APPENDIX B – CALCULATIONS

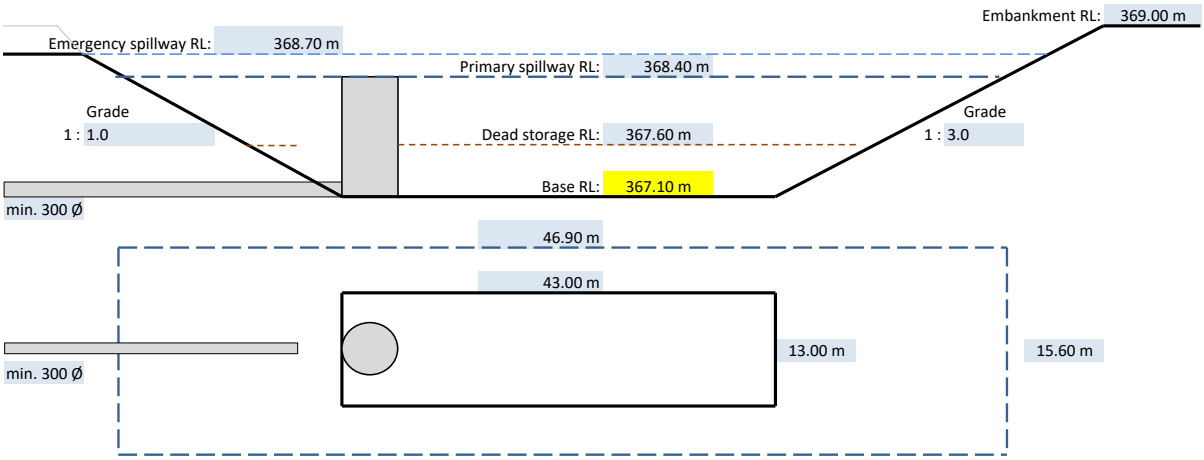
PHASE 1 SEDIMENT RETENTION POND A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	1A
Date:	29-01-26
Prepared by:	HD / MS

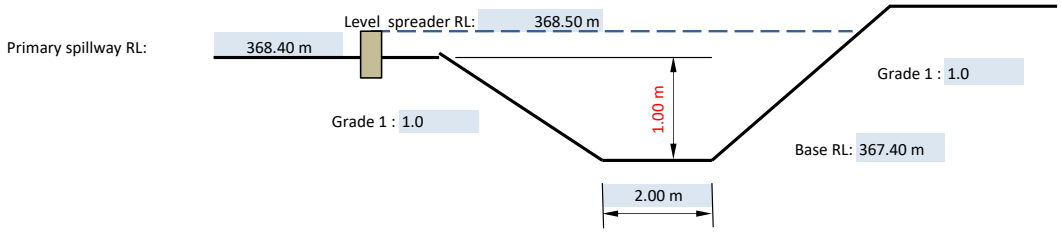
4.177

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.177
The slope gradient immediately above the proposed pond:	1 :	50
The slope length:	m	275
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	835.4
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	13.0
The adopted pond base length:	m	43.0
Pond width at the level of the primary spillway:	m	15.6
Pond length at the level of the primary spillway:	m	46.9
Length to width ratio at the level of the primary spillway:	1 :	3.0
Pond base area:	m^2	559.0
Pond area at the level of the primary spillway:	m^2	731.6
Volume of the pond below the primary spillway:	m^3	836
Dead storage volume (Lower 30% of pond volume):	m^3	251
Live storage volume (Upper 70% of pond volume):	m^3	585
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	44.50
Pond width at the dead storage height:	m	14.00
Pond area at the dead storage height:	m^2	623.00
Volume below the dead storage height:	m^3	295.36
Volume below the dead storage height minus the dead storage volume:	m^3	44.43
Decant structure details		
Required decant rate:	l/s	12.53
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.787
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.29
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	13.6
Forebay volume:	m^3	44
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.584
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



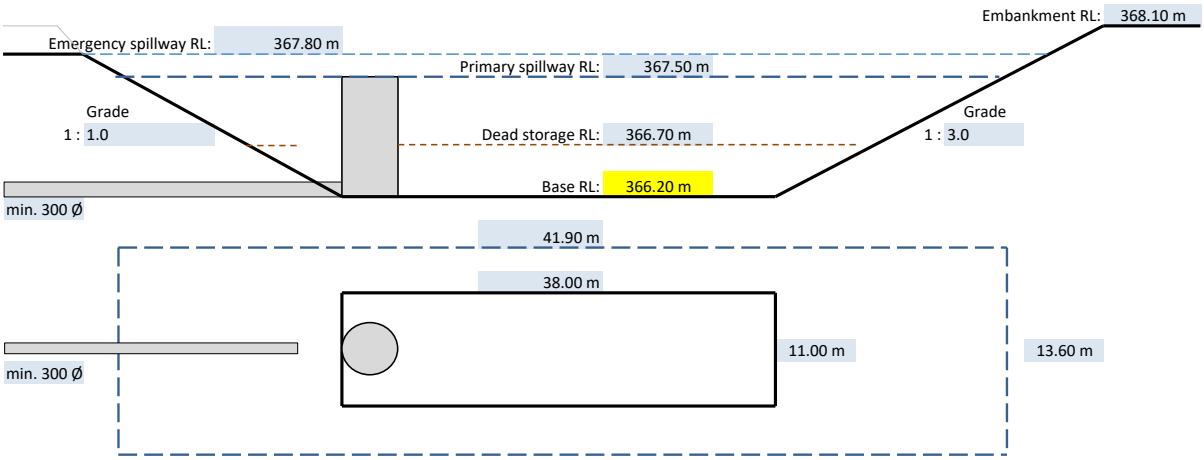
PHASE 1 SEDIMENT RETENTION POND B DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	1B
Date:	29-01-26
Prepared by:	HD / MS

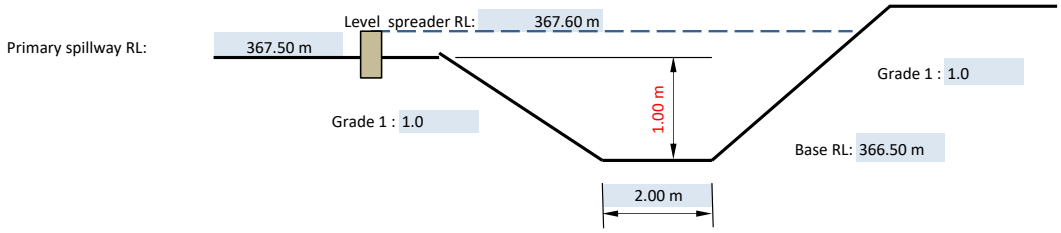
3.067

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	3.067
The slope gradient immediately above the proposed pond:	1 :	100
The slope length:	m	264
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	613.4
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	11.0
The adopted pond base length:	m	38.0
Pond width at the level of the primary spillway:	m	13.6
Pond length at the level of the primary spillway:	m	41.9
Length to width ratio at the level of the primary spillway:	1 :	3.1
Pond base area:	m^2	418.0
Pond area at the level of the primary spillway:	m^2	569.8
Volume of the pond below the primary spillway:	m^3	640
Dead storage volume (Lower 30% of pond volume):	m^3	192
Live storage volume (Upper 70% of pond volume):	m^3	448
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	39.50
Pond width at the dead storage height:	m	12.00
Pond area at the dead storage height:	m^2	474.00
Volume below the dead storage height:	m^3	222.85
Volume below the dead storage height minus the dead storage volume:	m^3	30.99
Decant structure details		
Required decant rate:	l/s	9.20
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.578
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.23
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	11.6
Forebay volume:	m^3	38
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.429
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



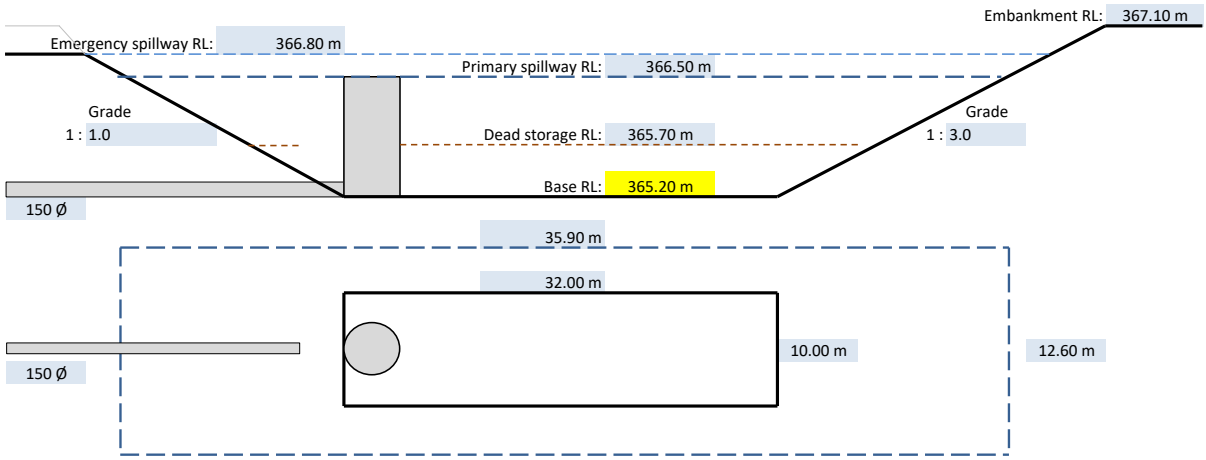
PHASE 2 SEDIMENT RETENTION POND A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	2A
Date:	29-11-26
Prepared by:	HD / MS

