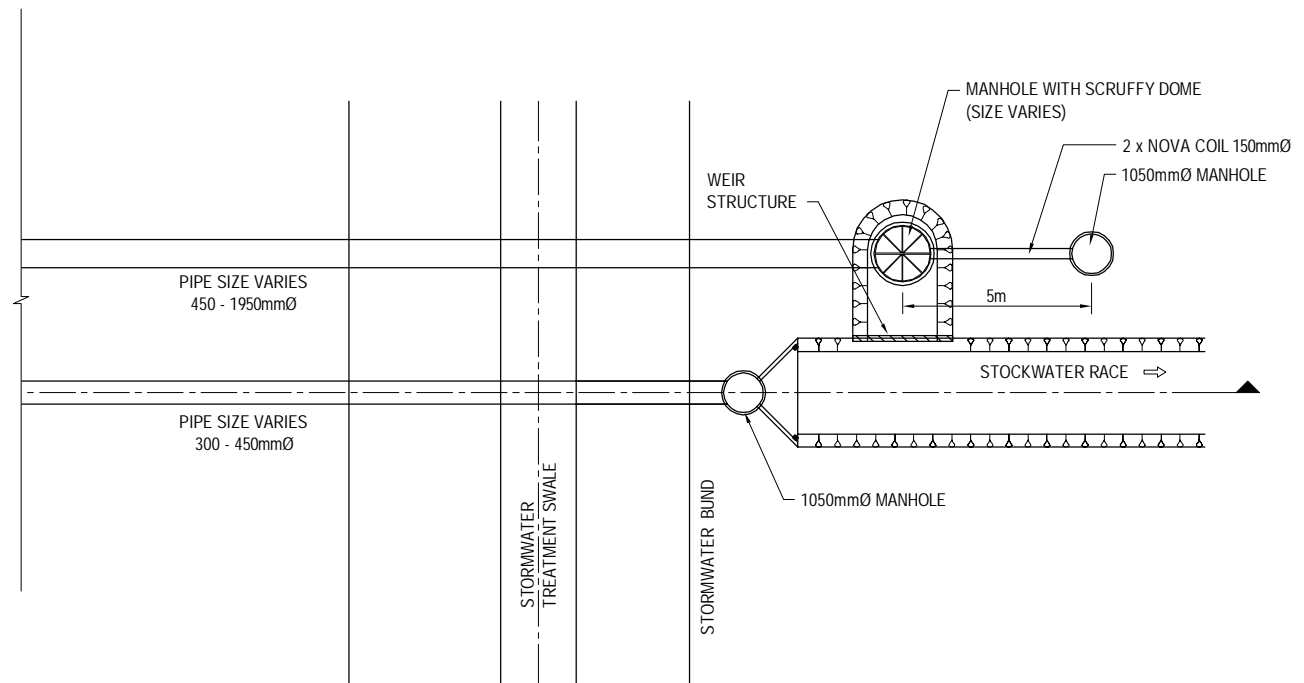
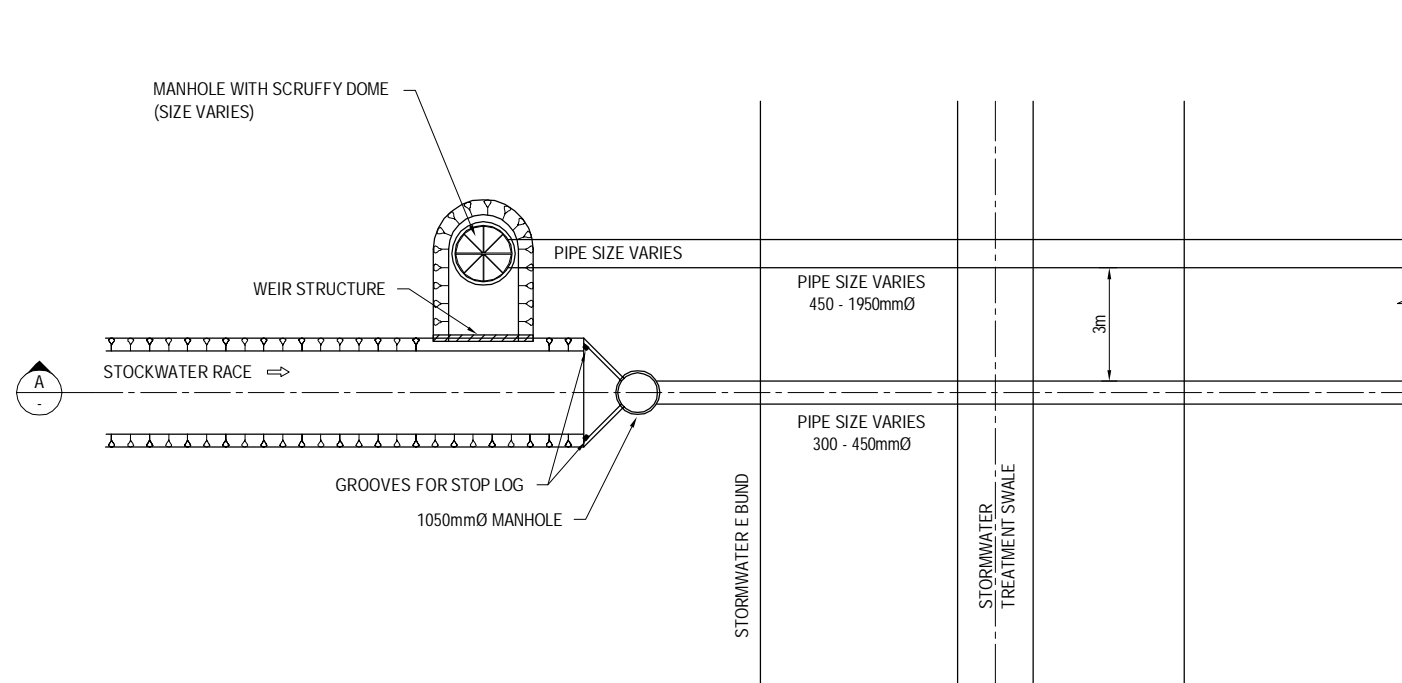
FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12

