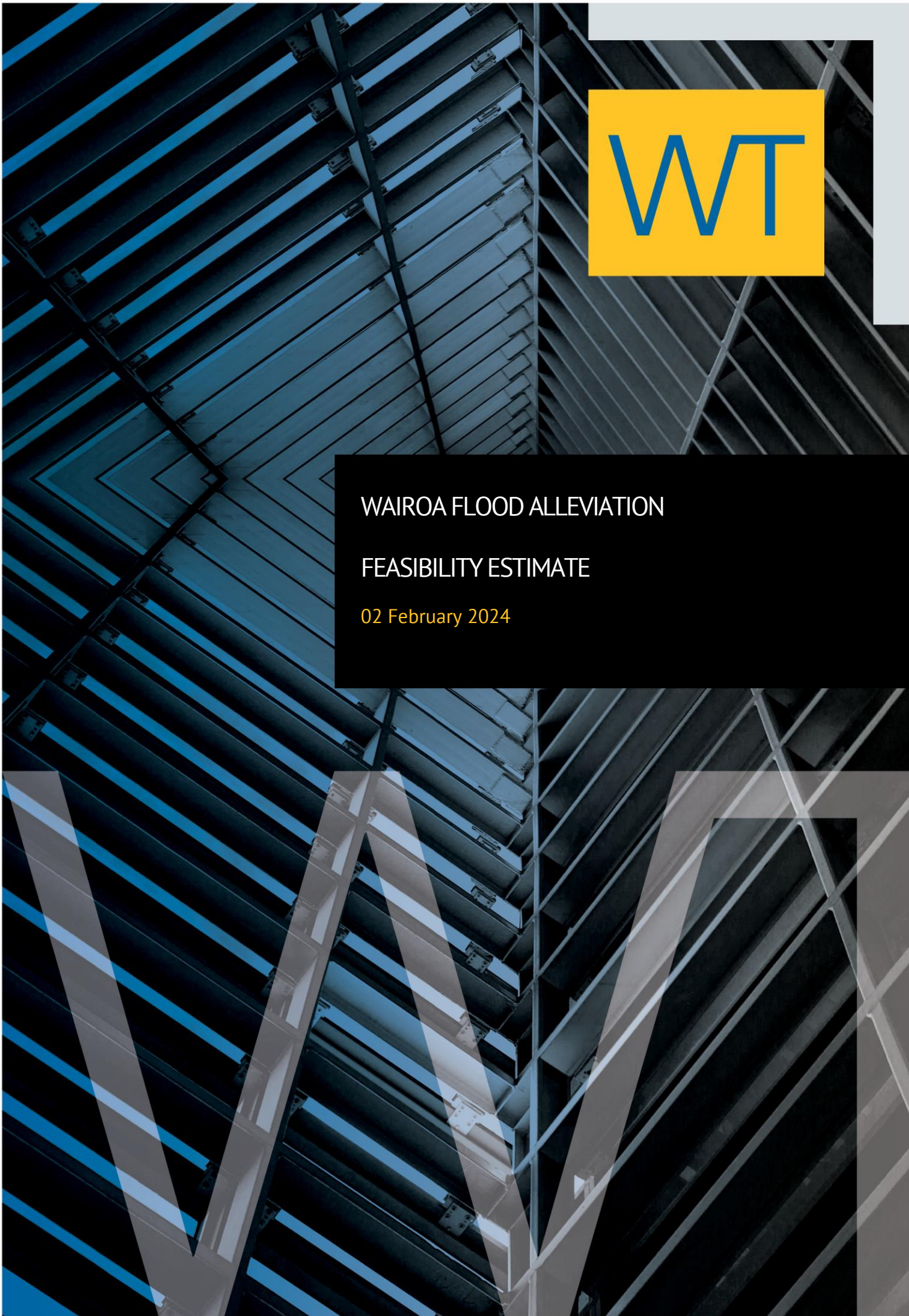




WAIROA FLOOD ALLEVIATION
FEASIBILITY ESTIMATE
02 February 2024



CONTENTS

CONTACT	1
1 INTRODUCTION	2
2 FINANCIAL SUMMARY	2
3 ASSUMPTIONS, CLARIFICATIONS AND EXCLUSIONS	3

APPENDICES

APPENDIX A: ESTIMATE BREAKDOWN

APPENDIX B: DESCRIPTION OF OPTIONS

CONTACT

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REVISION NO.	REVISION DATE	DRAFT.FINAL
00	02.02.24	DRAFT

1 INTRODUCTION

WT Infrastructure (WT) have been commissioned by WSP to provide a feasibility estimate for the Wairoa Flood Alleviation project.

We have provided estimates for the following options:

- Option 1 – Floodway
- Option 1B – Floodway
- Option 5 – Stopbank
- Option 7 - Floodway
- Option 17 – Combination of Option 5 + Option 7

Due to the limited details at this stage of the project, we have developed our estimates to provide a range of costing options. For each estimate we have provided a low, mid, and high-cost option. Assumptions regarding these are discussed in more detail under section 2 and 3 of this report.

We have relied upon the following documents when preparing this estimate:

- MCA Options – WSP – date received 16/1/2024
- WSP building footprint spreadsheet

2 FINANCIAL SUMMARY

The below table provides a summary of the estimated project cost for each option.

ITEM	DESCRIPTION	LOW	MID	HIGH
1.00	OPTION 1 - FLOODWAY	43,179,784	83,588,941	140,632,000
2.00	OPTION 1B - FLOODWAY	35,207,692	63,653,469	103,126,170
3.00	OPTION 5 - STOPBANK	26,071,838	34,944,118	46,622,527
4.00	OPTION 7 - FLOODWAY	20,129,168	41,055,143	70,368,131
5.00	OPTION 17 - COMBINATION 5 & 7	46,201,006	75,999,261	116,990,658

We have assumed the majority of construction details and have made a number of assumptions and allowances throughout the estimate. Please refer to the full estimate breakdown under the Appendices and our list of clarifications and exclusions under section 3 of this report.

2.1 KEY RISKS

As can be seen in the table above, the low, mid, and high options for each estimate have a substantial range. The following items are the key factors driving this.

Topsoil Strip: We have used a range a range of \$8, \$12, and \$18 per m³ for topsoil strip and respreading. This range varies due to the unknown availability of local plant and labour to undertake the works and availability of land for storage.

Cut to Waste: We have used a range of \$15, \$40, and \$75 per m³ for cut to waste. The low option of \$15 per m³ is assuming that all excavated material can be reused on site or nearby farm fields. For the \$40 per m³ option we have assumed that all material can be disposed at a nearby quarry or dump site in the local area not far from site. For the \$75 per m³ option we have assumed that all

excavated material will need to be trucked out of town. We see this item as a key risk factor, and further investigation is required to understand where exactly the material can be disposed.

Imported Aggregate: We have used a range of \$90, \$120, and \$160 per m³ for imported aggregates. We have undertaken some research and have found nearby quarries who have indicated they can provide the required material. From our investigations we have also found that the quality of aggregates in the area are not the best quality, which we see as a risk factor especially for meeting the required structural standards.

Rock Supply: We have used a range of \$90, \$150, and \$200 per m³ for rock supply. It has been assumed that limestone rock will be sufficient as fill to the Reno Mattresses. If this is not the case, the rock from out of the region will be required at extra cost.

Land Purchase: We have used a range of \$80k, \$100k and \$120k for land purchase value. This pricing has come from recent sales from the end of last year for the sale of farm/general land. The risk factor here is that the local farmers in the area do not want to sell their land, or in fact they want a much higher price than what has been indicated in our estimate.

Building Removal: We have used a range of \$120, \$150, and \$180 per m² for building removal. This range is all driven from where the material can be disposed.

Onsite and Offsite Overheads and Profit: We have used a range of 15%, 18%, and 20% for Onsite Overheads. We have used a range of 10%, 13% and 15% for Offsite Overheads and Profit. This range varies due to the unknown availability of local plant and labour to undertake the works. This is all dependent on the tier of contractor which undertakes the works.

3 ASSUMPTIONS, CLARIFICATIONS AND EXCLUSIONS

3.1 GENERAL ASSUMPTIONS, EXCLUSIONS AND CLARIFICATIONS

- For each estimate option we have included a low, mid, and high estimate option
- Programme duration for each option has been assumed. We have linked key items such as Erosion and Sediment control and Traffic Management to these programmes. As the project progresses, we will be able to have a better gauge on these costs.
- The majority of construction details have been assumed. We have built up our rates using knowledge from similar projects
- Allowances have been made for mobilisation and demobilisation of key plant and equipment required for each project. As the project progress we will get a better understanding of the exact plant which is required and the availability of these in the area.
- WSP Volumes have been used for all areas relating to areas, cut and fill volumes
- Allowances for building removal have been made as per the excel spreadsheet provided by WSP
- Land purchase allowances have been made as per the areas listed on the WSP MCA Options documents
- Allowances have been made for temporary roadways, which are to be used whilst the main roadway is being reconstructed for Ruataniwha Road, Waihere Road and Huramua Road East under each estimate where applicable
- Provisional allowances have been included for removal of existing fences. The exact quantity is unknown at this stage.
- Allowances have been made for removal of all vegetation including grass, low shrubs, and trees. The exact extent of these is unknown at this stage.