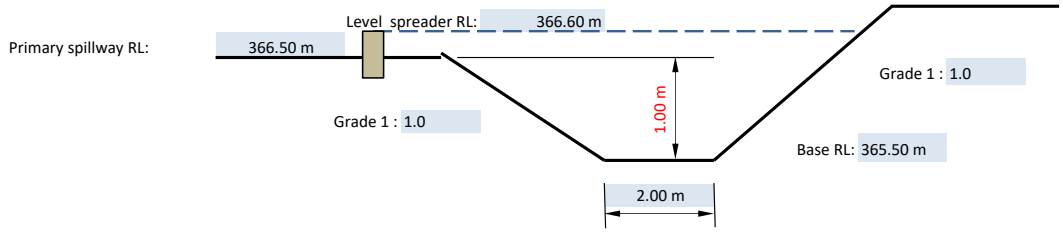
2.466

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	2.466
The slope gradient immediately above the proposed pond:	1 :	50
The slope length:	m	136
The average slope gradient over the whole catchment:	1 :	50
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	493.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	10.0
The adopted pond base length:	m	32.0
Pond width at the level of the primary spillway:	m	12.6
Pond length at the level of the primary spillway:	m	35.9
Length to width ratio at the level of the primary spillway:	1 :	2.8
Pond base area:	m^2	320.0
Pond area at the level of the primary spillway:	m^2	452.3
Volume of the pond below the primary spillway:	m^3	500
Dead storage volume (Lower 30% of pond volume):	m^3	150
Live storage volume (Upper 70% of pond volume):	m^3	350
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	33.50
Pond width at the dead storage height:	m	11.00
Pond area at the dead storage height:	m^2	368.50
Volume below the dead storage height:	m^3	171.98
Volume below the dead storage height minus the dead storage volume:	m^3	22.12
Decant structure details		
Required decant rate:	l/s	7.40
What is the catchment size?	ha	>3
Outlet pipe size:	mm	150 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.464
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.20
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	10.6
Forebay volume:	m^3	35
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.345
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



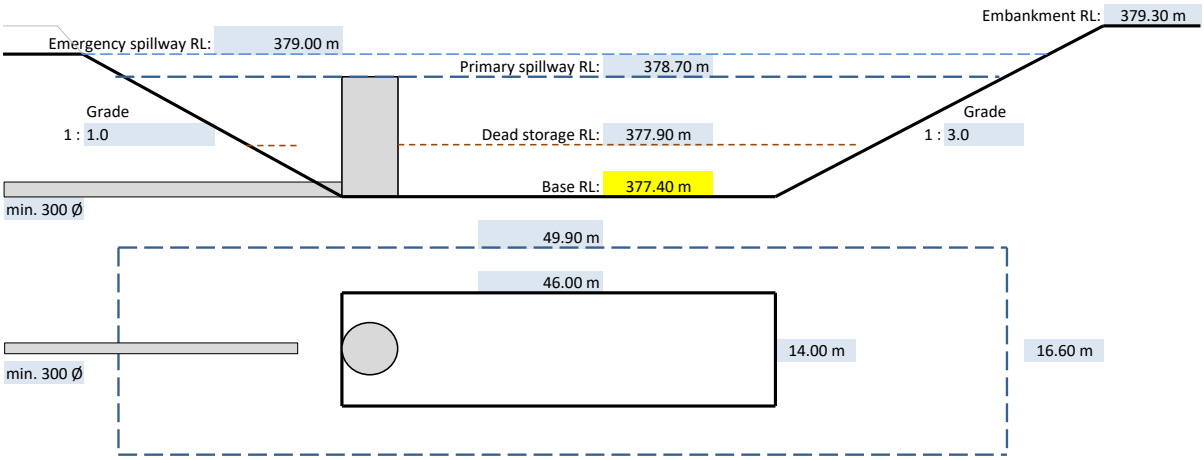
PHASE 2 SEDIMENT RETENTION POND B DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	2B
Date:	29-01-26
Prepared by:	HD / MS

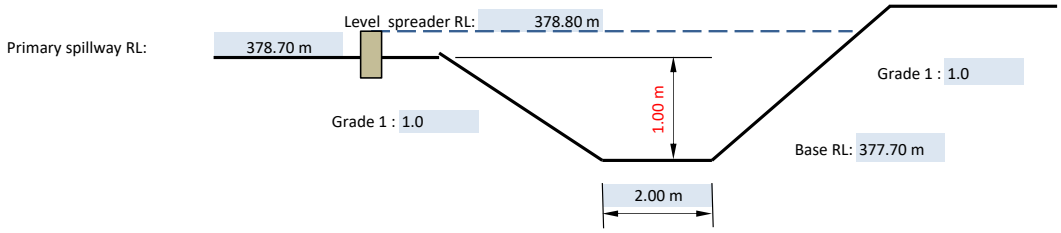
4.705

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.705
The slope gradient immediately above the proposed pond:	1 :	50
The slope length:	m	437
The average slope gradient over the whole catchment:	1 :	30
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	941
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	46.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	49.9
Length to width ratio at the level of the primary spillway:	1 :	3.0
Pond base area:	m^2	644.0
Pond area at the level of the primary spillway:	m^2	828.3
Volume of the pond below the primary spillway:	m^3	955
Dead storage volume (Lower 30% of pond volume):	m^3	286
Live storage volume (Upper 70% of pond volume):	m^3	668
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	47.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	712.50
Volume below the dead storage height:	m^3	338.98
Volume below the dead storage height minus the dead storage volume:	m^3	52.63
Decant structure details		
Required decant rate:	l/s	14.12
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.886
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.31
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.658
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



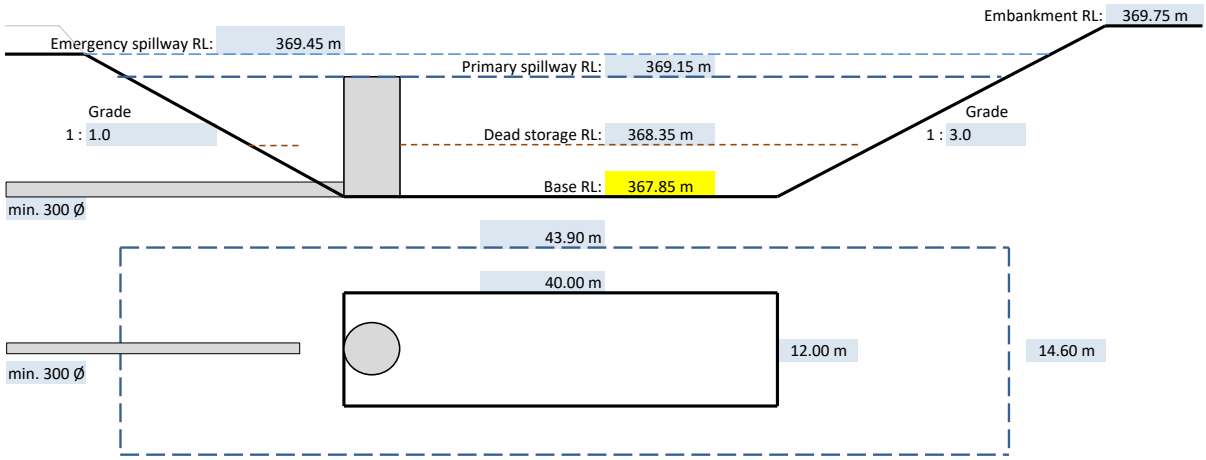
PHASE 2 SEDIMENT RETENTION POND C DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	2C
Date:	29-01-26
Prepared by:	HD / MS

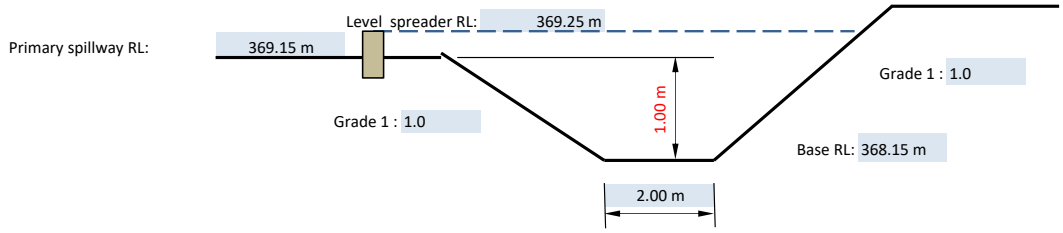
3.634

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	3.634
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	437
The average slope gradient over the whole catchment:	1 :	20
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	726.8
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	12.0
The adopted pond base length:	m	40.0
Pond width at the level of the primary spillway:	m	14.6
Pond length at the level of the primary spillway:	m	43.9
Length to width ratio at the level of the primary spillway:	1 :	3.0
Pond base area:	m^2	480.0
Pond area at the level of the primary spillway:	m^2	640.9
Volume of the pond below the primary spillway:	m^3	726
Dead storage volume (Lower 30% of pond volume):	m^3	218
Live storage volume (Upper 70% of pond volume):	m^3	508
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	41.50
Pond width at the dead storage height:	m	13.00
Pond area at the dead storage height:	m^2	539.50
Volume below the dead storage height:	m^3	254.73
Volume below the dead storage height minus the dead storage volume:	m^3	36.90
Decant structure details		
Required decant rate:	l/s	10.90
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.684
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.26
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	12.6
Forebay volume:	m^3	41
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.508
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



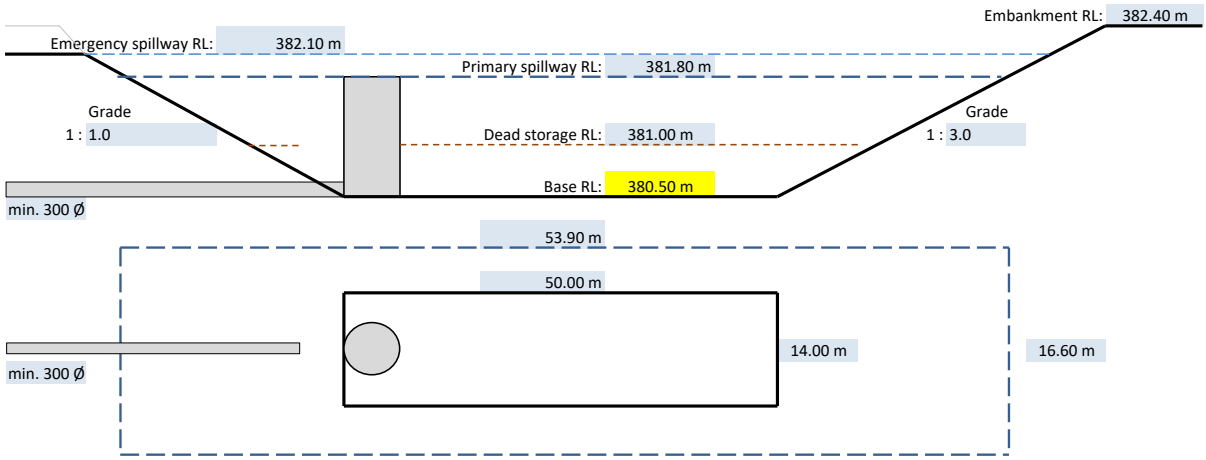
PHASE 3 SEDIMENT RETENTION POND A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	3A
Date:	29-01-26
Prepared by:	HD / MS