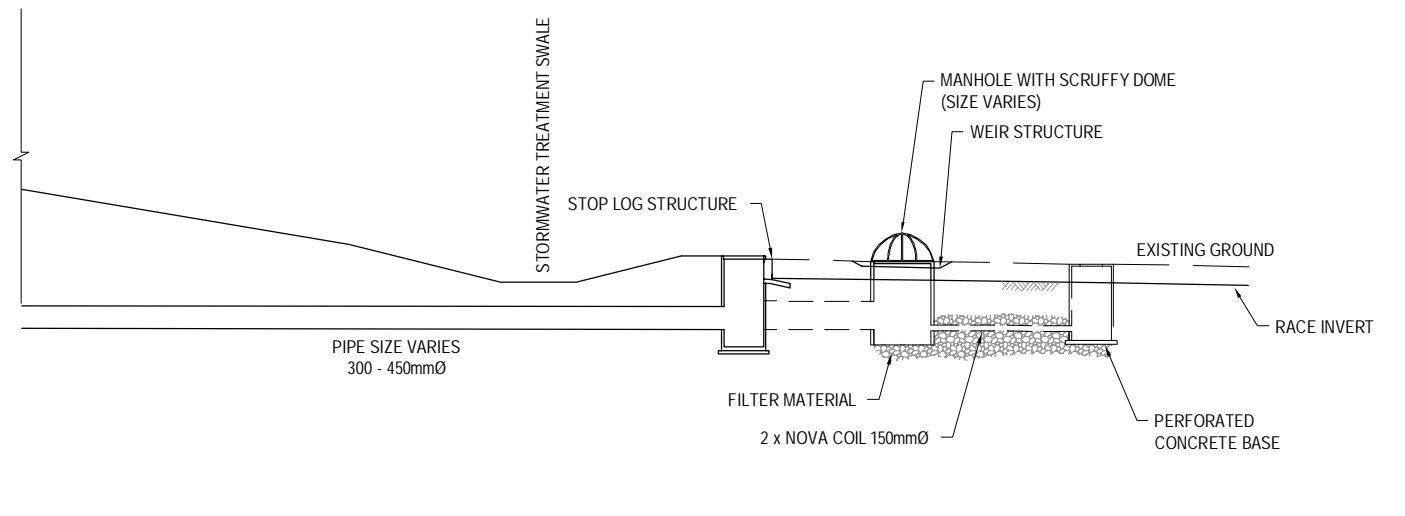
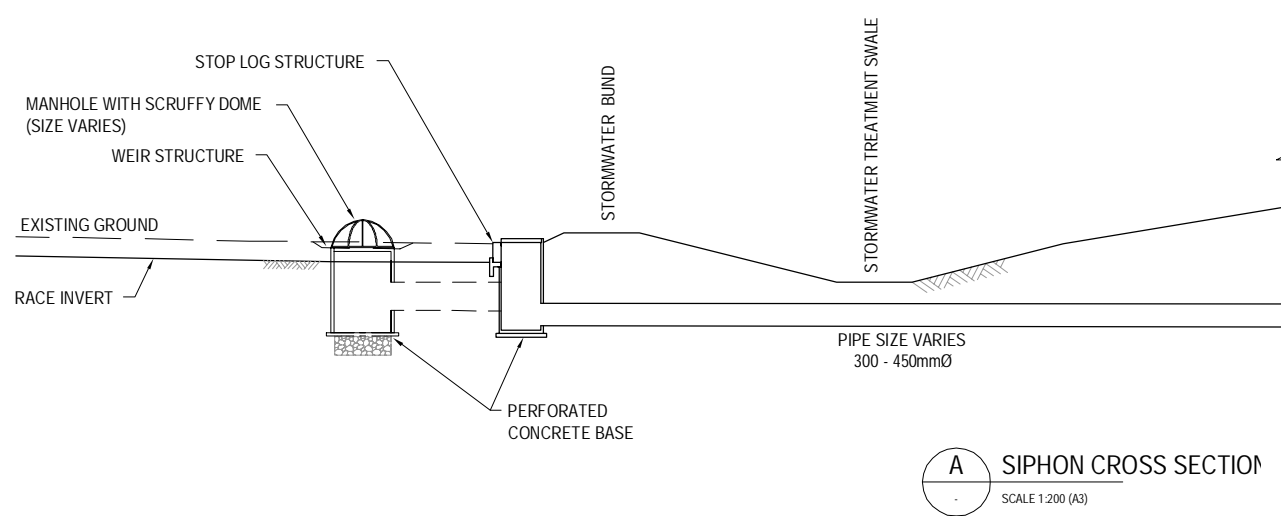


DO NOT SCALE	Drawn A. PORTEOUS	Designed K. ATKINS
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.	Drafting TM	Design Check TM
	Approved GAP	
	Date 16.10.12	
	A1 Scale	This Drawing must not be used for Construction unless signed as Approved
	A3 Scale H. 1:4000, V.1:200	

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS
Drawing No:	62236-A-C463
Rev:	1



TYPICAL STOCKWATER RACE
SIPHON PLAN
SCALE 1:200 (A3)



A SIPHON CROSS SECTION
SCALE 1:200 (A3)

FOR CONSENT

0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	CK	DGA	CG	14.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

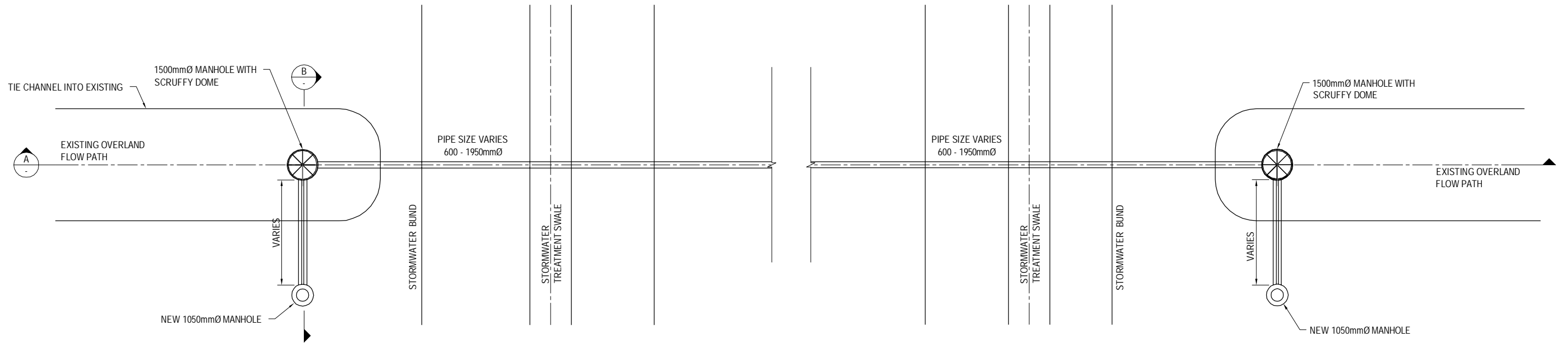


DO NOT SCALE

This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfill a legal requirement.