- Allowances have been made to remove existing power poles along Ruataniwha Road and Waihere Road. We have assumed a power pole every 50m of roadway it effected by the developments and is required to be removed.
- Allowances have been made for cutting existing topsoil to stockpile and reusing on site where applicable
- Allowances have been included to remove excess material off site
- Reno mattresses to river inlet and outlets to the floodway have been assumed to be filled with rock aggregate (70mm – 150mm dia)
- It has been assumed that the stopbanks inner core will be wrapped with site won material. Engineered fill has been assumed for the side batter slopes with Combigrid to 50% of the entire length
- It has been assumed that 25% of the new road surface will require soft ground remediation using 300mm AP65 with geotextile wrapping
- It has been assumed that both Ruataniwha Road and Waiherere Road will have the following construction make up; 300mm thick AP65, 150mm AP40, 45mm Asphalt
- It has been assumed that Huramua Road East will have the following construction make up; 300mm thick AP65 with gravel surface course
- An allowance for floodgates has been included to the new road entry and exit points at each new roadway constructed within a floodway
- An allowance for a swale drain has been included for each floodway option. It has been assumed that the swale drain is 2.5m thick and .8m deep. It has been assumed this will have a rock/aggregate backfill with a perforated pipe
- An allowance has been made to redirect or lower existing water mains where it has been affected by stopbanks and floodway's
- Where existing power poles have been removed, allowance have been included to run power and communication's underground via a shared services trench
- An allowance has been included to hydroseed floodway base channels
- Allowance has been included to hydroseed embankment sides on the stopbanks
- It has been assumed that a 5m width each side of the construction zone will be required to be tidied up using hydroseed
- Allowances have been included to relocate the Ruataniwha Marae under Option 5 and Option 17. The exact extent of this is unknown.

3.2 EXCLUSIONS

- GST
- Project Development Fees
- Legal or marketing costs
- Escalation
- Operational costs/downtime due to operations
- Removal of large / unforeseen ground objects
- Contaminated waste disposal
- Rebuild of existing properties in new location



APPENDIX A

Estimate Breakdown

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



SUMMARY

ITEM	DESCRIPTION	LOW	MID	HIGH
1.00	OPTION 1 - FLOODWAY	43,179,784	83,588,941	140,632,000
2.00	OPTION 1B - FLOODWAY	35,207,692	63,653,469	103,126,170
3.00	OPTION 5 - STOPBANK	26,071,838	34,944,118	46,622,527
4.00	OPTION 7 - FLOODWAY	20,129,168	41,055,143	70,368,131
5.00	OPTION 17 - COMBINATION 5 & 7	46,201,006	75,999,261	116,990,658

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,261,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				326,400
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	150,000.00	150,000
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	176,400.00	176,400
3.00	Demolition and Site Clearance				2,769,384
3.01	Sawcut existing roadway	24	m	15	360
3.02	Breakout existing roadway and dispose off-site	3,000	m2	25	75,000
3.03	Demolish existing farm fence and dispose off-site	6,649	m	15	99,734
3.04	Removal of existing power pole along existing roadways	10	no	5,000	50,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	322,800	m2	5	1,614,000
3.06	Remove vegetation and dispose off site (medium / large trees)	1,861	m	500	930,290
4.00	Earthworks				15,474,116
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	65,160	m3	8	521,280
4.02	Respread topsoil from stockpile upon completion (200mm thick)	65,160	m3	8	521,280
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	767,065	m3	15	11,505,975
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	7,134	m2	8	57,072
4.05	Reno Mattress (230mm thick with rock)	53,750	m2	53	2,868,509
5.00	Ground Improvements				86,500
5.01	EO rate for disposal of contaminated materials	115,134	m3	500	Excluded

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.02	Allowance for disposal of contaminated hot spots	1	item	50,000	50,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	300	m3	122	36,500
6.00	Pavements				382,800
	<u>Carriageway</u>				
6.01	Ruataniwha Road	2,000	m2	96	191,400
6.02	Waihirere Road	2,000	m2	96	191,400
7.00	Structures				660,000
7.01	Allowance for floodgates (assume 1m high)	4	no	120,000	480,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				734,750
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilies trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	250	297,250
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	500	m	300	150,000
9.00	Landscaping				158,137
9.01	Hydroseed to base of floodway	304,384	m2	1	152,192
9.02	Allowance for reinstatement to floodway perimeter	11,890	m2	1	5,945
10.00	Traffic Management				801,860
10.01	Traffic Management Allowance	1	item	801,860	801,860
11.00	Land Purchase				3,409,340
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	2,781.00	m2	120	333,720

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.02	Demolish existing community building and dispose off-site	1,279.00	m2	120	153,480
11.03	Demolish existing shed structure and dispose off-site	1,369.00	m2	60	82,140
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	33	ha	80,000	2,640,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	200,000	200,000
Sub-total					26,064,787
ON	Onsite Overheads	26,064,787	%	15.00%	3,909,718
OFF	Off-site Overheads and Profit	29,974,505	%	10.00%	2,997,450
Sub-total Construction					32,971,955
	Developmental Contributions	32,971,955	%		Excluded
	Consent Fees	32,971,955	%	1.00%	329,720
	Internal Fees	33,301,675	%	2.50%	832,542
	Professional Fees	34,134,216	%	10.00%	3,413,422
	Contingency	37,547,638	%	15.00%	5,632,146
	Escalation		%		Excluded
Total to Summary					43,179,784

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,261,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				219,600
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	197,100	197,100
3.00	Demolition and Site Clearance				2,769,384
3.01	Sawcut existing roadway	24	m	15	360
3.02	Breakout existing roadway and dispose off-site	3,000	m2	25	75,000
3.03	Demolish existing farm fence and dispose off-site	6,649	m	15	99,734
3.04	Removal of existing power pole along existing roadways	10	no	5,000	50,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	322,800	m2	5	1,614,000
3.06	Remove vegetation and dispose off site (medium / large trees)	1,861	m	500	930,290
4.00	Earthworks				35,985,016
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	65,160	m3	12	781,920
4.02	Respread topsoil from stockpile upon completion (200mm thick)	65,160	m3	12	781,920
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	767,065	m3	40	30,682,600
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	7,134	m2	8	57,072
4.05	Reno Mattress (230mm thick with rock)	53,750	m2	68	3,681,504
5.00	Ground Improvements				153,000
5.01	EO rate for disposal of contaminated materials	115,134	m3	500	Excluded

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.02	Allowance for disposal of contaminated hot spots	1	item	100,000	100,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	300	m3	177	53,000
6.00	Pavements				446,800
	<u>Carriageway</u>				
6.01	Ruataniwha Road	2,000	m2	112	223,400
6.02	Waihirere Road	2,000	m2	112	223,400
7.00	Structures				780,000
7.01	Allowance for floodgates (assume 1m high)	4	no	150,000	600,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				1,024,990
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	410	487,490
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	500	m	500	250,000
9.00	Landscaping				158,137
9.01	Hydroseed to base of floodway	304,384	m2	1	152,192
9.02	Allowance for reinstatement to floodway perimeter	11,890	m2	1	5,945
10.00	Traffic Management				801,860
10.01	Traffic Management Allowance	1	item	801,860	801,860
11.00	Land Purchase				4,268,520
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	2,781.00	m2	150	417,150

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.02	Demolish existing community building and dispose off-site	1,279.00	m2	150	191,850
11.03	Demolish existing shed structure and dispose off-site	1,369.00	m2	80	109,520
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	33	ha	100,000	3,300,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	250,000	250,000
Sub-total					47,868,807
ON	Onsite Overheads	47,868,807	%	18.00%	8,616,385
OFF	Off-site Overheads and Profit	56,485,192	%	13.00%	7,343,075
Sub-total Construction					63,828,268
	Developmental Contributions	63,828,268	%		Excluded
	Consent Fees	63,828,268	%	1.00%	638,283
	Internal Fees	64,466,550	%	2.50%	1,611,664
	Professional Fees	66,078,214	%	10.00%	6,607,821
	Contingency	72,686,035	%	15.00%	10,902,905
	Escalation		%		Excluded
Total to Summary					83,588,941

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,261,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				413,400
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	390,900	390,900
3.00	Demolition and Site Clearance				2,769,384
3.01	Sawcut existing roadway	24	m	15	360
3.02	Breakout existing roadway and dispose off-site	3,000	m2	25	75,000
3.03	Demolish existing farm fence and dispose off-site	6,649	m	15	99,734
3.04	Removal of existing power pole along existing roadways	10	no	5,000	50,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	322,800	m2	5	1,614,000
3.06	Remove vegetation and dispose off site (medium / large trees)	1,861	m	500	930,290
4.00	Earthworks				64,374,801
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	65,160	m3	18	1,172,880
4.02	Respread topsoil from stockpile upon completion (200mm thick)	65,160	m3	18	1,172,880
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	767,065	m3	75	57,529,875
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	7,134	m2	8	57,072
4.05	Reno Mattress (230mm thick with rock)	53,750	m2	83	4,442,094
5.00	Ground Improvements				225,500
5.01	EO rate for disposal of contaminated materials	115,134	m3	500	Excluded

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.02	Allowance for disposal of contaminated hot spots	1	item	150,000	150,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	300	m3	252	75,500
6.00	Pavements				578,800
	<u>Carriageway</u>				
6.01	Ruataniwha Road	2,000	m2	145	289,400
6.02	Waihirere Road	2,000	m2	145	289,400
7.00	Structures				980,000
7.01	Allowance for floodgates (assume 1m high)	4	no	200,000	800,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				1,124,990
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	410	487,490
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	500	m	700	350,000
9.00	Landscaping				158,137
9.01	Hydroseed to base of floodway	304,384	m2	1	152,192
9.02	Allowance for reinstatement to floodway perimeter	11,890	m2	1	5,945
10.00	Traffic Management				801,860
10.01	Traffic Management Allowance	1	item	801,860	801,860
11.00	Land Purchase				5,127,700
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	2,781.00	m2	180	500,580