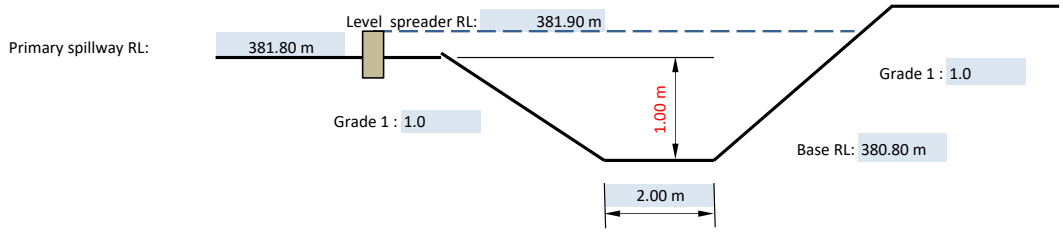
5.081

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	5.081
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	424
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	1016.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	50.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	53.9
Length to width ratio at the level of the primary spillway:	1 :	3.2
Pond base area:	m^2	700.0
Pond area at the level of the primary spillway:	m^2	894.7
Volume of the pond below the primary spillway:	m^3	1034
Dead storage volume (Lower 30% of pond volume):	m^3	310
Live storage volume (Upper 70% of pond volume):	m^3	724
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	51.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	772.50
Volume below the dead storage height:	m^3	367.98
Volume below the dead storage height minus the dead storage volume:	m^3	57.78
Decant structure details		
Required decant rate:	l/s	15.24
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.957
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.33
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.710
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



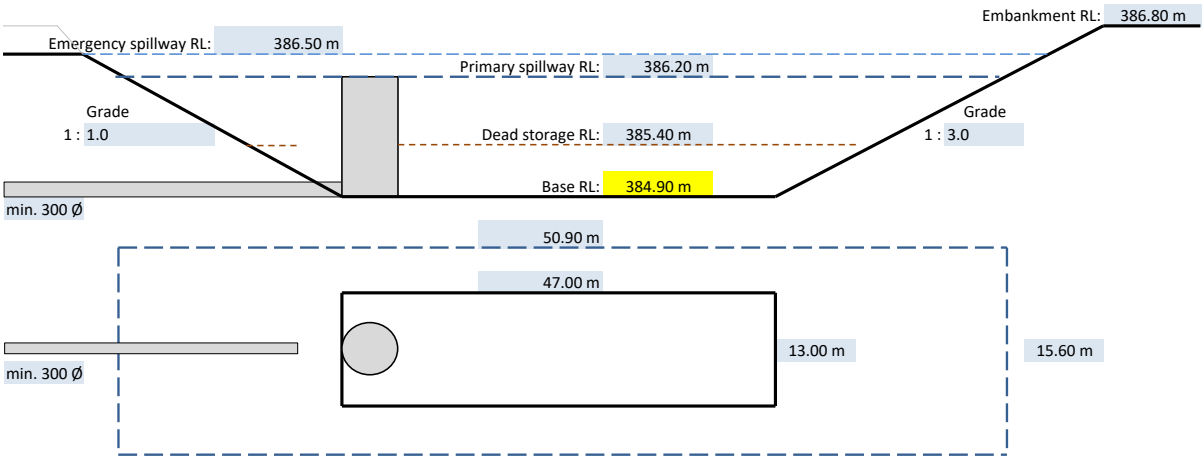
PHASE 3 SEDIMENT RETENTION POND B DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	3B
Date:	29-01-26
Prepared by:	HD / MS

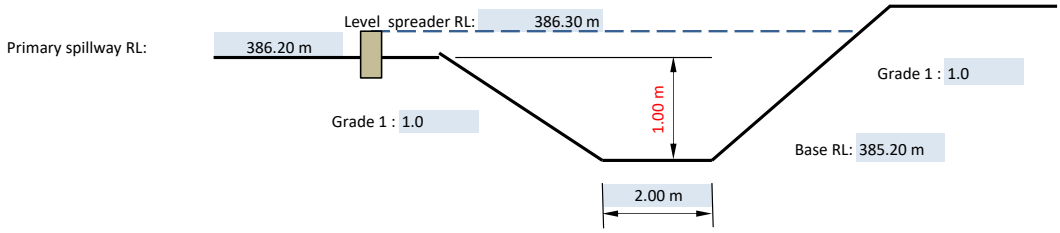
4.531

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.531
The slope gradient immediately above the proposed pond:	1 :	12.5
The slope length:	m	230
The average slope gradient over the whole catchment:	1 :	8
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	906.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	13.0
The adopted pond base length:	m	47.0
Pond width at the level of the primary spillway:	m	15.6
Pond length at the level of the primary spillway:	m	50.9
Length to width ratio at the level of the primary spillway:	1 :	3.3
Pond base area:	m^2	611.0
Pond area at the level of the primary spillway:	m^2	794.0
Volume of the pond below the primary spillway:	m^3	911
Dead storage volume (Lower 30% of pond volume):	m^3	273
Live storage volume (Upper 70% of pond volume):	m^3	637
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	48.50
Pond width at the dead storage height:	m	14.00
Pond area at the dead storage height:	m^2	679.00
Volume below the dead storage height:	m^3	322.35
Volume below the dead storage height minus the dead storage volume:	m^3	49.15
Decant structure details		
Required decant rate:	l/s	13.59
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.853
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.30
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	13.6
Forebay volume:	m^3	44
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.634
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



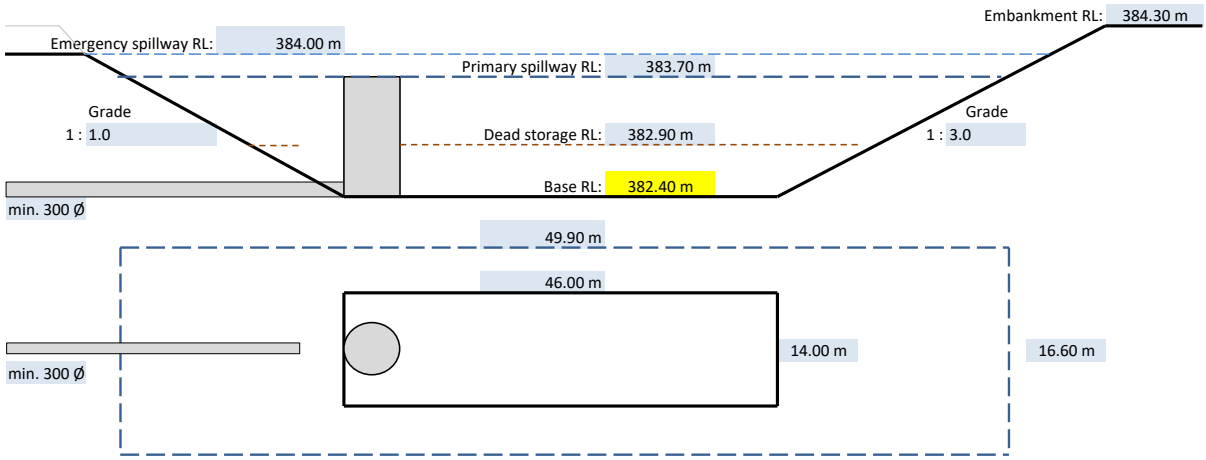
PHASE 3 SEDIMENT RETENTION POND C DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	3C
Date:	29-01-26
Prepared by:	HD / MS

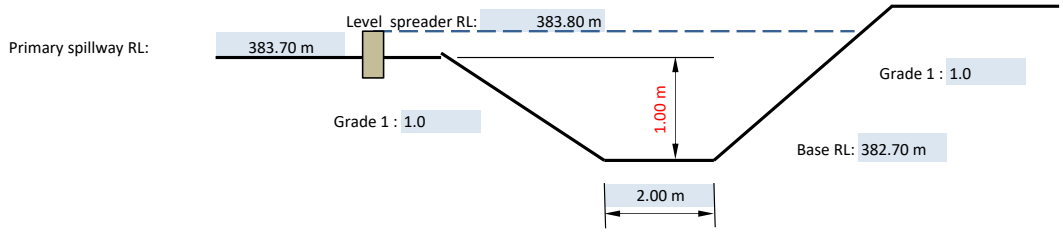
4.741

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.741
The slope gradient immediately above the proposed pond:	1 :	12.5
The slope length:	m	238
The average slope gradient over the whole catchment:	1 :	8
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	948.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	46.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	49.9
Length to width ratio at the level of the primary spillway:	1 :	3.0
Pond base area:	m^2	644.0
Pond area at the level of the primary spillway:	m^2	828.3
Volume of the pond below the primary spillway:	m^3	955
Dead storage volume (Lower 30% of pond volume):	m^3	286
Live storage volume (Upper 70% of pond volume):	m^3	668
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	47.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	712.50
Volume below the dead storage height:	m^3	338.98
Volume below the dead storage height minus the dead storage volume:	m^3	52.63
Decant structure details		
Required decant rate:	l/s	14.22
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.893
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.31
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.663
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