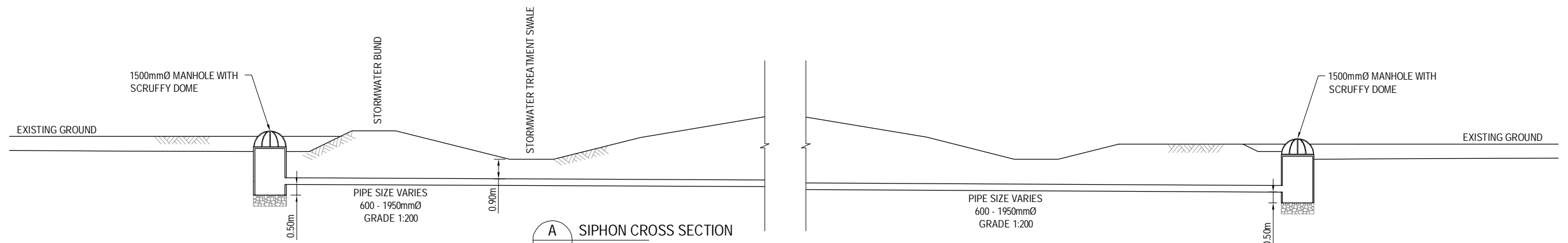
Drawn	CK	Designed	TP
Drafting Check	BSE	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale			
A3 Scale	1:200		

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 TYPICAL DRAINAGE DETAILS - SHEET 1 OF 5
Drawing No:	62236-B-C451
Rev:	0



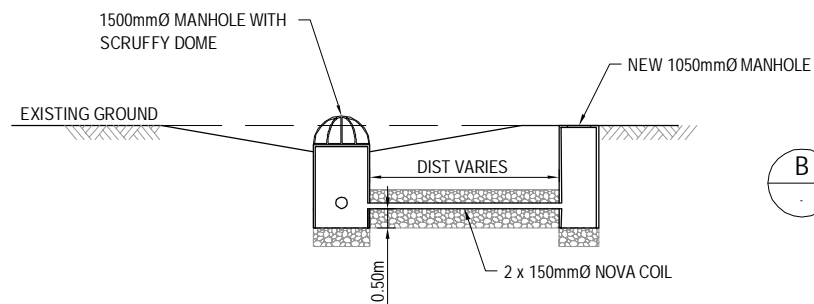
TYPICAL OVERLAND FLOW
SIPHON PLAN

SCALE 1:200 (A3)



A SIPHON CROSS SECTION

SCALE 1:200 (A3)



B SIPHON DISPOSAL SECTION

SCALE 1:200 (A3)

FOR CONSENT

0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AMW	DGA	CG	14.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



NZ TRANSPORT AGENCY
WAKA KOTAHI

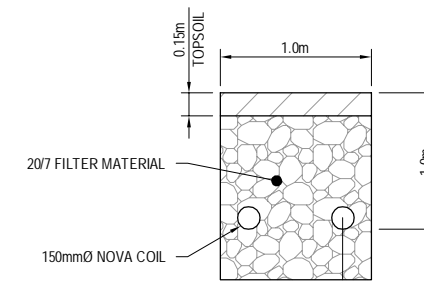
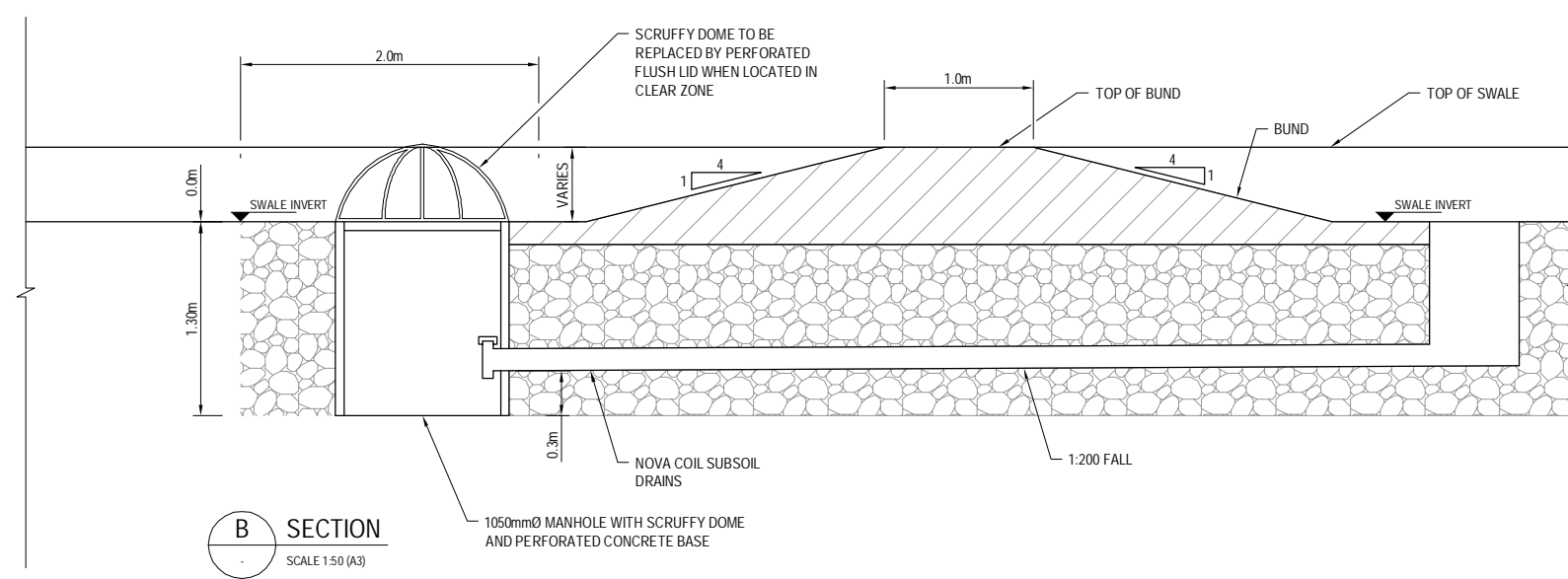


DO NOT SCALE

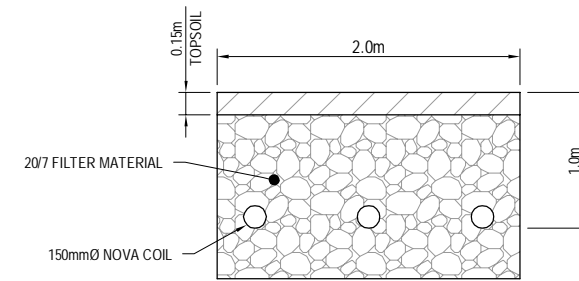
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn	AMW	Designed	TP
Drafting Check	BSE	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale		This Drawing must not be used for Construction unless signed as Approved	
A3 Scale	1:200		

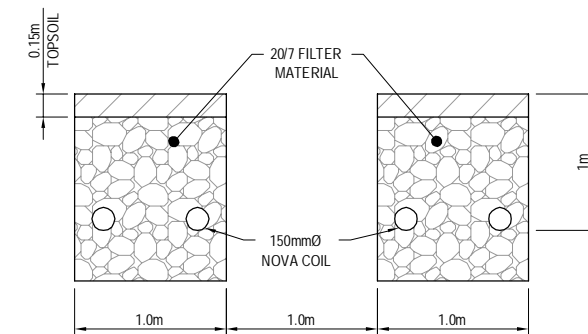
Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 TYPICAL DRAINAGE DETAILS - SHEET 2 OF 5
Drawing No:	62236-B-C452
Rev:	0