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.02	Demolish existing community building and dispose off-site	1,279.00	m2	180	230,220
11.03	Demolish existing shed structure and dispose off-site	1,369.00	m2	100	136,900
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	33	ha	120,000	3,960,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	300,000	300,000
Sub-total					77,816,072
ON	Onsite Overheads	77,816,072	%	20.00%	15,563,214
OFF	Off-site Overheads and Profit	93,379,286	%	15.00%	14,006,893
Sub-total Construction					107,386,179
	Developmental Contributions	107,386,179	%		Excluded
	Consent Fees	107,386,179	%	1.00%	1,073,862
	Internal Fees	108,460,041	%	2.50%	2,711,501
	Professional Fees	111,171,542	%	10.00%	11,117,154
	Contingency	122,288,696	%	15.00%	18,343,304
	Escalation		%		Excluded
Total to Summary					140,632,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,085,500
1.01	Dust suppression	10	month	96,800	968,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				269,952
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	150,000	150,000
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	119,952	119,952
3.00	Demolition and Site Clearance				1,925,696
3.01	Sawcut existing roadway	32	m	15	480
3.02	Breakout existing roadway and dispose off-site	2,040	m2	25	51,000
3.03	Demolish existing farm fence and dispose off-site	4,521	m	15	67,819
3.04	Removal of existing power pole along existing roadways	7	no	5,000	35,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	227,760	m2	5	1,138,800
3.06	Remove vegetation and dispose off site (medium / large trees)	1,265	m	500	632,597
4.00	Earthworks				12,814,206
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	49,765	m3	8	398,120
4.02	Respread topsoil from stockpile upon completion (200mm thick)	49,765	m3	8	398,120
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	494,223	m3	15	7,413,345
	<u>Embankment</u>				
4.04	Subbase to embankment (500mm high)	4,756	m3	90	428,040
4.05	1m high embankment (both sides)	13,900	m3	90	1,251,000
	<u>Reinforcement to Slipway</u>				
4.06	Enkamatt 7018	7,134	m2	8	57,072

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.07	Reno Mattress (230mm thick with rock)	53,750	m2	53	2,868,509
5.00	Ground Improvements				74,820
5.01	EO rate for disposal of contaminated materials	74,134	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	50,000	50,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	204	m3	122	24,820
6.00	Pavements				261,840
	<u>Carriageway</u>				
6.01	Ruataniwha Road	1,360	m2	96	130,920
6.02	Waihirere Road	1,360	m2	96	130,920
7.00	Structures				660,000
7.01	Allowance for floodgates (assume 1m high)	4	no	120,000	480,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				594,750
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilies trench	340	m	250	85,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	340	m	210	71,400
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	340	m	115	39,100
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	250	297,250
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	340	m	300	102,000
9.00	Landscaping				117,497
9.01	Hydroseed to base of floodway	209,264	m2	1	104,632
9.02	Allowance for reinstatement to floodway perimeter	5,945	m2	1	2,973
9.03	Hydro seed to embankment	19,785	m2	1	9,893
10.00	Traffic Management				685,420
10.01	Traffic Management Allowance	1	item	685,420	685,420

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.00	Land Purchase				2,762,880
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	3,982.00	m2	120	477,840
11.02	Demolish existing community building and dispose off-site	725.00	m2	120	87,000
11.03	Demolish existing shed structure and dispose off-site	2,634.00	m2	60	158,040
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	23	ha	80,000	1,840,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	200,000	200,000
	Sub-total				21,252,561
ON	Onsite Overheads	21,252,561	%	15.00%	3,187,884
OFF	Off-site Overheads and Profit	24,440,445	%	10.00%	2,444,045
	Sub-total Construction				26,884,490
	Developmental Contributions	26,884,490	%		Excluded
	Consent Fees	26,884,490	%	1.00%	268,845
	Internal Fees	27,153,334	%	2.50%	678,833
	Professional Fees	27,832,168	%	10.00%	2,783,217
	Contingency	30,615,385	%	15.00%	4,592,308
	Escalation		%		Excluded
	Total to Summary				35,207,692

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,085,500
1.01	Dust suppression	10	month	96,800	968,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				156,528
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	134,028	134,028
3.00	Demolition and Site Clearance				1,925,696
3.01	Sawcut existing roadway	32	m	15	480
3.02	Breakout existing roadway and dispose off-site	2,040	m2	25	51,000
3.03	Demolish existing farm fence and dispose off-site	4,521	m	15	67,819
3.04	Removal of existing power pole along existing roadways	7	no	5,000	35,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	227,760	m2	5	1,138,800
3.06	Remove vegetation and dispose off site (medium / large trees)	1,265	m	500	632,597
4.00	Earthworks				26,940,576
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	49,765	m3	12	597,180
4.02	Respread topsoil from stockpile upon completion (200mm thick)	49,765	m3	12	597,180
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	494,223	m3	40	19,768,920
	<u>Embankment</u>				
4.04	Subbase to embankment (500mm high)	4,756	m3	120	570,720
4.05	1m high embankment (both sides)	13,900	m3	120	1,668,000
	<u>Reinforcement to Slipway</u>				
4.06	Enkamatt 7018	7,134	m2	8	57,072

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.07	Reno Mattress (230mm thick with rock)	53,750	m2	68	3,681,504
5.00	Ground Improvements				136,040
5.01	EO rate for disposal of contaminated materials	74,134	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	100,000	100,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	204	m3	177	36,040
6.00	Pavements				305,360
	<u>Carriageway</u>				
6.01	Ruataniwha Road	1,360	m2	112	152,680
6.02	Waihirere Road	1,360	m2	112	152,680
7.00	Structures				780,000
7.01	Allowance for floodgates (assume 1m high)	4	no	150,000	600,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				852,990
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilies trench	340	m	250	85,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	340	m	210	71,400
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	340	m	115	39,100
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	410	487,490
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	340	m	500	170,000
9.00	Landscaping				117,497
9.01	Hydroseed to base of floodway	209,264	m2	1	104,632
9.02	Allowance for reinstatement to floodway perimeter	5,945	m2	1	2,973
9.03	Hydro seed to embankment	19,785	m2	1	9,893
10.00	Traffic Management				685,420
10.01	Traffic Management Allowance	1	item	685,420	685,420

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.00	Land Purchase				3,466,770
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	3,982.00	m2	150	597,300
11.02	Demolish existing community building and dispose off-site	725.00	m2	150	108,750
11.03	Demolish existing shed structure and dispose off-site	2,634.00	m2	80	210,720
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	23	ha	100,000	2,300,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	250,000	250,000
	Sub-total				36,452,378
ON	Onsite Overheads	36,452,378	%	18.00%	6,561,428
OFF	Off-site Overheads and Profit	43,013,805	%	13.00%	5,591,795
	Sub-total Construction				48,605,600
	Developmental Contributions	48,605,600	%		Excluded
	Consent Fees	48,605,600	%	1.00%	486,056
	Internal Fees	49,091,656	%	2.50%	1,227,291
	Professional Fees	50,318,948	%	10.00%	5,031,895
	Contingency	55,350,842	%	15.00%	8,302,626
	Escalation		%		Excluded
	Total to Summary				63,653,469

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,085,500
1.01	Dust suppression	10	month	96,800	968,000
1.02	Silt Fences	2,300	m	25	57,500
1.03	Allowance for movement of silt fences to suit staging	1	item	60,000	60,000
2.00	Temporary Works				288,312
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	265,812	265,812
3.00	Demolition and Site Clearance				1,925,696
3.01	Sawcut existing roadway	32	m	15	480
3.02	Breakout existing roadway and dispose off-site	2,040	m2	25	51,000
3.03	Demolish existing farm fence and dispose off-site	4,521	m	15	67,819
3.04	Removal of existing power pole along existing roadways	7	no	5,000	35,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	227,760	m2	5	1,138,800
3.06	Remove vegetation and dispose off site (medium / large trees)	1,265	m	500	632,597
4.00	Earthworks				46,342,391
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	49,765	m3	18	895,770
4.02	Respread topsoil from stockpile upon completion (200mm thick)	49,765	m3	18	895,770
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	494,223	m3	75	37,066,725
	<u>Embankment</u>				
4.04	Subbase to embankment (500mm high)	4,756	m3	160	760,960
4.05	1m high embankment (both sides)	13,900	m3	160	2,224,000
	<u>Reinforcement to Slipway</u>				
4.06	Enkamatt 7018	7,134	m2	8	57,072

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.07	Reno Mattress (230mm thick with rock)	53,750	m2	83	4,442,094
5.00	Ground Improvements				151,340
5.01	EO rate for disposal of contaminated materials	74,134	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	100,000	100,000
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	204	m3	252	51,340
6.00	Pavements				395,120
	<u>Carriageway</u>				
6.01	Ruataniwha Road	1,360	m2	145	197,560
6.02	Waihirere Road	1,360	m2	145	197,560
7.00	Structures				980,000
7.01	Allowance for floodgates (assume 1m high)	4	no	200,000	800,000
7.02	Allowance for new farm fencing	3,000	m	60	180,000
8.00	Utility Services				920,990
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	340	m	250	85,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	340	m	210	71,400
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	340	m	115	39,100
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	1,189	m	410	487,490
	<u>Water</u>				
8.05	Allowance to lower existing watermain below floodway	340	m	700	238,000
9.00	Landscaping				117,497
9.01	Hydroseed to base of floodway	209,264	m2	1	104,632
9.02	Allowance for reinstatement to floodway perimeter	5,945	m2	1	2,973
9.03	Hydro seed to embankment	19,785	m2	1	9,893
10.00	Traffic Management				685,420
10.01	Traffic Management Allowance	1	item	685,420	685,420

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 1B - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.00	Land Purchase				4,170,660
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	3,982.00	m2	180	716,760
11.02	Demolish existing community building and dispose off-site	725.00	m2	180	130,500
11.03	Demolish existing shed structure and dispose off-site	2,634.00	m2	100	263,400
	<u>Land Purchase</u>				
11.04	Purchase of rural / general land	23	ha	120,000	2,760,000
	<u>Accommodation Works</u>				
11.05	Allowance for access and Accommodation costs	1	item	300,000	300,000
Sub-total					57,062,926
ON	Onsite Overheads	57,062,926	%	20.00%	11,412,585
OFF	Off-site Overheads and Profit	68,475,511	%	15.00%	10,271,327
Sub-total Construction					78,746,838
	Developmental Contributions	78,746,838	%		Excluded
	Consent Fees	78,746,838	%	1.00%	787,468
	Internal Fees	79,534,306	%	2.50%	1,988,358
	Professional Fees	81,522,664	%	10.00%	8,152,266
	Contingency	89,674,930	%	15.00%	13,451,240
	Escalation		%		Excluded
Total to Summary					103,126,170

