

Report

# Huia Site Selection Short-list Cost Estimate

**Prepared for Watercare Services Ltd (Client)**

**By CH2M Beca Limited**

13 September 2016



### Revision History

Revision N°	Prepared By	Description	Date
A	Jack Brennan		26/9/16

### Document Acceptance

Action	Name	Signed	Date
Prepared by	Jack Brennan	<i>J Brennan</i>	26/9/16
Reviewed by	Dennis Hunt	<i>D M Hunt</i>	26 September 2016
Approved by	Clive Rundle	<i>C Rundle</i>	27 September 2016
on behalf of	CH2M Beca Limited		

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## 1 Introduction

This report is written to describe the cost estimate approach used for the shortlist of sites. It will also summarise the cost estimates for the four sites, which are:

- The Existing Site
- Manuka Road
- Parker North
- Parker South

This report should be read in conjunction with the Shortlist Site Development Report<sup>1</sup>, the Ancillary Structures Summary Report<sup>2</sup> and the cost estimate spreadsheets in the appendix.

The appendices include:

- Appendix A - Cost Estimate Summary: this provides a summary of the key line items and allows direct comparison of the four sites
- Appendix B – Site Specific Risks: this is an individual sheet for each site, which looks at the site specific risks associated with each line item
- Appendix C – NPV Summary: this indicates the costs over time associated with each site and the associated capital infrastructure and provides an NPV summary based on the Watercare NPV calculation spreadsheet
- Appendix D – Detailed Site Cost Estimates: this is the full cost estimate for each site. These should be referred to when interrogating the detail of the individual estimates.

## 2 Cost Estimate Approach

### 2.1 Base Capital Cost

The costs have been developed through a combination of unit rates, examples from similar projects and engineering judgement. Where appropriate the cost estimates previously developed for the Huia Water Treatment Plant and North Harbour Watermain have been utilised.

#### 2.1.1 Water Treatment Plant

The water treatment plant costs have been developed using the designs in the Shortlist Site Development Report<sup>1</sup>. Civil and structural costs directly utilise the quantities on the drawings in this report and use current material and construction costs from the CH2M Beca database.

The process, mechanical, instrumentation, electrical and control costs were based on the process sizing in the site development report. The costs were drawn from costs provided by suppliers and from similar historical projects.

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<sup>1</sup> GHD (Sept, 2016) Shortlist Site Development Report

<sup>2</sup> CH2M Beca (Sept, 2016) Ancillary Structures Summary Report

The P&G costs for the water treatment plant are shown as a separate line, which includes onsite overheads and admin costs.

### **2.1.2 Treated Water Storage**

The treated water storage reservoirs cost estimates for the civil and structural costs were also based on the drawings in the Shortlist Site Development Report. These were then compared with the cost estimates for the Runciman Reservoirs to provide an allowance for inlet and outlet pipework and other ancillary costs.

### **2.1.3 Raw and Treated Water Transmission**

The unit rate that has been used for trenched 1,200mm CLS pipeline is \$4,771/m. This is based on a detailed cost review that was carried out for the Hunua No.1 replacement study in 2014. This study utilised experience from the Waikato Watermain, the Cossey's raw watermain and included a detailed breakdown from an Auckland based contractor.

The tunnel costs are based on the estimate provided to Watercare by McConnell Dowell for the Woodlands Park Tunnel (2014).

This has a fixed cost of \$5 million for the equipment and fixed P&G.

The flexible costs include:

- Shafts
- Line installation
- Pipe installation
- Contingency
- Design, consents, contract supervision and project management

The unit rate for the flexible costs comes to \$14,525/m.

### **2.1.4 Off-spec Discharges**

The overflow and attenuation requirements was calculated based on the overflow assessment that was carried out by T&T (Options for off-spec discharges, April 2016). The distance to the closest discharge point was used to estimate the overflow pipeline length and the pipeline was sized to be 1200mm.

In the case of the existing site, which requires the Muddy Creek pipeline for off-spec discharges, the cost estimate that was previously developed by MWH was utilised.

### **2.1.5 Other Ancillary Infrastructure**

The following ancillary infrastructure costs have been used:

- Wastewater pipeline installation costs were estimated using the Watercare Unit rates database.
- Offsite Power costs were estimated using a per meter rate for installation, which was provided from Vector via Watercare.
- Fibre communications costs were developed from a rate of \$300/m installation, which was provided by Watercare.

### 2.1.6 Design, Management and Consenting

These costs were based on standard percentages applied to the total capital cost as broken down below.

- Design, management, construction and contract supervision (15%)
- Consent and regulatory fees (2%)
- Client internal costs (3%)

### 2.1.7 Land Acquisition

Land costs have been taken from the latest CV values from Auckland Councils GIS. This is based on the land needed to construct the plant and reservoir at its proposed location.

An additional 35% has been added to the purchase price to reflect the current Auckland market.

A purchasing cost per property of \$25,000 has been included to account for legal costs and property negotiations.

Where the land surrounding the existing treatment plant can be sold an allowance for a cost saving has been made. This has been based on the CV of the Watercare owned property, which has been proportionally split based on land area.

## 2.2 Risk Costing

Due to the concept level detail of the current scheme designs, there is a degree of uncertainty associated with the cost estimates. This uncertainty has been split into specific technical risks, which differ for each scheme, and price uncertainty.

### 2.2.1 Specific Risks

The specific technical risks have been allocated a maximum cost and a likelihood which are multiplied to provide an expected specific risk cost. These are detailed in Appendix B. Some of the specific areas where there is uncertainty at this stage of design include:

- Ground conditions and earthworks
- Land acquisition
- Additional process and mechanical complexity arises during the detailed design stage
- The available working area on the construction site
- Tunnel lining and ground conditions
- Road repairs
- System control requirements
- Construction around existing heritage buildings
- Consenting risks

### 2.2.2 Price Uncertainty

The cost estimates are in the order of minus 15% to plus 25% accuracy overall.

## 2.3 Capital Cost Estimate

The expected specific risk cost has been added to the base capital cost estimate to provide an expected capital cost estimate.

## 2.4 Operational Cost Estimate

The operational costs for the water treatment plant utilised the Opex estimate from the MWH concept design water treatment plant. This figure is not anticipated to vary between sites.

The energy requirements of the pumps was separated out and calculated based on the total head requirement and length of the rising main. This figure is not anticipated to vary significantly between the sites because:

- There is little difference between the sites in the hydraulic grade at the inlet of the plant
- The top water level of the treated water reservoirs is the same for all four sites

The Opex estimates have been developed for comparative purposes only.

## 2.5 NPV Calculation

The 20 year NPV has been calculated for the four sites and includes the effects of inclusion, exclusion or deferment of ancillary projects in Watercare's capital projects programme, as appropriate. The NPV has been calculated using Watercare's NPV spreadsheet, which uses inflation rates that are consistent with Watercare's Long Term Plans. The NPV calculation is based on the capital and operational cost estimates for each site and the capital cost estimates previously prepared for Watercare for the following projects:

- Upper Nihotupu raw watermain
- The raw water aqueduct
- The treated water aqueduct

The staging of these schemes and the Huia project are based on the spend profiles from the Watercare Asset Management Plan (AMP). The Waitakere Water Treatment Plant replacement has not been included as this does not differ between sites.

### 3 Cost Estimate Summary

#### 3.1 Cost Summary

A summary of the cost estimates for the four sites is provided in Table 1; a more detailed breakdown is provided in Appendix A.

**Table 1 Cost Estimate Summary**

	Existing	Manuka	Parker North	Parker South
Water Treatment Plant	146,300,000	153,000,000	146,400,000	147,100,000
Reservoirs (civil structure only)	23,400,000	23,400,000	21,700,000	20,200,000
Raw water tunnel	-	-	26,000,000	23,200,000
Connection to aqueduct	700,000	2,300,000	3,700,000	3,700,000
Gravity supply from Upper Nihotupu RWM	-	5,600,000	4,300,000	4,300,000
Off-spec discharge	18,600,000	1,100,000	1,500,000	1,900,000
Wastewater pipeline	-	-	800,000	900,000
Treated water tunnel	20,200,000	20,200,000	-	-
Treated water pipeline	24,800,000	26,800,000	30,200,000	31,800,000
Offsite Power Upgrades	1,800,000	1,700,000	1,100,000	1,800,000
Fibre communications	1,600,000	1,600,000	2,300,000	2,100,000
<b>SUB-TOTAL</b>	<b>237,400,000</b>	<b>235,700,000</b>	<b>238,000,000</b>	<b>237,000,000</b>
Design, management, construction and contract supervision (15%)	35,600,000	35,400,000	35,700,000	35,400,000
Consent and regulatory fees (2%)	4,700,000	4,700,000	4,800,000	4,700,000
Client internal costs (3%)	7,100,000	7,100,000	7,100,000	7,100,000
Land purchase and sale costs	-	2,000,000	9,600,000	21,000,000
<b>TOTAL</b>	<b>\$ 284,800,000</b>	<b>\$ 284,900,000</b>	<b>\$ 295,200,000</b>	<b>\$ 305,200,000</b>
Specific Risks (refer to individual site breakdowns)	26,000,000	31,000,000	31,000,000	28,000,000
<b>TOTAL including specific risks</b>	<b>\$ 311,000,000</b>	<b>\$ 316,000,000</b>	<b>\$ 326,000,000</b>	<b>\$ 333,000,000</b>

#### 3.2 Cost Differentials

There is very little difference between the water treatment plant costs for the four sites. This is because all four site designs are based on the same template and process units. The difference in the treatment plant costs largely arise from differences in the earthworks requirements. The main cost differentials between the four sites are:

- The overflow discharge pipeline required for the existing site
- Land acquisition associated with the Parker Road Sites
- The additional tunnelling length associated with the Parker Road Sites
- The Upper Nihotupu raw watermain connection for the Parker Road sites and Manuka Road

#### 3.3 Key Differentiating Risks

A full breakdown of the site specific risks that have been identified is provided in Appendix B. The key differentiating risks are:

- The confined nature of the Woodlands Park Road sites
- Uncertainties associated with the tunnelling and whether the raw water tunnel will required lining
- Geotechnical issues and ground conditions

- Road reinstatement costs

### 3.4 NPV

The breakdown of the 20 year NPV for the four sites is presented in Table 2. The key points regarding the NPV are:

- The Parker sites have a lower NPV because the amount of ancillary capital projects is lower than the Woodlands Park site.
- The replacement/relining of the Huia treated water aqueduct has been included in the Woodlands Park Road NPV and this will provide additional resilience to the treated water network but at a capital cost that is not available for the Parker sites.

**Table 2 20yr NPV for the four sites**

Option Name	NPV 20 Years
Existing Site	\$368,000,000
Manuka Road	\$369,000,000
Parker Road North	\$359,000,000
Parker Road South	\$367,000,000

### 3.5 Conclusion

The capital costs and 20yr NPV for the four sites are presented in Figure 1. The error bars indicate the cost uncertainty. It can be seen from this figure that there is limited difference between the sites. The Woodland Park Road sites have a marginally lower capital cost but the Parker Road Sites have a marginally lower NPV.

The following have been excluded from the cost estimate and will need to be included by Watercare to get an overall cost estimate:

- GST
- Escalation post September 2016
- Capitalised interest
- Costs to date
- Insurance
- Legal and finance costs.

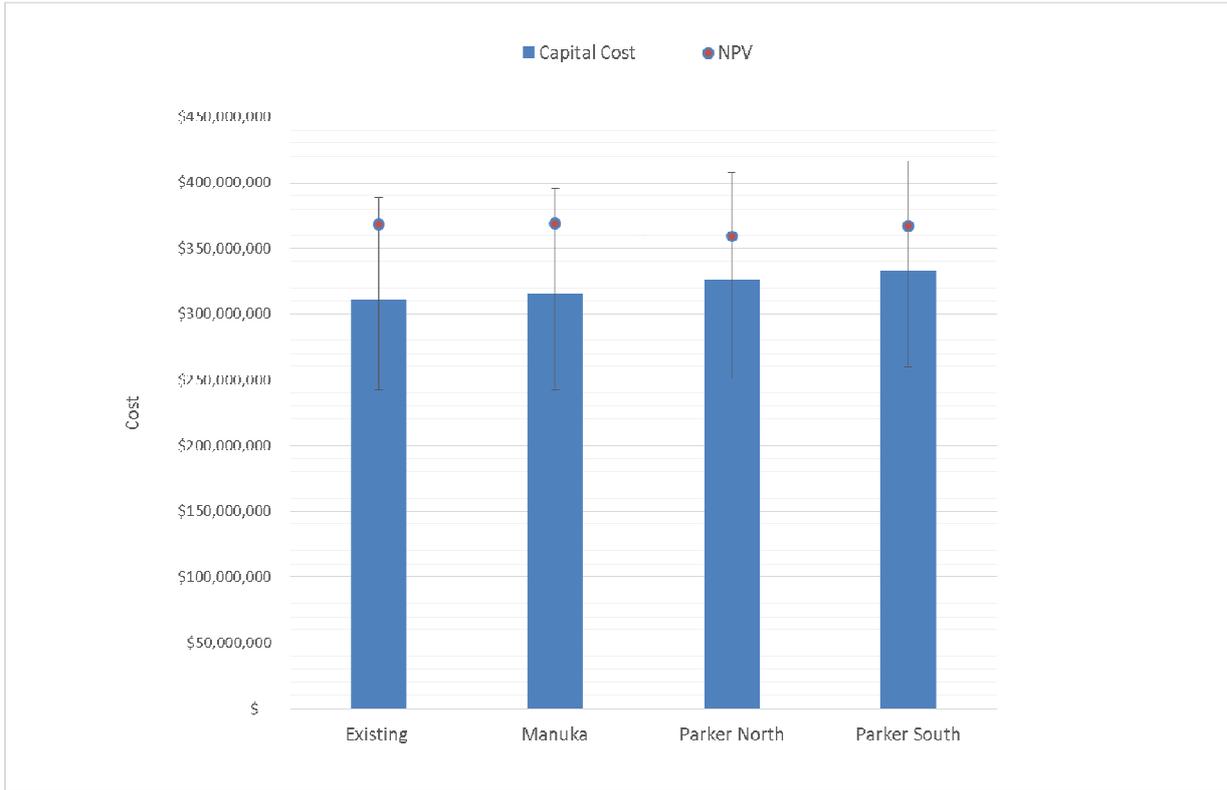


Figure 1. Scheme capital cost estimate and NPV comparison (brackets indicate price range)

Appendix A

## Cost Estimate Summary

## Huia WTP Cost Estimate Summary Comparison

Process costs are concept level. Civil costs are preliminary level.

The estimates are in the order of minus 15% to plus 25% accuracy overall.

See below for additional notes and exclusions.

	Existing	Manuka	Parker North	Parker South	
1	Water Treatment Plant	146,300,000	153,000,000	146,400,000	147,100,000
1.01	Site Clearance and Demolition	2,600,000	700,000	1,200,000	1,000,000
1.02	Environmental Compliance and Management	900,000	1,000,000	900,000	900,000
1.03	General Earthworks	2,600,000	5,900,000	4,600,000	5,000,000
1.04	Chemical Systems	8,600,000	8,600,000	8,600,000	8,600,000
1.05	DAF	14,000,000	14,000,000	14,000,000	14,000,000
1.06	BAC filters	22,400,000	22,400,000	22,400,000	22,400,000
1.07	Ozone	11,200,000	11,200,000	11,200,000	11,200,000
1.08	Residuals management	25,900,000	25,100,000	25,600,000	26,100,000
1.09	Raw water pump station	-	7,800,000	-	-
1.10	Chlorine contact tank + treated water pump station	12,300,000	7,500,000	12,300,000	12,300,000
1.11	Ancillary pipework (interconnecting pipework and serv	5,300,000	5,300,000	5,300,000	5,300,000
1.12	Power supply and generation	5,000,000	5,000,000	5,000,000	5,000,000
1.13	Administration building	500,000	1,400,000	1,400,000	1,400,000
1.14	Lagoon	-	1,800,000	1,400,000	900,000
1.15	Services relocation	600,000	300,000	100,000	100,000
1.16	Roading and finishing works (inc landscaping)	5,600,000	5,500,000	4,400,000	4,800,000
1.17	Traffic management and temporary works	2,500,000	2,500,000	1,700,000	1,700,000
1.18	Instrumentation and Control and SCADA	9,300,000	9,300,000	9,300,000	9,300,000
1.19	Process commissioning and support	600,000	600,000	600,000	600,000
1.20	Project closeout	700,000	700,000	700,000	700,000
1.21	O&M manuals and training	300,000	300,000	300,000	300,000
1.22	P+G (Contractors onsite overheads and admin costs)	15,400,000	16,100,000	15,400,000	15,500,000
Ancillary Structures (inc P&G)					
2	Reservoirs (civil structure only)	23,400,000	23,400,000	21,700,000	20,200,000
3	Raw water tunnel	-	-	26,000,000	23,200,000
4	Connection to aqueduct	700,000	2,300,000	3,700,000	3,700,000
5	Gravity supply from Upper Nihotupu RWM	-	5,600,000	4,300,000	4,300,000
6	Off-spec discharge	18,600,000	1,100,000	1,500,000	1,900,000
7	Wastewater pipeline	-	-	800,000	900,000
8	Treated water tunnel	20,200,000	20,200,000	-	-
9	Treated water pipeline	24,800,000	26,800,000	30,200,000	31,800,000
10	Offsite Power Upgrades	1,800,000	1,700,000	1,100,000	1,800,000
11	Fibre communications	1,600,000	1,600,000	2,300,000	2,100,000
SUB-TOTAL		<b>237,400,000</b>	<b>235,700,000</b>	<b>238,000,000</b>	<b>237,000,000</b>

Design, management, construction and contract supervision (15%)	35,600,000	35,400,000	35,700,000	35,400,000
Consent and regulatory fees (2%)	4,700,000	4,700,000	4,800,000	4,700,000
Client internal costs (3%)	7,100,000	7,100,000	7,100,000	7,100,000
Land purchase and sale costs	-	2,000,000	9,600,000	21,000,000
<b>TOTAL</b>	<b>\$ 284,800,000</b>	<b>\$ 284,900,000</b>	<b>\$ 295,200,000</b>	<b>\$ 305,200,000</b>

Specific Risks (refer to individual site breakdowns)	26,000,000	31,000,000	31,000,000	28,000,000
<b>TOTAL including specific risks</b>	<b>\$ 311,000,000</b>	<b>\$ 316,000,000</b>	<b>\$ 326,000,000</b>	<b>\$ 333,000,000</b>

<b>Upper Bound (+25%)</b>	<b>\$ 388,750,000</b>	<b>\$ 395,000,000</b>	<b>\$ 407,500,000</b>	<b>\$ 416,250,000</b>
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Raw Water Infrastructure Upgrades				
Upper Nihotupu Raw Watermain (2029-2035)	36,000,000	36,000,000	35,000,000	35,000,000
Raw Water Aqueduct (2017-2035)	13,300,000	13,300,000		
Treated Water Aqueduct (2023-2024)	14,000,000	14,000,000		

<b>NPV 20yr (using WSL inflation rates) including all upg</b>	<b>\$ 368,000,000</b>	<b>\$ 369,000,000</b>	<b>\$ 359,000,000</b>	<b>\$ 367,000,000</b>
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### Notes:

These estimates are based on the GHD civils drawings and information and the Beca information for the ancillary structures.