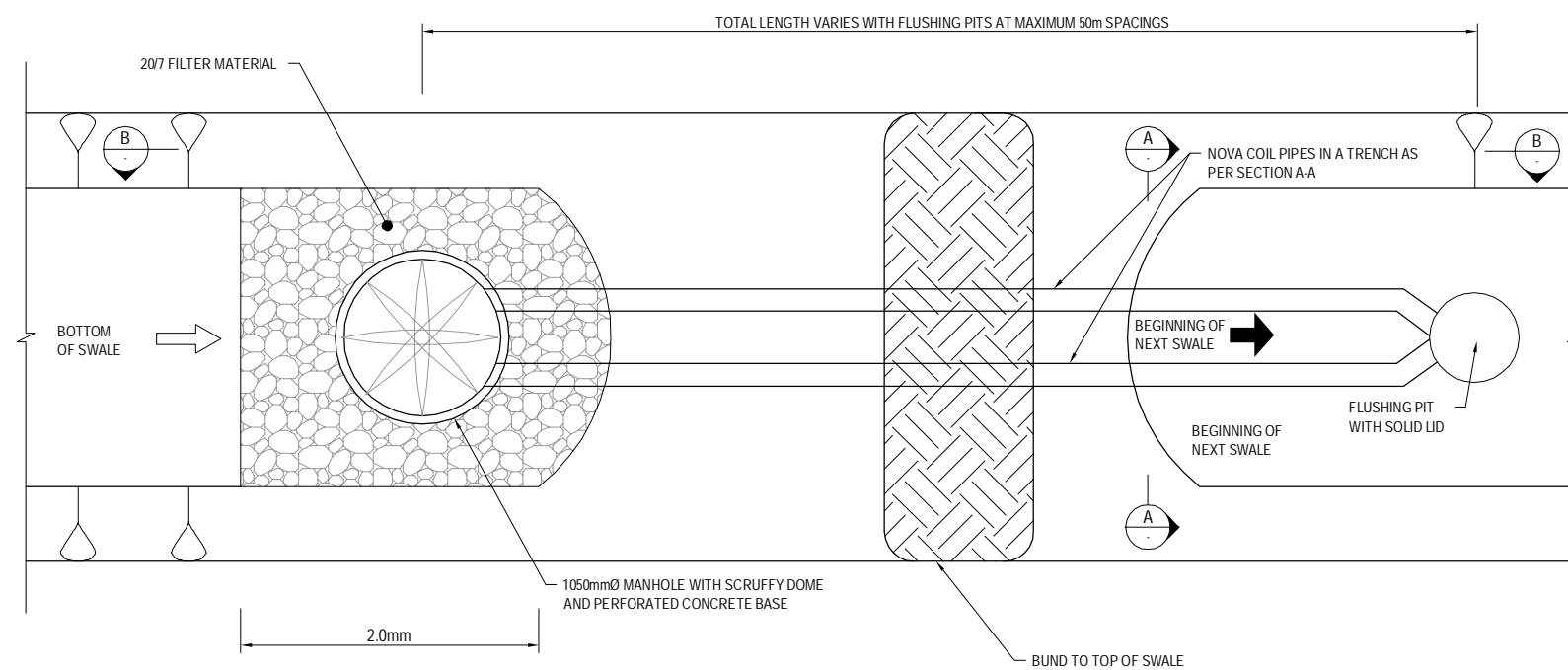
A SECTION SUBSOIL DRAINAGE CROSS SECTION
SCALE 1:50 (A3) 2m WIDTH SOAKAGE AREA



A SECTION SUBSOIL DRAINAGE CROSS SECTION
SCALE 1:50 (A3) 3m WIDTH SOAKAGE AREA



A SECTION SUBSOIL DRAINAGE CROSS SECTION
SCALE 1:50 (A3) 4m WIDTH SOAKAGE AREA



SOAK PIT DETAILS
WHERE FIRST FLUSH POND NOT REQUIRED
SCALE 1:50 (A3)

FOR CONSENT

0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AMW	DGA	CG	14.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

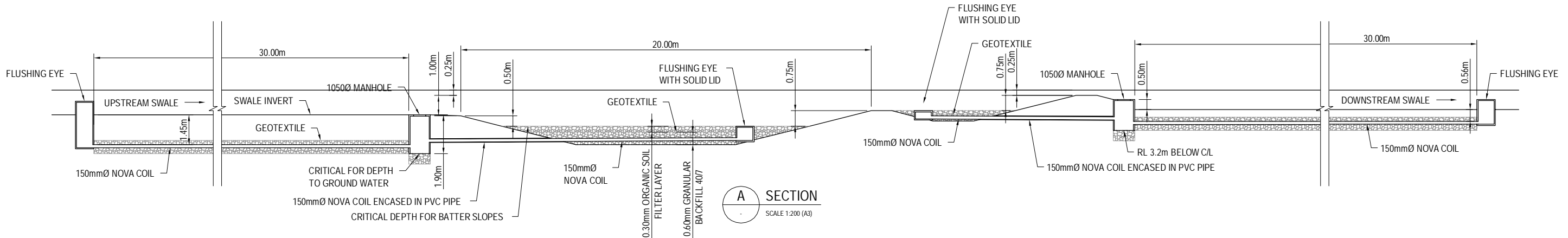
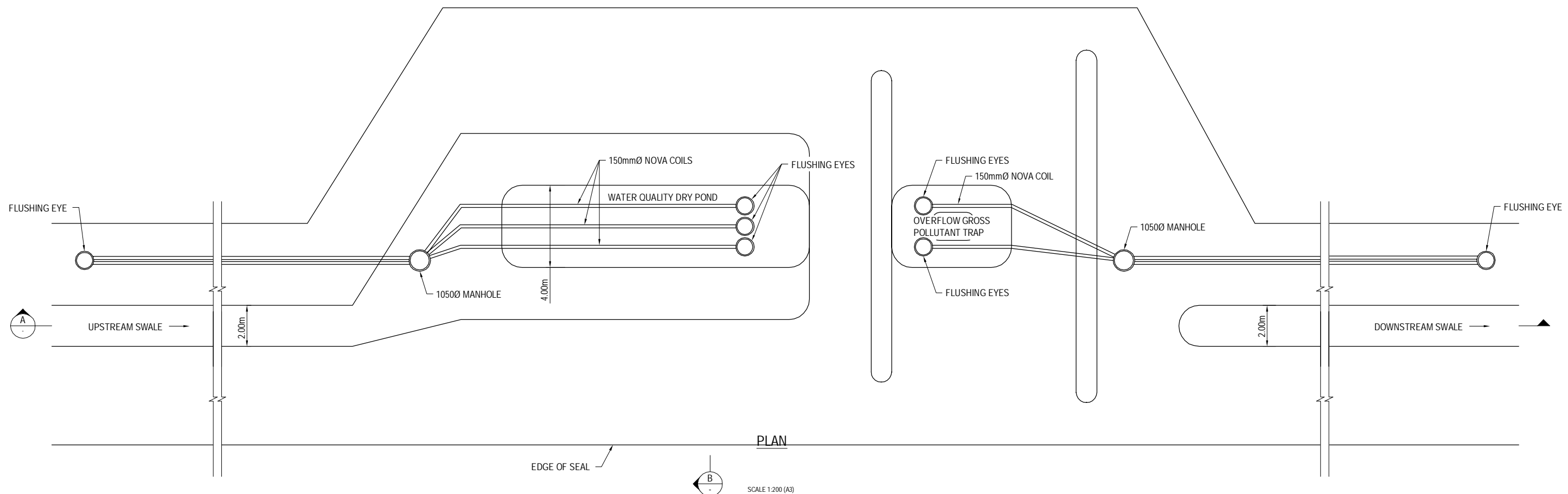