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,388,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
2.00	Temporary Works				282,060
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	259,560	259,560
3.00	Demolition and Site Clearance				930,240
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000
4.00	Earthworks				7,777,225
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	8	75,200
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	8	75,200
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	27,095	m3	15	406,425
	<u>Stopbank Formation</u>				
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	90	2,215,800
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	90	1,915,200

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.09	Post settlement fill; 300mm thick	14,772	m3	90	1,329,480
4.10	Testing	386	no	200	77,200
5.00	Ground Improvements				45,625
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	122	45,625
6.00	Pavements				475,500
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	95	475,500
7.00	Structures				240,000
7.01	Allowance for new farm fencing	4,000	m	60	240,000
8.00	Utility Services				437,500
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				
8.04	Allowance to lower existing watermain below floodway	500	m	300	150,000
9.00	Landscaping				51,009
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
10.00	Traffic Management				438,430
10.01	Traffic Management Allowance	1	item	438,430	438,430
11.00	Land Purchase				3,671,760
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	750,000	750,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	120	70,320

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.03	Demolish existing community building and dispose off-site	423.00	m2	120	50,760
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	60	40,680
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	80,000	2,560,000
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	200,000	200,000
Sub-total					15,737,848
ON	Onsite Overheads	15,737,848	%	15.00%	2,360,677
OFF	Off-site Overheads and Profit	18,098,526	%	10.00%	1,809,853
Sub-total Construction					19,908,378
	Developmental Contributions	19,908,378	%		Excluded
	Consent Fees	19,908,378	%	1.00%	199,084
	Internal Fees	20,107,462	%	2.50%	502,687
	Professional Fees	20,610,149	%	10.00%	2,061,015
	Contingency	22,671,164	%	15.00%	3,400,675
	Escalation		%		Excluded
Total to Summary					26,071,838

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,388,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
2.00	Temporary Works				298,440
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	275,940	275,940
3.00	Demolition and Site Clearance				930,240
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000
4.00	Earthworks				10,349,960
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	12	112,800
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	12	112,800
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	27,095	m3	40	1,083,800
	<u>Stopbank Formation</u>				
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	120	2,954,400
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	120	2,553,600

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.09	Post settlement fill; 300mm thick	14,772	m3	120	1,772,640
4.10	Testing	386	no	200	77,200
5.00	Ground Improvements				66,250
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	177	66,250
6.00	Pavements				555,500
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	111	555,500
7.00	Structures				240,000
7.01	Allowance for new farm fencing	4,000	m	60	240,000
8.00	Utility Services				537,500
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				
8.04	Allowance to lower existing watermain below floodway	500	m	500	250,000
9.00	Landscaping				51,009
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
10.00	Traffic Management				438,430
10.01	Traffic Management Allowance	1	item	438,430	438,430
11.00	Land Purchase				5,155,590
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	1,500,000	1,500,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	150	87,900

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.03	Demolish existing community building and dispose off-site	423.00	m2	150	63,450
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	80	54,240
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	100,000	3,200,000
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	250,000	250,000
Sub-total					20,011,418
ON	Onsite Overheads	20,011,418	%	18.00%	3,602,055
OFF	Off-site Overheads and Profit	23,613,474	%	13.00%	3,069,752
Sub-total Construction					26,683,225
	Developmental Contributions	26,683,225	%		Excluded
	Consent Fees	26,683,225	%	1.00%	266,832
	Internal Fees	26,950,058	%	2.50%	673,751
	Professional Fees	27,623,809	%	10.00%	2,762,381
	Contingency	30,386,190	%	15.00%	4,557,928
	Escalation		%		Excluded
Total to Summary					34,944,118

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				1,388,500
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
2.00	Temporary Works				569,760
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	547,260	547,260
3.00	Demolition and Site Clearance				930,240
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000
4.00	Earthworks				13,837,965
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	18	169,200
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	18	169,200
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	27,095	m3	75	2,032,125
	<u>Stopbank Formation</u>				
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	160	3,939,200
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	160	3,404,800

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
4.09	Post settlement fill; 300mm thick	14,772	m3	160	2,363,520
4.10	Testing	386	no	200	77,200
5.00	Ground Improvements				94,375
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	252	94,375
6.00	Pavements				720,500
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	144	720,500
7.00	Structures				240,000
7.01	Allowance for new farm fencing	4,000	m	60	240,000
8.00	Utility Services				637,500
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				
8.04	Allowance to lower existing watermain below floodway	500	m	700	350,000
9.00	Landscaping				51,009
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
10.00	Traffic Management				438,430
10.01	Traffic Management Allowance	1	item	438,430	438,430
11.00	Land Purchase				6,889,420
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	2,500,000	2,500,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	180	105,480

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 5 - STOPBANK (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.03	Demolish existing community building and dispose off-site	423.00	m2	180	76,140
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	100	67,800
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	120,000	3,840,000
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	300,000	300,000
Sub-total					25,797,698
ON	Onsite Overheads	25,797,698	%	20.00%	5,159,540
OFF	Off-site Overheads and Profit	30,957,238	%	15.00%	4,643,586
Sub-total Construction					35,600,824
	Developmental Contributions	35,600,824	%		Excluded
	Consent Fees	35,600,824	%	1.00%	356,008
	Internal Fees	35,956,832	%	2.50%	898,921
	Professional Fees	36,855,753	%	10.00%	3,685,575
	Contingency	40,541,328	%	15.00%	6,081,199
	Escalation		%		Excluded
Total to Summary					46,622,527

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				862,000
1.01	Dust suppression	9	month	88,000	792,000
1.02	Silt Fences	1,200	m	25	30,000
1.03	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				60,807
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	38,307	38,307
3.00	Demolition and Site Clearance				1,027,450
3.01	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.02	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.03	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.04	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				7,622,991
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	8	236,160
4.02	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	8	236,160
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	404,788	m3	15	6,071,820
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	3,600	m2	8	28,800
4.05	Reno Mattress (230mm thick with rock)	31,980	m2	33	1,050,051
5.00	Ground Improvements				29,003
5.01	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	122	9,003
6.00	Pavements				78,440
	<u>Carriageway</u>				
6.01	Huramua Road East	1,984	m2	40	78,440
7.00	Structures				341,520
7.01	Allowance for floodgates (assume 1m high)	2	no	120,000	240,000
7.02	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				291,450
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilities trench	246	m	250	61,500
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	250	150,000
9.00	Landscaping				78,600
9.01	Hydroseed to base of floodway	151,200	m2	1	75,600
9.02	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				403,190
10.01	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				1,355,200
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	250.00	m2	120	30,000
11.02	Demolish existing shed structure and dispose off-site	420.00	m2	60	25,200
	<u>Land Purchase</u>				
11.03	Purchase of rural / general land	15	ha	80,000	1,200,000
	<u>Accommodation Works</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.04	Allowance for access and Accommodation costs	1	item	100,000	100,000
Sub-total					12,150,651
ON	Onsite Overheads	12,150,651	%	15.00%	1,822,598
OFF	Off-site Overheads and Profit	13,973,248	%	10.00%	1,397,325
Sub-total Construction					15,370,573
	Developmental Contributions	15,370,573	%		Excluded
	Consent Fees	15,370,573	%	1.00%	153,706
	Internal Fees	15,524,279	%	2.50%	388,107
	Professional Fees	15,912,386	%	10.00%	1,591,239
	Contingency	17,503,625	%	15.00%	2,625,544
	Escalation		%		Excluded
Total to Summary					20,129,168

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				862,000
1.01	Dust suppression	9	month	88,000	792,000
1.02	Silt Fences	1,200	m	25	30,000
1.03	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				70,353
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	47,853	47,853
3.00	Demolition and Site Clearance				1,027,450
3.01	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.02	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.03	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.04	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				18,429,957
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	12	354,240
4.02	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	12	354,240
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	404,788	m3	40	16,191,520
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	3,600	m2	8	28,800
4.05	Reno Mattress (230mm thick with rock)	31,980	m2	47	1,501,157
5.00	Ground Improvements				33,073
5.01	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	177	13,073
6.00	Pavements				96,320
	<u>Carriageway</u>				
6.01	Huramua Road East	1,984	m2	49	96,320
7.00	Structures				401,520
7.01	Allowance for floodgates (assume 1m high)	2	no	150,000	300,000
7.02	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				387,450
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	246	m	250	61,500
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	410	246,000
9.00	Landscaping				78,600
9.01	Hydroseed to base of floodway	151,200	m2	1	75,600
9.02	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				403,190
10.01	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				1,721,100
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	250.00	m2	150	37,500
11.02	Demolish existing shed structure and dispose off-site	420.00	m2	80	33,600
	<u>Land Purchase</u>				
11.03	Purchase of rural / general land	15	ha	100,000	1,500,000
	<u>Accommodation Works</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.04	Allowance for access and Accommodation costs	1	item	150,000	150,000
Sub-total					23,511,014
ON	Onsite Overheads	23,511,014	%	18.00%	4,231,982
OFF	Off-site Overheads and Profit	27,742,996	%	13.00%	3,606,589
Sub-total Construction					31,349,585
	Developmental Contributions	31,349,585	%		Excluded
	Consent Fees	31,349,585	%	1.00%	313,496
	Internal Fees	31,663,081	%	2.50%	791,577
	Professional Fees	32,454,658	%	10.00%	3,245,466
	Contingency	35,700,124	%	15.00%	5,355,019
	Escalation		%		Excluded
Total to Summary					41,055,143