Rates used in these estimates are based on a mixture of the following:

- CH2M Beca database
- First principles
- Costs from suppliers
- Similar Historical projects

### Exclusions:

- Excavation in hard rock / basalt
- Night or after hours work
- Cost for shutting down any existing plant
- Asbestos removal / disposal
- GST
- Escalation after September 2016
- Capitalised interest
- Costs to date
- Operating and Maintenance cost
- Insurance costs
- Legal and finance fees

Appendix B

## Site Specific Risks





## Huia WTP Cost Estimate Summary Parker North

Process costs are concept level. Civil costs are preliminary level.

The estimates are in the order of minus 15% to plus 25% accuracy overall.

See below for additional notes and exclusions.

	Baseline Cost	Max Additional Cost	Likelihood	Specific risks	Comments	Assumptions
<b>1</b>	<b>Water Treatment Plant</b>	<b>146,400,000</b>				
1.01	Site Clearance and Demolition	1,200,000				
1.02	Environmental Compliance and Management	900,000				
1.03	General Earthworks	4,600,000	8,700,000	50%	4,350,000	Additional piling across the site
1.04	Chemical Systems	8,600,000	2,580,000	30%	774,000	Detailed design adds process and mechanical complexity
1.05	DAF	14,000,000	1,400,000	30%	420,000	Detailed design adds process and mechanical complexity
1.06	BAC filters	22,400,000	2,240,000	30%	672,000	Detailed design adds process and mechanical complexity
1.07	Ozone	11,200,000	1,120,000	30%	336,000	Detailed design adds process and mechanical complexity
1.08	Residuals management	25,600,000	2,560,000	30%	768,000	Detailed design adds process and mechanical complexity
1.09	Raw water pump station	-				
1.10	Chlorine contact tank + treated water pump station	12,300,000	2,000,000	20%	400,000	Additional Noise Control needed
1.11	Ancillary pipework (interconnecting pipework and services)	5,300,000				Additional structural noise barriers
1.12	Power supply and generation	5,000,000	500,000	30%	150,000	Detailed design results in greater load from site
1.13	Administration building	1,400,000	500,000	30%	150,000	Additional Scope from technology, fit out etc
1.14	Lagoon	1,400,000				
1.15	Services relocation	100,000	500,000	10%	50,000	Full survey indicates significant services relocation
1.16	Roading and finishing works (inc landscaping)	4,400,000	5,000,000	20%	1,000,000	Additional Landscaping mitigation needed
1.17	Traffic management and temporary works	1,700,000				Costs of temporary and permanent relocation for multiple services
1.18	Instrumentation and Control and SCADA	9,300,000	2,325,000	30%	697,500	Detailed design adds control complexity
1.19	Process commissioning and support	600,000				As per Runciman Reservoir
1.20	Project closeout	700,000				
1.21	O&M manuals and training	300,000				
1.22	P+G (Contractors onsite Overheads)	15,400,000				
<b>Ancillary Structures (inc P&amp;G)</b>						
<b>2</b>	<b>Reservoirs (civil structure only)</b>	<b>21,700,000</b>	<b>8,000,000</b>	<b>50%</b>	<b>4,000,000</b>	<b>Additional preload requirements following geotech investigation</b>
<b>3</b>	<b>Raw water tunnel</b>	<b>26,000,000</b>	<b>8,356,000</b>	<b>50%</b>	<b>4,178,000</b>	<b>Risks due to tunnel length and uncertainty regarding ground conditions</b>
			9,191,600	50%	4,595,800	Internal pipe to tunnel needed to prevent water losses to groundwater
4	Connection to aqueduct	3,700,000	2,000,000	20%	400,000	Additional communications needed to provide control at the raw water source
5	Gravity supply from Upper Nihotupu RWM	4,300,000				
6	Off-spec discharge	1,500,000	500,000	50%	250,000	Ecological remediation needed due to location of discharge
7	Wastewater pipeline	800,000	2,000,000	20%	400,000	Wastewater pipeline needs to be deeper to be gravity or a pump station is needed
8	Treated water tunnel	-				Approximate pump station cost
9	Treated water pipeline	30,200,000	2,040,000	50%	1,020,000	Full road reinstatement needed in Parker Rd due to narrow road
10	Offsite Power Upgrades	1,100,000	2,000,000	20%	400,000	Back-up supply from a second sub-station needed
11	Fibre communications on raw and treated water network	2,300,000				As per Woodlands sites
<b>SUB-TOTAL</b>		<b>238,000,000</b>				
<b>Design, management, construction and contract supervision (15%)</b>						
		35,700,000				
<b>Consent and regulatory fees (2%)</b>						
		4,800,000	8,000,000	50%	4,000,000	Consenting costs in line with Central Interceptor
<b>Client internal costs (3%)</b>						
		7,100,000				
<b>Land purchase</b>						
		12,100,000				
<b>Land sale</b>						
		-	4,500,000	20%	900,000	Land sale unsuccessful- (contaminated land/heritage value)
<b>Demolition of existing site</b>						
		2,000,000	2,000,000	50%	1,000,000	Demolition around existing heritage building adds costs and complexity
<b>TOTAL</b>		<b>\$ 295,200,000</b>	<b>78,012,600</b>		<b>30,911,300</b>	
<b>Specific Risks</b>		<b>30,911,300</b>				
<b>TOTAL including specific risks</b>		<b>\$ 326,111,300</b>				
<b>PRICE UNCERTAINTY</b>						
<b>Upper Bound (+25%)</b>		<b>\$ 407,639,125</b>				

## Huia WTP Cost Estimate Summary Parker South

Process costs are concept level. Civil costs are preliminary level.  
 The estimates are in the order of minus 15% to plus 25% accuracy overall.  
 See below for additional notes and exclusions.

	Baseline Cost	Max Additional Cost	Likelihood	Specific risks	Comments	Assumptions	
1	Water Treatment Plant	147,100,000					
1.01	Site Clearance and Demolition	1,000,000					
1.02	Environmental Compliance and Management	900,000					
1.03	General Earthworks	5,000,000	8,700,000	50%	4,350,000	Additional piling across the site	Based on 50,000m2 at 5m deep and \$35/m
1.04	Chemical Systems	8,600,000	2,580,000	30%	774,000	Detailed design adds process and mechanical complexity	30% of cost estimate
1.05	DAF	14,000,000	1,400,000	30%	420,000	Detailed design adds process and mechanical complexity	10% of cost estimate
1.06	BAC filters	22,400,000	2,240,000	30%	672,000	Detailed design adds process and mechanical complexity	10% of cost estimate
1.07	Ozone	11,200,000	1,120,000	30%	336,000	Detailed design adds process and mechanical complexity	10% of cost estimate
1.08	Residuals management	26,100,000	2,610,000	30%	783,000	Detailed design adds process and mechanical complexity	10% of cost estimate
1.09	Raw water pump station	-					
1.10	Chlorine contact tank + treated water pump station	12,300,000	2,000,000	20%	400,000	Additional Noise Control needed	Additional structural noise barriers
1.11	Ancillary pipework (interconnecting pipework and services)	5,300,000					
1.12	Power supply and generation	5,000,000	500,000	30%	150,000	Detailed design results in greater load from site	10% of cost estimate
1.13	Administration building	1,400,000	500,000	30%	150,000	Additional Scope from technology, fit out etc	
1.14	Lagoon	900,000					
1.15	Services relocation	100,000	500,000	10%	50,000	Full survey indicates significant services relocation	Costs of temporary and permanent relocation for multiple services
1.16	Roading and finishing works (inc landscaping)	4,800,000	5,000,000	20%	1,000,000	Additional Landscaping mitigation needed	As per Runciman Reservoir
1.17	Traffic management and temporary works	1,700,000					
1.18	Instrumentation and Control and SCADA	9,300,000	2,325,000	30%	697,500	Detailed design adds control complexity	25% of cost estimate
1.19	Process commissioning and support	600,000					
1.20	Project closeout	700,000					
1.21	O&M manuals and training	300,000					
1.22	P+G (Contractors onsite Overheads)	15,500,000					
Ancillary Structures (inc P&G)							
2	Reservoirs (civil structure only)	20,200,000	8,000,000	50%	4,000,000	Additional preload requirements following geotech investigation	As per Runciman Reservoir
3	Raw water tunnel	23,200,000	7,208,000	50%	3,604,000	Risks due to tunnel length and uncertainty regarding ground conditions	McDow estimate doubled
			7,928,800	50%	3,964,400	Internal pipe to tunnel needed to prevent water losses to groundwater	\$1500 for install from MacDow plus \$1700 for pipe purchase plus on costs plus contingency
4	Connection to aqueduct	3,700,000	2,000,000	20%	400,000	Additional communications needed to provide control at the raw water source	
5	Gravity supply from Upper Nihotupu RWM	4,300,000					
6	Off-spec discharge	1,900,000	500,000	50%	250,000	Ecological remediation needed due to location of discharge	
7	Wastewater pipeline	900,000	2,000,000	20%	400,000	Wastewater pipeline needs to be deeper to be gravity or a pump station is needed	Approximate pump station cost
8	Treated water tunnel	-					
9	Treated water pipeline	31,800,000	2,640,000	50%	1,320,000	Full road reinstatement needed in Parker Rd due to narrow road	\$1200/m of road lane
10	Offsite Power Upgrades	1,800,000	2,000,000	20%	400,000	Back-up supply from a second sub-station needed	As per Woodlands sites
11	Fibre communications on raw and treated water network	2,100,000					
SUB-TOTAL		237,000,000					
Design, management, construction and contract supervision (15%)							35,400,000
Consent and regulatory fees (2%)							4,700,000
Client internal costs (3%)							7,100,000
Land purchase							23,500,000
Land sale							- 4,500,000
Demolition of existing site							2,000,000
<b>TOTAL</b>		<b>\$ 305,200,000</b>	<b>69,751,800</b>		<b>28,120,900</b>		
Specific Risks		28,120,900					
<b>TOTAL including specific risks</b>		<b>\$ 333,320,900</b>					
<b>PRICE UNCERTAINTY</b>							
<b>Upper Bound (+25%)</b>		<b>\$ 416,651,125</b>					

Appendix C

## NPV Summary

Existing Site		Manuka Road		Parker Rd North		Parker Rd South	
Huia WTP	\$ 311,000,000	Huia WTP	\$ 316,000,000	Huia WTP	\$ 326,000,000	Huia WTP	\$ 333,000,000
Huia Opex	\$ 3,660,000						
Cost Savings (subtracted from total)		Cost Savings (subtracted from total)		Cost Savings (subtracted from total)		Cost Savings (subtracted from total)	
TW Aqueduct	\$ 14,000,000	TW Aqueduct	\$ 14,000,000	TW Aqueduct	\$ -	TW Aqueduct	\$ -
RW Aqueduct	\$ 13,300,000	RW Aqueduct	\$ 13,300,000	RW Aqueduct	\$ -	RW Aqueduct	\$ -
Upper Niho	\$ 36,000,000	Upper Niho	\$ 36,000,000	Upper Niho	\$ 35,000,000	Upper Niho	\$ 35,000,000
Waitakere	\$ -						
NPV (20yr) <sup>1</sup>	\$ 368,000,000	NPV (20yr) <sup>1</sup>	\$ 369,000,000	NPV (20yr) <sup>1</sup>	\$ 359,000,000	NPV (20yr) <sup>1</sup>	\$ 367,000,000
2016	\$ 6,220,000	2016	\$ 6,320,000	2016	\$ 6,520,000	2016	\$ 6,660,000
2017	\$ 26,210,000	2017	\$ 26,610,000	2017	\$ 26,080,000	2017	\$ 26,640,000
2018	\$ 32,430,000	2018	\$ 32,930,000	2018	\$ 32,600,000	2018	\$ 33,300,000
2019	\$ 62,200,000	2019	\$ 63,200,000	2019	\$ 65,200,000	2019	\$ 66,600,000
2020	\$ 77,750,000	2020	\$ 79,000,000	2020	\$ 81,500,000	2020	\$ 83,250,000
2021	\$ 62,200,000	2021	\$ 63,200,000	2021	\$ 65,200,000	2021	\$ 66,600,000
2022	\$ 31,100,000	2022	\$ 31,600,000	2022	\$ 32,600,000	2022	\$ 33,300,000
2023	\$ 22,550,000	2023	\$ 22,800,000	2023	\$ 16,300,000	2023	\$ 16,650,000
2024	\$ 10,660,000	2024	\$ 10,660,000	2024	\$ 3,660,000	2024	\$ 3,660,000
2025	\$ 3,660,000	2025	\$ 3,660,000	2025	\$ 3,660,000	2025	\$ 3,660,000
2026	\$ 6,320,000	2026	\$ 6,320,000	2026	\$ 3,660,000	2026	\$ 3,660,000
2027	\$ 6,320,000	2027	\$ 6,320,000	2027	\$ 3,660,000	2027	\$ 3,660,000
2028	\$ 3,660,000	2028	\$ 3,660,000	2028	\$ 3,660,000	2028	\$ 3,660,000
2029	\$ 7,260,000	2029	\$ 7,260,000	2029	\$ 7,160,000	2029	\$ 7,160,000
2030	\$ 9,060,000	2030	\$ 9,060,000	2030	\$ 8,910,000	2030	\$ 8,910,000
2031	\$ 14,460,000	2031	\$ 14,460,000	2031	\$ 14,160,000	2031	\$ 14,160,000
2032	\$ 10,860,000	2032	\$ 10,860,000	2032	\$ 10,660,000	2032	\$ 10,660,000
2033	\$ 10,860,000	2033	\$ 10,860,000	2033	\$ 10,660,000	2033	\$ 10,660,000
2034	\$ 8,120,000	2034	\$ 8,120,000	2034	\$ 5,410,000	2034	\$ 5,410,000
2035	\$ 6,320,000	2035	\$ 6,320,000	2035	\$ 3,660,000	2035	\$ 3,660,000
2036	\$ 3,660,000	2036	\$ 3,660,000	2036	\$ 3,660,000	2036	\$ 3,660,000
2037	\$ 3,660,000	2037	\$ 3,660,000	2037	\$ 3,660,000	2037	\$ 3,660,000
2038	\$ 3,660,000	2038	\$ 3,660,000	2038	\$ 3,660,000	2038	\$ 3,660,000
2039	\$ 3,660,000	2039	\$ 3,660,000	2039	\$ 3,660,000	2039	\$ 3,660,000
2040	\$ 3,660,000	2040	\$ 3,660,000	2040	\$ 3,660,000	2040	\$ 3,660,000
2041	\$ 3,660,000	2041	\$ 3,660,000	2041	\$ 3,660,000	2041	\$ 3,660,000
2042	\$ 3,660,000	2042	\$ 3,660,000	2042	\$ 3,660,000	2042	\$ 3,660,000
2043	\$ 3,660,000	2043	\$ 3,660,000	2043	\$ 3,660,000	2043	\$ 3,660,000
2044	\$ 3,660,000	2044	\$ 3,660,000	2044	\$ 3,660,000	2044	\$ 3,660,000
2045	\$ 3,660,000	2045	\$ 3,660,000	2045	\$ 3,660,000	2045	\$ 3,660,000
2046	\$ 3,660,000	2046	\$ 3,660,000	2046	\$ 3,660,000	2046	\$ 3,660,000
2047	\$ 3,660,000	2047	\$ 3,660,000	2047	\$ 3,660,000	2047	\$ 3,660,000
2048	\$ 3,660,000	2048	\$ 3,660,000	2048	\$ 3,660,000	2048	\$ 3,660,000
2049	\$ 3,660,000	2049	\$ 3,660,000	2049	\$ 3,660,000	2049	\$ 3,660,000
2050	\$ 3,660,000	2050	\$ 3,660,000	2050	\$ 3,660,000	2050	\$ 3,660,000
2051	\$ 3,660,000	2051	\$ 3,660,000	2051	\$ 3,660,000	2051	\$ 3,660,000
2052	\$ 3,660,000	2052	\$ 3,660,000	2052	\$ 3,660,000	2052	\$ 3,660,000
2053	\$ 3,660,000	2053	\$ 3,660,000	2053	\$ 3,660,000	2053	\$ 3,660,000
2054	\$ 3,660,000	2054	\$ 3,660,000	2054	\$ 3,660,000	2054	\$ 3,660,000
2055	\$ 3,660,000	2055	\$ 3,660,000	2055	\$ 3,660,000	2055	\$ 3,660,000
2056	\$ 3,660,000	2056	\$ 3,660,000	2056	\$ 3,660,000	2056	\$ 3,660,000
2057	\$ 3,660,000	2057	\$ 3,660,000	2057	\$ 3,660,000	2057	\$ 3,660,000
2058	\$ 3,660,000	2058	\$ 3,660,000	2058	\$ 3,660,000	2058	\$ 3,660,000
2059	\$ 3,660,000	2059	\$ 3,660,000	2059	\$ 3,660,000	2059	\$ 3,660,000
2060	\$ 3,660,000	2060	\$ 3,660,000	2060	\$ 3,660,000	2060	\$ 3,660,000
2061	\$ 3,660,000	2061	\$ 3,660,000	2061	\$ 3,660,000	2061	\$ 3,660,000
2062	\$ 3,660,000	2062	\$ 3,660,000	2062	\$ 3,660,000	2062	\$ 3,660,000
2063	\$ 3,660,000	2063	\$ 3,660,000	2063	\$ 3,660,000	2063	\$ 3,660,000
2064	\$ 3,660,000	2064	\$ 3,660,000	2064	\$ 3,660,000	2064	\$ 3,660,000
2065	\$ 3,660,000	2065	\$ 3,660,000	2065	\$ 3,660,000	2065	\$ 3,660,000