DO NOT SCALE

This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person.
This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn	AMW	Designed	TP
Drafting Check	BSE	Design Check	TM
Approved	CMG	Date	10.05.12
A1 Scale		This Drawing must not be used for Construction unless signed as Approved	
A3 Scale	1:50		

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
	Typical Drainage Details - Sheet 3 of 5
Drawing No:	62236-B-C453
Rev:	0



FOR CONSENT

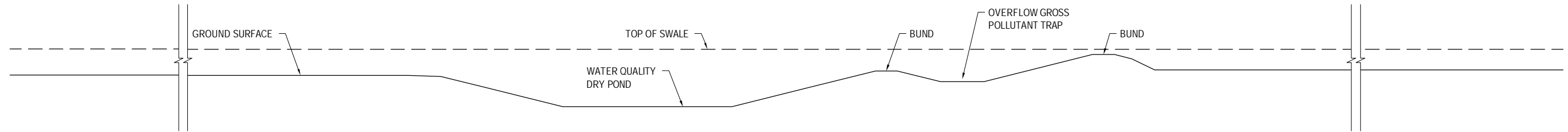
0	FOR CONSENT	ALP	DGA	GAP	16.10.12	
B	FINAL SCHEME ASSESSMENT	ALP	DGA	CMG	10.05.12	
A	FOR INFORMATION	AMW	DGA	CG	14.10.11	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



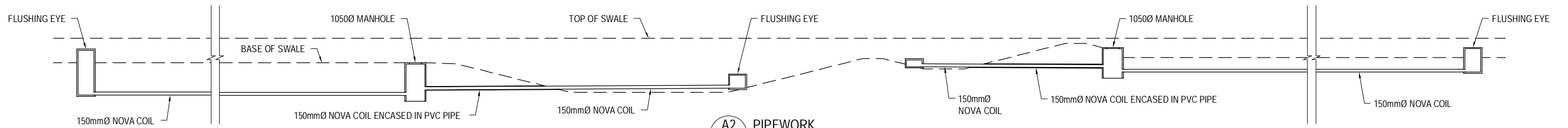
DO NOT SCALE
 This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person.
 This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfill a legal requirement.

Drawn	AMW	Designed	TP
Drafting Check	BSE	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale			
A3 Scale	1:200		

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
	TYPICAL DRAINAGE DETAILS - SHEET 4 OF 5
Drawing No:	62236-B-C454
Rev:	0



A1 GROUND SURFACE
SCALE 1:200 (A3)



A2 PIPEWORK
SCALE 1:200 (A3)

FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
0	FOR CONSENT		ALP	DGA	GAP	16.10.12
B	FINAL SCHEME ASSESSMENT		ALP	DGA	CMG	10.05.12
A	FOR INFORMATION		AMW	DGA	CG	14.10.11

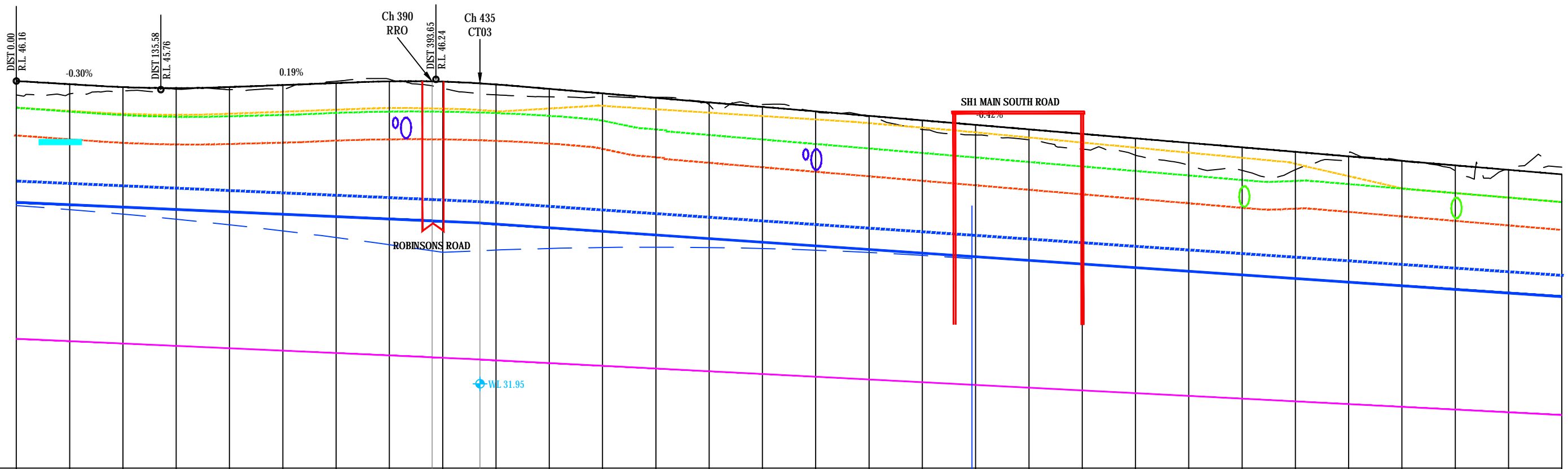


DO NOT SCALE

This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person.
This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn	AMW	Designed	TP
Drafting Check	BSE	Design Check	TM
Approved	CMG		
Date	10.05.12		
A1 Scale	A3 HALF SIZE SHOWN	This Drawing must not be used for Construction unless signed as Approved	
A3 Scale			

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
	TYPICAL DRAINAGE DETAILS - SHEET 5 OF 5
Drawing No:	62236-B-C455
Rev:	0



DESIGN SURFACE LEVELS	46.16	46.01	45.88	45.83	45.88	45.97	46.06	46.15	46.13	46.00	45.79	45.58	45.37	45.16	44.95	44.74	44.53	44.31	44.10	43.89	43.68	43.47	43.26	43.05	42.84	42.63	42.42	42.20	41.99	41.78
EXISTING SURFACE LEVELS	45.50	45.56	45.69	45.78	45.75	45.78	46.15	46.24	45.82	45.51	45.42	45.43	45.40	45.05	45.06	44.72	44.50	43.88	43.63	43.40	42.97	42.68	42.22	41.96	42.00	42.63	42.42	41.95	42.02	42.12
DISTANCE	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450
VERTICAL SCHEMATIC																														
HORIZONTAL SCHEMATIC																														

LONGITUDINAL SECTION ON CONTROL STRING MCA0
 SCALE HORIZ=1:2000 VERT=1:100 @ A1
 SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND			
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
	DESIGN ROAD CENTRELINE		STORMWATER POND *
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)
	SWALE INFILTRATION (1.3m)		STOCKWATER / DRAINAGE SIPHON *
	WL XX.XX		OVERLAND FLOW SIPHON *
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)
	1m CLEARANCE FROM HIGH WATER TABLE		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
			GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