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				862,000
1.01	Dust suppression	9	month	88,000	792,000
1.02	Silt Fences	1,200	m	25	30,000
1.03	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				81,897
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	59,397	59,397
3.00	Demolition and Site Clearance				1,027,450
3.01	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.02	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.03	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.04	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				33,339,071
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	18	531,360
4.02	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	18	531,360
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	404,788	m3	75	30,359,100
	<u>Reinforcement to Slipway</u>				
4.04	Enkamatt 7018	3,600	m2	8	28,800
4.05	Reno Mattress (230mm thick with rock)	31,980	m2	59	1,888,451
5.00	Ground Improvements				38,623
5.01	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.02	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.03	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	252	18,623
6.00	Pavements				130,080
	<u>Carriageway</u>				
6.01	Huramua Road East	1,984	m2	66	130,080
7.00	Structures				501,520
7.01	Allowance for floodgates (assume 1m high)	2	no	200,000	400,000
7.02	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				387,450
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilities trench	246	m	250	61,500
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.04	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	410	246,000
9.00	Landscaping				78,600
9.01	Hydroseed to base of floodway	151,200	m2	1	75,600
9.02	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				403,190
10.01	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				2,087,000
	<u>Demolition and Site Clearance</u>				
11.01	Demolish existing residential building and dispose off-site	250.00	m2	180	45,000
11.02	Demolish existing shed structure and dispose off-site	420.00	m2	100	42,000
	<u>Land Purchase</u>				
11.03	Purchase of rural / general land	15	ha	120,000	1,800,000
	<u>Accommodation Works</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 7 - FLOODWAY (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
11.04	Allowance for access and Accommodation costs	1	item	200,000	200,000
Sub-total					38,936,881
ON	Onsite Overheads	38,936,881	%	20.00%	7,787,376
OFF	Off-site Overheads and Profit	46,724,258	%	15.00%	7,008,639
Sub-total Construction					53,732,896
	Developmental Contributions	53,732,896	%		Excluded
	Consent Fees	53,732,896	%	1.00%	537,329
	Internal Fees	54,270,225	%	2.50%	1,356,756
	Professional Fees	55,626,981	%	10.00%	5,562,698
	Contingency	61,189,679	%	15.00%	9,178,452
	Escalation		%		Excluded
Total to Summary					70,368,131

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				2,250,500
	<u>Option 5 Stopbank</u>				
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
	<u>Option 7 - Floodway</u>				
1.04	Dust suppression	9	month	88,000	792,000
1.05	Silt Fences	1,200	m	25	30,000
1.06	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				342,867
	<u>Option 5 Stopbank</u>				
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	259,560	259,560
	<u>Option 7 - Floodway</u>				
	<u>Mobilisation and Demobilisation</u>				
2.03	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.04	Allowance for temporary roadways	1	item	38,307	38,307
3.00	Demolition and Site Clearance				1,957,690
	<u>Option 5 Stopbank</u>				
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
<u>Option 7 - Floodway</u>					
3.07	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.08	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.09	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.10	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				15,400,216
<u>Option 5 Stopbank</u>					
<u>Topsoil Strip</u>					
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	8	75,200
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	8	75,200
<u>Bulk Earthworks</u>					
4.03	Cut to waste	27,095	m3	15	406,425
<u>Stopbank Formation</u>					
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	90	2,215,800
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	90	1,915,200
4.09	Post settlement fill; 300mm thick	14,772	m3	90	1,329,480
4.10	Testing	386	no	200	77,200
<u>Option 7 - Floodway</u>					
<u>Topsoil Strip</u>					
4.11	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	8	236,160
4.12	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	8	236,160
<u>Bulk Earthworks</u>					
4.13	Cut to waste	404,788	m3	15	6,071,820
<u>Reinforcement to Slipway</u>					
4.14	Enkamatt 7018	3,600	m2	8	28,800
4.15	Reno Mattress (230mm thick with rock)	31,980	m2	33	1,050,051
5.00	Ground Improvements				74,628
<u>Option 5 Stopbank</u>					

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	122	45,625
	<u>Option 7 - Floodway</u>				
5.03	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.04	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000
5.05	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	122	9,003
6.00	Pavements				553,940
	<u>Option 5 Stopbank</u>				
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	95	475,500
	<u>Option 7 - Floodway</u>				
	<u>Carriageway</u>				
6.02	Huramua Road East	1,984	m2	40	78,440
7.00	Structures				581,520
	<u>Option 5 Stopbank</u>				
7.01	Allowance for new farm fencing	4,000	m	60	240,000
	<u>Option 7 - Floodway</u>				
7.02	Allowance for floodgates (assume 1m high)	2	no	120,000	240,000
7.03	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				728,950
	<u>Option 5 Stopbank</u>				
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
8.04	Allowance to lower existing watermain below floodway	500	m	300	150,000
	<u>Option 7 - Floodway</u>				
	<u>Shared Utilities Trench</u>				
8.05	Allowance for shared utilities trench	246	m	250	61,500
	<u>Power</u>				
8.06	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.07	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.08	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	250	150,000
9.00	Landscaping				129,609
	<u>Option 5 Stopbank</u>				
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
	<u>Option 7 - Floodway</u>				
9.03	Hydroseed to base of floodway	151,200	m2	1	75,600
9.04	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				841,620
	<u>Option 5 Stopbank</u>				
10.01	Traffic Management Allowance	1	item	438,430	438,430
	<u>Option 7 - Floodway</u>				
10.02	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				5,026,960
	<u>Option 5 Stopbank</u>				
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	750,000	750,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	120	70,320
11.03	Demolish existing community building and dispose off-site	423.00	m2	120	50,760
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	60	40,680
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	80,000	2,560,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (LOW OPTION)

Code	Description	Quantity	UOM	Rate	Total
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	200,000	200,000
	<u>Option 7 - Floodway</u>				
	<u>Demolition and Site Clearance</u>				
11.07	Demolish existing residential building and dispose off-site	250	m2	120	30,000
11.08	Demolish existing shed structure and dispose off-site	420	m2	60	25,200
	<u>Land Purchase</u>				
11.09	Purchase of rural / general land	15	ha	80,000	1,200,000
	<u>Accommodation Works</u>				
11.10	Allowance for access and Accommodation costs	1	item	100,000	100,000
Sub-total					27,888,499
ON	Onsite Overheads	27,888,499	%	15.00%	4,183,275
OFF	Off-site Overheads and Profit	32,071,774	%	10.00%	3,207,177
Sub-total Construction					35,278,952
	Developmental Contributions	35,278,952	%		Excluded
	Consent Fees	35,278,952	%	1.00%	352,790
	Internal Fees	35,631,741	%	2.50%	890,794
	Professional Fees	36,522,535	%	10.00%	3,652,253
	Contingency	40,174,788	%	15.00%	6,026,218
	Escalation		%		Excluded
Total to Summary					46,201,006

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				2,250,500
	<u>Option 5 Stopbank</u>				
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
	<u>Option 7 - Floodway</u>				
1.04	Dust suppression	9	month	88,000	792,000
1.05	Silt Fences	1,200	m	25	30,000
1.06	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				368,793
	<u>Option 5 Stopbank</u>				
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	275,940	275,940
	<u>Option 7 - Floodway</u>				
	<u>Mobilisation and Demobilisation</u>				
2.03	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.04	Allowance for temporary roadways	1	item	47,853	47,853
3.00	Demolition and Site Clearance				1,957,690
	<u>Option 5 Stopbank</u>				
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
<u>Option 7 - Floodway</u>					
3.07	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.08	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.09	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.10	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				28,779,917
<u>Option 5 Stopbank</u>					
<u>Topsoil Strip</u>					
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	12	112,800
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	12	112,800
<u>Bulk Earthworks</u>					
4.03	Cut to waste	27,095	m3	40	1,083,800
<u>Stopbank Formation</u>					
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	120	2,954,400
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	120	2,553,600
4.09	Post settlement fill; 300mm thick	14,772	m3	120	1,772,640
4.10	Testing	386	no	200	77,200
<u>Option 7 - Floodway</u>					
<u>Topsoil Strip</u>					
4.11	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	12	354,240
4.12	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	12	354,240
<u>Bulk Earthworks</u>					
4.13	Cut to waste	404,788	m3	40	16,191,520
<u>Reinforcement to Slipway</u>					
4.14	Enkamatt 7018	3,600	m2	8	28,800
4.15	Reno Mattress (230mm thick with rock)	31,980	m2	47	1,501,157
5.00	Ground Improvements				99,323
<u>Option 5 Stopbank</u>					

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	177	66,250
	<u>Option 7 - Floodway</u>				
5.03	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.04	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000
5.05	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	177	13,073
6.00	Pavements				651,820
	<u>Option 5 Stopbank</u>				
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	111	555,500
	<u>Option 7 - Floodway</u>				
	<u>Carriageway</u>				
6.02	Huramua Road East	1,984	m2	49	96,320
7.00	Structures				641,520
	<u>Option 5 Stopbank</u>				
7.01	Allowance for new farm fencing	4,000	m	60	240,000
	<u>Option 7 - Floodway</u>				
7.02	Allowance for floodgates (assume 1m high)	2	no	150,000	300,000
7.03	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				924,950
	<u>Option 5 Stopbank</u>				
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
8.04	Allowance to lower existing watermain below floodway	500	m	500	250,000
	<u>Option 7 - Floodway</u>				
	<u>Shared Utilities Trench</u>				
8.05	Allowance for shared utilities trench	246	m	250	61,500
	<u>Power</u>				
8.06	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.07	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.08	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	410	246,000
9.00	Landscaping				129,609
	<u>Option 5 Stopbank</u>				
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
	<u>Option 7 - Floodway</u>				
9.03	Hydroseed to base of floodway	151,200	m2	1	75,600
9.04	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				841,620
	<u>Option 5 Stopbank</u>				
10.01	Traffic Management Allowance	1	item	438,430	438,430
	<u>Option 7 - Floodway</u>				
10.02	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				6,876,690
	<u>Option 5 Stopbank</u>				
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	1,500,000	1,500,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	150	87,900
11.03	Demolish existing community building and dispose off-site	423.00	m2	150	63,450
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	80	54,240
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	100,000	3,200,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

February 2024



OPTION 17 - COMBINATION (MID OPTION)