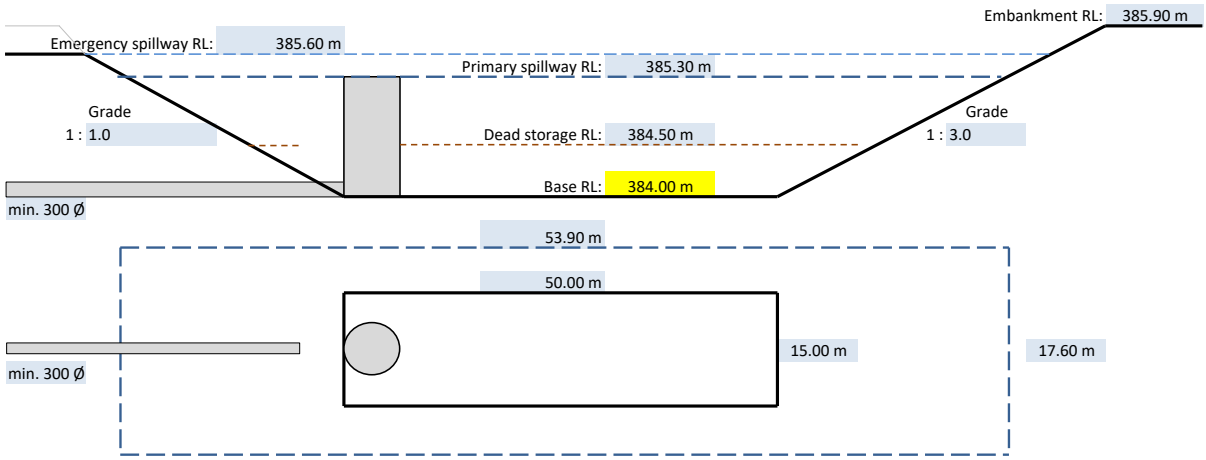
PHASE 3 SEDIMENT RETENTION POND D DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	3D
Date:	29-01-26
Prepared by:	HD / MS

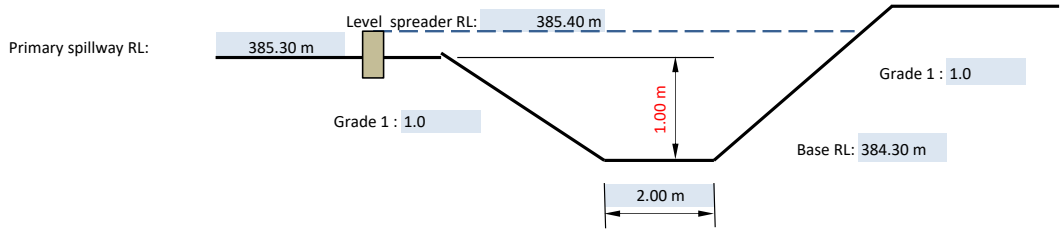
5.10

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	5.101
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	451
The average slope gradient over the whole catchment:	1 :	20
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	1020.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	15.0
The adopted pond base length:	m	48.0
Pond width at the level of the primary spillway:	m	17.6
Pond length at the level of the primary spillway:	m	51.9
Length to width ratio at the level of the primary spillway:	1 :	3.1
Pond base area:	m^2	720.0
Pond area at the level of the primary spillway:	m^2	913.4
Volume of the pond below the primary spillway:	m^3	1059
Dead storage volume (Lower 30% of pond volume):	m^3	318
Live storage volume (Upper 70% of pond volume):	m^3	741
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	49.50
Pond width at the dead storage height:	m	16.00
Pond area at the dead storage height:	m^2	729.00
Volume below the dead storage height:	m^3	377.86
Volume below the dead storage height minus the dead storage volume:	m^3	60.08
Decant structure details		
Required decant rate:	l/s	15.30
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.961
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.33
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	15.6
Forebay volume:	m^3	49
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.713
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



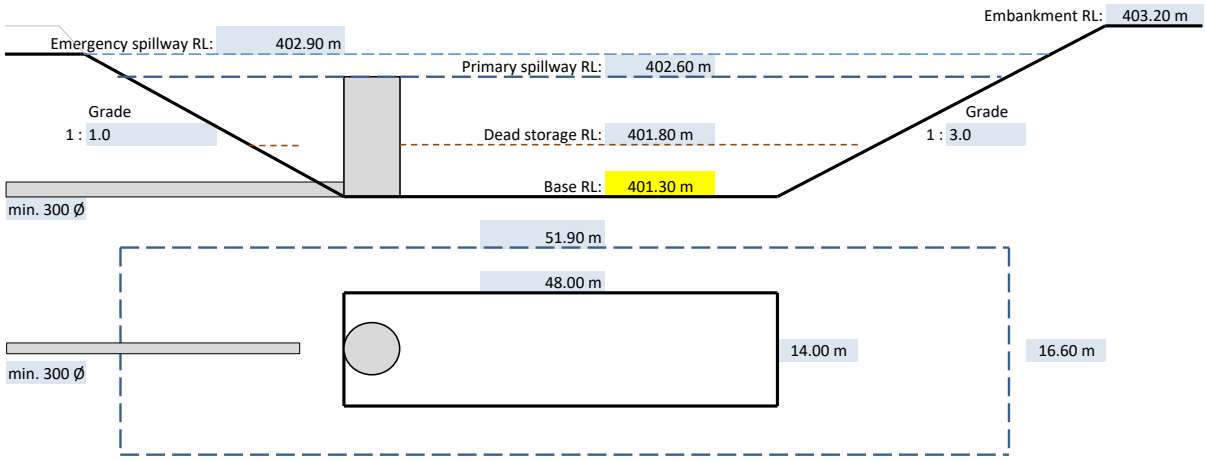
PHASE 4 SEDIMENT RETENTION POND A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4A
Date:	29-01-26
Prepared by:	HD / MS

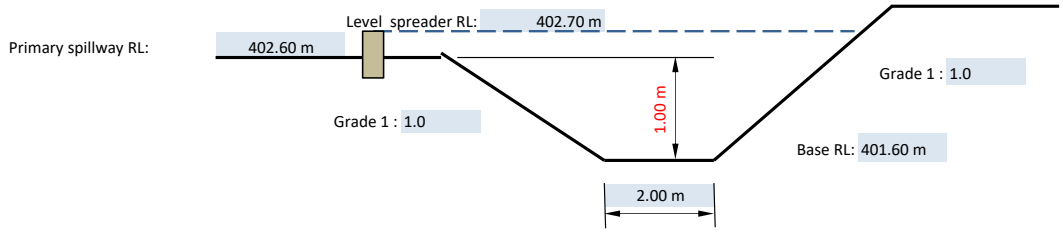
4.954

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.954
The slope gradient immediately above the proposed pond:	1 :	50
The slope length:	m	364
The average slope gradient over the whole catchment:	1 :	30
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	990.8
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	48.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	51.9
Length to width ratio at the level of the primary spillway:	1 :	3.1
Pond base area:	m^2	672.0
Pond area at the level of the primary spillway:	m^2	861.5
Volume of the pond below the primary spillway:	m^3	994
Dead storage volume (Lower 30% of pond volume):	m^3	298
Live storage volume (Upper 70% of pond volume):	m^3	696
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	49.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	742.50
Volume below the dead storage height:	m^3	353.48
Volume below the dead storage height minus the dead storage volume:	m^3	55.20
Decant structure details		
Required decant rate:	l/s	14.86
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.933
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.32
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.693
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



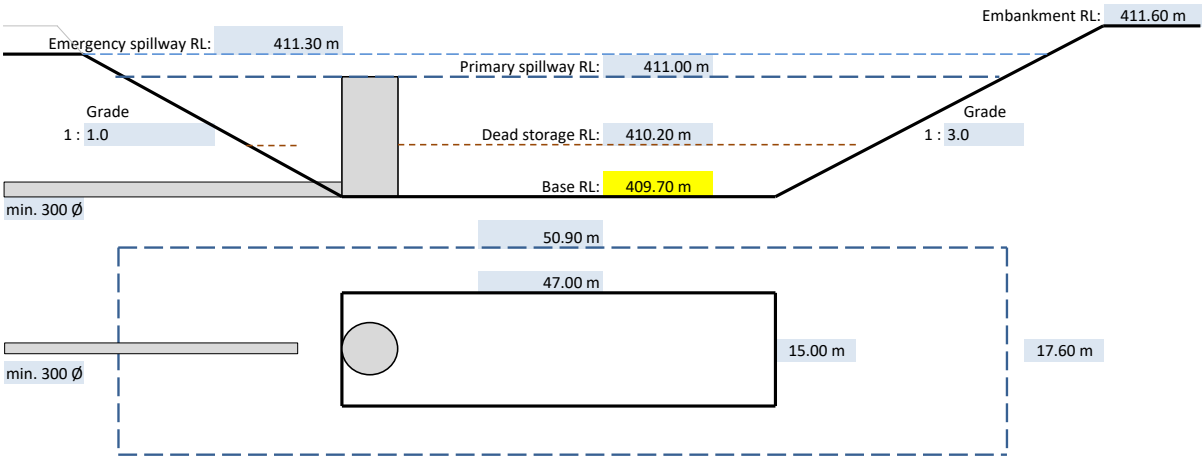
PHASE 4 SEDIMENT RETENTION POND B DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4B
Date:	29-01-26
Prepared by:	HD / MS

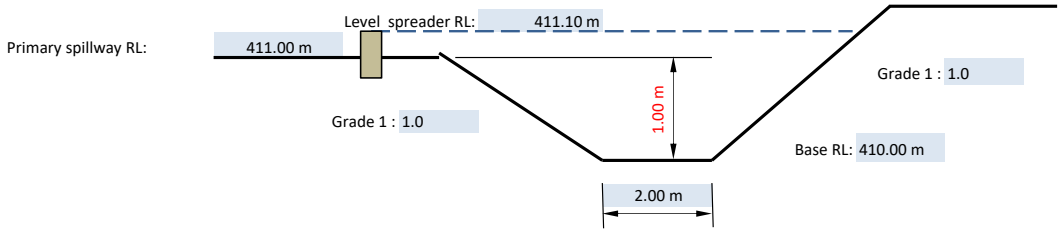
5.124

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	5.124
The slope gradient immediately above the proposed pond:	1 :	50
The slope length:	m	355
The average slope gradient over the whole catchment:	1 :	50
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	1024.8
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	15.0
The adopted pond base length:	m	47.0
Pond width at the level of the primary spillway:	m	17.6
Pond length at the level of the primary spillway:	m	50.9
Length to width ratio at the level of the primary spillway:	1 :	2.9
Pond base area:	m^2	705.0
Pond area at the level of the primary spillway:	m^2	895.8
Volume of the pond below the primary spillway:	m^3	1038
Dead storage volume (Lower 30% of pond volume):	m^3	311
Live storage volume (Upper 70% of pond volume):	m^3	727
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	48.50
Pond width at the dead storage height:	m	16.00
Pond area at the dead storage height:	m^2	776.00
Volume below the dead storage height:	m^3	370.11
Volume below the dead storage height minus the dead storage volume:	m^3	58.69
Decant structure details		
Required decant rate:	l/s	15.37
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.965
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.33
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	15.6
Forebay volume:	m^3	49
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.717
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