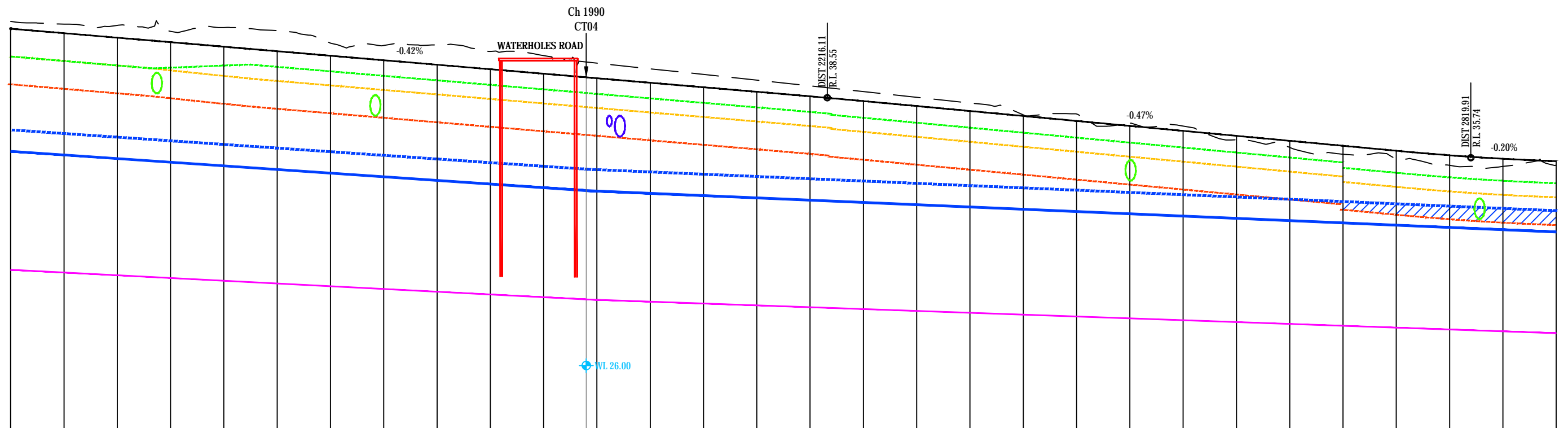
FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE	Drawn A. PORTEOUS	Designed K. ATKINS
<small>This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.</small>	Drafting TM	Design TM
	Check GAP	Check
	Approved GAP	
	Date 16.10.12	
	A1 Scale	This Drawing must not be used for Construction unless signed as Approved
	A3 Scale H: 1:4000, V: 1:200	

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS
Drawing No:	62236-B-C461
Rev:	1



DESIGN SURFACE LEVELS	41.78	41.57	41.36	41.15	40.94	40.73	40.52	40.31	40.09	39.88	39.67	39.46	39.25	39.04	38.83	38.61	38.39	38.16	37.93	37.69	37.46	37.23	37.00	36.76	36.53	36.30	36.07	35.85	35.69	35.58		
EXISTING SURFACE LEVELS	42.12	42.00	41.94	41.66	41.84	41.69	41.11	41.00	41.02	40.72	40.52	39.99.00	39.99.00	39.99.00	39.99.00	39.99.00	39.99.00	39.99.00	39.99.00	39.99.00	37.75	37.78	37.35	37.22	36.58	36.22	35.90	35.86	35.38	35.33	35.39	
DISTANCE	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900		
VERTICAL SCHEMATIC	D=449.43																P=-0.42% L=1694.80		R=280000.00 L=121.29		P=-0.47% L=478.01										R=50000.00 L=130.30	
HORIZONTAL SCHEMATIC	R=1800.00 L=1236.99																															

SCALE HORIZ=1:2000 VERT=1:100 @ A1
SCALE HORIZ=1:4000 VERT=1:200 @ A3
LONGITUDINAL SECTION ON CONTROL STRING MCA0

LEGEND					
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
	DESIGN ROAD CENTRELINE		STORMWATER POND *		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		STOCKWATER / DRAINAGE SIPHON *		OVERLAND FLOW SIPHON *
	SWALE INFILTRATION (1.3m)		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)		
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)				
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)				
	1m CLEARANCE FROM HIGH WATER TABLE				

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



FOR CONSENT

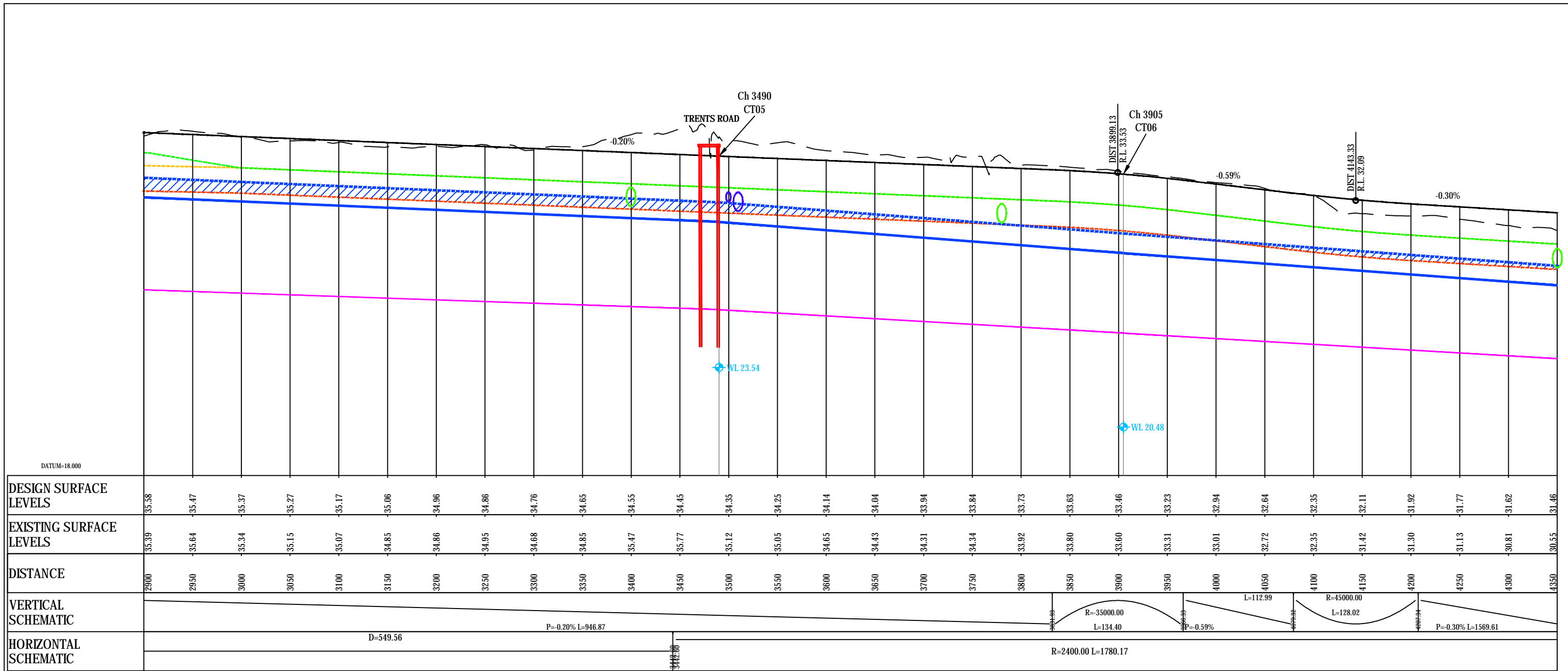
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person.
This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn	A. PORTEOUS	Designed	K. ATKINS
Drafting	TM	Design	TM
Check		Check	
Approved	GAP		
Date	16.10.12		
A1 Scale			
A3 Scale	H. 1:4000, V. 1:200		