<sup>1</sup>NPV Calculated using Watercares NPV Spreadsheet

Appendix D

## Detailed Site Cost Estimates

## Appendix D1: Existing Site

**GENERAL SUMMARY**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	<b><u>HUIA WATER TREATMENT PLANT OPTIONS</u></b>				
	<b>MIX OF CONCEPT (PROCESS) AND PRELIMINARY (CIVILS) DESIGN COST ESTIMATES:</b>				
	<b>Note: These estimates are in the order of minus 15% to plus 25% accuracy overall.</b>				
	<b><u>EXISTING SITE OPTION</u></b>				
1	Civil Works				96,410,000
2	Process Plant and Equipment				76,820,000
3	Ancillary Structures				64,290,000
	<b>Construction Subtotal</b>				<b>237,520,000</b>
4	Implementation Costs				47,500,000
5	Land Costs - No Land Purchase				
	<b>Indirects Subtotal</b>				<b>47,500,000</b>
	<b>EXISTING SITE TOTAL</b>				<b>285,020,000</b>
	<b>NOTES</b>				
	These estimates are based on the GHD civils drawings and information and the Beca information for the process mechanical, electrical and ancillary structures.				
	Rates used in these estimates are based on a mixture of the following: - CH2M Beca database - First principles - Costs from suppliers - Similar historical projects				
	An estimating contingency has been included in the estimate to cover items of unforeseen detail and design development. This contingency is expected to be converted to scope and therefore should not be regarded as discretionary.				
	<b>EXCLUSIONS</b>				
	Excavation in hard rock / basalt				

**GENERAL SUMMARY**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	Night or after hours work				
	Cost for shutting down any existing plant.				
	Specific construction noise control measures				
	Asbestos removal / disposal				
	GST				
	Project Contingency				
	Escalation after September 2016				
	Capitalised interest				
	Costs to date				
	Operating and Maintenance cost				
	Insurance costs				
	Legal and finance fees				
	<b>TOTALS OF SELECTED SECTIONS</b>				<b>285,020,000</b>
		<b>NZ\$</b>			

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
1	<b><u>CIVIL WORKS - EXISTING SITE OPTION</u></b>				
	<b>Site Clearance and Demolition</b>				
	Clear site - remove vegetation, etc.	m2	53,000	7.00	371,000
	Demolish buildings and plant	sum	1	2,000,000.00	2,000,000
	<b>Sub Total **</b>				<b>2,371,000</b>
	<b>Environmental Compliance and Management</b>				
	Allowance for environmental compliance including erosion and sediment control	sum	1	850,000.00	850,000
	<b>Sub Total **</b>				<b>850,000</b>
	<b>General Earthworks</b>				
	Allowance for the contractors laydown area - assume 300 thick hardfill including removal on completion	m2	2,500	50.00	125,000
	Total cut	m3	30,030		
	Total fill	m3	29,800		
	Remove topsoil and respreads on completion - say 150 thick	m3	7,950	45.00	357,750
	Cut to fill - assume 50% of fill can be obtained from cut material	m3	14,900	12.00	178,800
	Cut to waste	m3	15,130	40.00	605,200
	Imported fill	m3	14,900	50.00	745,000
	Allowance for undercut in soft spots including imported fill - assume 10% of cut volume	m3	3,003	110.00	330,330
	<b>Sub Total **</b>				<b>2,342,080</b>
	<b>Chemical Storage Building</b>				
	Piling - no piling needed	note			
	500 th reinforced concrete floor slab including foundation beams	m2	61	844.00	51,484
	250 th reinforced concrete floor slab including foundation beams	m2	793	695.00	551,135
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Sealer to bunded floors	m2	757	150.00	113,550

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	250 th precast concrete walls	m2	1,534	560.00	859,040
	Allowance for 250 th concrete screen walls including foundations	m2	252	790.00	199,080
	Allowance for roofing including steel support	m2	903	500.00	451,500
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	50,000.00	50,000
	Allowance for roller door	no	10	12,000.00	120,000
	Small power and lighting	m2	854	100.00	85,400
	Mechanical ventilation	m2	520	350.00	182,000
	Sprinkler system including smoke and heat detection	m2	854	110.00	93,940
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,932,129</b>
	<b>Chlorine Storage Building</b>				
	Note: Assume the building is the same as the chemical storage building as there is no design info for this building	note			
	Piling - no piling needed	note			
	Rate for Chemical Storage applied to this buildings area	m2	189	3,400.00	642,600
	<b>Sub Total **</b>				<b>642,600</b>
	<b>Electrical Compound</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	215	595.00	127,925
	Allowance for plinths and miscellaneous works	sum	1	10,000.00	10,000
	Upper floor	m2	60	300.00	18,000
	200 th precast concrete walls	m2	499	540.00	269,460
	Allowance for roofing including steel support	m2	215	450.00	96,750
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	20,000.00	20,000
	Allowance for roller door - approx. 5m x 4m high	no	1	12,000.00	12,000

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for roller door - approx. 3m x 3m high	no	1	8,000.00	8,000
	Small power and lighting	m2	215	100.00	21,500
	Mechanical ventilation	m2	215	300.00	64,500
	Extra value for air conditioning to the 11kV switchroom	m2	53	600.00	31,800
	Sprinkler system including smoke and heat detection	m2	215	110.00	23,650
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>728,585</b>
	<b>DAF Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	1,526	800.00	1,220,800
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	852	45.00	38,340
	500 th reinforced concrete floor slab	m2	2,053	675.00	1,385,775
	300 th reinforced concrete walls	m2	3,818	755.00	2,882,590
	Allowance for walkways over the tank	m2	201	1,060.00	213,060
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,053	570.00	1,170,210
	Small power and lighting	m2	2,053	70.00	143,710
	Mechanical ventilation	m2	2,053	100.00	205,300
	Extra value for air conditioning to the MCC room	m2	43	600.00	25,800
	Allowance for miscellaneous works	sum	1	500,000.00	500,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>7,885,585</b>
	<b>Ozone Generator Room</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	294	595.00	174,930
	Allowance for plinths and miscellaneous				

## Section '1'-'Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	works	sum	1	30,000.00	30,000
	200 th precast concrete walls	m2	581	540.00	313,740
	Allowance for roofing including steel support	m2	294	450.00	132,300
	Allowance for miscellaneous works - bollards, etc.	sum	1	10,000.00	10,000
	Allowance for roller door - approx. 5m x 4m high	no	3	12,000.00	36,000
	Small power and lighting	m2	294	100.00	29,400
	Mechanical ventilation	m2	294	300.00	88,200
	Sprinkler system including smoke and heat detection	m2	294	110.00	32,340
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>871,910</b>
	<b>Ozone Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	600	730.00	438,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	522	45.00	23,490
	500 th reinforced concrete floor slab	m2	418	655.00	273,790
	500 th reinforced concrete upper floors	m2	79	618.00	48,822
	500 th reinforced concrete walls	m2	682	870.00	593,340
	400 th reinforced concrete walls	m2	827	776.00	641,752
	Allowance for cover and walkways over the central area	m2	116	630.00	73,080
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	418	660.00	275,880
	Small power and lighting	m2	418	70.00	29,260
	Mechanical ventilation	m2	418	100.00	41,800
	Allowance for miscellaneous works	sum	1	100,000.00	100,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>2,574,214</b>

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>BAC Filter Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	1,500	810.00	1,215,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,350	45.00	60,750
	400 th reinforced concrete floor slab	m2	2,085	608.00	1,267,680
	400 th reinforced concrete upper floors	m2	3,225	576.00	1,857,600
	400 th reinforced concrete walls	m2	4,837	830.00	4,014,710
	Inlet channel works	sum	1	330,000.00	330,000
	Allowance for cover and walkways over the inlet channel/open gallery area	m2	523	540.00	282,420
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,065	590.00	1,218,350
	Small power and lighting	m2	2,065	70.00	144,550
	Mechanical ventilation	m2	2,065	100.00	206,500
	Allowance for miscellaneous works	sum	1	300,000.00	300,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>10,997,560</b>
	<b>Chlorine Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	2,093	700.00	1,465,100
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,113	45.00	50,085
	500 th reinforced concrete floor slab	m2	1,553	655.00	1,017,215
	500 th reinforced concrete walls	m2	1,647	845.00	1,391,715
	300 th reinforced concrete walls	m2	1,078	734.00	791,252
	Allowance for a cover over the tank	m2	1,553	700.00	1,087,100
	Allowance for miscellaneous works	sum	1	200,000.00	200,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>6,037,467</b>

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Treated Water Pump Station</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	893	800.00	714,400
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	471	45.00	21,195
	250 th reinforced concrete floor slab	m2	386	480.00	185,280
	400 th reinforced concrete upper floors	m2	386	576.00	222,336
	Allowance for pump plinths	sum	1	25,000.00	25,000
	250 th reinforced concrete walls	m2	476	590.00	280,840
	Allowance for upper structure and roofing including steel support	m2	386	1,300.00	501,800
	Allowance for miscellaneous works	sum	1	150,000.00	150,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>2,135,851</b>
	<b>Washout Balance Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	15	10,500.00	157,500
	Temporary sheet piles to average 11m BGL all round including waler beams and ties	m2	990	750.00	742,500
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	510	45.00	22,950
	500 th reinforced concrete floor slab	m2	404	544.00	219,776
	400 th reinforced concrete walls	m2	628	800.00	502,400
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,670,126</b>
	<b>Sludge Balance Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	10,500.00	210,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	504	865.00	435,960

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	283	45.00	12,735
	250 th reinforced concrete floor slab	m2	272	432.00	117,504
	300 th reinforced concrete walls	m2	321	756.00	242,676
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,043,875</b>
	<b>Supernatant Return Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	10,500.00	210,000
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	760	770.00	585,200
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	402	45.00	18,090
	250 th reinforced concrete floor slab	m2	301	432.00	130,032
	300 th reinforced concrete walls	m2	471	756.00	356,076
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,324,398</b>
	<b>Sludge Thickener Feed Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	322	790.00	254,380
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	175	45.00	7,875
	250 th reinforced concrete floor slab	m2	86	432.00	37,152
	300 th reinforced concrete walls	m2	171	756.00	129,276
	Allowance for miscellaneous works	sum	1	15,000.00	15,000
	<b>Sub Total **</b>				<b>443,683</b>
	<b>Sludge Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			

## Section '1'-Civil Works'

COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the sccond tank	sum	1	716,840.00	716,840
	<b>Sub Total **</b>				<b>1,433,680</b>
	<b>Washwater Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	22	10,500.00	231,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the sccond tank	sum	1	947,840.00	947,840
	<b>Sub Total **</b>				<b>1,895,680</b>
	<b>Sludge Dewatering Building (Filter Press)</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	10,500.00	210,000
	Building area	m2	656		

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	300 th reinforced concrete floor slab including foundation beams	m2	524	595.00	311,780
	300 th reinforced concrete upper floor	m2	269	514.00	138,266
	200 th precast concrete walls	m2	1,413	540.00	763,020
	400 x 400 concrete columns	m	54	400.00	21,600
	Allowance for roofing including structure	m2	404	450.00	181,800
	Stair rising 6m	no	1	21,000.00	21,000
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Allowance for roller door	no	3	12,000.00	36,000
	Small power and lighting	m2	656	100.00	65,600
	Mechanical ventilation	m2	656	350.00	229,600
	Extra value for air conditioning to the MCC/office room	m2	34	400.00	13,600
	Sprinkler system including smoke and heat detection	m2	656	110.00	72,160
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,239,426</b>
	<b>Reservoirs (2 No)</b>				
	Note: The following cost is for one reservoir (see last item for second reservoir)	note			
	Reservoir volume	m3	28,905		
	Retaining wall - say average 8m high x 80m long	m2	640	1,500.00	960,000
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 5m c/c (no permanent liners)	no	120	10,500.00	1,260,000
	500 th reinforced concrete floor slab	m2	2,915	690.00	2,011,350
	400 th reinforced concrete walls	m2	1,912	1,200.00	2,294,400
	500 th reinforced concrete roof slab including allowance for internal columns, etc.	m2	2,915	845.00	2,463,175
	Stairs rising 10m and balustrade around the top of the reservoir	sum	1	100,000.00	100,000
	Allowance for miscellaneous works	sum	1	250,000.00	250,000
	Allowance for fence and gates	sum	1	145,000.00	145,000

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Add the above total for the second tank	sum	1	9,483,925.00	9,483,925
	<b>Sub Total **</b>				<b>18,967,850</b>
	<b>Administration Building</b>				
	Existing building - no new construction	note			
	Allowance for fitout of existing building including amenities	sum	1	350,000.00	350,000
	Allowance for paving and landscaping to entrance and external areas	sum	1	75,000.00	75,000
	<b>Sub Total **</b>				<b>425,000</b>
	<b>Services Relocation</b>				
	Nominal allowance for services relocation	sum	1	500,000.00	500,000
	<b>Sub Total **</b>				<b>500,000</b>
	<b>Roading and Finishing Works</b>				
	New roads and parking including kerbs, drainage, etc. - 40mm AC14 on 2 coat chipseal on 150mm AP40 on 300mm AP40 on geotextile on prepared areas (AP 40 with cement stabilisation)	m2	8,900	180.00	1,602,000
	Allowance for general site drainage works	sum	1	500,000.00	500,000
	Allowance for general site retaining works	sum	1	500,000.00	500,000
	Allowance for site lighting	no	40	10,000.00	400,000
	Allowance for general landscaping	sum	1	750,000.00	750,000
	Allowance for permanent noise control measures	sum	1	1,000,000.00	1,000,000
	Security fence	m	1,000	250.00	250,000
	Main entrance gate, gatehouse, etc.	note		existing	
	Secondary entrance gate	sum	1	50,000.00	50,000
	<b>Sub Total **</b>				<b>5,052,000</b>
	<b>Traffic Management and Temporary Works</b>				
	Allowance for traffic management and temporary works	sum	1	2,250,000.00	2,250,000
	<b>Sub Total **</b>				<b>2,250,000</b>
	<b>Preliminaries &amp; General</b>				

## Section '1'-'Civil Works'

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for the contractor's health and safety plan and a fulltime site supervision representative - assume 36 months	sum	1	320,000.00	320,000
	Allowance for all as-built documentation	sum	1	100,000.00	100,000
	Contractors on-site overheads (P&G) (say 8% of construction cost)	sum	78,035,000	0.08	6,242,800
	Contractors off-site overheads and margin (say 4%)	sum	84,277,000	0.04	3,371,080
	<b>Sub Total **</b>				<b>10,033,880</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	87,649,000	0.10	8,764,900
	Rounding	sum	1	-3,479.00	-3,479
	<b>Sub Total **</b>				<b>8,761,421</b>
	<b>TOTAL #*</b>				<b>96,410,000</b>
	<b>Totals for Section '1'-'Civil Works'</b>				<b>96,410,000</b>

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
2	<b><u>PROCESS PLANT AND EQUIPMENT - EXISTING SITE OPTION</u></b>				
	<b><u>CHEMICAL SYSTEMS</u></b>				
	<b>Alum</b>				
	105m3 alum storage tank	no	2	180,000.00	360,000
	7m3 day tank	no	2	20,000.00	40,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	100	120.00	12,000
	<b>Sub Total **</b>				<b>532,000</b>
	<b>Poly (Flocculant, Thickening and Dewatering Aids) - 3 No</b>				
	Make up skid	no	6	90,000.00	540,000
	Dosing pumps and associated pipework	no	3	60,000.00	180,000
	Dosing lines	m	300	120.00	36,000
	<b>Sub Total **</b>				<b>756,000</b>
	<b>Lime</b>				
	30 tonne silo and associated transfer batching	no	2	360,000.00	720,000
	30m3 day tank	no	2	72,000.00	144,000
	7.5kW mixers	no	2	30,000.00	60,000
	Dosing pumps and associated pipework	no	4	90,000.00	360,000
	Dosing lines	m	500	180.00	90,000
	2kL post lime tanks	no	2	50,000.00	100,000
	0.5kL pre lime tanks	no	2	30,000.00	60,000
	<b>Sub Total **</b>				<b>1,534,000</b>
	<b>Fluoride</b>				
	10m3 bulk supply tank	no	2	30,000.00	60,000
	500L day tank	no	2	12,000.00	24,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	200	120.00	24,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>228,000</b>
	<b>Carbon Dioxide (assume leased)</b>				
	Dosing lines (4 x 200m)	m	800	120.00	96,000
	<b>Sub Total</b>	**			<b>96,000</b>
	<b>Chlorine Gas</b>				
	Chlorine gas	sum	1	1,000,000.00	1,000,000
	<b>Sub Total</b>	**			<b>1,000,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,146,000	0.20	829,200
	<b>Sub Total</b>	**			<b>829,200</b>
	<b>DAF</b>				
	<b>Mechanical Supply and Installation</b>				
	2kW mixers	no	16	25,000.00	400,000
	Subnatant collection	m2	700	1,200.00	840,000
	5000L pressure vessel	no	8	60,000.00	480,000
	Recycle pumps	no	10	60,000.00	600,000
	50kW air compressor and receiver	no	2	240,000.00	480,000
	Float scraper	no	8	90,000.00	720,000
	DAF nozzles (dispersion valve array)	no	8	30,000.00	240,000
	Allowance for pipework, valves and connections	sum	1	960,000.00	960,000
	<b>Sub Total</b>	**			<b>4,720,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,720,000	0.20	944,000
	<b>Sub Total</b>	**			<b>944,000</b>
	<b>BAC FILTERS</b>				
	<b>Mechanical Supply and Installation</b>				

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Plenum floor	m2	1,135	2,400.00	2,724,000
	400mm th layer of sand	m3	450	800.00	360,000
	350mm th layer of gravel	m3	400	500.00	200,000
	1500mm th layer of BAC media	m3	1,700	1,450.00	2,465,000
	Upwash launders	no	14	50,000.00	700,000
	75kW upwash pumps	no	3	60,000.00	180,000
	175kW air scour blowers	no	2	100,000.00	200,000
	Allowance for pipework, valves and connections	sum	1	2,400,000.00	2,400,000
	<b>Sub Total **</b>				<b>9,229,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	9,229,000	0.20	1,845,800
	<b>Sub Total **</b>				<b>1,845,800</b>
	<b><u>OZONE</u></b>				
	<b>Mechanical Supply and Installation</b>				
	VPSA ozone system	sum	1	4,800,000.00	4,800,000
	Allowance for associated work not covered in the basic price	25%	4,800,000	0.25	1,200,000
	Allowance for pipework, valves and connections	sum	1	580,000.00	580,000
	<b>Sub Total **</b>				<b>6,580,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	6,580,000	0.20	1,316,000
	<b>Sub Total **</b>				<b>1,316,000</b>
	<b><u>RESIDUALS MANAGEMENT</u></b>				
	<b>Washout Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000