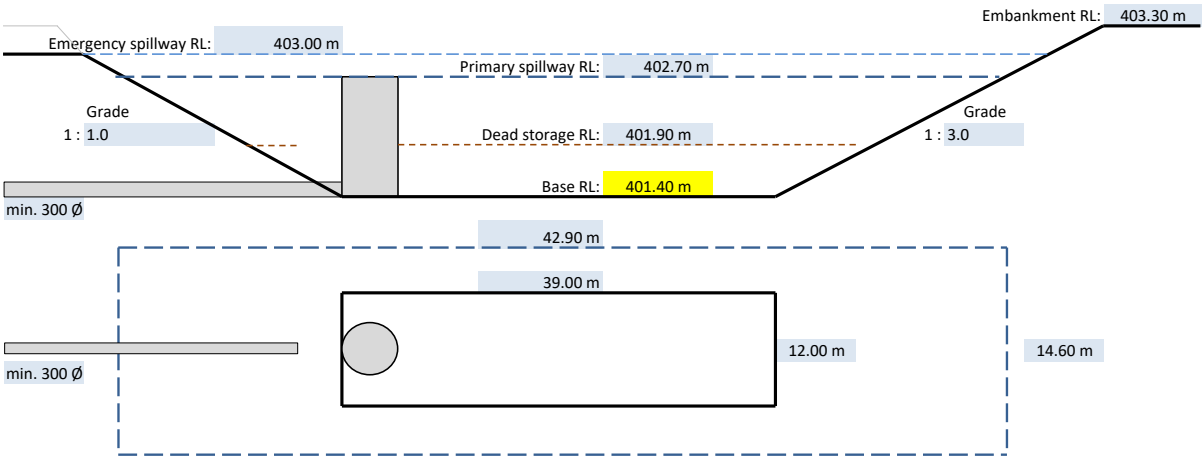
PHASE 4 SEDIMENT RETENTION POND C DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4C
Date:	29-01-26
Prepared by:	HD / MS

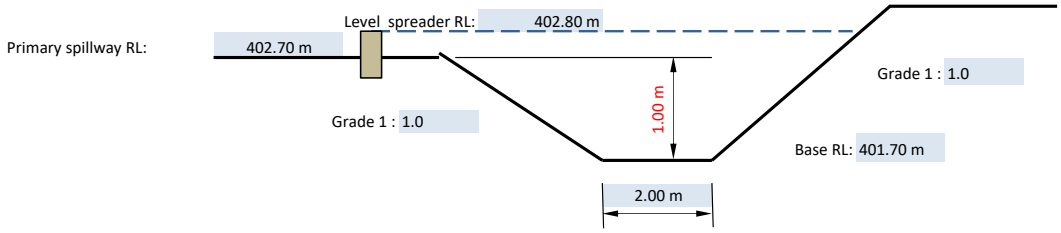
3.491

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	3.491
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	297
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	698.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	12.0
The adopted pond base length:	m	39.0
Pond width at the level of the primary spillway:	m	14.6
Pond length at the level of the primary spillway:	m	42.9
Length to width ratio at the level of the primary spillway:	1 :	2.9
Pond base area:	m^2	468.0
Pond area at the level of the primary spillway:	m^2	626.3
Volume of the pond below the primary spillway:	m^3	709
Dead storage volume (Lower 30% of pond volume):	m^3	213
Live storage volume (Upper 70% of pond volume):	m^3	496
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	40.50
Pond width at the dead storage height:	m	13.00
Pond area at the dead storage height:	m^2	526.50
Volume below the dead storage height:	m^3	248.48
Volume below the dead storage height minus the dead storage volume:	m^3	35.83
Decant structure details		
Required decant rate:	l/s	10.47
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.657
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.25
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	12.6
Forebay volume:	m^3	41
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.488
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



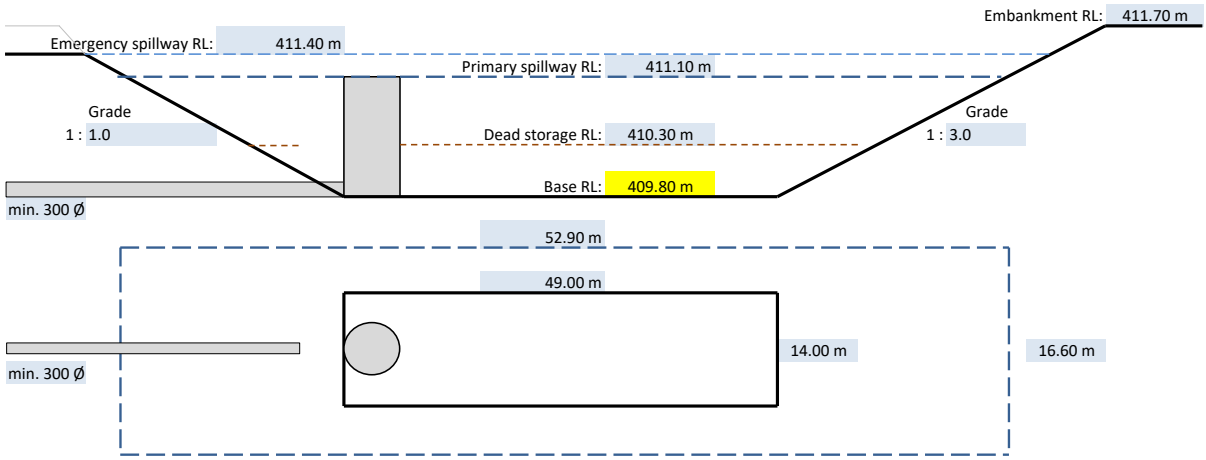
PHASE 4 SEDIMENT RETENTION POND C DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4D
Date:	29-01-26
Prepared by:	HD / MS

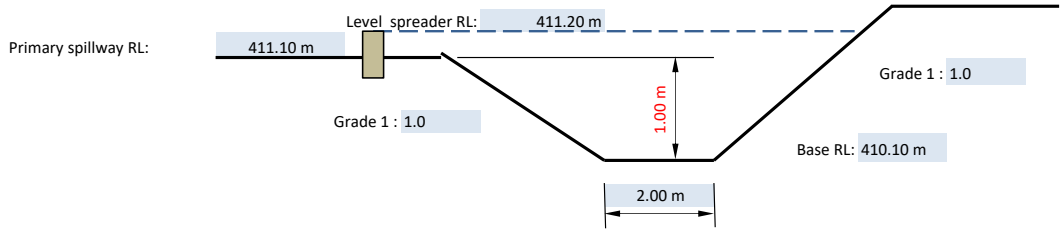
4.993

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.993
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	384
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	998.6
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	49.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	52.9
Length to width ratio at the level of the primary spillway:	1 :	3.2
Pond base area:	m^2	686.0
Pond area at the level of the primary spillway:	m^2	878.1
Volume of the pond below the primary spillway:	m^3	1014
Dead storage volume (Lower 30% of pond volume):	m^3	304
Live storage volume (Upper 70% of pond volume):	m^3	710
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	50.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	757.50
Volume below the dead storage height:	m^3	360.73
Volume below the dead storage height minus the dead storage volume:	m^3	56.49
Decant structure details		
Required decant rate:	l/s	14.98
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.940
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.32
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.698
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



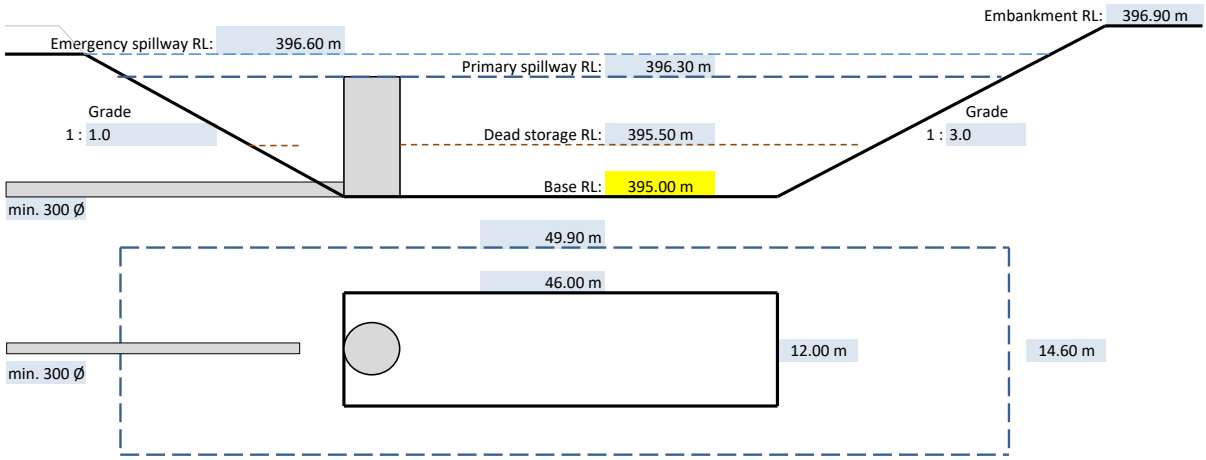
PHASE 4 SEDIMENT RETENTION POND E DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4E
Date:	29-01-26
Prepared by:	HD / MS