Client	NEW ZEALAND TRANSPORT AGENCY		
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11		
Title	MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS		
Drawing No:	62236-B-C462	Rev:	1



LONGITUDINAL SECTION ON CONTROL STRING MCA0
 SCALE HORIZ=1:2000 VERT=1:100 @ A1
 SCALE HORIZ=1:4000 VERT=1:200 @ A3



LEGEND			
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
	DESIGN ROAD CENTRELINE		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	SWALE INFILTRATION (1.3m)		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		STORMWATER POND *
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		OVERLAND FLOW SIPHON *
	1m CLEARANCE FROM HIGH WATER TABLE		

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE

FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1	FOR FURTHER INFORMATION RESPONSE		JAL	TP/DGA	GAP	09.04.13
0	FOR CONSENT		ALP	DGA	GAP	16.10.12



DO NOT SCALE

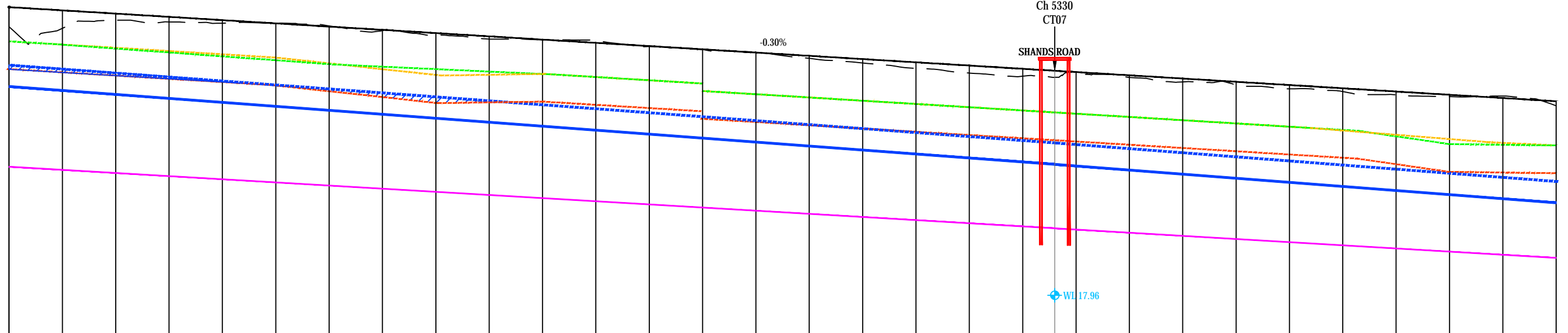
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn	A. PORTEOUS	Designed	K. ATKINS
Drafting Check	TM	Design Check	TM
Approved	GAP		
Date	16.10.12		
A1 Scale			
A3 Scale	H. 1:4000, V. 1:200		

Client **NEW ZEALAND TRANSPORT AGENCY**
 Project **SH1 REGION 11 RP350/3.92 TO RP365/2.11**
 Title **MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS**

Drawing No: **62236-B-C463**

Rev: **1**



DESIGN SURFACE LEVELS	31.46	31.31	31.16	31.01	30.86	30.70	30.55	30.40	30.25	30.10	29.94	29.79	29.64	29.49	29.33	29.18	29.03	28.88	28.73	28.57	28.42	28.27	28.12	27.97	27.81	27.66	27.51	27.36	27.21	27.05			
EXISTING SURFACE LEVELS	30.55	30.47	30.85	30.77	30.71	30.69	30.59	30.37	30.15	29.96	29.94	29.90	29.62	29.47	29.36	29.06	28.84	28.59	28.38	28.22	28.38	28.17	27.96	27.82	27.63	27.51	27.35	27.27	27.30	26.84			
DISTANCE	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800			
VERTICAL SCHEMATIC																																	
HORIZONTAL SCHEMATIC	R=2400.00 L=1780.17																	L=322.77	R=2400.00 L=630.72														

SCALE HORIZ=1:4000 VERT=1:200 @ A3
 LONGITUDINAL SECTION ON CONTROL STRING MCA0
 SCALE HORIZ=1:2000 VERT=1:100 @ A1



LEGEND					
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
	DESIGN ROAD CENTRELINE		SWALE INFILTRATION (1.3m)		STORMWATER POND *
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		STOCKWATER / DRAINAGE SIPHON *
	SWALE INFILTRATION (1.3m)		ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		OVERLAND FLOW SIPHON *
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		1m CLEARANCE FROM HIGH WATER TABLE		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE

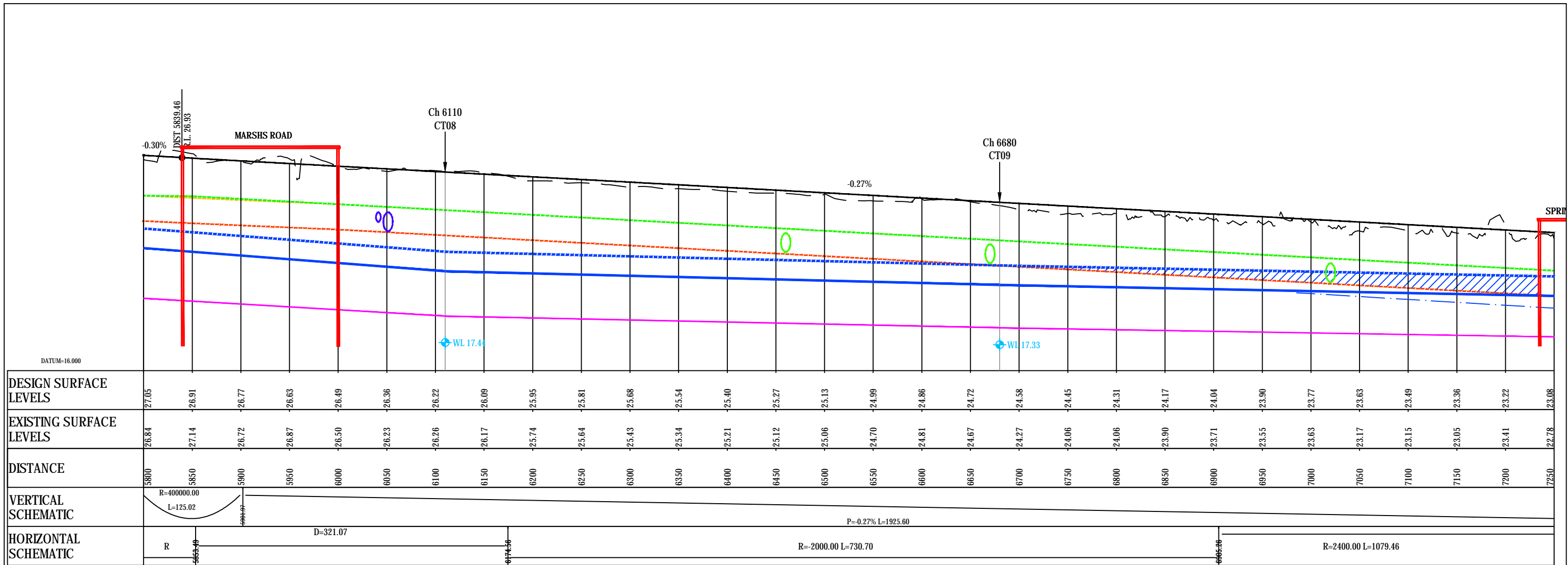
FOR CONSENT

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE	Drawn A. PORTEOUS	Designed K. ATKINS
<small>This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.</small>	Drafting Check TM	Design Check TM
	Approved GAP	
	Date 16.10.12	
	A1 Scale	This Drawing must not be used for Construction unless signed as Approved
	A3 Scale H. 1:4000, V.1:200	

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS
Drawing No:	62236-B-C464
Rev:	1



LONGITUDINAL SECTION ON CONTROL STRING MCA0

SCALE HORIZ=1:2000 VERT=1:100 @ A1
 SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND					
	EXISTING GROUND		50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)		MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
	DESIGN ROAD CENTRELINE		STORMWATER POND *		GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)		STOCKWATER / DRAINAGE SIPHON *		
	SWALE INFILTRATION (1.3m)		OVERLAND FLOW SIPHON *		
	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)		BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)		
	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)				
	1m CLEARANCE FROM HIGH WATER TABLE				

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



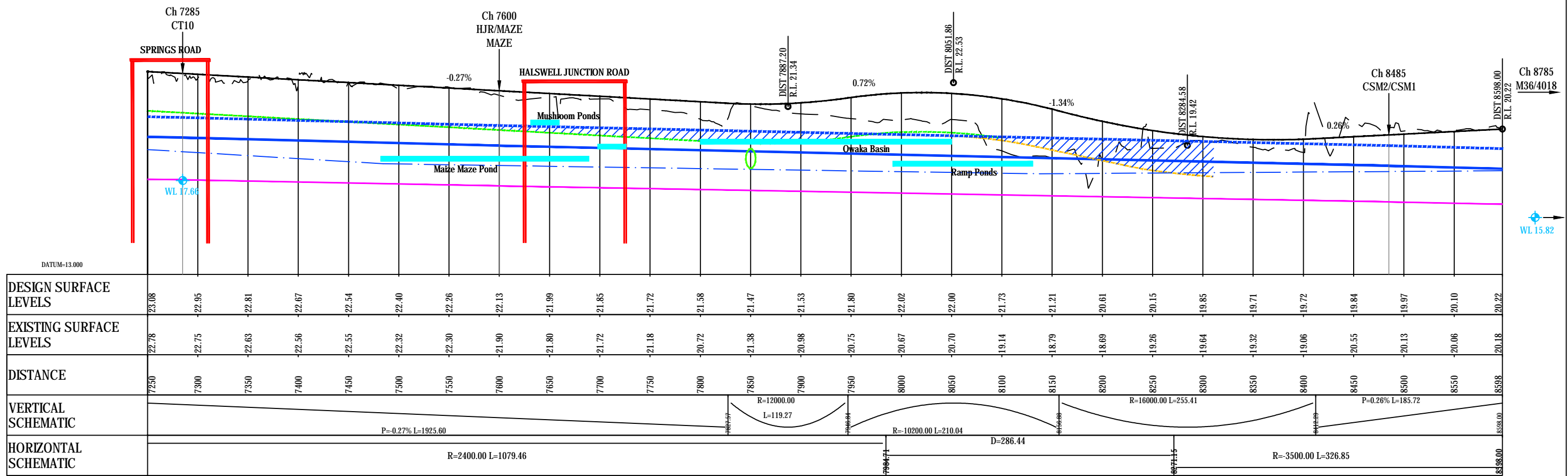
FOR CONSENT

No	Revision	Note	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE	
Drawn A. PORTEOUS	Designed K. ATKINS
Drafting Check TM	Design Check TM
Approved GAP	
Date 16.10.12	
A1 Scale	This Drawing must not be used for Construction unless signed as Approved
A3 Scale H. 1:4000, V.1:200	

Client	NEW ZEALAND TRANSPORT AGENCY
Project	SH1 REGION 11 RP350/3.92 TO RP365/2.11
Title	MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS
Drawing No:	62236-B-C465
Rev:	1



LONGITUDINAL SECTION ON CONTROL STRING MCA0
 SCALE HORIZ=1:2000 VERT=1:100 @ A1
 SCALE HORIZ=1:4000 VERT=1:200 @ A3

LEGEND		
—	EXISTING GROUND	50% PREDICTED GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)
—	DESIGN ROAD CENTRELINE	MAX GROUND WATER PROFILE WITH LOWERING STRATEGY IN PLACE. I.E. GROUNDWATER PROFILE WITH PUMPING TO MAX EXTRACTION RATE OF 100/s
—	DESIGN SWALE INVERT LEVEL (LEFT & RIGHT)	GROUND WATER PROFILE WITH GROUND WATER LOWERING STRATEGY IN PLACE. I.E. INTERCEPT GROUND WATER AND DIVERT TO UPPER KNIGHTS STREAM
—	SWALE INFILTRATION (1.3m)	
WL XX.XX	AVERAGE GROUNDWATER LEVEL JAN '11 (OBSERVED)	
—	ASSUMED HIGH GROUNDWATER LEVEL (INCL. CENTRAL PLAINS WATER ALLOWANCE)	
—	1m CLEARANCE FROM HIGH WATER TABLE	
—	STORMWATER POND *	
—	STOCKWATER / DRAINAGE SIPHON *	
—	OVERLAND FLOW SIPHON *	
—	BRIDGE STRUCTURE * (PILE DEPTH UNKNOWN)	

* SYMBOLS REFERENCED ARE DIAGRAMMATIC ONLY AND NOT TO SCALE



FOR CONSENT

No	Revision	Note	Drawn	Checked	Approved	Date
1		FOR FURTHER INFORMATION RESPONSE	JAL	TP/DGA	GAP	09.04.13
0		FOR CONSENT	ALP	DGA	GAP	16.10.12



DO NOT SCALE
 This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Drawn A. PORTEOUS
 Drafting Check TM
 Approved GAP
 Date 16.10.12
 A1 Scale
 A3 Scale H: 1:4000, V:1:200

Designed K. ATKINS
 Design Check TM
 This Drawing must not be used for Construction unless signed as Approved

Client **NEW ZEALAND TRANSPORT AGENCY**
 Project **SH1 REGION 11 RP350/3.92 TO RP365/2.11**
 Title **MAIN SOUTH ROAD FOUR LANING GROUNDWATER LONGITUDINAL SECTIONS**

Drawing No: **62236-B-C466**

Rev: **1**