Code	Description	Quantity	UOM	Rate	Total
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	250,000	250,000
	<u>Option 7 - Floodway</u>				
	<u>Demolition and Site Clearance</u>				
11.07	Demolish existing residential building and dispose off-site	250	m2	150	37,500
11.08	Demolish existing shed structure and dispose off-site	420	m2	80	33,600
	<u>Land Purchase</u>				
11.09	Purchase of rural / general land	15	ha	100,000	1,500,000
	<u>Accommodation Works</u>				
11.10	Allowance for access and Accommodation costs	1	item	150,000	150,000
Sub-total					43,522,432
ON	Onsite Overheads	43,522,432	%	18.00%	7,834,038
OFF	Off-site Overheads and Profit	51,356,470	%	13.00%	6,676,341
Sub-total Construction					58,032,811
	Developmental Contributions	58,032,811	%		Excluded
	Consent Fees	58,032,811	%	1.00%	580,328
	Internal Fees	58,613,139	%	2.50%	1,465,328
	Professional Fees	60,078,467	%	10.00%	6,007,847
	Contingency	66,086,314	%	15.00%	9,912,947
	Escalation		%		Excluded
Total to Summary					75,999,261

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

January 2024



OPTION 17 - COMBINATION (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
1.00	Environmental Compliance				2,250,500
	<u>Option 5 Stopbank</u>				
1.01	Dust suppression	12	month	95,333	1,144,000
1.02	Silt Fences	5,780	m	25	144,500
1.03	Allowance for movement of silt fences to suit staging	1	item	100,000	100,000
	<u>Option 7 - Floodway</u>				
1.04	Dust suppression	9	month	88,000	792,000
1.05	Silt Fences	1,200	m	25	30,000
1.06	Allowance for movement of silt fences to suit staging	1	item	40,000	40,000
2.00	Temporary Works				651,657
	<u>Option 5 Stopbank</u>				
	<u>Mobilisation and Demobilisation</u>				
2.01	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.02	Allowance for temporary roadways	1	item	547,260	547,260
	<u>Option 7 - Floodway</u>				
	<u>Mobilisation and Demobilisation</u>				
2.03	Mobilisation and Demobilisation of key plant and equipment	1	item	22,500	22,500
	<u>Temporary Road Ways</u>				
2.04	Allowance for temporary roadways	1	item	59,397	59,397
3.00	Demolition and Site Clearance				1,957,690
	<u>Option 5 Stopbank</u>				
3.01	Sawcut existing roadway	16	m	15	240
3.02	Breakout existing roadway and dispose off-site	4,000	m2	25	100,000
3.03	Demolish existing farm fence and dispose off-site	4,000	m	15	60,000
3.04	Removal of existing power pole along existing roadways	20	no	5,000	100,000
3.05	Remove vegetation and dispose off site (grass, low shrubs, small trees)	47,000	m2	5	235,000
3.06	Remove vegetation and dispose off site (medium / large trees)	870	m	500	435,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

January 2024



OPTION 17 - COMBINATION (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
	<u>Option 7 - Floodway</u>				
3.07	Demolish existing farm fence and dispose off-site	1,230	m	15	18,450
3.08	Removal of existing power pole along existing roadways	5	no	5,000	25,000
3.09	Remove vegetation and dispose off site (grass, low shrubs, small trees)	147,600	m2	5	738,000
3.10	Remove vegetation and dispose off site (medium / large trees)	492	m	500	246,000
4.00	Earthworks				47,177,036
	<u>Option 5 Stopbank</u>				
	<u>Topsoil Strip</u>				
4.01	Strip topsoil to stockpile - 200mm thick assumed	9,400	m3	18	169,200
4.02	Respread topsoil from stockpile upon completion (200mm thick)	9,400	m3	18	169,200
	<u>Bulk Earthworks</u>				
4.03	Cut to waste	27,095	m3	75	2,032,125
	<u>Stopbank Formation</u>				
4.04	Imported Fill; 500mm thick subbase to stopbank	24,620	m3	160	3,939,200
4.05	Geotextile to Silt Core	66,020	m2	8	528,160
4.06	Compacted Silt Core (assume site won't settle)	31,920	m3	30	957,600
4.07	Combigrid to Batter Slope	24,620	m2	8	196,960
4.08	Engineered Fill to Batters	21,280	m3	160	3,404,800
4.09	Post settlement fill; 300mm thick	14,772	m3	160	2,363,520
4.10	Testing	386	no	200	77,200
	<u>Option 7 - Floodway</u>				
	<u>Topsoil Strip</u>				
4.11	Strip topsoil to stockpile - 200mm thick assumed	29,520	m3	18	531,360
4.12	Respread topsoil from stockpile upon completion (200mm thick)	29,520	m3	18	531,360
	<u>Bulk Earthworks</u>				
4.13	Cut to waste	404,788	m3	75	30,359,100
	<u>Reinforcement to Slipway</u>				
4.14	Enkamatt 7018	3,600	m2	8	28,800
4.15	Reno Mattress (230mm thick with rock)	31,980	m2	59	1,888,451
5.00	Ground Improvements				132,998
	<u>Option 5 Stopbank</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

January 2024



OPTION 17 - COMBINATION (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
5.01	EO rate for disposal of contaminated materials	4,065	m3	500	Excluded
5.02	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	375	m3	252	94,375
	<u>Option 7 - Floodway</u>				
5.03	EO rate for disposal of contaminated materials	60,719	m3	500	Excluded
5.04	Allowance for disposal of contaminated hot spots	1	item	20,000	20,000
5.05	Allowance for soft ground remediation (assumed 25% of area); assume 300mm undercut with AP65 backfill	74	m3	252	18,623
6.00	Pavements				850,580
	<u>Option 5 Stopbank</u>				
	<u>Carriageway</u>				
6.01	Ruataniwha Road	5,000	m2	144	720,500
	<u>Option 7 - Floodway</u>				
	<u>Carriageway</u>				
6.02	Huramua Road East	1,984	m2	66	130,080
7.00	Structures				741,520
	<u>Option 5 Stopbank</u>				
7.01	Allowance for new farm fencing	4,000	m	60	240,000
	<u>Option 7 - Floodway</u>				
7.02	Allowance for floodgates (assume 1m high)	2	no	200,000	400,000
7.03	Allowance for new farm fencing	1,692	m	60	101,520
8.00	Utility Services				1,024,950
	<u>Option 5 Stopbank</u>				
	<u>Shared Utilites Trench</u>				
8.01	Allowance for shared utilites trench	500	m	250	125,000
	<u>Power</u>				
8.02	Allowance to underground existing overhead power	500	m	210	105,000
	<u>Communications</u>				
8.03	Allowance to underground existing fibre	500	m	115	57,500
	<u>Water</u>				

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

January 2024



OPTION 17 - COMBINATION (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
8.04	Allowance to lower existing watermain below floodway	500	m	700	350,000
	<u>Option 7 - Floodway</u>				
	<u>Shared Utilities Trench</u>				
8.05	Allowance for shared utilities trench	246	m	250	61,500
	<u>Power</u>				
8.06	Allowance to underground existing overhead power	246	m	210	51,660
	<u>Communications</u>				
8.07	Allowance to underground existing fibre	246	m	115	28,290
	<u>Drainage</u>				
8.08	Allowance for swale drain (assumed 2.5m wide x .8m deep)	600	m	410	246,000
9.00	Landscaping				129,609
	<u>Option 5 Stopbank</u>				
9.01	Hydro seed to embankment	73,117	m2	1	36,559
9.02	Allowance for reinstatement to embankment perimeter	28,900	m2	1	14,450
	<u>Option 7 - Floodway</u>				
9.03	Hydroseed to base of floodway	151,200	m2	1	75,600
9.04	Allowance for reinstatement to floodway perimeter	6,000	m2	1	3,000
10.00	Traffic Management				841,620
	<u>Option 5 Stopbank</u>				
10.01	Traffic Management Allowance	1	item	438,430	438,430
	<u>Option 7 - Floodway</u>				
10.02	Traffic Management Allowance	1	item	403,190	403,190
11.00	Land Purchase				8,976,420
	<u>Option 5 Stopbank</u>				
	<u>Demolition and Site Clearance</u>				
11.01	Allowance to relocate Ruataniwha Marae	1	item	2,500,000	2,500,000
11.02	Demolish existing residential building and dispose off-site	586.00	m2	180	105,480
11.03	Demolish existing community building and dispose off-site	423.00	m2	180	76,140
11.04	Demolish existing shed structure and dispose off-site	678.00	m2	100	67,800
	<u>Land Purchase</u>				
11.05	Purchase of rural / general land	32	ha	120,000	3,840,000

WAIROA FLOOD ALLEVIATION

CONCEPT DESIGN

January 2024



OPTION 17 - COMBINATION (HIGH OPTION)

Code	Description	Quantity	UOM	Rate	Total
	<u>Accommodation Works</u>				
11.06	Allowance for access and Accommodation costs	1	item	300,000	300,000
	<u>Option 7 - Floodway</u>				
	<u>Demolition and Site Clearance</u>				
11.07	Demolish existing residential building and dispose off-site	250	m2	180	45,000
11.08	Demolish existing shed structure and dispose off-site	420	m2	100	42,000
	<u>Land Purchase</u>				
11.09	Purchase of rural / general land	15	ha	120,000	1,800,000
	<u>Accommodation Works</u>				
11.10	Allowance for access and Accommodation costs	1	item	200,000	200,000
Sub-total					64,734,580
ON	Onsite Overheads	64,734,580	%	20.00%	12,946,916
OFF	Off-site Overheads and Profit	77,681,496	%	15.00%	11,652,224
Sub-total Construction					89,333,720
	Developmental Contributions	89,333,720	%		Excluded
	Consent Fees	89,333,720	%	1.00%	893,337
	Internal Fees	90,227,057	%	2.50%	2,255,676
	Professional Fees	92,482,734	%	10.00%	9,248,273
	Contingency	101,731,007	%	15.00%	15,259,651
	Escalation		%		Excluded
Total to Summary					116,990,658

p



APPENDIX B

Description Of Options



Description of Options (31-01-24)

1.1 Option 1 - Floodway

Option 1 consists of a 250m wide by ~2m deep floodway (a secondary high level flow channel that activates only during significant floods) which provides a formalised and clear path for out of channel flows that bypass the Wairoa River channel during significant flood events (Figure 2-1). The floodway would have the following attributes:

Attribute	Approximates
Length	1km
Depth	2m
Width	250m
Volume of cut	765,580 m ³
Volume of Fill	200mm topsoil layer, with 300mm in locations outlined below.
Area	32.58ha
Construction	<ul style="list-style-type: none">• Side batters down to the floodway. The floodway will have a relatively flat base. 200mm topsoil layer.• Will include a central drain / swale to intercept run-off / groundwater seepage.• Waihirere Road and Ruataniwha Roads will need to be re-built down into and across floodway. Barrier arms on the roads similar to those at rail crossings. The road slope to be approx 10%.• All buildings and trees/features in the alignment of the floodway will need to be removed/demolished• We have assumed no floodgates at the northern end of the floodway to control the entry of water into the floodway.• Start and end of floodway to have reno mattress with 300mm topsoil layer cover.