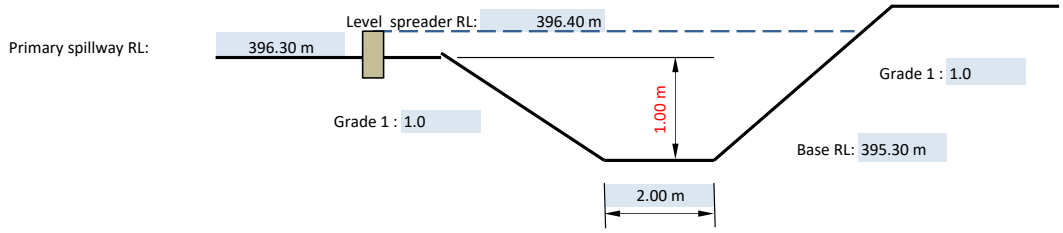
4.15

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.15
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	222
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	830
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	12.0
The adopted pond base length:	m	46.0
Pond width at the level of the primary spillway:	m	14.6
Pond length at the level of the primary spillway:	m	49.9
Length to width ratio at the level of the primary spillway:	1 :	3.4
Pond base area:	m^2	552.0
Pond area at the level of the primary spillway:	m^2	728.5
Volume of the pond below the primary spillway:	m^3	830
Dead storage volume (Lower 30% of pond volume):	m^3	249
Live storage volume (Upper 70% of pond volume):	m^3	581
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	47.50
Pond width at the dead storage height:	m	13.00
Pond area at the dead storage height:	m^2	617.50
Volume below the dead storage height:	m^3	292.22
Volume below the dead storage height minus the dead storage volume:	m^3	43.31
Decant structure details		
Required decant rate:	l/s	12.45
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.782
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.29
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	12.6
Forebay volume:	m^3	41
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.580
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



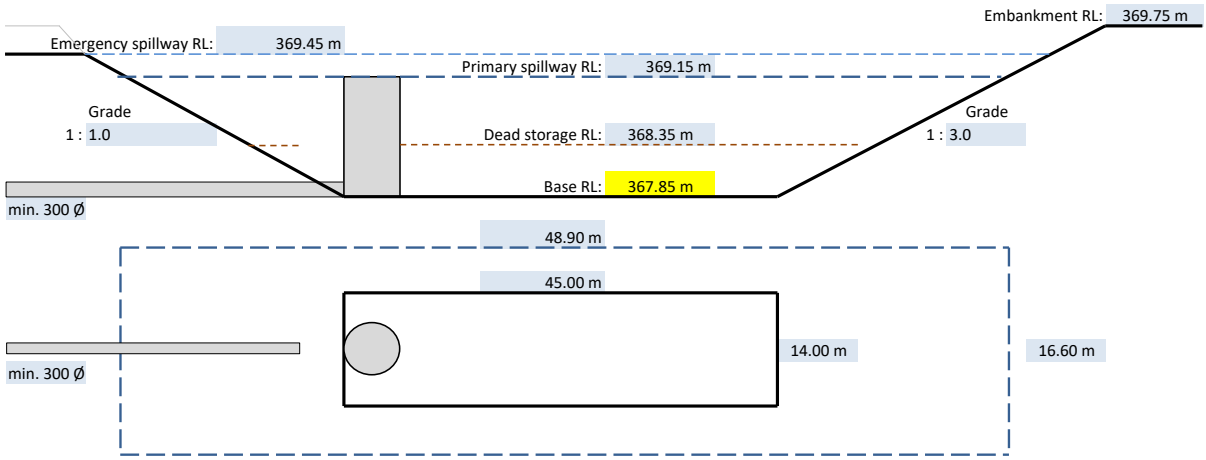
PHASE 4 RETENTION POND F DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	4F
Date:	29-01-26
Prepared by:	HD / MS

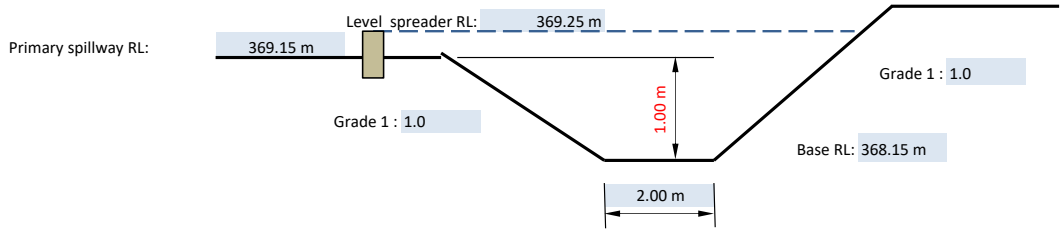
4.59

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.59
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	460
The average slope gradient over the whole catchment:	1 :	15
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	918
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	45.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	48.9
Length to width ratio at the level of the primary spillway:	1 :	2.9
Pond base area:	m^2	630.0
Pond area at the level of the primary spillway:	m^2	811.7
Volume of the pond below the primary spillway:	m^3	935
Dead storage volume (Lower 30% of pond volume):	m^3	280
Live storage volume (Upper 70% of pond volume):	m^3	654
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	46.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	697.50
Volume below the dead storage height:	m^3	331.73
Volume below the dead storage height minus the dead storage volume:	m^3	51.34
Decant structure details		
Required decant rate:	l/s	13.77
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.864
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.31
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.642
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



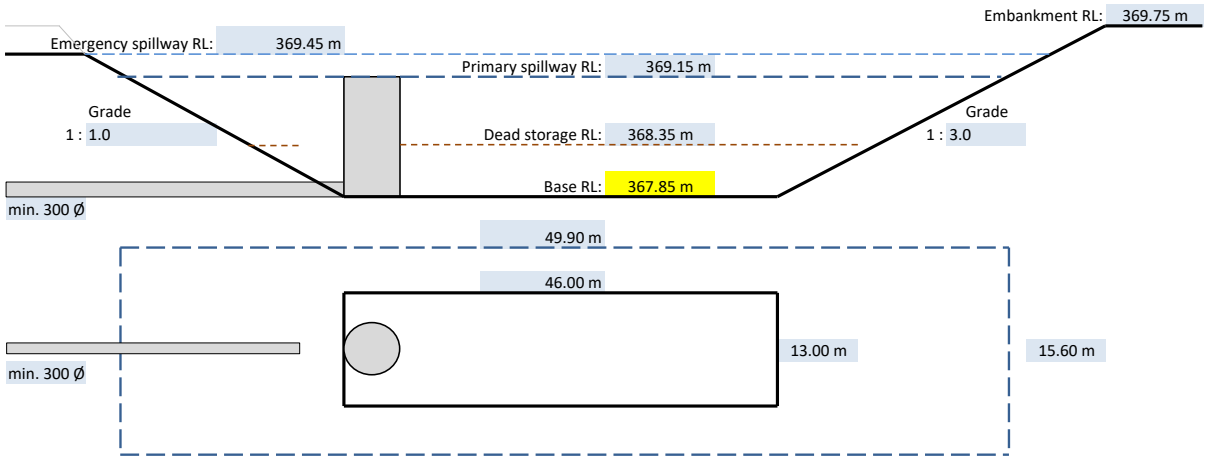
PHASE 5 SEDIMENT RETENTION POND A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	5A
Date:	29-01-26
Prepared by:	HD / MS

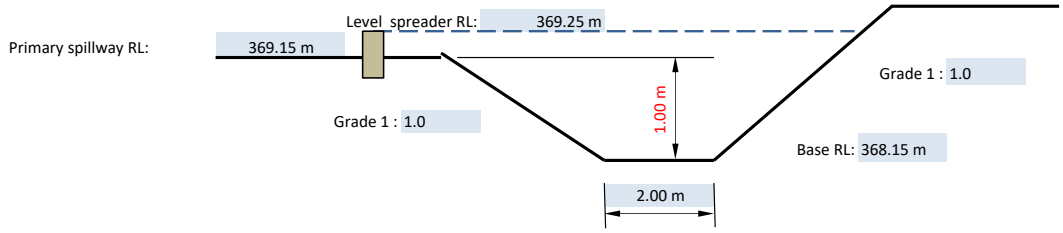
4.412

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.412
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	348
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	882.4
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	13.0
The adopted pond base length:	m	46.0
Pond width at the level of the primary spillway:	m	15.6
Pond length at the level of the primary spillway:	m	49.9
Length to width ratio at the level of the primary spillway:	1 :	3.2
Pond base area:	m^2	598.0
Pond area at the level of the primary spillway:	m^2	778.4
Volume of the pond below the primary spillway:	m^3	892
Dead storage volume (Lower 30% of pond volume):	m^3	268
Live storage volume (Upper 70% of pond volume):	m^3	624
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	47.50
Pond width at the dead storage height:	m	14.00
Pond area at the dead storage height:	m^2	665.00
Volume below the dead storage height:	m^3	315.60
Volume below the dead storage height minus the dead storage volume:	m^3	47.97
Decant structure details		
Required decant rate:	l/s	13.24
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.831
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.30
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	13.6
Forebay volume:	m^3	44
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.617
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



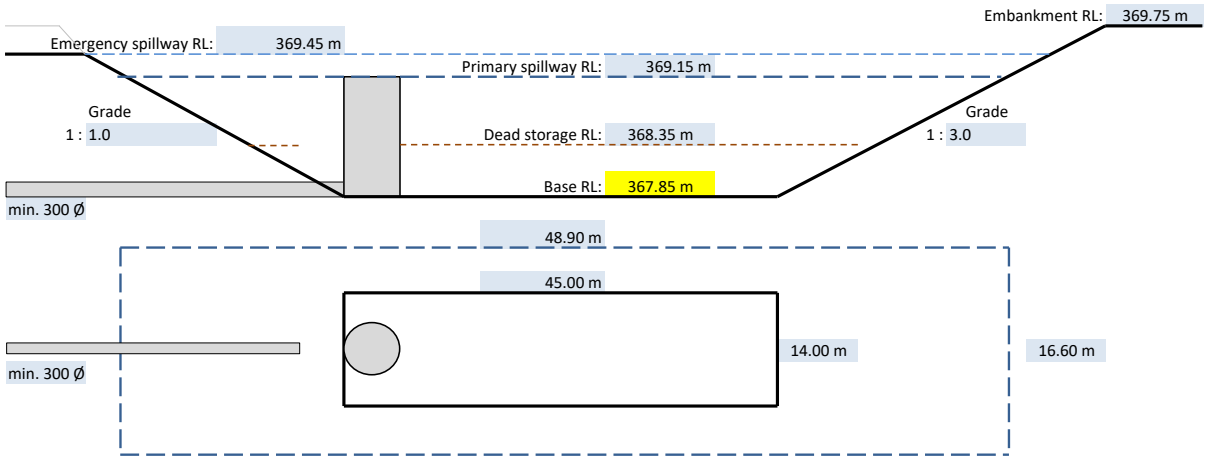
PHASE 5 SEDIMENT RETENTION POND B DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	5B
Date:	29-01-26
Prepared by:	HD / MS