## Section '2'-Process Plant and Equipment'

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Sludge Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Filter Presses</b>				
	Filter press and ancillary equipment supply	no	2	1,700,000.00	3,400,000
	Filter press install and ancillaries	no	2	2,500,000.00	5,000,000
	<b>Sub Total **</b>				<b>8,400,000</b>
	<b>Other Pumps and Mixers</b>				
	Washout balance tank mixers - 4kW submersible	no	2	60,000.00	120,000
	Washout thickener feed pumps - 15kW open impeller	no	2	45,000.00	90,000
	Filter to waste return pumps - 22kW centrifugal	no	2	60,000.00	120,000
	De-aeration tank mixers - 1kW submersible	no	2	30,000.00	60,000
	De-aeration tank pumps - 30kW progressive cavity	no	2	75,000.00	150,000
	Supernatant return pumps - 30kW centrifugal	no	2	75,000.00	150,000
	Sludge thickener feed tank mixers - 1kW submersible	no	2	30,000.00	60,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sludge thickener feed pumps - 5kW open impeller	no	2	30,000.00	60,000
	Sludge balance tank mixers - 2kW submersible	no	4	45,000.00	180,000
	Sludge filter press feed pumps - 5kW progressive cavity	no	2	90,000.00	180,000
	Attenuation storage return pumps - 15kW open impeller	no	2	45,000.00	90,000
	<b>Sub Total **</b>				<b>1,260,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	13,280,000	0.20	2,656,000
	<b>Sub Total **</b>				<b>2,656,000</b>
	<b><u>TREATED WATER PUMP STATION</u></b>				
	<b>Mechanical Supply and Installation</b>				
	Pumps and motors - 215kW	no	5	350,000.00	1,750,000
	Allowance for pipework, valves and connections	sum	1	1,200,000.00	1,200,000
	<b>Sub Total **</b>				<b>2,950,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	sum	1	700,000.00	700,000
	<b>Sub Total **</b>				<b>700,000</b>
	<b><u>ANCILLARIES</u></b>				
	Service water	sum	1	240,000.00	240,000
	Air supply	sum	1	540,000.00	540,000
	Allowance for additional interconnecting pipework, valves and connections	sum	1	4,000,000.00	4,000,000
	<b>Sub Total **</b>				<b>4,780,000</b>
	<b><u>POWER SUPPLY</u></b>				
	Standby diesel generator - 2.5MW	no	1	1,500,000.00	1,500,000
	11kV Vector power supply upgrade and HV reticulation	sum	1	2,320,000.00	2,320,000

## Section '2'-Process Plant and Equipment'

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for power upgrade to the existing network	m	2,800	600.00	1,680,000
	Allowance for fibre along the new raw and treated water pipelines	m	4,820	300.00	1,446,000
	<b>Sub Total **</b>				<b>6,946,000</b>
	<b><u>OTHER</u></b>				
	<b>SCADA</b>				
	Allowance for software development and commissioning	sum	1	1,000,000.00	1,000,000
	<b>Sub Total **</b>				<b>1,000,000</b>
	<b>Process Commissioning and Support</b>				
	Allowance for commissioning and support	sum	1	500,000.00	500,000
	<b>Sub Total **</b>				<b>500,000</b>
	<b>Project Closeout</b>				
	Allowance for spare equipment	sum	1	500,000.00	500,000
	Allowance for project completion report including defects liability period coordination - Based on 10 hours/week over 52 weeks assuming majority of the defects will be rectified over the first 3 months	sum	1	130,000.00	130,000
	<b>Sub Total **</b>				<b>630,000</b>
	<b>O&amp;M Manuals and Training</b>				
	Allowance for O&M manuals	sum	1	100,000.00	100,000
	Allowance for O&M training	sum	1	200,000.00	200,000
	<b>Sub Total **</b>				<b>300,000</b>
	<b>Preliminaries &amp; General</b>				
	Contractors on-site overheads (P&G) (say 6% of construction cost)	sum	63,352,000	0.06	3,801,120
	Contractors off-site overheads and margin (say 4%)	sum	67,153,000	0.04	2,686,120
	<b>Sub Total **</b>				<b>6,487,240</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	69,839,000	0.10	6,983,900

**Section '2'-'Process Plant and Equipment'**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

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SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Rounding	sum	1	-3,140.00	-3,140
		<b>Sub Total **</b>			<b>6,980,760</b>
		<b>TOTAL #*</b>			<b>76,820,000</b>
	<b>Totals for Section '2'-'Process Plant and Equipment'</b>				<b>76,820,000</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
3	<b><u>ANCILLARY STRUCTURES - EXISTING SITE OPTION</u></b>				
	<b>Raw Water Infrastructure</b>				
	Connection to the raw water aqueduct - from the aqueduct to inlet - 1200mm dia	m	65	9,500.00	617,500
	<b>Sub Total **</b>				<b>617,500</b>
	<b>Off-Spec Discharge</b>				
	Allowance for Muddy Creek pipeline (cost from previous estimate) to inlet - 1200mm dia	sum	1	16,900,000.00	16,900,000
	<b>Sub Total **</b>				<b>16,900,000</b>
	<b>Treated Water Infrastructure</b>				
	<b><i>Treated Water Tunnel</i></b>				
	Note: It is assumed that there are no basalt present in the area of the tunnel and shafts	note			
	Tunnel - 2m dia unlined tunnel	m	820	8,000.00	6,560,000
	Tunnel sleeve including 1200mm dia pipeline	m	820	6,300.00	5,166,000
	Jacking shaft at Treatment Plant - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Intermediate reception shaft - 5m dia x 35m deep	no	1	1,000,000.00	1,000,000
	Jacking shaft at Mackies Rest - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Tunnel fixed costs	sum	1	5,000,000.00	5,000,000
	<b>Sub Total **</b>				<b>18,356,000</b>
	<b><i>Treated Water Pipeline</i></b>				
	Pipeline from treated water pump station to reservoirs - 1200mm dia	m	150	4,800.00	720,000
	Reservoir pipework (1200mm dia - includes inlet manifold, outlet, overflow and scour)	sum	1	2,600,000.00	2,600,000
	Pipeline outlet to network - 1200mm dia	m	4,000	4,800.00	19,200,000
	<b>Sub Total **</b>				<b>22,520,000</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for all as-built documentation	sum	1	50,000.00	50,000

## Section '3'-'Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

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Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Contractors on-site overheads	note		included	
	Contractors off-site overheads and margin	note		included	
	<b>Sub Total</b>	**			<b>50,000</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	58,444,000	0.10	5,844,400
	Rounding	sum	1	2,100.00	2,100
	<b>Sub Total</b>	**			<b>5,846,500</b>
	<b>TOTAL</b>	#*			<b>64,290,000</b>
	<b>Totals for Section '3'-'Ancillary Structures'</b>				<b>64,290,000</b>

## Section '4'-Implementation Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - EXISTING SITE OPTION

DATE : Thu 08 Sep 2016 03:25pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
4	<b><u>IMPLEMENTATION COSTS - EXISTING SITE OPTION</u></b>				
	Allowance for all Design, Management, Construction and Contract supervision, etc. (say 15%)	sum	237,520,000	0.15	35,628,000
	Allowance for consent and regulatory fees (say 2%)	sum	237,520,000	0.02	4,750,400
	Allowance for client internal costs (say 3%)	sum	237,520,000	0.03	7,125,600
	Rounding	sum	1	-4,000.00	-4,000
	<b>Sub Total **</b>				<b>47,500,000</b>
	<b>Totals for Section '4'-Implementation Costs'</b>				<b>47,500,000</b>

## Appendix D2: Manuka Road

**GENERAL SUMMARY**

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

SubTitle : July 2016

COMPANY : Beca

DATE : Thu 08 Sep 2016 03:34pm

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	<b><u>HUIA WATER TREATMENT PLANT OPTIONS</u></b>				
	<b>MIX OF CONCEPT (PROCESS) AND PRELIMINARY (CIVILS) DESIGN COST ESTIMATES:</b>				
	<b>Note: These estimates are in the order of minus 15% to plus 25% accuracy overall.</b>				
	<b><u>MANUKA ROAD OPTION</u></b>				
1	Civil Works				100,870,000
2	Process Plant and Equipment				78,910,000
3	Ancillary Structures				56,080,000
	<b>Construction Subtotal</b>				<b>235,860,000</b>
4	Implementation Costs				47,170,000
5	Land Costs - No Land Purchase				
	<b>Indirects Subtotal</b>				<b>47,170,000</b>
	<b>MANUKA ROAD TOTAL</b>				<b>283,030,000</b>
	<b>NOTES</b>				
	<p>These estimates are based on the GHD civils drawings and information and the Beca information for the process mechanical, electrical and ancillary structures.</p> <p>This Rev 1 estimate is based on the following revised drawings:51-33575-3-A001 and -A002 (both Rev A and undated)</p> <p>Rates used in these estimates are based on a mixture of the following:</p> <ul style="list-style-type: none"> <li>- CH2M Beca database</li> <li>- First principles</li> <li>- Costs from suppliers</li> <li>- Similar historical projects</li> </ul> <p>An estimating contingency has been included in the estimate to cover items of unforeseen detail and design development. This contingency is expected to be converted to scope and therefore should not be regarded as discretionary.</p>				

**GENERAL SUMMARY**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	<b>EXCLUSIONS</b>				
	Excavation in hard rock / basalt				
	Night or after hours work				
	Cost for shutting down any existing plant				
	Specific construction noise control measures				
	Asbestos removal / disposal				
	GST				
	Project Contingency				
	Escalation after September 2016				
	Capitalised interest				
	Costs to date				
	Operating and Maintenance cost				
	Insurance costs				
	Legal and finance fees				
	<b>TOTALS OF SELECTED SECTIONS</b>	<b>NZ\$</b>			<b>283,030,000</b>

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
1	<b>CIVIL WORKS - MANUKA ROAD OPTION</b>				
	<b>Site Clearance and Demolition</b>				
	Clear site - remove vegetation, etc.	m2	54,000	12.00	648,000
	<b>Sub Total **</b>				<b>648,000</b>
	<b>Environmental Compliance and Management</b>				
	Allowance for environmental compliance including erosion and sediment control	sum	1	870,000.00	870,000
	<b>Sub Total **</b>				<b>870,000</b>
	<b>General Earthworks</b>				
	Allowance for the contractors laydown area - assume 300 thick hardfill including removal on completion	m2	2,300	50.00	115,000
	Total cut	m3	87,050		
	Total fill	m3	30,090		
	Remove topsoil and respeads on completion - say 150 thick	m3	8,100	45.00	364,500
	Cut to fill - assume 50% of fill can be obtained from cut material	m3	15,045	12.00	180,540
	Cut to waste	m3	72,005	40.00	2,880,200
	Imported fill	m3	15,045	50.00	752,250
	Allowance for undercut in soft spots including imported fill - assume 10% of cut volume	m3	8,705	110.00	957,550
	Allowance for disposal of contaminated material - assume from existing lagoon	m3	850	100.00	85,000
	<b>Sub Total **</b>				<b>5,335,040</b>
	<b>Chemical Storage Building</b>				
	Piling - no piling needed	note			
	500 th reinforced concrete floor slab including foundation beams	m2	61	844.00	51,484
	250 th reinforced concrete floor slab including foundation beams	m2	793	695.00	551,135
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Sealer to bunded floors	m2	757	150.00	113,550

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	250 th precast concrete walls	m2	1,534	560.00	859,040
	Allowance for 250 th concrete screen walls including foundations	m2	252	790.00	199,080
	Allowance for roofing including steel support	m2	903	500.00	451,500
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	50,000.00	50,000
	Allowance for roller door	no	10	12,000.00	120,000
	Small power and lighting	m2	854	100.00	85,400
	Mechanical ventilation	m2	520	350.00	182,000
	Sprinkler system including smoke and heat detection	m2	854	110.00	93,940
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,932,129</b>
	<b>Chlorine Storage Building</b>				
	Note: Assume the building is the same as the chemical storage building as there is no design info for this building	note			
	Piling - no piling needed	note			
	Rate for Chemical Storage applied to this buildings area	m2	189	3,400.00	642,600
	<b>Sub Total **</b>				<b>642,600</b>
	<b>Electrical Compound</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	215	595.00	127,925
	Allowance for plinths and miscellaneous works	sum	1	10,000.00	10,000
	Upper floor	m2	60	300.00	18,000
	200 th precast concrete walls	m2	499	540.00	269,460
	Allowance for roofing including steel support	m2	215	450.00	96,750
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	20,000.00	20,000
	Allowance for roller door - approx. 5m x 4m high	no	1	12,000.00	12,000
	Allowance for roller door - approx. 3m x				

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	3m high	no	1	8,000.00	8,000
	Small power and lighting	m2	215	100.00	21,500
	Mechanical ventilation	m2	215	300.00	64,500
	Extra value for air conditioning to the 11kV switchroom	m2	53	600.00	31,800
	Sprinkler system including smoke and heat detection	m2	215	110.00	23,650
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>728,585</b>
	<b>DAF Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	1,526	800.00	1,220,800
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	852	45.00	38,340
	500 th reinforced concrete floor slab	m2	2,053	675.00	1,385,775
	300 th reinforced concrete walls	m2	3,818	755.00	2,882,590
	Allowance for walkways over the tank	m2	201	1,060.00	213,060
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,053	570.00	1,170,210
	Small power and lighting	m2	2,053	70.00	143,710
	Mechanical ventilation	m2	2,053	100.00	205,300
	Extra value for air conditioning to the MCC room	m2	43	600.00	25,800
	Allowance for miscellaneous works	sum	1	500,000.00	500,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>7,885,585</b>
	<b>Ozone Generator Room</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	294	595.00	174,930
	Allowance for plinths and miscellaneous works	sum	1	30,000.00	30,000

## Section '1'-Civil Works'

COMPANY : Beca

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DATE : Thu 08 Sep 2016 03:34pm

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	200 th precast concrete walls	m2	581	540.00	313,740
	Allowance for roofing including steel support	m2	294	450.00	132,300
	Allowance for miscellaneous works - bollards, etc.	sum	1	10,000.00	10,000
	Allowance for roller door - approx. 5m x 4m high	no	3	12,000.00	36,000
	Small power and lighting	m2	294	100.00	29,400
	Mechanical ventilation	m2	294	300.00	88,200
	Sprinkler system including smoke and heat detection	m2	294	110.00	32,340
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>871,910</b>
	<b>Ozone Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	600	730.00	438,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	522	45.00	23,490
	500 th reinforced concrete floor slab	m2	418	655.00	273,790
	500 th reinforced concrete upper floors	m2	79	618.00	48,822
	500 th reinforced concrete walls	m2	682	870.00	593,340
	400 th reinforced concrete walls	m2	827	776.00	641,752
	Allowance for cover and walkways over the central area	m2	116	630.00	73,080
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	418	660.00	275,880
	Small power and lighting	m2	418	70.00	29,260
	Mechanical ventilation	m2	418	100.00	41,800
	Allowance for miscellaneous works	sum	1	100,000.00	100,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>2,574,214</b>
	<b>BAC Filter Tank</b>				

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	1,500	810.00	1,215,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,350	45.00	60,750
	400 th reinforced concrete floor slab	m2	2,085	608.00	1,267,680
	400 th reinforced concrete upper floors	m2	3,225	576.00	1,857,600
	400 th reinforced concrete walls	m2	4,837	830.00	4,014,710
	Inlet channel works	sum	1	330,000.00	330,000
	Allowance for cover and walkways over the inlet channel/open gallery area	m2	523	540.00	282,420
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,065	590.00	1,218,350
	Small power and lighting	m2	2,065	70.00	144,550
	Mechanical ventilation	m2	2,065	100.00	206,500
	Allowance for miscellaneous works	sum	1	300,000.00	300,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>10,997,560</b>
	<b>Chlorine Contact Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at 5m c/c (no permanent liners)	no	66	10,500.00	693,000
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	2,093	700.00	1,465,100
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,113	45.00	50,085
	500 th reinforced concrete floor slab	m2	1,553	655.00	1,017,215
	500 th reinforced concrete walls	m2	1,647	845.00	1,391,715
	300 th reinforced concrete walls	m2	1,078	734.00	791,252
	Allowance for a cover over the tank	m2	1,553	700.00	1,087,100
	Allowance for miscellaneous works	sum	1	200,000.00	200,000
	Allowance for drainage	sum	1	35,000.00	35,000

## Section '1'-Civil Works'

COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>6,730,467</b>
	<b>Raw Water Pump Station</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at 4m c/c (no permanent liners)	no	20	10,500.00	210,000
	Temporary sheet piles to 18m BGL all round including waler beams and ties	m2	900	680.00	612,000
	Excavate and stockpile on site	m3	2,051	25.00	51,275
	Backfill with excavated material	m3	560	45.00	25,200
	Cart away excess material	m3	1,492	25.00	37,300
	1800 th reinforced concrete floor slab	m2	111	1,585.00	175,935
	500 th reinforced concrete floor slab	m2	29	585.00	16,965
	250 th reinforced concrete floor slab	m2	108	465.00	50,220
	Allowance for pump plinths	sum	1	5,000.00	5,000
	500 th reinforced concrete roof slab	m2	140	738.00	103,320
	500 th reinforced concrete walls including cast-in pipe stubs, openings, etc.	m2	497	835.00	414,995
	250 th reinforced concrete walls	m2	541	590.00	319,190
	Allowance for roofing including steel support	m2	162	750.00	121,500
	Allowance for roller door	no	1	12,000.00	12,000
	Allow for double door	no	1	5,000.00	5,000
	Small power and lighting	m2	162	120.00	19,440
	Mechanical ventilation	m2	162	350.00	56,700
	Extra value for air conditioning to the MCC room	m2	21	300.00	6,300
	Sprinkler system including smoke and heat detection	m2	162	110.00	17,820
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total</b>	**			<b>2,285,160</b>
	<b>Washout Balance Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at 4m c/c (no permanent liners)	no	15	10,500.00	157,500
	Temporary sheet piles to average 11m BGL all round including waler beams and ties	m2	990	750.00	742,500

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COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	510	45.00	22,950
	500 th reinforced concrete floor slab	m2	404	544.00	219,776
	400 th reinforced concrete walls	m2	628	800.00	502,400
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,670,126</b>
	<b>Sludge Balance Tank</b>				
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	7,000.00	140,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	504	865.00	435,960
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	283	45.00	12,735
	250 th reinforced concrete floor slab	m2	272	432.00	117,504
	300 th reinforced concrete walls	m2	321	756.00	242,676
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>973,875</b>
	<b>Supernatant Return Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	760	770.00	585,200
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	402	45.00	18,090
	250 th reinforced concrete floor slab	m2	301	432.00	130,032
	300 th reinforced concrete walls	m2	471	756.00	356,076
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,114,398</b>
	<b>Sludge Thickener Feed Tank</b>				
	Piling - no piling needed	note			

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	322	790.00	254,380
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	175	45.00	7,875
	250 th reinforced concrete floor slab	m2	86	432.00	37,152
	300 th reinforced concrete walls	m2	171	756.00	129,276
	Allowance for miscellaneous works	sum	1	15,000.00	15,000
	<b>Sub Total **</b>				<b>443,683</b>
	<b>Sludge Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the scnd tank	sum	1	716,840.00	716,840
	<b>Sub Total **</b>				<b>1,433,680</b>
	<b>Washwater Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440