Table 2.1 – Option Attributes

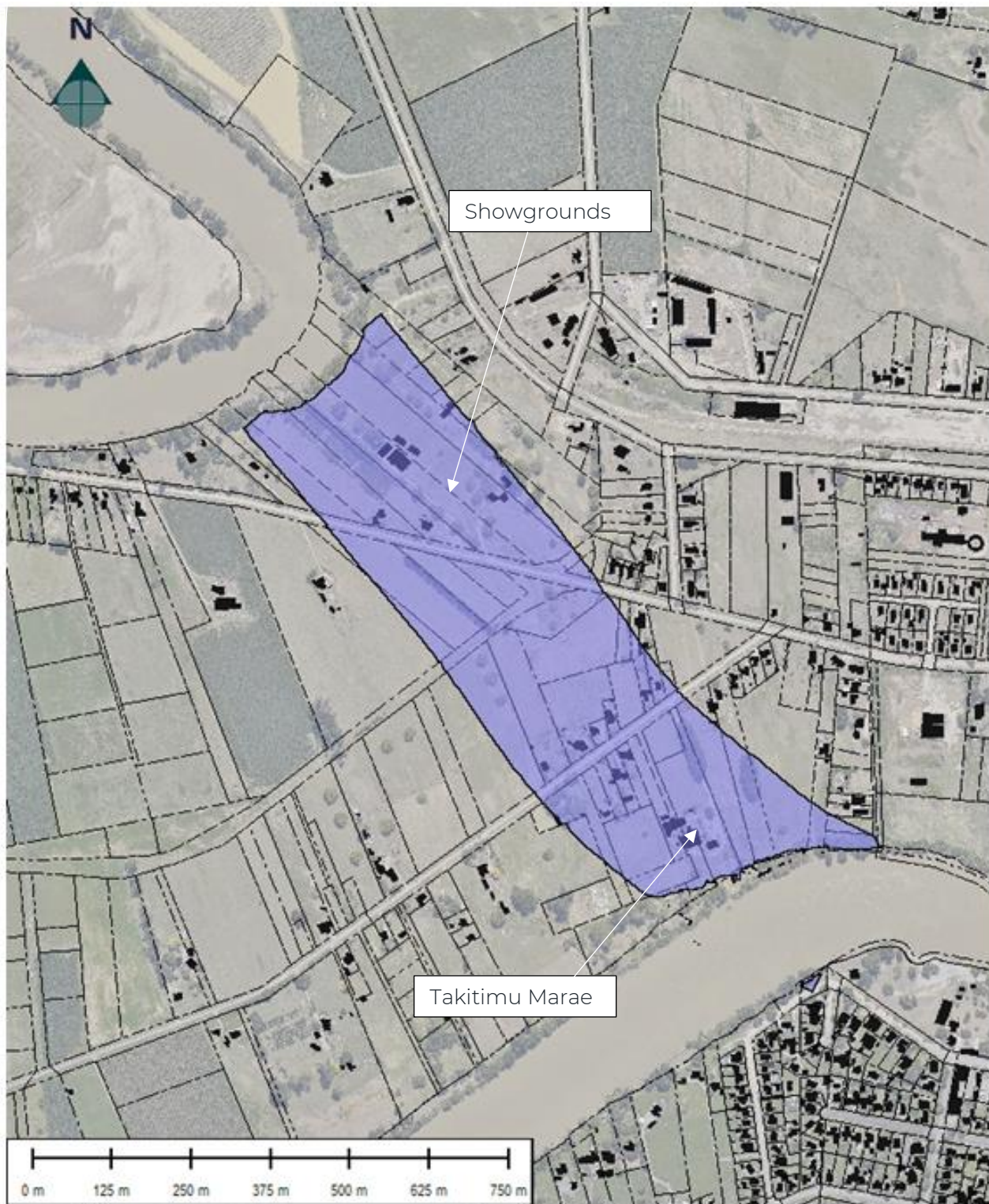


Figure 2-1.Option 1

1.2 Option 5 – Stopbank

Option 5 is a stopbank in the location shown on Figure 2.3 below. For this multi-criteria analysis we have assumed that an earth wall stopbank would be constructed. The alignment shown below is a potential alignment chosen to minimise affecting private property by utilising the road and rail corridor where possible.

The concept stopbank has the following characteristics:

Attribute	Approximates
Length	2.89km
Height	Typically less than 2m high, but up to 4m high in places
Cross Section	<p>4m wide crest with 1:3 sides 10 wide crest where road is on top with 2 x 3.5m lanes plus 1.5m shoulders</p>
Volume of fill	53,200m ³
Extent of land affected	32ha
Construction	<ul style="list-style-type: none"> • Will likely have a compacted low permeability silt core (1:1 side slope) 4m wide at crest with ordinary fill placed on the sides, finished with 200 mm topsoil and grassed. • Assume a 500 mm cut to waste under the stopbank footprint. • Dwellings on stopbank side will need to be removed or demolished for safety reasons. • Ruataniwha marae would need to be moved to the landward side of the stopbank.

Table 2.2 – Option Attributes

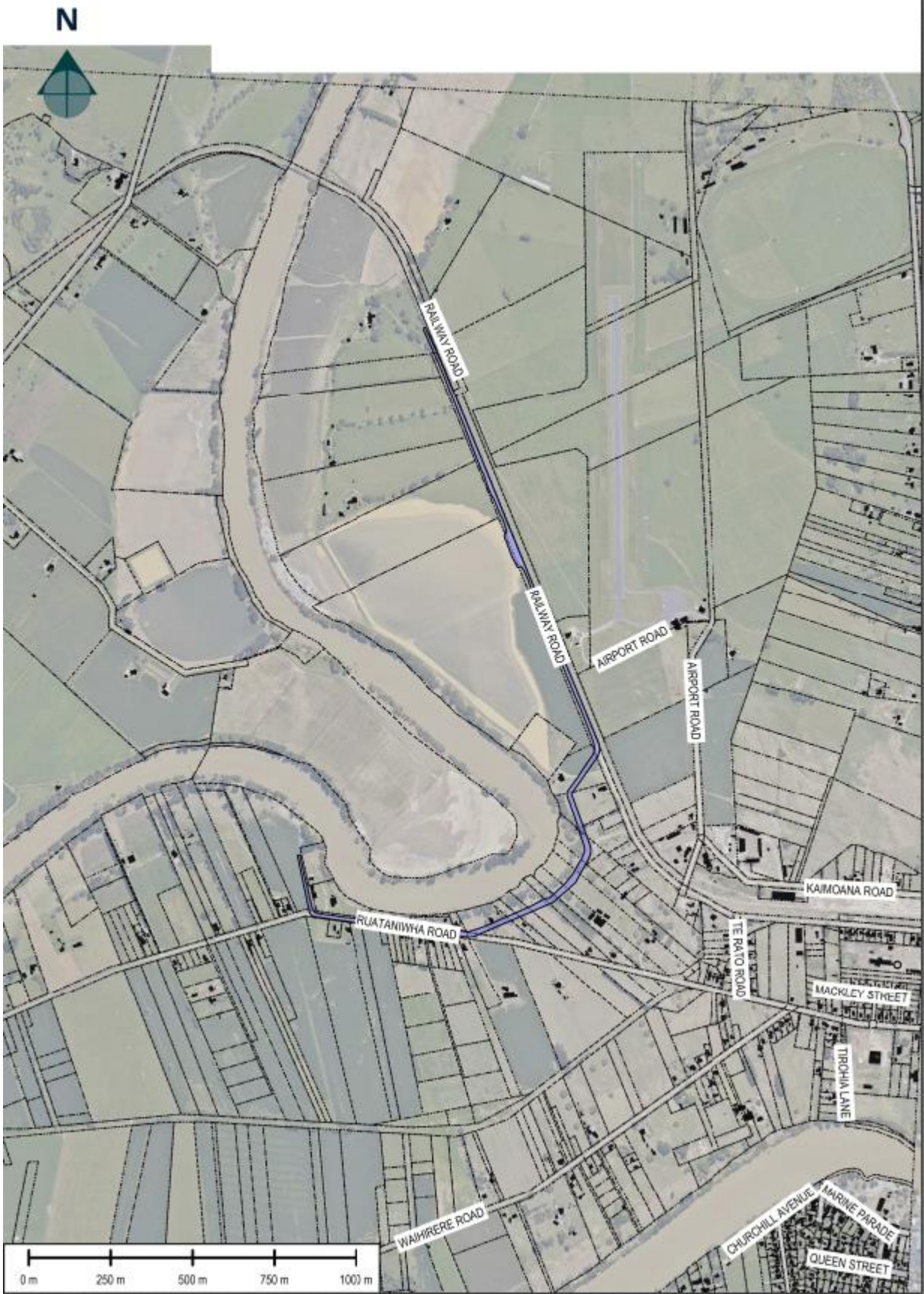


Figure 2-3 Stopbank Option 5



1.3 Option 17 - Combination of Option 5 + Option 7

This option consists of a combination of Option 5 and Option 7. This includes the stopbank from Option 5 with a floodway on the true right bank, upstream of the flood breakout area (

Figure 2-5). This option was modelled to see if the area subjected to increased flood depths in Option 5 could be reduced.