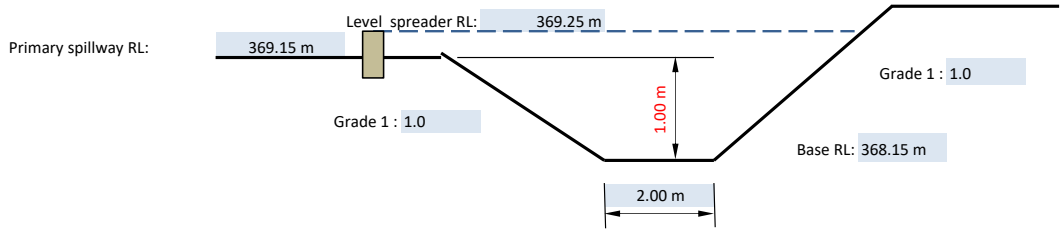
4.474

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.474
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	326
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	894.8
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	45.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	48.9
Length to width ratio at the level of the primary spillway:	1 :	2.9
Pond base area:	m^2	630.0
Pond area at the level of the primary spillway:	m^2	811.7
Volume of the pond below the primary spillway:	m^3	935
Dead storage volume (Lower 30% of pond volume):	m^3	280
Live storage volume (Upper 70% of pond volume):	m^3	654
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	46.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	697.50
Volume below the dead storage height:	m^3	331.73
Volume below the dead storage height minus the dead storage volume:	m^3	51.34
Decant structure details		
Required decant rate:	l/s	13.42
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.843
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.30
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.626
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



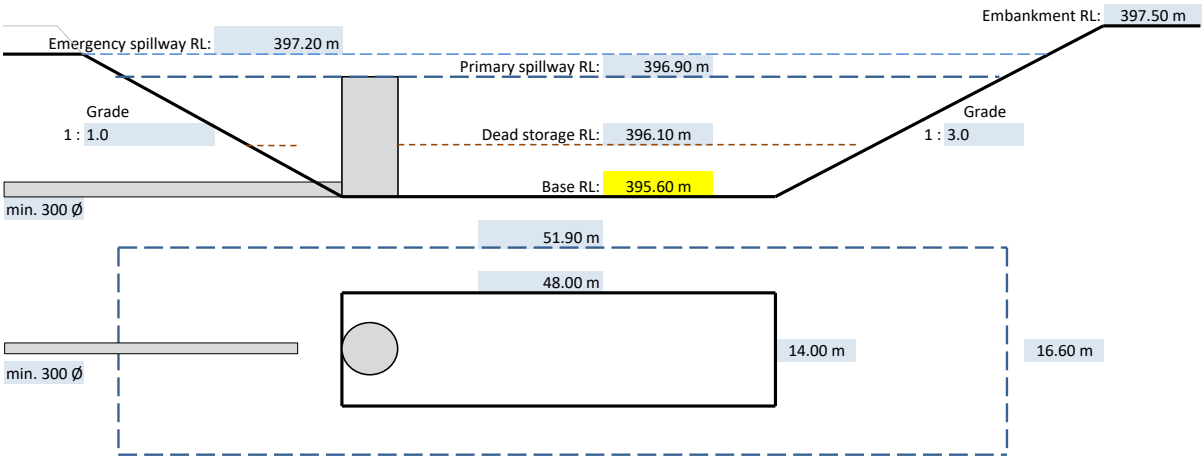
PHASE 5 SEDIMENT RETENTION POND C DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	SC
Date:	29-01-26
Prepared by:	HD / MS

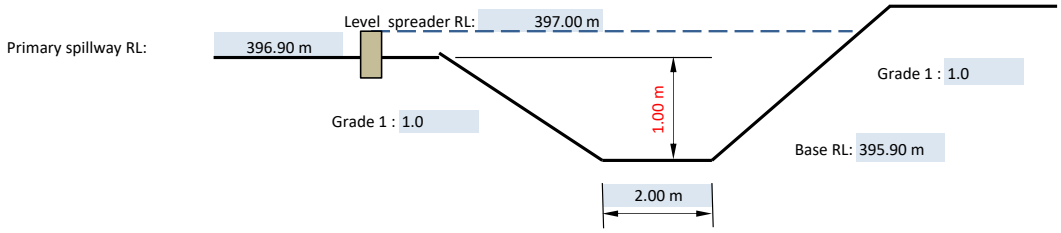
4.921

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.921
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	268
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	984.2
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	48.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	51.9
Length to width ratio at the level of the primary spillway:	1 :	3.1
Pond base area:	m^2	672.0
Pond area at the level of the primary spillway:	m^2	861.5
Volume of the pond below the primary spillway:	m^3	994
Dead storage volume (Lower 30% of pond volume):	m^3	298
Live storage volume (Upper 70% of pond volume):	m^3	696
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	49.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	742.50
Volume below the dead storage height:	m^3	353.48
Volume below the dead storage height minus the dead storage volume:	m^3	55.20
Decant structure details		
Required decant rate:	l/s	14.76
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.927
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.32
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.688
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



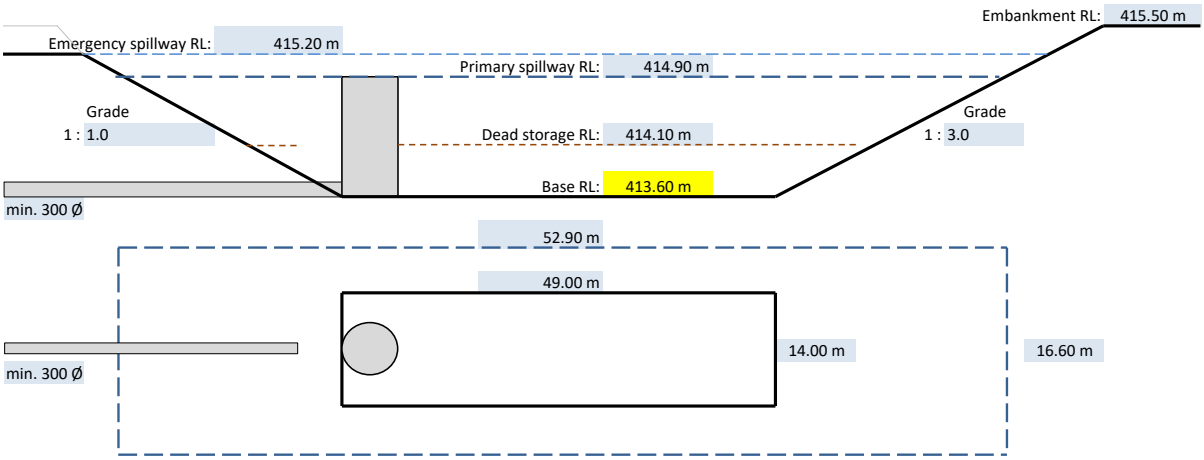
PHASE 5 SEDIMENT RETENTION POND D DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	5D
Date:	29-01-26
Prepared by:	HD / MS

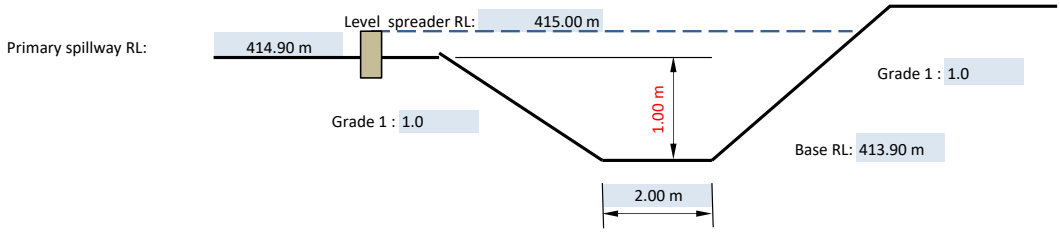
5.029

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	5.029
The slope gradient immediately above the proposed pond:	1 :	30
The slope length:	m	335
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	1005.8
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	14.0
The adopted pond base length:	m	49.0
Pond width at the level of the primary spillway:	m	16.6
Pond length at the level of the primary spillway:	m	52.9
Length to width ratio at the level of the primary spillway:	1 :	3.2
Pond base area:	m^2	686.0
Pond area at the level of the primary spillway:	m^2	878.1
Volume of the pond below the primary spillway:	m^3	1014
Dead storage volume (Lower 30% of pond volume):	m^3	304
Live storage volume (Upper 70% of pond volume):	m^3	710
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	50.50
Pond width at the dead storage height:	m	15.00
Pond area at the dead storage height:	m^2	757.50
Volume below the dead storage height:	m^3	360.73
Volume below the dead storage height minus the dead storage volume:	m^3	56.49
Decant structure details		
Required decant rate:	l/s	15.09
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.947
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.32
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	14.6
Forebay volume:	m^3	47
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.703
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