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COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the sccond tank	sum	1	716,840.00	716,840
	<b>Sub Total **</b>				<b>1,433,680</b>
	<b>Sludge Dewatering Building (Filter Press)</b>				
	Building area	m2	656		
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 5m c/c (no permanent liners)	no	20	10,500.00	210,000
	300 th reinforced concrete floor slab including foundation beams	m2	524	595.00	311,780
	300 th reinforced concrete upper floor	m2	269	514.00	138,266
	200 th precast concrete walls	m2	1,413	540.00	763,020
	400 x 400 concrete columns	m	54	400.00	21,600
	Allowance for roofing including structure	m2	404	450.00	181,800
	Stair rising 6m	no	1	21,000.00	21,000
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Allowance for roller door	no	3	12,000.00	36,000
	Small power and lighting	m2	656	100.00	65,600
	Mechanical ventilation	m2	656	350.00	229,600
	Extra value for air conditioning to the MCC/office room	m2	34	400.00	13,600
	Sprinkler system including smoke and heat detection	m2	656	110.00	72,160
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,239,426</b>
	<b>Reservoirs (2 No)</b>				
	Note: The following cost is for one reservoir (see last item for second reservoir)	note			
	Reservoir volume	m3	28,905		
	Retaining wall - say average 8m high x 80m long	m2	640	1,500.00	960,000

## Section '1'-'Civil Works'

COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Piling - assume 600mm dia x 15m long in-situ concrete piles at average 5m c/c (no permanent liners)	no	120	10,500.00	1,260,000
	500 th reinforced concrete floor slab	m2	2,915	690.00	2,011,350
	400 th reinforced concrete walls	m2	1,912	1,200.00	2,294,400
	500 th reinforced concrete roof slab including allowance for internal columns, etc.	m2	2,915	845.00	2,463,175
	Stairs rising 10m and balustrade around the top of the reservoir	sum	1	100,000.00	100,000
	Allowance for miscellaneous works	sum	1	250,000.00	250,000
	Allowance for fence and gates	sum	1	145,000.00	145,000
	Add the above total for the second tank	sum	1	9,483,925.00	9,483,925
	<b>Sub Total **</b>				<b>18,967,850</b>
	<b>Lagoon</b>				
	Allowance for lagoon finishing works - liner, inlet, outlet, planting, etc. (note excavation and fill are in general earthworks)	m2	7,500	175.00	1,312,500
	Allowance for retaining walls - assume 67m long x average 3m high	m2	201	1,500.00	301,500
	<b>Sub Total **</b>				<b>1,614,000</b>
	<b>Administration Building</b>				
	Piling - no piling needed	note			
	Building area	m2	403		
	General building works	m2	403	2,200.00	886,600
	Allowance for fitout	m2	403	750.00	302,250
	Extra value for amenities fitout	m2	29	1,000.00	29,000
	Allowance for paving and landscaping to entrance and external areas	sum	1	75,000.00	75,000
	<b>Sub Total **</b>				<b>1,292,850</b>
	<b>Services Relocation</b>				
	Nominal allowance for services relocation	sum	1	250,000.00	250,000
	<b>Sub Total **</b>				<b>250,000</b>

## Section '1'-'Civil Works'

COMPANY : Beca

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Roading and Finishing Works</b>				
	New roads and parking including kerbs, drainage, etc. - 40mm AC14 on 2 coat chipseal on 150mm AP40 on 300mm AP40 on geotextile on prepared areas (AP 40 with cement stabilisation)	m2	8,000	180.00	1,440,000
	Allowance for general site drainage works	sum	1	500,000.00	500,000
	Allowance for general site retaining works	sum	1	500,000.00	500,000
	Allowance for site lighting	no	40	10,000.00	400,000
	Allowance for general landscaping	sum	1	750,000.00	750,000
	Allowance for permanent noise control measures	sum	1	1,000,000.00	1,000,000
	Security fence	m	1,000	250.00	250,000
	Main entrance gate, gatehouse, etc.	sum	1	150,000.00	150,000
	Secondary entrance gate	sum	1	50,000.00	50,000
	<b>Sub Total **</b>				<b>5,040,000</b>
	<b>Traffic Management and Temporary Works</b>				
	Allowance for traffic management and temporary works	sum	1	2,250,000.00	2,250,000
	<b>Sub Total **</b>				<b>2,250,000</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for the contractor's health and safety plan and a fulltime site supervision representative - assume 36 months	sum	1	320,000.00	320,000
	Allowance for all as-built documentation	sum	1	100,000.00	100,000
	Contractors on-site overheads (P&G) (say 8% of construction cost)	sum	81,645,000	0.08	6,531,600
	Contractors off-site overheads and margin (say 4%)	sum	88,176,000	0.04	3,527,040
	<b>Sub Total **</b>				<b>10,478,640</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	91,703,000	0.10	9,170,300
	Rounding	sum	1	-3,758.00	-3,758
	<b>Sub Total **</b>				<b>9,166,542</b>
	<b>TOTAL #*</b>				<b>100,870,000</b>
	<b>Totals for Section '1'-'Civil Works'</b>				<b>100,870,000</b>

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
2	<b><u>PROCESS PLANT AND EQUIPMENT - MANUKA ROAD OPTION</u></b>				
	<b><u>CHEMICAL SYSTEMS</u></b>				
	<b>Alum</b>				
	105m3 alum storage tank	no	2	180,000.00	360,000
	7m3 day tank	no	2	20,000.00	40,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	100	120.00	12,000
	<b>Sub Total **</b>				<b>532,000</b>
	<b>Poly (Flocculant, Thickening and Dewatering Aids) - 3 No</b>				
	Make up skid	no	6	90,000.00	540,000
	Dosing pumps and associated pipework	no	3	60,000.00	180,000
	Dosing lines	m	300	120.00	36,000
	<b>Sub Total **</b>				<b>756,000</b>
	<b>Lime</b>				
	30 tonne silo and associated transfer batching	no	2	360,000.00	720,000
	30m3 day tank	no	2	72,000.00	144,000
	7.5kW mixers	no	2	30,000.00	60,000
	Dosing pumps and associated pipework	no	4	90,000.00	360,000
	Dosing lines	m	500	180.00	90,000
	2kL post lime tanks	no	2	50,000.00	100,000
	0.5kL pre lime tanks	no	2	30,000.00	60,000
	<b>Sub Total **</b>				<b>1,534,000</b>
	<b>Fluoride</b>				
	10m3 bulk supply tank	no	2	30,000.00	60,000
	500L day tank	no	2	12,000.00	24,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	200	120.00	24,000

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>228,000</b>
	<b>Carbon Dioxide (assume leased)</b>				
	Dosing lines (4 x 200m)	m	800	120.00	96,000
	<b>Sub Total</b>	**			<b>96,000</b>
	<b>Chlorine Gas</b>				
	Chlorine gas	sum	1	1,000,000.00	1,000,000
	<b>Sub Total</b>	**			<b>1,000,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,146,000	0.20	829,200
	<b>Sub Total</b>	**			<b>829,200</b>
	<b>DAF</b>				
	<b>Mechanical Supply and Installation</b>				
	2kW mixers	no	16	25,000.00	400,000
	Subnatant collection	m2	700	1,200.00	840,000
	5000L pressure vessel	no	8	60,000.00	480,000
	Recycle pumps	no	10	60,000.00	600,000
	50kW air compressor and receiver	no	2	240,000.00	480,000
	Float scraper	no	8	90,000.00	720,000
	DAF nozzles (dispersion valve array)	no	8	30,000.00	240,000
	Allowance for pipework, valves and connections	sum	1	960,000.00	960,000
	<b>Sub Total</b>	**			<b>4,720,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,720,000	0.20	944,000
	<b>Sub Total</b>	**			<b>944,000</b>
	<b>BAC FILTERS</b>				
	<b>Mechanical Supply and Installation</b>				

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Plenum floor	m2	1,135	2,400.00	2,724,000
	400mm th layer of sand	m3	450	800.00	360,000
	350mm th layer of gravel	m3	400	500.00	200,000
	1500mm th layer of BAC media	m3	1,700	1,450.00	2,465,000
	Upwash launders	no	14	50,000.00	700,000
	75kW upwash pumps	no	3	60,000.00	180,000
	175kW air scour blowers	no	2	100,000.00	200,000
	Allowance for pipework, valves and connections	sum	1	2,400,000.00	2,400,000
	<b>Sub Total **</b>				<b>9,229,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	9,229,000	0.20	1,845,800
	<b>Sub Total **</b>				<b>1,845,800</b>
	<b><u>OZONE</u></b>				
	<b>Mechanical Supply and Installation</b>				
	VPSA ozone system	sum	1	4,800,000.00	4,800,000
	Allowance for associated work not covered in the basic price	25%	4,800,000	0.25	1,200,000
	Allowance for pipework, valves and connections	sum	1	580,000.00	580,000
	<b>Sub Total **</b>				<b>6,580,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	6,580,000	0.20	1,316,000
	<b>Sub Total **</b>				<b>1,316,000</b>
	<b><u>RESIDUALS MANAGEMENT</u></b>				
	<b>Washout Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Sludge Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Filter Presses</b>				
	Filter press and ancillary equipment supply	no	2	1,700,000.00	3,400,000
	Filter press install and ancillaries	no	2	2,500,000.00	5,000,000
	<b>Sub Total **</b>				<b>8,400,000</b>
	<b>Other Pumps and Mixers</b>				
	Washout balance tank mixers - 4kW submersible	no	2	60,000.00	120,000
	Washout thickener feed pumps - 15kW open impeller	no	2	45,000.00	90,000
	Filter to waste return pumps - 22kW centrifugal	no	2	60,000.00	120,000
	De-aeration tank mixers - 1kW submersible	no	2	30,000.00	60,000
	De-aeration tank pumps - 30kW progressive cavity	no	2	75,000.00	150,000
	Supernatant return pumps - 30kW centrifugal	no	2	75,000.00	150,000
	Sludge thickener feed tank mixers - 1kW submersible	no	2	30,000.00	60,000

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sludge thickener feed pumps - 5kW open impeller	no	2	30,000.00	60,000
	Sludge balance tank mixers - 2kW submersible	no	4	45,000.00	180,000
	Sludge filter press feed pumps - 5kW progressive cavity	no	2	90,000.00	180,000
	Attenuation storage return pumps - 15kW open impeller	no	2	45,000.00	90,000
	<b>Sub Total **</b>				<b>1,260,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	13,280,000	0.20	2,656,000
	<b>Sub Total **</b>				<b>2,656,000</b>
	<b><u>RAW WATER PUMP STATION</u></b>				
	<b>Mechanical Supply and Installation</b>				
	Raw water screen supply - band screens	no	2	400,000.00	800,000
	Raw water screen install	sum	1	1,000,000.00	1,000,000
	Raw water screens screenings handling	sum	1	100,000.00	100,000
	Pumps and motors - 215kW	no	5	350,000.00	1,750,000
	Allowance for pipework, valves and connections	sum	1	1,200,000.00	1,200,000
	<b>Sub Total **</b>				<b>4,850,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	sum	1	700,000.00	700,000
	<b>Sub Total **</b>				<b>700,000</b>
	<b><u>ANCILLARIES</u></b>				
	Service water	sum	1	240,000.00	240,000
	Air supply	sum	1	540,000.00	540,000
	Allowance for additional interconnecting pipework, valves and connections	sum	1	4,000,000.00	4,000,000
	<b>Sub Total **</b>				<b>4,780,000</b>

## Section '2'-'Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b><u>POWER SUPPLY</u></b>				
	Standby diesel generator - 2.5MW	no	1	1,500,000.00	1,500,000
	11kV Vector power supply upgrade and HV reticulation	sum	1	2,320,000.00	2,320,000
	Allowance for power upgrade to the existing network	m	2,500	600.00	1,500,000
	Allowance for fibre along the new raw and treated water pipelines	m	4,820	300.00	1,446,000
	<b>Sub Total **</b>				<b>6,766,000</b>
	<b><u>OTHER</u></b>				
	<b>SCADA</b>				
	Allowance for software development and commissioning	sum	1	1,000,000.00	1,000,000
	<b>Sub Total **</b>				<b>1,000,000</b>
	<b>Process Commissioning and Support</b>				
	Allowance for commissioning and support	sum	1	500,000.00	500,000
	<b>Sub Total **</b>				<b>500,000</b>
	<b>Project Closeout</b>				
	Allowance for spare equipment	sum	1	500,000.00	500,000
	Allowance for project completion report including defects liability period coordination - Based on 10 hours/week over 52 weeks assuming majority of the defects will be rectified over the first 3 months	sum	1	130,000.00	130,000
	<b>Sub Total **</b>				<b>630,000</b>
	<b>O&amp;M Manuals and Training</b>				
	Allowance for O&M manuals	sum	1	100,000.00	100,000
	Allowance for O&M training	sum	1	200,000.00	200,000
	<b>Sub Total **</b>				<b>300,000</b>
	<b>Preliminaries &amp; General</b>				
	Contractors on-site overheads (P&G) (say 6% of construction cost)	sum	65,072,000	0.06	3,904,320

## Section '2'-'Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Contractors off-site overheads and margin (say 4%)	sum	68,976,000	0.04	2,759,040
	<b>Sub Total **</b>				<b>6,663,360</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	71,735,000	0.10	7,173,500
	Rounding	sum	1	1,140.00	1,140
	<b>Sub Total **</b>				<b>7,174,640</b>
	<b>TOTAL #*</b>				<b>78,910,000</b>
	<b>Totals for Section '2'-'Process Plant and Equipment'</b>				<b>78,910,000</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
3	<b><u>ANCILLARY STRUCTURES - MANUKA ROAD OPTION</u></b>				
	<b>Raw Water Infrastructure</b>				
	Connection to the raw water aqueduct - trenched section along Exhibition Drive - 550mm dia	m	400	5,300.00	2,120,000
	Gravity supply from Upper Nihotupu raw water main - trenched section along Exhibition Drive and via reservoir site - 550mm dia	m	2,037	2,500.00	5,092,500
	<b>Sub Total **</b>				<b>7,212,500</b>
	<b>Off-Spec Discharge</b>				
	Overflow pipeline to lagoon - 1200mm dia	m	213	4,800.00	1,022,400
	<b>Sub Total **</b>				<b>1,022,400</b>
	<b>Treated Water Infrastructure</b>				
	<b>Treated Water Tunnel</b>				
	Note: It is assumed that there are no basalt present in the area of the tunnel and shafts	note			
	Tunnel - 2m dia unlined tunnel	m	820	8,000.00	6,560,000
	Tunnel sleeve including 1200mm dia pipeline	m	820	6,300.00	5,166,000
	Jacking shaft at Treatment Plant - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Intermediate reception shaft - 5m dia x 35m deep	no	1	1,000,000.00	1,000,000
	Jacking shaft at Mackies Rest - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Tunnel fixed costs	sum	1	5,000,000.00	5,000,000
	<b>Sub Total **</b>				<b>18,356,000</b>
	<b>Treated Water Pipeline</b>				
	Pipeline from treated water pump station to reservoirs - 1200mm dia	m	530	4,800.00	2,544,000
	Reservoir pipework (1200mm dia - includes inlet manifold, outlet, overflow and scour)	sum	1	2,600,000.00	2,600,000
	Pipeline outlet to network - 1200mm dia	m	4,000	4,800.00	19,200,000
	<b>Sub Total **</b>				<b>24,344,000</b>

## Section '3'-'Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Preliminaries &amp; General</b>				
	Allowance for all as-built documentation	sum	1	50,000.00	50,000
	Contractors on-site overheads	note		included	
	Contractors off-site overheads and margin	note		included	
	<b>Sub Total **</b>				<b>50,000</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	50,985,000	0.10	5,098,500
	Rounding	sum	1	-3,400.00	-3,400
	<b>Sub Total **</b>				<b>5,095,100</b>
	<b>TOTAL #*</b>				<b>56,080,000</b>
	<b>Totals for Section '3'-'Ancillary Structures'</b>				<b>56,080,000</b>

## Section '4'-Implementation Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - MANUKA ROAD OPTION

DATE : Thu 08 Sep 2016 03:34pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
4	<b><u>IMPLEMENTATION COSTS - MANUKA ROAD OPTION</u></b>				
	Allowance for all Design, Management, Construction and Contract supervision, etc. (say 15%)	sum	235,860,000	0.15	35,379,000
	Allowance for consent and regulatory fees (say 2%)	sum	235,860,000	0.02	4,717,200
	Allowance for client internal costs (say 3%)	sum	235,860,000	0.03	7,075,800
	Rounding	sum	1	-2,000.00	-2,000
	<b>Sub Total **</b>				<b>47,170,000</b>
	<b>Totals for Section '4'-Implementation Costs'</b>				<b>47,170,000</b>

## Appendix D3: Parker North

**GENERAL SUMMARY**

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

SubTitle : July 2016

COMPANY : Beca

DATE : Thu 08 Sep 2016 03:46pm

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	<b><u>HUIA WATER TREATMENT PLANT OPTIONS</u></b>				
	<b>MIX OF CONCEPT (PROCESS) AND PRELIMINARY (CIVILS) DESIGN COST ESTIMATES:</b>				
	<b>Note: These estimates are in the order of minus 15% to plus 25% accuracy overall.</b>				
	<b><u>PARKER ROAD NORTH OPTION</u></b>				
1	Civil Works				94,970,000
2	Process Plant and Equipment				76,860,000
3	Ancillary Structures				66,650,000
				<b>Construction Subtotal</b>	<b>238,480,000</b>
4	Implementation Costs				47,700,000
5	Land Costs				9,570,000
				<b>Indirects Subtotal</b>	<b>57,270,000</b>
				<b>PARKER ROAD NORTH TOTAL</b>	<b>295,750,000</b>
	<b>NOTES</b>				
	<p>These estimates are based on the GHD civils drawings and information and the Beca information for the process mechanical, electrical and ancillary structures.</p> <p>Rates used in these estimates are based on a mixture of the following:</p> <ul style="list-style-type: none"> <li>- CH2M Beca database</li> <li>- First principles</li> <li>- Costs from suppliers</li> <li>- Similar historical projects</li> </ul> <p>An estimating contingency has been included in the estimate to cover items of unforeseen detail and design development. This contingency is expected to be converted to scope and therefore should not be regarded as discretionary.</p>				
	<b>EXCLUSIONS</b>				
	Excavation in hard rock / basalt				