The Option 7 floodway would have the following attributes:

Attribute	Approximates
Length	600m
Depth	2 to 3m
Volume of cut	404,300 m ³
Volume of Fill	200mm topsoil layer
Extent of land affected	14.76ha
Construction	<ul style="list-style-type: none"> • Side batters down to the floodway. The floodway will have a relatively flat base. 200mm topsoil layer. • Will include a central drain / swale to intercept run-off / groundwater seepage. • Huramua Road East will need to be re-built down into and across floodway. Barrier arms on the road similar to those at rail crossings. • The road slope to be approx 10%. • All buildings and trees/features in the alignment of the floodway will need to be removed/demolished. • We have assumed no floodgates at the northern end of the floodway to control the entry of water into the floodway.

Table 2.3 – Option 7 Attributes

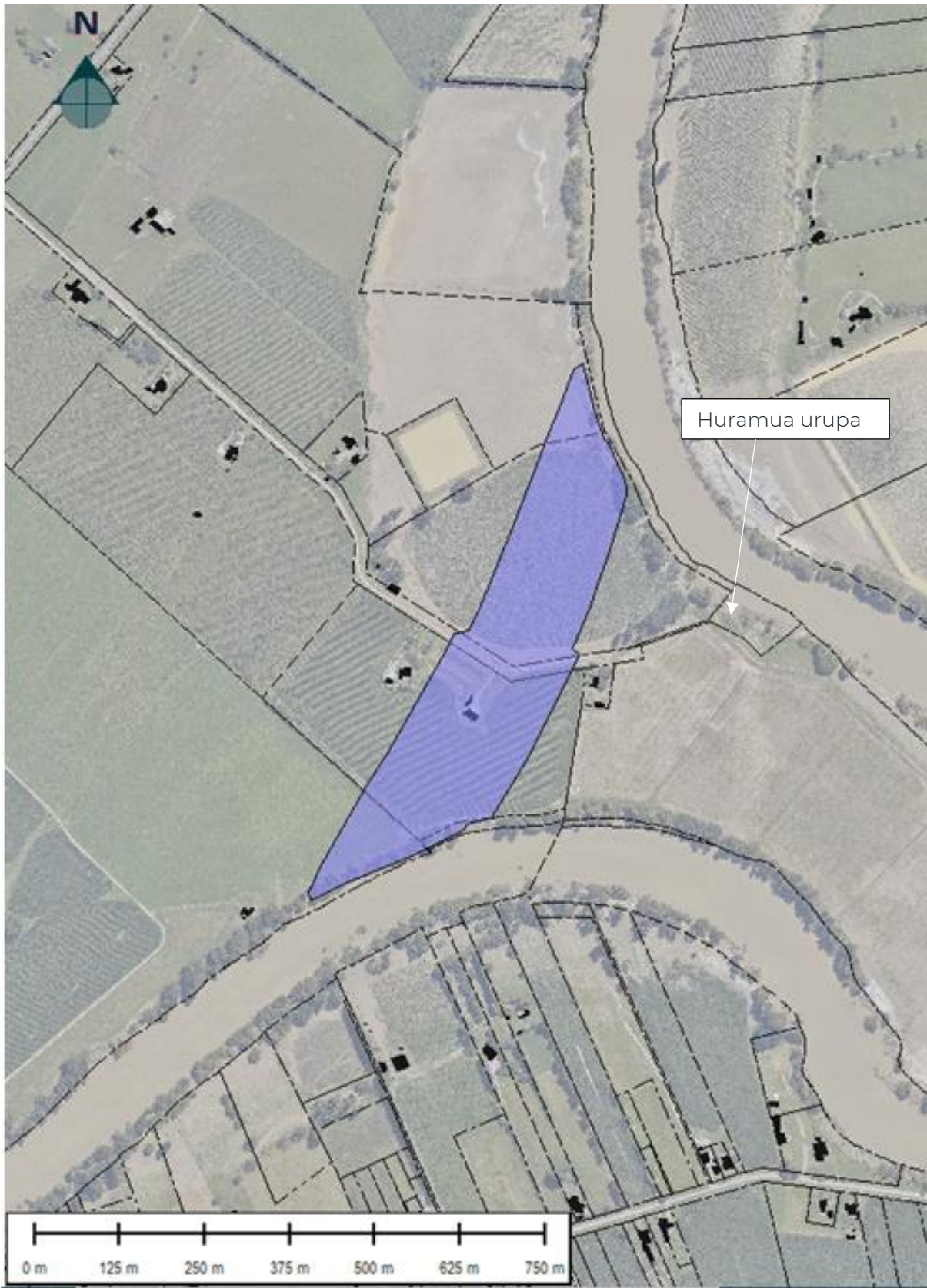


Figure 2-5 Option 7 - Floodway



1.4 Option 1B - Floodway

Option 1b is a variation of Option 1 and consists of a 170m wide by ~2m deep floodway (a secondary high level flow channel that activates only during significant floods) which provides a formalised and clear path for out of channel flows that bypass the Wairoa River channel during significant flood events (Figure 2-1). The floodway would have the following attributes:

Attribute	Approximates
Length	1km
Depth	2m
Width	150m
Volume of cut	488,120 m ³ cut
Volume of Fill	13,900 m ³ fill Plus 200mm topsoil layer, with 300mm in locations outlined below.
Extent of land affected	22.98ha
Construction	<ul style="list-style-type: none"> • Side batters down to the floodway. The floodway will have a relatively flat base. 200mm topsoil layer. • Will include a central drain / swale to intercept run-off / groundwater seepage. • The edges of the channel will include a 1m high embankment both sides – this would likely be compacted site won material due to low height finished with topsoil. We have assumed the embankments will have a 2m crest wide crest with 1:3 side slopes. • Waihirere Road and Ruataniwha Roads will need to be re-built down into and across floodway. Barrier arms on the roads similar to those at rail crossings. The road slope to be approx 10%. • All buildings and trees/features in the alignment of the floodway will need to be removed/demolished • We have assumed no floodgates at the northern end of the floodway to control the entry of water into the floodway. • Start and end of floodway to have reno mattress with 300mm topsoil layer cover.

Table 2.4 – Option 1b Attributes

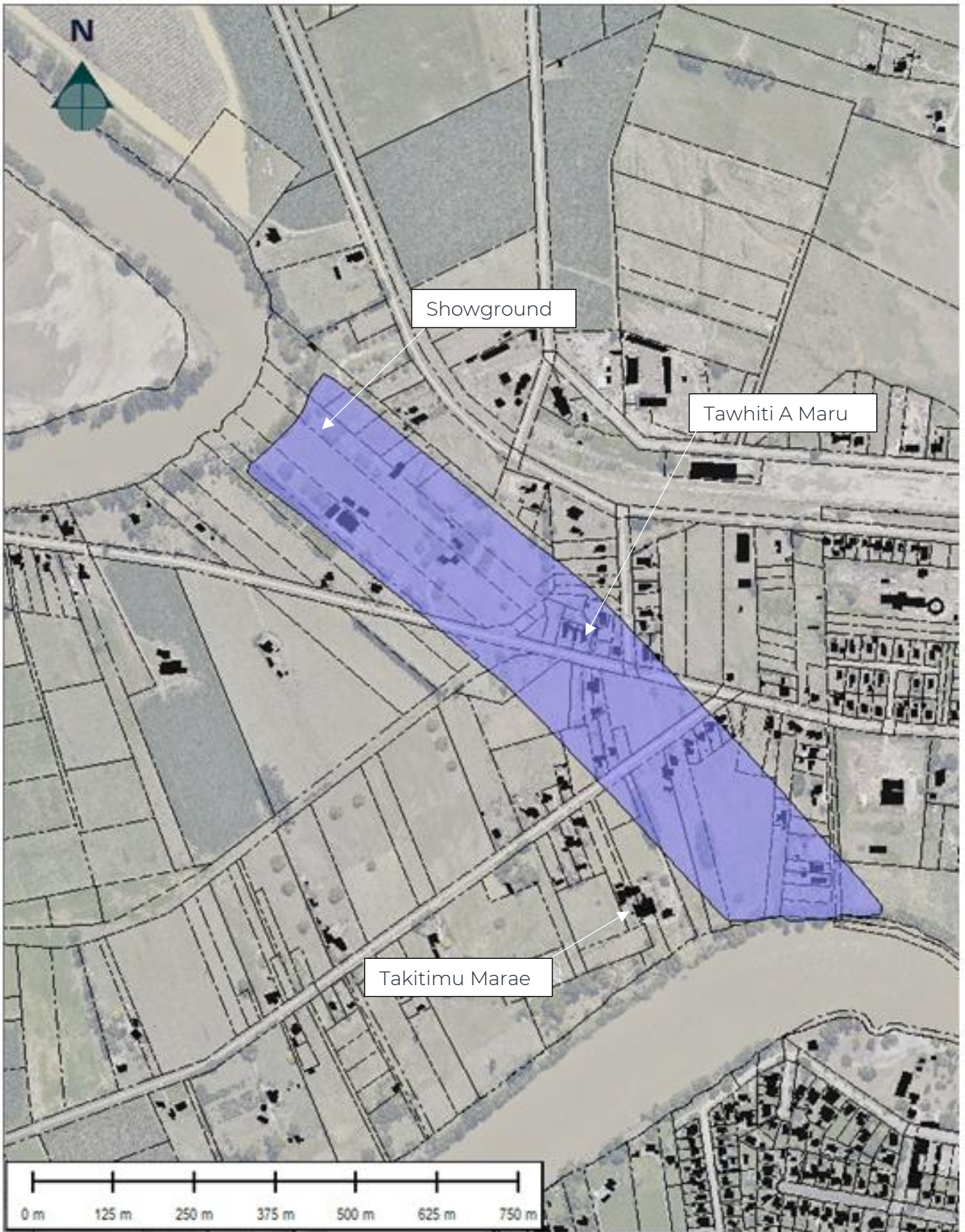


Table 2.4 – Option 1B Alignment