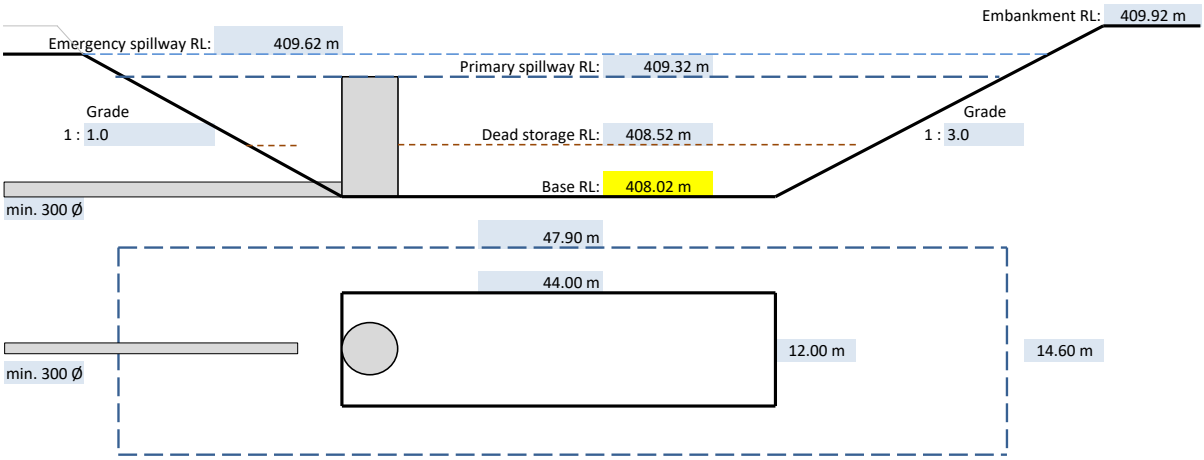
PHASE 5 SEDIMENT RETENTION POND E DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	5E
Date:	29-01-26
Prepared by:	HD / MS

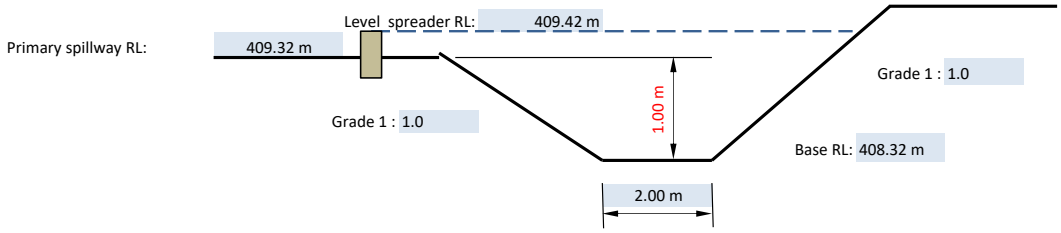
3.89

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	3.89
The slope gradient immediately above the proposed pond:	1 :	20
The slope length:	m	450
The average slope gradient over the whole catchment:	1 :	20
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	778
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	12.0
The adopted pond base length:	m	44.0
Pond width at the level of the primary spillway:	m	14.6
Pond length at the level of the primary spillway:	m	47.9
Length to width ratio at the level of the primary spillway:	1 :	3.3
Pond base area:	m^2	528.0
Pond area at the level of the primary spillway:	m^2	699.3
Volume of the pond below the primary spillway:	m^3	795
Dead storage volume (Lower 30% of pond volume):	m^3	239
Live storage volume (Upper 70% of pond volume):	m^3	557
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	45.50
Pond width at the dead storage height:	m	13.00
Pond area at the dead storage height:	m^2	591.50
Volume below the dead storage height:	m^3	279.72
Volume below the dead storage height minus the dead storage volume:	m^3	41.17
Decant structure details		
Required decant rate:	l/s	11.67
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.733
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.27
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	12.6
Forebay volume:	m^3	41
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.544
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



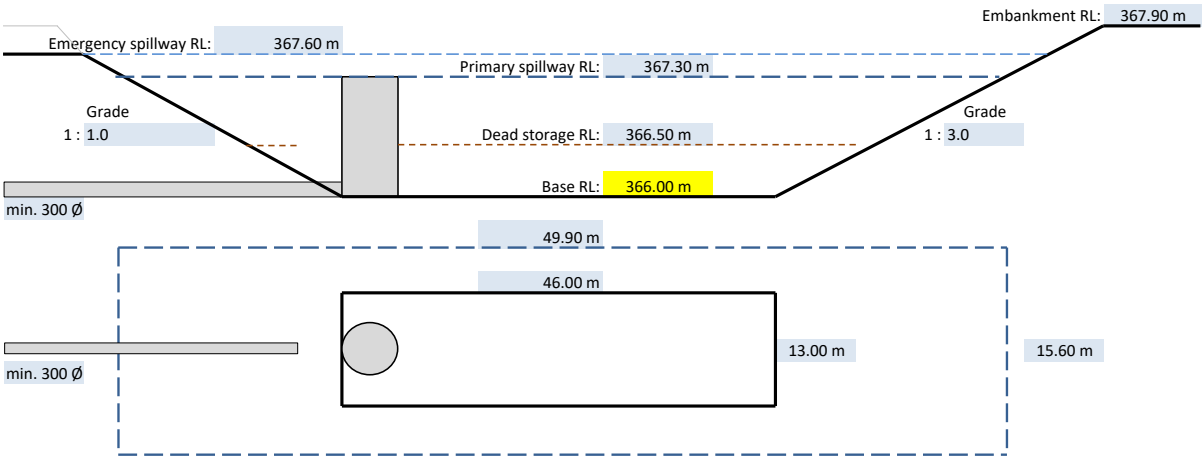
PHASE 6 SEDIMENT RETENTION PONG A DESIGN

Project Number:	4048
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown-Lakes District, Otago, New Zealand
Pond Number:	6A
Date:	29-01-26
Prepared by:	HD / MS

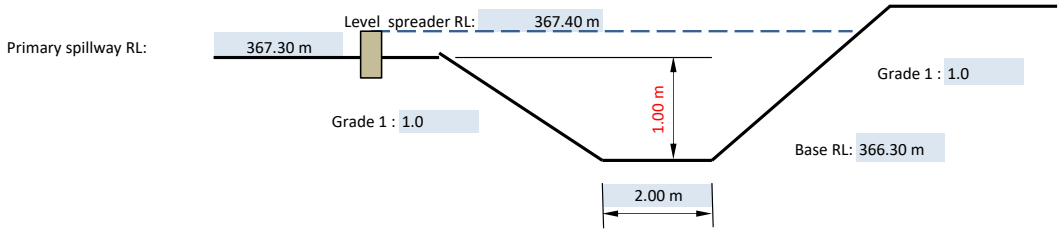
4.45

	Units	Input/Output
Minimum sediment pond volume		
Size of the exposed catchment area:	ha	4.45
The slope gradient immediately above the proposed pond:	1 :	100
The slope length:	m	460
The average slope gradient over the whole catchment:	1 :	100
Volume per unit area of catchment used for the minimum pond size:	m^3/ ha	200
Minimum pond volume:	m^3	890
Sediment pond dimensions		
The gradient of the inlet slope:	1 :	2
The gradient of the other wall slopes:	1 :	1
The height from the bottom of the pond to the primary spillway:	m	1.3
The adopted pond base width:	m	13.0
The adopted pond base length:	m	46.0
Pond width at the level of the primary spillway:	m	15.6
Pond length at the level of the primary spillway:	m	49.9
Length to width ratio at the level of the primary spillway:	1 :	3.2
Pond base area:	m^2	598.0
Pond area at the level of the primary spillway:	m^2	778.4
Volume of the pond below the primary spillway:	m^3	892
Dead storage volume (Lower 30% of pond volume):	m^3	268
Live storage volume (Upper 70% of pond volume):	m^3	624
Dead storage height		
Dead storage height:	m	0.50
Pond length at the dead storage height:	m	47.50
Pond width at the dead storage height:	m	14.00
Pond area at the dead storage height:	m^2	665.00
Volume below the dead storage height:	m^3	315.60
Volume below the dead storage height minus the dead storage volume:	m^3	47.97
Decant structure details		
Required decant rate:	l/s	13.35
What is the catchment size?	ha	>3
Outlet pipe size:	mm	min. 300 Ø
Number of decant systems required:		3
Height of decant system 1 from pond base:	m	0.50
Height of decant system 2 from pond base:	m	0.77
Height of decant system 3 from pond base:	m	1.03
Emergency spillway details		
Runoff coefficient:		0.60
AEP 1% rainfall intensity:	mm/hr	113
AEP 1% flow using Rational Method formula:	m^3/s	0.838
Spillway width:	m	3.0
Broad crested weir coefficient:		1.705
Depth of flow over emergency spillway:	m	0.30
Forebay details		
The gradient of forebay wall slopes:	1 :	1
The adopted forebay depth:	m	1
The adopted forebay base width:	m	2.0
The forebay base length:	m	13.6
Forebay volume:	m^3	44
Dirty Water Diversion Max Flow		
Runoff coefficient:		0.60
AEP 5% rainfall intensity:	mm/hr	83.9
AEP 5% flow using Rational Method formula:	m^3/s	0.622
Tc	Min	10.000
Runoff (L)	L	252874.600
Runoff (l/min)	l/min	25287.460
Runoff (l/s)	l/s	421.458

SEDIMENT RETENTION POND DETAILS



FOREBAY DETAILS



Dirty Water Diversion Sizing

WORST CASE - PHASE 3 SEDIMENT RETENTION POND D DESIGN

Project Number:	4048	5.101
Address:	122, Morven Ferry Road, Arrow Junction, Queenstown	
Pond Number:	3D	3D
Date:	29-01-26	29-01-26
Prepared by:	HD / MS	HD

Flow q (m3/s)	0.421	(5% AEP / 20 Year)	
Base width (m)	1.00		
Side slopes. 1 in Z (left & right)	3.0	2.0	5.101
ave Z	*2.50*		30
Roughness (mannings) n	0.035		451 Flow width = 2.52 m
Grade s (m/m)	0.010	*1.0%*	20
coef c = s^.5/n	*2.86*		
			1.0 Depth = 0.30 m
DEPTH D (m)	**0.30**	*0.09*	3.0 2.0
Area (m2)	*0.11*		2
Perimeter (m)	*2.63*		Base= 1.00 m
R = A/P (m)	*0.04*		2
K = AR^.66/n	*0*		15
Velocity (m/s)	**3.82**		48
Vel. head (m)	*0.74*		
Top width (m)	2.52		
Froude No.	5.83		