**GENERAL SUMMARY**

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

SubTitle : July 2016

COMPANY : Beca

DATE : Thu 08 Sep 2016 03:46pm

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	Night or after hours work				
	Cost for shutting down any existing plant.				
	Specific construction noise control measures				
	Asbestos removal / disposal				
	GST				
	Project contingency				
	Escalation after September 2016				
	Capitalised interest				
	Costs to date				
	Operating and Maintenance cost				
	Insurance costs				
	Legal and finance fees				
	<b>TOTALS OF SELECTED SECTIONS</b>	<b>NZ\$</b>			<b>295,750,000</b>

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
1	<b><u>CIVIL WORKS - PARKER ROAD NORTH OPTION</u></b>				
	<b>Site Clearance and Demolition</b>				
	Clear site - remove vegetation, etc.	m2	60,000	6.00	360,000
	Demolish buildings -approximately 14 No houses and associated buildings	sum	1	700,000.00	700,000
	<b>Sub Total **</b>				<b>1,060,000</b>
	<b>Environmental Compliance and Management</b>				
	Allowance for environmental compliance including erosion and sediment control	sum	1	850,000.00	850,000
	<b>Sub Total **</b>				<b>850,000</b>
	<b>General Earthworks</b>				
	Allowance for the contractors laydown area - assume 300 thick hardfill including removal on completion	m2	2,500	50.00	125,000
	Total cut	m3	73,140		
	Total fill	m3	30,060		
	Remove topsoil and respreads on completion - say 150 thick	m3	9,000	45.00	405,000
	Cut to fill - assume 50% of fill can be obtained from cut material	m3	15,030	12.00	180,360
	Cut to waste	m3	58,110	40.00	2,324,400
	Imported fill	m3	15,030	50.00	751,500
	Allowance for undercut in soft spots including imported fill - assume 5% of cut volume	m3	3,657	110.00	402,270
	<b>Sub Total **</b>				<b>4,188,530</b>
	<b>Chemical Storage Building</b>				
	Piling - no piling needed	note			
	500 th reinforced concrete floor slab including foundation beams	m2	61	844.00	51,484
	250 th reinforced concrete floor slab including foundation beams	m2	793	695.00	551,135
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sealer to bunded floors	m2	757	150.00	113,550
	250 th precast concrete walls	m2	1,534	560.00	859,040
	Allowance for 250 th concrete screen walls including foundations	m2	252	790.00	199,080
	Allowance for roofing including steel support	m2	903	500.00	451,500
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	50,000.00	50,000
	Allowance for roller door	no	10	12,000.00	120,000
	Small power and lighting	m2	854	100.00	85,400
	Mechanical ventilation	m2	520	350.00	182,000
	Sprinkler system including smoke and heat detection	m2	854	110.00	93,940
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,932,129</b>
	<b>Chlorine Storage Building</b>				
	Note: Assume the building is the same as the chemical storage building as there is no design info for this building	note			
	Piling - no piling needed	note			
	Rate for Chemical Storage applied to this buildings area	m2	189	3,400.00	642,600
	<b>Sub Total **</b>				<b>642,600</b>
	<b>Electrical Compound</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	215	595.00	127,925
	Allowance for plinths and miscellaneous works	sum	1	10,000.00	10,000
	Upper floor	m2	60	300.00	18,000
	200 th precast concrete walls	m2	499	540.00	269,460
	Allowance for roofing including steel support	m2	215	450.00	96,750
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	20,000.00	20,000
	Allowance for roller door - approx. 5m x 4m high	no	1	12,000.00	12,000

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	Allowance for roller door - approx. 3m x 3m high	no	1	8,000.00	8,000
	Small power and lighting	m2	215	100.00	21,500
	Mechanical ventilation	m2	215	300.00	64,500
	Extra value for air conditioning to the 11kV switchroom	m2	53	600.00	31,800
	Sprinkler system including smoke and heat detection	m2	215	110.00	23,650
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>728,585</b>
	<b>DAF Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	1,526	800.00	1,220,800
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	852	45.00	38,340
	500 th reinforced concrete floor slab	m2	2,053	675.00	1,385,775
	300 th reinforced concrete walls	m2	3,818	755.00	2,882,590
	Allowance for walkways over the tank	m2	201	1,060.00	213,060
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,053	570.00	1,170,210
	Small power and lighting	m2	2,053	70.00	143,710
	Mechanical ventilation	m2	2,053	100.00	205,300
	Extra value for air conditioning to the MCC room	m2	43	600.00	25,800
	Allowance for miscellaneous works	sum	1	500,000.00	500,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>7,885,585</b>
	<b>Ozone Generator Room</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	294	595.00	174,930

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for plinths and miscellaneous works	sum	1	30,000.00	30,000
	200 th precast concrete walls	m2	581	540.00	313,740
	Allowance for roofing including steel support	m2	294	450.00	132,300
	Allowance for miscellaneous works - bollards, etc.	sum	1	10,000.00	10,000
	Allowance for roller door - approx. 5m x 4m high	no	3	12,000.00	36,000
	Small power and lighting	m2	294	100.00	29,400
	Mechanical ventilation	m2	294	300.00	88,200
	Sprinkler system including smoke and heat detection	m2	294	110.00	32,340
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>871,910</b>
	<b>Ozone Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	600	730.00	438,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	522	45.00	23,490
	500 th reinforced concrete floor slab	m2	418	655.00	273,790
	500 th reinforced concrete upper floors	m2	79	618.00	48,822
	500 th reinforced concrete walls	m2	682	870.00	593,340
	400 th reinforced concrete walls	m2	827	776.00	641,752
	Allowance for cover and walkways over the central area	m2	116	630.00	73,080
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	418	660.00	275,880
	Small power and lighting	m2	418	70.00	29,260
	Mechanical ventilation	m2	418	100.00	41,800
	Allowance for miscellaneous works	sum	1	100,000.00	100,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>2,574,214</b>

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>BAC Filter Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	1,500	810.00	1,215,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,350	45.00	60,750
	400 th reinforced concrete floor slab	m2	2,085	608.00	1,267,680
	400 th reinforced concrete upper floors	m2	3,225	576.00	1,857,600
	400 th reinforced concrete walls	m2	4,837	830.00	4,014,710
	Inlet channel works	sum	1	330,000.00	330,000
	Allowance for cover and walkways over the inlet channel/open gallery area	m2	523	540.00	282,420
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,065	590.00	1,218,350
	Small power and lighting	m2	2,065	70.00	144,550
	Mechanical ventilation	m2	2,065	100.00	206,500
	Allowance for miscellaneous works	sum	1	300,000.00	300,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>10,997,560</b>
	<b>Chlorine Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	2,093	700.00	1,465,100
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,113	45.00	50,085
	500 th reinforced concrete floor slab	m2	1,553	655.00	1,017,215
	500 th reinforced concrete walls	m2	1,647	845.00	1,391,715
	300 th reinforced concrete walls	m2	1,078	734.00	791,252
	Allowance for a cover over the tank	m2	1,553	700.00	1,087,100
	Allowance for miscellaneous works	sum	1	200,000.00	200,000
	Allowance for drainage	sum	1	35,000.00	35,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>6,037,467</b>
	<b>Treated Water Pump Station</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	893	800.00	714,400
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	471	45.00	21,195
	250 th reinforced concrete floor slab	m2	386	480.00	185,280
	400 th reinforced concrete upper floors	m2	386	576.00	222,336
	Allowance for pump plinths	sum	1	25,000.00	25,000
	250 th reinforced concrete walls	m2	476	590.00	280,840
	Allowance for upper structure and roofing including steel support	m2	386	1,300.00	501,800
	Allowance for miscellaneous works	sum	1	150,000.00	150,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total</b>	**			<b>2,135,851</b>
	<b>Washout Balance Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 11m BGL all round including waler beams and ties	m2	990	750.00	742,500
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	510	45.00	22,950
	500 th reinforced concrete floor slab	m2	404	544.00	219,776
	400 th reinforced concrete walls	m2	628	800.00	502,400
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total</b>	**			<b>1,512,626</b>
	<b>Sludge Balance Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	7,000.00	140,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	504	865.00	435,960

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	283	45.00	12,735
	250 th reinforced concrete floor slab	m2	272	432.00	117,504
	300 th reinforced concrete walls	m2	321	756.00	242,676
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>973,875</b>
	<b>Supernatant Return Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	7,000.00	140,000
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	760	770.00	585,200
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	402	45.00	18,090
	250 th reinforced concrete floor slab	m2	301	432.00	130,032
	300 th reinforced concrete walls	m2	471	756.00	356,076
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,254,398</b>
	<b>Sludge Thickener Feed Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	6	7,000.00	42,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	322	790.00	254,380
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	175	45.00	7,875
	250 th reinforced concrete floor slab	m2	86	432.00	37,152
	300 th reinforced concrete walls	m2	171	756.00	129,276
	Allowance for miscellaneous works	sum	1	15,000.00	15,000
	<b>Sub Total **</b>				<b>485,683</b>
	<b>Sludge Thickeners (2 No)</b>				
	Note: The following cost is for one tank				

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	(see last item for second tank)	note			
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	22	7,000.00	154,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the scnd tank	sum	1	870,840.00	870,840
	<b>Sub Total **</b>				<b>1,741,680</b>
	<b>Washwater Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	22	7,000.00	154,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the scnd tank	sum	1	870,840.00	870,840
	<b>Sub Total **</b>				<b>1,741,680</b>
	<b>Sludge Dewatering Building (Filter Press)</b>				
	Piling - no piling needed	note			

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Building area	m2	656		
	300 th reinforced concrete floor slab including foundation beams	m2	524	595.00	311,780
	300 th reinforced concrete upper floor	m2	269	514.00	138,266
	200 th precast concrete walls	m2	1,413	540.00	763,020
	400 x 400 concrete columns	m	54	400.00	21,600
	Allowance for roofing including structure	m2	404	450.00	181,800
	Stair rising 6m	no	1	21,000.00	21,000
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Allowance for roller door	no	3	12,000.00	36,000
	Small power and lighting	m2	656	100.00	65,600
	Mechanical ventilation	m2	656	350.00	229,600
	Extra value for air conditioning to the MCC/office room	m2	34	400.00	13,600
	Sprinkler system including smoke and heat detection	m2	656	110.00	72,160
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,029,426</b>
	<b>Reservoirs (2 No)</b>				
	Note: The following cost is for one reservoir (see last item for second reservoir)	note			
	Reservoir volume	m3	28,905		
	Retaining wall - say average 7m high x 80m long	m2	560	1,500.00	840,000
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 5m c/c (no permanent liners)	no	120	7,000.00	840,000
	500 th reinforced concrete floor slab	m2	2,915	690.00	2,011,350
	400 th reinforced concrete walls	m2	1,912	1,200.00	2,294,400
	500 th reinforced concrete roof slab including allowance for internal columns, etc.	m2	2,915	845.00	2,463,175
	Stairs rising 10m and balustrade around the top of the reservoir	sum	1	100,000.00	100,000
	Allowance for miscellaneous works	sum	1	250,000.00	250,000

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Add the above total for the second tank	sum	1	8,798,925.00	8,798,925
	<b>Sub Total **</b>				<b>17,597,850</b>
	<b>Administration Building</b>				
	Piling - no piling needed	note			
	Building area	m2	403		
	General building works	m2	403	2,200.00	886,600
	Allowance for fitout	m2	403	750.00	302,250
	Extra value for amenities fitout	m2	29	1,000.00	29,000
	Allowance for paving and landscaping to entrance and external areas	sum	1	75,000.00	75,000
	<b>Sub Total **</b>				<b>1,292,850</b>
	<b>Lagoon</b>				
	Allowance for lagoon finishing works - liner, inlet, outlet, planting, etc. (note excavation and fill are in general earthworks)	m2	6,200	205.00	1,271,000
	<b>Sub Total **</b>				<b>1,271,000</b>
	<b>Services Relocation</b>				
	Nominal allowance for services relocation	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>100,000</b>
	<b>Roading and Finishing Works</b>				
	New roads and parking including kerbs, drainage, etc. - 40mm AC14 on 2 coat chipseal on 150mm AP40 on 300mm AP40 on geotextile on prepared areas (AP 40 with cement stabilisation)	m2	7,600	180.00	1,368,000
	Allowance for site lighting	no	40	10,000.00	400,000
	Allowance for general landscaping	sum	1	750,000.00	750,000
	Allowance for permanent noise control measures	sum	1	1,000,000.00	1,000,000
	Security fence	m	1,500	250.00	375,000
	Main entrance gate, gatehouse, etc.	sum	1	150,000.00	150,000
	<b>Sub Total **</b>				<b>4,043,000</b>
	<b>Traffic Management and Temporary Works</b>				

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	Allowance for traffic management and temporary works	sum	1	1,500,000.00	1,500,000
	<b>Sub Total **</b>				<b>1,500,000</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for the contractor's health and safety plan and a fulltime site supervision representative - assume 36 months	sum	1	320,000.00	320,000
	Allowance for all as-built documentation	sum	1	100,000.00	100,000
	Contractors on-site overheads (P&G) (say 8% of construction cost)	sum	76,868,000	0.08	6,149,440
	Contractors off-site overheads and margin (say 4%)	sum	83,018,000	0.04	3,320,720
	<b>Sub Total **</b>				<b>9,890,160</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	86,339,000	0.10	8,633,900
	Rounding	sum	1	-2,559.00	-2,559
	<b>Sub Total **</b>				<b>8,631,341</b>
	<b>TOTAL #*</b>				<b>94,970,000</b>
	<b>Totals for Section '1'-'Civil Works'</b>				<b>94,970,000</b>

## Section '2'-'Process Plant and Equipment'

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
2	<b><u>PROCESS PLANT AND EQUIPMENT - PARKER ROAD NORTH OPTION</u></b>				
	<b><u>CHEMICAL SYSTEMS</u></b>				
	<b>Alum</b>				
	105m3 alum storage tank	no	2	180,000.00	360,000
	7m3 day tank	no	2	20,000.00	40,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	100	120.00	12,000
	<b>Sub Total **</b>				<b>532,000</b>
	<b>Poly (Flocculant, Thickening and Dewatering Aids) - 3 No</b>				
	Make up skid	no	6	90,000.00	540,000
	Dosing pumps and associated pipework	no	3	60,000.00	180,000
	Dosing lines	m	300	120.00	36,000
	<b>Sub Total **</b>				<b>756,000</b>
	<b>Lime</b>				
	30 tonne silo and associated transfer batching	no	2	360,000.00	720,000
	30m3 day tank	no	2	72,000.00	144,000
	7.5kW mixers	no	2	30,000.00	60,000
	Dosing pumps and associated pipework	no	4	90,000.00	360,000
	Dosing lines	m	500	180.00	90,000
	2kL post lime tanks	no	2	50,000.00	100,000
	0.5kL pre lime tanks	no	2	30,000.00	60,000
	<b>Sub Total **</b>				<b>1,534,000</b>
	<b>Fluoride</b>				
	10m3 bulk supply tank	no	2	30,000.00	60,000
	500L day tank	no	2	12,000.00	24,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	200	120.00	24,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>228,000</b>
	<b>Carbon Dioxide (assume leased)</b>				
	Dosing lines (4 x 200m)	m	800	120.00	96,000
	<b>Sub Total</b>	**			<b>96,000</b>
	<b>Chlorine Gas</b>				
	Chlorine gas	sum	1	1,000,000.00	1,000,000
	<b>Sub Total</b>	**			<b>1,000,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,146,000	0.20	829,200
	<b>Sub Total</b>	**			<b>829,200</b>
	<b>DAF</b>				
	<b>Mechanical Supply and Installation</b>				
	2kW mixers	no	16	25,000.00	400,000
	Subnatant collection	m2	700	1,200.00	840,000
	5000L pressure vessel	no	8	60,000.00	480,000
	Recycle pumps	no	10	60,000.00	600,000
	50kW air compressor and receiver	no	2	240,000.00	480,000
	Float scraper	no	8	90,000.00	720,000
	DAF nozzles (dispersion valve array)	no	8	30,000.00	240,000
	Allowance for pipework, valves and connections	sum	1	960,000.00	960,000
	<b>Sub Total</b>	**			<b>4,720,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,720,000	0.20	944,000
	<b>Sub Total</b>	**			<b>944,000</b>
	<b>BAC FILTERS</b>				
	<b>Mechanical Supply and Installation</b>				

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Plenum floor	m2	1,135	2,400.00	2,724,000
	400mm th layer of sand	m3	450	800.00	360,000
	350mm th layer of gravel	m3	400	500.00	200,000
	1500mm th layer of BAC media	m3	1,700	1,450.00	2,465,000
	Upwash launders	no	14	50,000.00	700,000
	75kW upwash pumps	no	3	60,000.00	180,000
	175kW air scour blowers	no	2	100,000.00	200,000
	Allowance for pipework, valves and connections	sum	1	2,400,000.00	2,400,000
	<b>Sub Total **</b>				<b>9,229,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	9,229,000	0.20	1,845,800
	<b>Sub Total **</b>				<b>1,845,800</b>
	<b><u>OZONE</u></b>				
	<b>Mechanical Supply and Installation</b>				
	VPSA ozone system	sum	1	4,800,000.00	4,800,000
	Allowance for associated work not covered in the basic price	25%	4,800,000	0.25	1,200,000
	Allowance for pipework, valves and connections	sum	1	580,000.00	580,000
	<b>Sub Total **</b>				<b>6,580,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	6,580,000	0.20	1,316,000
	<b>Sub Total **</b>				<b>1,316,000</b>
	<b><u>RESIDUALS MANAGEMENT</u></b>				
	<b>Washout Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Sludge Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Filter Presses</b>				
	Filter press and ancillary equipment supply	no	2	1,700,000.00	3,400,000
	Filter press install and ancillaries	no	2	2,500,000.00	5,000,000
	<b>Sub Total **</b>				<b>8,400,000</b>
	<b>Other Pumps and Mixers</b>				
	Washout balance tank mixers - 4kW submersible	no	2	60,000.00	120,000
	Washout thickener feed pumps - 15kW open impeller	no	2	45,000.00	90,000
	Filter to waste return pumps - 22kW centrifugal	no	2	60,000.00	120,000
	De-aeration tank mixers - 1kW submersible	no	2	30,000.00	60,000
	De-aeration tank pumps - 30kW progressive cavity	no	2	75,000.00	150,000
	Supernatant return pumps - 30kW centrifugal	no	2	75,000.00	150,000
	Sludge thickener feed tank mixers - 1kW submersible	no	2	30,000.00	60,000

## Section '2'-'Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sludge thickener feed pumps - 5kW open impeller	no	2	30,000.00	60,000
	Sludge balance tank mixers - 2kW submersible	no	4	45,000.00	180,000
	Sludge filter press feed pumps - 5kW progressive cavity	no	2	90,000.00	180,000
	Attenuation storage return pumps - 15kW open impeller	no	2	45,000.00	90,000
	<b>Sub Total **</b>				<b>1,260,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	13,280,000	0.20	2,656,000
	<b>Sub Total **</b>				<b>2,656,000</b>
	<b><u>TREATED WATER PUMP STATION</u></b>				
	<b>Mechanical Supply and Installation</b>				
	Pumps and motors - 215kW	no	5	350,000.00	1,750,000
	Allowance for pipework, valves and connections	sum	1	1,200,000.00	1,200,000
	<b>Sub Total **</b>				<b>2,950,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	sum	1	700,000.00	700,000
	<b>Sub Total **</b>				<b>700,000</b>
	<b><u>ANCILLARIES</u></b>				
	Service water	sum	1	240,000.00	240,000
	Air supply	sum	1	540,000.00	540,000
	Allowance for additional interconnecting pipework, valves and connections	sum	1	4,000,000.00	4,000,000
	<b>Sub Total **</b>				<b>4,780,000</b>
	<b><u>POWER SUPPLY</u></b>				
	Standby diesel generator - 2.5MW	no	1	1,500,000.00	1,500,000
	11kV Vector power supply upgrade and HV reticulation	sum	1	2,320,000.00	2,320,000

## Section '2'-Process Plant and Equipment'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for power upgrade to the existing network	m	1,700	600.00	1,020,000
	Allowance for fibre along the new raw and treated water pipelines	m	7,110	300.00	2,133,000
	<b>Sub Total **</b>				<b>6,973,000</b>
	<b><u>OTHER</u></b>				
	<b>SCADA</b>				
	Allowance for software development and commissioning	sum	1	1,000,000.00	1,000,000
	<b>Sub Total **</b>				<b>1,000,000</b>
	<b>Process Commissioning and Support</b>				
	Allowance for commissioning and support	sum	1	500,000.00	500,000
	<b>Sub Total **</b>				<b>500,000</b>
	<b>Project Closeout</b>				
	Allowance for spare equipment	sum	1	500,000.00	500,000
	Allowance for project completion report including defects liability period coordination - Based on 10 hours/week over 52 weeks assuming majority of the defects will be rectified over the first 3 months	sum	1	130,000.00	130,000
	<b>Sub Total **</b>				<b>630,000</b>
	<b>O&amp;M Manuals and Training</b>				
	Allowance for O&M manuals	sum	1	100,000.00	100,000
	Allowance for O&M training	sum	1	200,000.00	200,000
	<b>Sub Total **</b>				<b>300,000</b>
	<b>Preliminaries &amp; General</b>				
	Contractors on-site overheads (P&G) (say 6% of construction cost)	sum	63,379,000	0.06	3,802,740
	Contractors off-site overheads and margin (say 4%)	sum	67,182,000	0.04	2,687,280
	<b>Sub Total **</b>				<b>6,490,020</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	69,869,000	0.10	6,986,900

**Section '2'-'Process Plant and Equipment'**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Rounding	sum	1	4,080.00	4,080
		<b>Sub Total **</b>			<b>6,990,980</b>
		<b>TOTAL #*</b>			<b>76,860,000</b>
	<b>Totals for Section '2'-'Process Plant and Equipment'</b>				<b>76,860,000</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
3	<b><u>ANCILLARY STRUCTURES - PARKER ROAD NORTH OPTION</u></b>				
	<b>Raw Water Infrastructure</b>				
	<b>Raw Water Tunnel</b>				
	Note: It is assumed that there are no basalt present in the area of the tunnel and shafts	note			
	Tunnel - 2m dia unlined tunnel	m	2,089	8,000.00	16,712,000
	Jacking shaft at Treatment Plant - 5m x 8m x 15m deep	no	1	470,000.00	470,000
	Intermediate reception shaft - 5m dia x 40m deep	no	1	1,100,000.00	1,100,000
	Jacking shaft at Mackies Rest - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Tunnel fixed costs	sum	1	5,000,000.00	5,000,000
	<b>Sub Total **</b>				<b>23,597,000</b>
	<b>Gravity Supply from Upper Nihotupu Raw Water Main</b>				
	Trenched section along Exhibition Drive - 55mm dia	m	1,580	2,500.00	3,950,000
	<b>Sub Total **</b>				<b>3,950,000</b>
	<b>Access Road Upgrade to Mackies Rest</b>				
	Road - 780m x 8m wide	m2	6,240	300.00	1,872,000
	<b>Sub Total **</b>				<b>1,872,000</b>
	<b>Connection to Raw Water Infrastructure</b>				
	Nominal allowance for connecting the Huia Raw Watermain and Lower Niho Raw Watermain	sum	1	1,500,000.00	1,500,000
	<b>Sub Total **</b>				<b>1,500,000</b>
	<b>Off-Spec Discharge</b>				
	Discharge pipework to Allen Swamp - 1200mm dia	m	40	9,500.00	380,000
	Nominal allowance for the outfall structure	sum	1	1,000,000.00	1,000,000
	Sewer - waste water connection to network - 150mm dia gravity sewer	m	3,000	250.00	750,000
	<b>Sub Total **</b>				<b>2,130,000</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Treated Water Transmission</b>				
	Pipeline from treated water pump station to reservoirs - 1200mm dia	m	165	4,800.00	792,000
	Reservoir pipework (1200mm dia - includes inlet manifold, outlet, overflow and scour)	sum	1	2,600,000.00	2,600,000
	Pipeline outlet to network - 1200mm dia	m	5,021	4,800.00	24,100,800
	<b>Sub Total **</b>				<b>27,492,800</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for all as-built documentation	sum	1	50,000.00	50,000
	Contractors on-site overheads	note		included	
	Contractors off-site overheads and margin	note		included	
	<b>Sub Total **</b>				<b>50,000</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	60,592,000	0.10	6,059,200
	Rounding	sum	1	-1,000.00	-1,000
	<b>Sub Total **</b>				<b>6,058,200</b>
	<b>TOTAL #*</b>				<b>66,650,000</b>
	<b>Totals for Section '3'-Ancillary Structures'</b>				<b>66,650,000</b>

## Section '4'-Implementation Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
4	<b><u>IMPLEMENTATION COSTS - PARKER ROAD NORTH OPTION</u></b>				
	Allowance for all Design, Management, Construction and Contract supervision, etc. (say 15%)	sum	238,480,000	0.15	35,772,000
	Allowance for consent and regulatory fees (say 2%)	sum	238,480,000	0.02	4,769,600
	Allowance for client internal costs (say 3%)	sum	238,480,000	0.03	7,154,400
	Rounding	sum	1	4,000.00	4,000
	<b>Sub Total **</b>				<b>47,700,000</b>
	<b>Totals for Section '4'-Implementation Costs'</b>				<b>47,700,000</b>

## Section '5'-'Land Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD NORTH OPTION

DATE : Thu 08 Sep 2016 03:46pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
5	<b><u>LAND CONSTS - PARKER ROAD NORTH OPTION</u></b>				
	Allowance for all property purchase costs - say 135% of CV	sum	1	11,792,000.00	11,792,000
	Allowance for legal fees (say \$25,000 per property)	no	11	25,000.00	275,000
	Allowance to sell Existing and Manuka sites	sum	-1	4,500,000.00	-4,500,000
	Demolition of existing plant at Existing Woodlands Park site before selling the land	sum	1	2,000,000.00	2,000,000
	Rounding	sum	1	3,000.00	3,000
	<b>Sub Total **</b>				<b>9,570,000</b>
	<b>Totals for Section '5'-'Land Costs'</b>				<b>9,570,000</b>

## Appendix D4: Parker South

**GENERAL SUMMARY**

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

SubTitle : July 2016

COMPANY : Beca

DATE : Thu 08 Sep 2016 03:57pm

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	<b><u>HUIA WATER TREATMENT PLANT OPTIONS</u></b>				
	<b>MIX OF CONCEPT (PROCESS) AND PRELIMINARY (CIVILS) DESIGN COST ESTIMATES:</b>				
	<b>Note: These estimates are in the order of minus 15% to plus 25% accuracy overall.</b>				
	<b><u>PARKER ROAD SOUTH OPTION</u></b>				
1	Civil Works				94,160,000
2	Process Plant and Equipment				77,410,000
3	Ancillary Structures				65,910,000
	<b>Construction Subtotal</b>				<b>237,480,000</b>
4	Implementation Costs				47,500,000
5	Land Costs				21,010,000
	<b>Indirects Subtotal</b>				<b>68,510,000</b>
	<b>PARKER ROAD SOUTH TOTAL</b>				<b>305,990,000</b>
	<b>NOTES</b>				
	These estimates are based on the GHD civils drawings and information and the Beca information for the process mechanical, electrical and ancillary structures.				
	Rates used in these estimates are based on a mixture of the following: - CH2M Beca database - First principles - Costs from suppliers - Similar historical projects				
	An estimating contingency has been included in the estimate to cover items of unforeseen detail and design development. This contingency is expected to be converted to scope and therefore should not be regarded as discretionary.				
	<b>EXCLUSIONS</b>				
	Excavation in hard rock / basalt				

**GENERAL SUMMARY**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

CO	SECTION NAME	UNIT	QTY	RATE	COST
	Night or after hours work				
	Cost for shutting down any existing plant.				
	Specific construction noise control measures				
	Asbestos removal / disposal				
	GST				
	Project contingency				
	Escalation after September 2016				
	Capitalised interest				
	Costs to date				
	Operating and Maintenance cost				
	Insurance costs				
	Legal and finance fees				
	<b>TOTALS OF SELECTED SECTIONS</b>				<b>305,990,000</b>
		<b>NZ\$</b>			

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
1	<b><u>CIVIL WORKS - PARKER ROAD SOUTH OPTION</u></b>				
	<b>Site Clearance and Demolition</b>				
	Clear site - remove vegetation, etc.	m2	66,000	6.00	396,000
	Demolish buildings -approximately 11 No houses and associated buildings	sum	1	550,000.00	550,000
	<b>Sub Total **</b>				<b>946,000</b>
	<b>Environmental Compliance and Management</b>				
	Allowance for environmental compliance including erosion and sediment control	sum	1	850,000.00	850,000
	<b>Sub Total **</b>				<b>850,000</b>
	<b>General Earthworks</b>				
	Allowance for the contractors laydown area - assume 300 thick hardfill including removal on completion	m2	2,525	50.00	126,250
	Total cut	m3	80,270		
	Total fill	m3	28,360		
	Remove topsoil and respreads on completion - say 150 thick	m3	9,900	45.00	445,500
	Cut to fill - assume 50% of fill can be obtained from cut material	m3	14,180	12.00	170,160
	Cut to waste	m3	66,090	40.00	2,643,600
	Imported fill	m3	14,180	50.00	709,000
	Allowance for undercut in soft spots including imported fill - assume 5% of cut volume	m3	4,014	110.00	441,540
	<b>Sub Total **</b>				<b>4,536,050</b>
	<b>Chemical Storage Building</b>				
	Piling - no piling needed	note			
	500 th reinforced concrete floor slab including foundation beams	m2	61	844.00	51,484
	250 th reinforced concrete floor slab including foundation beams	m2	793	695.00	551,135
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sealer to bunded floors	m2	757	150.00	113,550
	250 th precast concrete walls	m2	1,534	560.00	859,040
	Allowance for 250 th concrete screen walls including foundations	m2	252	790.00	199,080
	Allowance for roofing including steel support	m2	903	500.00	451,500
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	50,000.00	50,000
	Allowance for roller door	no	10	12,000.00	120,000
	Small power and lighting	m2	854	100.00	85,400
	Mechanical ventilation	m2	520	350.00	182,000
	Sprinkler system including smoke and heat detection	m2	854	110.00	93,940
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,932,129</b>
	<b>Chlorine Storage Building</b>				
	Note: Assume the building is the same as the chemical storage building as there is no design info for this building	note			
	Piling - no piling needed	note			
	Rate for Chemical Storage applied to this buildings area	m2	189	3,400.00	642,600
	<b>Sub Total **</b>				<b>642,600</b>
	<b>Electrical Compound</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	215	595.00	127,925
	Allowance for plinths and miscellaneous works	sum	1	10,000.00	10,000
	Upper floor	m2	60	300.00	18,000
	200 th precast concrete walls	m2	499	540.00	269,460
	Allowance for roofing including steel support	m2	215	450.00	96,750
	Allowance for miscellaneous works - stairs, bollards, etc.	sum	1	20,000.00	20,000
	Allowance for roller door - approx. 5m x 4m high	no	1	12,000.00	12,000

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for roller door - approx. 3m x 3m high	no	1	8,000.00	8,000
	Small power and lighting	m2	215	100.00	21,500
	Mechanical ventilation	m2	215	300.00	64,500
	Extra value for air conditioning to the 11kV switchroom	m2	53	600.00	31,800
	Sprinkler system including smoke and heat detection	m2	215	110.00	23,650
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>728,585</b>
	<b>DAF Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	1,526	800.00	1,220,800
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	852	45.00	38,340
	500 th reinforced concrete floor slab	m2	2,053	675.00	1,385,775
	300 th reinforced concrete walls	m2	3,818	755.00	2,882,590
	Allowance for walkways over the tank	m2	201	1,060.00	213,060
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,053	570.00	1,170,210
	Small power and lighting	m2	2,053	70.00	143,710
	Mechanical ventilation	m2	2,053	100.00	205,300
	Extra value for air conditioning to the MCC room	m2	43	600.00	25,800
	Allowance for miscellaneous works	sum	1	500,000.00	500,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>7,885,585</b>
	<b>Ozone Generator Room</b>				
	Piling - no piling needed	note			
	300 th reinforced concrete floor slab including foundation beams	m2	294	595.00	174,930

## Section '1'-Civil Works'

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

SubTitle : July 2016

COMPANY : Beca

DATE : Thu 08 Sep 2016 03:57pm

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for plinths and miscellaneous works	sum	1	30,000.00	30,000
	200 th precast concrete walls	m2	581	540.00	313,740
	Allowance for roofing including steel support	m2	294	450.00	132,300
	Allowance for miscellaneous works - bollards, etc.	sum	1	10,000.00	10,000
	Allowance for roller door - approx. 5m x 4m high	no	3	12,000.00	36,000
	Small power and lighting	m2	294	100.00	29,400
	Mechanical ventilation	m2	294	300.00	88,200
	Sprinkler system including smoke and heat detection	m2	294	110.00	32,340
	Allowance for drainage	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>871,910</b>
	<b>Ozone Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	600	730.00	438,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	522	45.00	23,490
	500 th reinforced concrete floor slab	m2	418	655.00	273,790
	500 th reinforced concrete upper floors	m2	79	618.00	48,822
	500 th reinforced concrete walls	m2	682	870.00	593,340
	400 th reinforced concrete walls	m2	827	776.00	641,752
	Allowance for cover and walkways over the central area	m2	116	630.00	73,080
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	418	660.00	275,880
	Small power and lighting	m2	418	70.00	29,260
	Mechanical ventilation	m2	418	100.00	41,800
	Allowance for miscellaneous works	sum	1	100,000.00	100,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total **</b>				<b>2,574,214</b>

## Section '1'-Civil Works'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>BAC Filter Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	1,500	810.00	1,215,000
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,350	45.00	60,750
	400 th reinforced concrete floor slab	m2	2,085	608.00	1,267,680
	400 th reinforced concrete upper floors	m2	3,225	576.00	1,857,600
	400 th reinforced concrete walls	m2	4,837	830.00	4,014,710
	Inlet channel works	sum	1	330,000.00	330,000
	Allowance for cover and walkways over the inlet channel/open gallery area	m2	523	540.00	282,420
	Allowance for roof and wall cladding including structures - Colorsteel on epoxy coated structural steel	m2	2,065	590.00	1,218,350
	Small power and lighting	m2	2,065	70.00	144,550
	Mechanical ventilation	m2	2,065	100.00	206,500
	Allowance for miscellaneous works	sum	1	300,000.00	300,000
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>10,997,560</b>
	<b>Chlorine Contact Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	2,093	700.00	1,465,100
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	1,113	45.00	50,085
	500 th reinforced concrete floor slab	m2	1,553	655.00	1,017,215
	500 th reinforced concrete walls	m2	1,647	845.00	1,391,715
	300 th reinforced concrete walls	m2	1,078	734.00	791,252
	Allowance for a cover over the tank	m2	1,553	700.00	1,087,100
	Allowance for miscellaneous works	sum	1	200,000.00	200,000
	Allowance for drainage	sum	1	35,000.00	35,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>6,037,467</b>
	<b>Treated Water Pump Station</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 15m BGL all round including waler beams and ties	m2	893	800.00	714,400
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	471	45.00	21,195
	250 th reinforced concrete floor slab	m2	386	480.00	185,280
	400 th reinforced concrete upper floors	m2	386	576.00	222,336
	Allowance for pump plinths	sum	1	25,000.00	25,000
	250 th reinforced concrete walls	m2	476	590.00	280,840
	Allowance for upper structure and roofing including steel support	m2	386	1,300.00	501,800
	Allowance for miscellaneous works	sum	1	150,000.00	150,000
	Allowance for drainage	sum	1	35,000.00	35,000
	<b>Sub Total</b>	**			<b>2,135,851</b>
	<b>Washout Balance Tank</b>				
	Piling - no piling needed	note			
	Temporary sheet piles to average 11m BGL all round including waler beams and ties	m2	990	750.00	742,500
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	510	45.00	22,950
	500 th reinforced concrete floor slab	m2	404	544.00	219,776
	400 th reinforced concrete walls	m2	628	800.00	502,400
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total</b>	**			<b>1,512,626</b>
	<b>Sludge Balance Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	7,000.00	140,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	504	865.00	435,960

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	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	283	45.00	12,735
	250 th reinforced concrete floor slab	m2	272	432.00	117,504
	300 th reinforced concrete walls	m2	321	756.00	242,676
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>973,875</b>
	<b>Supernatant Return Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	20	7,000.00	140,000
	Temporary sheet piles to average 10m BGL all round including waler beams and ties	m2	760	770.00	585,200
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	402	45.00	18,090
	250 th reinforced concrete floor slab	m2	301	432.00	130,032
	300 th reinforced concrete walls	m2	471	756.00	356,076
	Allowance for miscellaneous works	sum	1	25,000.00	25,000
	<b>Sub Total **</b>				<b>1,254,398</b>
	<b>Sludge Thickener Feed Tank</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	6	7,000.00	42,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	322	790.00	254,380
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	175	45.00	7,875
	250 th reinforced concrete floor slab	m2	86	432.00	37,152
	300 th reinforced concrete walls	m2	171	756.00	129,276
	Allowance for miscellaneous works	sum	1	15,000.00	15,000
	<b>Sub Total **</b>				<b>485,683</b>
	<b>Sludge Thickeners (2 No)</b>				
	Note: The following cost is for one tank				

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	(see last item for second tank)	note			
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	22	7,000.00	154,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the scnd tank	sum	1	870,840.00	870,840
	<b>Sub Total **</b>				<b>1,741,680</b>
	<b>Washwater Thickeners (2 No)</b>				
	Note: The following cost is for one tank (see last item for second tank)	note			
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 4m c/c (no permanent liners)	no	22	7,000.00	154,000
	Temporary sheet piles to average 7m BGL all round including waler beams and ties	m2	385	890.00	342,650
	Excavate and cart away - in general earthworks	note			
	Backfill with excavated material	m3	390	45.00	17,550
	Average 700 th reinforced concrete floor slab	m2	144	760.00	109,440
	250 th reinforced concrete walls	m2	215	800.00	172,000
	250 th reinforced concrete channel floor	m2	45	560.00	25,200
	Allowance for miscellaneous works	sum	1	50,000.00	50,000
	Add the above total for the scnd tank	sum	1	870,840.00	870,840
	<b>Sub Total **</b>				<b>1,741,680</b>
	<b>Sludge Dewatering Building (Filter Press)</b>				
	Piling - assume 600mm dia x 10m long in-situ concrete piles				

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	(no permanent liners)	no	20	7,000.00	140,000
	Building area	m2	656		
	Retaining wall - say average 5m high x 40m long	m2	200	1,500.00	300,000
	300 th reinforced concrete floor slab including foundation beams	m2	524	595.00	311,780
	300 th reinforced concrete upper floor	m2	269	514.00	138,266
	200 th precast concrete walls	m2	1,413	540.00	763,020
	400 x 400 concrete columns	m	54	400.00	21,600
	Allowance for roofing including structure	m2	404	450.00	181,800
	Stair rising 6m	no	1	21,000.00	21,000
	Allowance for plinths and miscellaneous works	sum	1	75,000.00	75,000
	Allowance for roller door	no	3	12,000.00	36,000
	Small power and lighting	m2	656	100.00	65,600
	Mechanical ventilation	m2	656	350.00	229,600
	Extra value for air conditioning to the MCC/office room	m2	34	400.00	13,600
	Sprinkler system including smoke and heat detection	m2	656	110.00	72,160
	Allowance for drainage	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>2,469,426</b>
	<b>Reservoirs (2 No)</b>				
	Note: The following cost is for one reservoir (see last item for second reservoir)	note			
	Reservoir volume	m3	28,905		
	Retaining wall - say average 3m high x 50m long	m2	150	1,500.00	225,000
	Piling - assume 600mm dia x 10m long in-situ concrete piles at average 5m c/c (no permanent liners)	no	120	7,000.00	840,000
	500 th reinforced concrete floor slab	m2	2,915	690.00	2,011,350
	400 th reinforced concrete walls	m2	1,912	1,200.00	2,294,400
	500 th reinforced concrete roof slab including allowance for internal columns, etc.	m2	2,915	845.00	2,463,175

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Stairs rising 10m and balustrade around the top of the reservoir	sum	1	100,000.00	100,000
	Allowance for miscellaneous works	sum	1	250,000.00	250,000
	Add the above total for the second tank	sum	1	8,183,925.00	8,183,925
	<b>Sub Total **</b>				<b>16,367,850</b>
	<b>Administration Building</b>				
	Piling - no piling needed	note			
	Building area	m2	403		
	General building works	m2	403	2,200.00	886,600
	Allowance for fitout	m2	403	750.00	302,250
	Extra value for amenities fitout	m2	29	1,000.00	29,000
	Allowance for paving and landscaping to entrance and external areas	sum	1	75,000.00	75,000
	<b>Sub Total **</b>				<b>1,292,850</b>
	<b>Lagoon</b>				
	Allowance for lagoon finishing works - liner, inlet, outlet, planting, etc. (note excavation and fill are in general earthworks)	m2	4,200	205.00	861,000
	<b>Sub Total **</b>				<b>861,000</b>
	<b>Services Relocation</b>				
	Nominal allowance for services relocation	sum	1	100,000.00	100,000
	<b>Sub Total **</b>				<b>100,000</b>
	<b>Roading and Finishing Works</b>				
	New roads and parking including kerbs, drainage, etc. - 40mm AC14 on 2 coat chipseal on 150mm AP40 on 300mm AP40 on geotextile on prepared areas (AP 40 with cement stabilisation)	m2	7,800	180.00	1,404,000
	Allowance for general retaining works	sum	1	350,000.00	350,000
	Allowance for site lighting	no	40	10,000.00	400,000
	Allowance for general landscaping	sum	1	750,000.00	750,000
	Allowance for permanent noise control measures	sum	1	1,000,000.00	1,000,000
	Security fence	m	1,200	250.00	300,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Main entrance gate, gatehouse, etc.	sum	1	150,000.00	150,000
	<b>Sub Total **</b>				<b>4,354,000</b>
	<b>Traffic Management and Temporary Works</b>				
	Allowance for traffic management and temporary works	sum	1	1,500,000.00	1,500,000
	<b>Sub Total **</b>				<b>1,500,000</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for the contractor's health and safety plan and a fulltime site supervision representative - assume 36 months	sum	1	320,000.00	320,000
	Allowance for all as-built documentation	sum	1	100,000.00	100,000
	Contractors on-site overheads (P&G) (say 8% of construction cost)	sum	76,213,000	0.08	6,097,040
	Contractors off-site overheads and margin (say 4%)	sum	82,310,000	0.04	3,292,400
	<b>Sub Total **</b>				<b>9,809,440</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	85,602,000	0.10	8,560,200
	Rounding	sum	1	-2,659.00	-2,659
	<b>Sub Total **</b>				<b>8,557,541</b>
	<b>TOTAL #*</b>				<b>94,160,000</b>
	<b>Totals for Section '1'-'Civil Works'</b>				<b>94,160,000</b>

## Section '2'-'Process Plant and Equipment'

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
2	<b><u>PROCESS PLANT AND EQUIPMENT - PARKER ROAD SOUTH OPTION</u></b>				
	<b><u>CHEMICAL SYSTEMS</u></b>				
	<b>Alum</b>				
	105m3 alum storage tank	no	2	180,000.00	360,000
	7m3 day tank	no	2	20,000.00	40,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	100	120.00	12,000
	<b>Sub Total **</b>				<b>532,000</b>
	<b>Poly (Flocculant, Thickening and Dewatering Aids) - 3 No</b>				
	Make up skid	no	6	90,000.00	540,000
	Dosing pumps and associated pipework	no	3	60,000.00	180,000
	Dosing lines	m	300	120.00	36,000
	<b>Sub Total **</b>				<b>756,000</b>
	<b>Lime</b>				
	30 tonne silo and associated transfer batching	no	2	360,000.00	720,000
	30m3 day tank	no	2	72,000.00	144,000
	7.5kW mixers	no	2	30,000.00	60,000
	Dosing pumps and associated pipework	no	4	90,000.00	360,000
	Dosing lines	m	500	180.00	90,000
	2kL post lime tanks	no	2	50,000.00	100,000
	0.5kL pre lime tanks	no	2	30,000.00	60,000
	<b>Sub Total **</b>				<b>1,534,000</b>
	<b>Fluoride</b>				
	10m3 bulk supply tank	no	2	30,000.00	60,000
	500L day tank	no	2	12,000.00	24,000
	Dosing pumps and associated pipework	no	2	60,000.00	120,000
	Dosing lines	m	200	120.00	24,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Sub Total</b>	**			<b>228,000</b>
	<b>Carbon Dioxide (assume leased)</b>				
	Dosing lines (4 x 200m)	m	800	120.00	96,000
	<b>Sub Total</b>	**			<b>96,000</b>
	<b>Chlorine Gas</b>				
	Chlorine gas	sum	1	1,000,000.00	1,000,000
	<b>Sub Total</b>	**			<b>1,000,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,146,000	0.20	829,200
	<b>Sub Total</b>	**			<b>829,200</b>
	<b>DAF</b>				
	<b>Mechanical Supply and Installation</b>				
	2kW mixers	no	16	25,000.00	400,000
	Subnatant collection	m2	700	1,200.00	840,000
	5000L pressure vessel	no	8	60,000.00	480,000
	Recycle pumps	no	10	60,000.00	600,000
	50kW air compressor and receiver	no	2	240,000.00	480,000
	Float scraper	no	8	90,000.00	720,000
	DAF nozzles (dispersion valve array)	no	8	30,000.00	240,000
	Allowance for pipework, valves and connections	sum	1	960,000.00	960,000
	<b>Sub Total</b>	**			<b>4,720,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	4,720,000	0.20	944,000
	<b>Sub Total</b>	**			<b>944,000</b>
	<b>BAC FILTERS</b>				
	<b>Mechanical Supply and Installation</b>				

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Plenum floor	m2	1,135	2,400.00	2,724,000
	400mm th layer of sand	m3	450	800.00	360,000
	350mm th layer of gravel	m3	400	500.00	200,000
	1500mm th layer of BAC media	m3	1,700	1,450.00	2,465,000
	Upwash launders	no	14	50,000.00	700,000
	75kW upwash pumps	no	3	60,000.00	180,000
	175kW air scour blowers	no	2	100,000.00	200,000
	Allowance for pipework, valves and connections	sum	1	2,400,000.00	2,400,000
	<b>Sub Total **</b>				<b>9,229,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	9,229,000	0.20	1,845,800
	<b>Sub Total **</b>				<b>1,845,800</b>
	<b><u>OZONE</u></b>				
	<b>Mechanical Supply and Installation</b>				
	VPSA ozone system	sum	1	4,800,000.00	4,800,000
	Allowance for associated work not covered in the basic price	25%	4,800,000	0.25	1,200,000
	Allowance for pipework, valves and connections	sum	1	580,000.00	580,000
	<b>Sub Total **</b>				<b>6,580,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	6,580,000	0.20	1,316,000
	<b>Sub Total **</b>				<b>1,316,000</b>
	<b><u>RESIDUALS MANAGEMENT</u></b>				
	<b>Washout Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Sludge Thickeners (2 No)</b>				
	Floc chamber	no	2	50,000.00	100,000
	Floor rake	no	2	360,000.00	720,000
	Mixer paddles	no	2	25,000.00	50,000
	Launder	no	2	25,000.00	50,000
	Supernatant recycle pumps	no	4	90,000.00	360,000
	Sludge pumps	no	4	90,000.00	360,000
	Allowance for pipework, valves and connections	no	2	85,000.00	170,000
	<b>Sub Total **</b>				<b>1,810,000</b>
	<b>Filter Presses</b>				
	Filter press and ancillary equipment supply	no	2	1,700,000.00	3,400,000
	Filter press install and ancillaries	no	2	2,500,000.00	5,000,000
	<b>Sub Total **</b>				<b>8,400,000</b>
	<b>Other Pumps and Mixers</b>				
	Washout balance tank mixers - 4kW submersible	no	2	60,000.00	120,000
	Washout thickener feed pumps - 15kW open impeller	no	2	45,000.00	90,000
	Filter to waste return pumps - 22kW centrifugal	no	2	60,000.00	120,000
	De-aeration tank mixers - 1kW submersible	no	2	30,000.00	60,000
	De-aeration tank pumps - 30kW progressive cavity	no	2	75,000.00	150,000
	Supernatant return pumps - 30kW centrifugal	no	2	75,000.00	150,000
	Sludge thickener feed tank mixers - 1kW submersible	no	2	30,000.00	60,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Sludge thickener feed pumps - 5kW open impeller	no	2	30,000.00	60,000
	Sludge balance tank mixers - 2kW submersible	no	4	45,000.00	180,000
	Sludge filter press feed pumps - 5kW progressive cavity	no	2	90,000.00	180,000
	Attenuation storage return pumps - 15kW open impeller	no	2	45,000.00	90,000
	<b>Sub Total **</b>				<b>1,260,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	20%	13,280,000	0.20	2,656,000
	<b>Sub Total **</b>				<b>2,656,000</b>
	<b><u>TREATED WATER PUMP STATION</u></b>				
	<b>Mechanical Supply and Installation</b>				
	Pumps and motors - 215kW	no	5	350,000.00	1,750,000
	Allowance for pipework, valves and connections	sum	1	1,200,000.00	1,200,000
	<b>Sub Total **</b>				<b>2,950,000</b>
	<b>Electrical, Instrumentation and Controls</b>				
	Allowance for electrical, instrumentation and controls	sum	1	700,000.00	700,000
	<b>Sub Total **</b>				<b>700,000</b>
	<b><u>ANCILLARIES</u></b>				
	Service water	sum	1	240,000.00	240,000
	Air supply	sum	1	540,000.00	540,000
	Allowance for additional interconnecting pipework, valves and connections	sum	1	4,000,000.00	4,000,000
	<b>Sub Total **</b>				<b>4,780,000</b>
	<b><u>POWER SUPPLY</u></b>				
	Standby diesel generator - 2.5MW	no	1	1,500,000.00	1,500,000
	11kV Vector power supply upgrade and HV reticulation	sum	1	2,320,000.00	2,320,000

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BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Allowance for power upgrade to the existing network	m	2,800	600.00	1,680,000
	Allowance for fibre along the new raw and treated water pipelines	m	6,434	300.00	1,930,200
	<b>Sub Total **</b>				<b>7,430,200</b>
	<b><u>OTHER</u></b>				
	<b>SCADA</b>				
	Allowance for software development and commissioning	sum	1	1,000,000.00	1,000,000
	<b>Sub Total **</b>				<b>1,000,000</b>
	<b>Process Commissioning and Support</b>				
	Allowance for commissioning and support	sum	1	500,000.00	500,000
	<b>Sub Total **</b>				<b>500,000</b>
	<b>Project Closeout</b>				
	Allowance for spare equipment	sum	1	500,000.00	500,000
	Allowance for project completion report including defects liability period coordination - Based on 10 hours/week over 52 weeks assuming majority of the defects will be rectified over the first 3 months	sum	1	130,000.00	130,000
	<b>Sub Total **</b>				<b>630,000</b>
	<b>O&amp;M Manuals and Training</b>				
	Allowance for O&M manuals	sum	1	100,000.00	100,000
	Allowance for O&M training	sum	1	200,000.00	200,000
	<b>Sub Total **</b>				<b>300,000</b>
	<b>Preliminaries &amp; General</b>				
	Contractors on-site overheads (P&G) (say 6% of construction cost)	sum	63,836,000	0.06	3,830,160
	Contractors off-site overheads and margin (say 4%)	sum	67,666,000	0.04	2,706,640
	<b>Sub Total **</b>				<b>6,536,800</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	70,373,000	0.10	7,037,300

**Section '2'-'Process Plant and Equipment'**

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	Rounding	sum	1	-300.00	-300
		<b>Sub Total **</b>			<b>7,037,000</b>
		<b>TOTAL #*</b>			<b>77,410,000</b>
	<b>Totals for Section '2'-'Process Plant and Equipment'</b>				<b>77,410,000</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
3	<b><u>ANCILLARY STRUCTURES - PARKER ROAD SOUTH OPTION</u></b>				
	<b>Raw Water Infrastructure</b>				
	<b>Raw Water Tunnel</b>				
	Note: It is assumed that there are no basalt present in the area of the tunnel and shafts	note			
	Tunnel - 2m dia unlined tunnel	m	1,802	8,000.00	14,416,000
	Jacking shaft at Treatment Plant - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Intermediate reception shaft - 5m dia x 35m deep	no	1	1,000,000.00	1,000,000
	Jacking shaft at Mackies Rest - 5m x 8m x 10m deep	no	1	315,000.00	315,000
	Tunnel fixed costs	sum	1	5,000,000.00	5,000,000
	<b>Sub Total **</b>				<b>21,046,000</b>
	<b>Gravity Supply from Upper Nihotupu Raw Water Main</b>				
	Trenched section along Exhibition Drive - 550mm dia	m	1,580	2,500.00	3,950,000
	<b>Sub Total **</b>				<b>3,950,000</b>
	<b>Access Road Upgrade to Mackies Rest</b>				
	Road - 780m x 8m wide	m2	6,240	300.00	1,872,000
	<b>Sub Total **</b>				<b>1,872,000</b>
	<b>Connection to Raw Water Infrastructure</b>				
	Nominal allowance for connecting the Huia Raw Watermain and Lower Niho Raw Watermain	sum	1	1,500,000.00	1,500,000
	<b>Sub Total **</b>				<b>1,500,000</b>
	<b>Off-Spec Discharge</b>				
	Discharge pipework to Allen Swamp - 1200mm dia	m	150	4,800.00	720,000
	Nominal allowance for the outfall structure	sum	1	1,000,000.00	1,000,000
	Sewer - waste water connection to network - 150mm dia gravity sewer	m	3,342	250.00	835,500
	<b>Sub Total **</b>				<b>2,555,500</b>

## Section '3'-Ancillary Structures'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b>Treated Water Transmission</b>				
	Pipeline from treated water pump station to reservoirs - 1200mm dia	m	137	4,800.00	657,600
	Reservoir pipework (1200mm dia - includes inlet manifold, outlet, overflow and scour)	sum	1	2,600,000.00	2,600,000
	Pipeline outlet to network - 1200mm dia	m	5,352	4,800.00	25,689,600
	<b>Sub Total **</b>				<b>28,947,200</b>
	<b>Preliminaries &amp; General</b>				
	Allowance for all as-built documentation	sum	1	50,000.00	50,000
	Contractors on-site overheads	note		included	
	Contractors off-site overheads and margin	note		included	
	<b>Sub Total **</b>				<b>50,000</b>
	<b>Estimating Contingency</b>				
	Allowance for estimating contingency (10%)	sum	59,921,000	0.10	5,992,100
	Rounding	sum	1	-2,800.00	-2,800
	<b>Sub Total **</b>				<b>5,989,300</b>
	<b>TOTAL #*</b>				<b>65,910,000</b>
	<b>Totals for Section '3'-Ancillary Structures'</b>				<b>65,910,000</b>

## Section '4'-Implementation Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
4	<b><u>IMPLEMENTATION COSTS - PARKER ROAD SOUTH OPTION</u></b>				
	Allowance for all Design, Management, Construction and Contract supervision, etc. (say 15%)	sum	237,480,000	0.15	35,622,000
	Allowance for consent and regulatory fees (say 2%)	sum	237,480,000	0.02	4,749,600
	Allowance for client internal costs (say 3%)	sum	237,480,000	0.03	7,124,400
	Rounding	sum	1	4,000.00	4,000
	<b>Sub Total **</b>				<b>47,500,000</b>
	<b>Totals for Section '4'-Implementation Costs'</b>				<b>47,500,000</b>

## Section '5'-'Land Costs'

COMPANY : Beca

PROJECT : HUIA WATER TREATMENT PLANT - PARKER ROAD SOUTH OPTION

DATE : Thu 08 Sep 2016 03:57pm

SubTitle : July 2016

Bid Currency : NZD

BQREF	DESCRIPTION	UNIT	QTY	RATE	COST
5	<b><u>LAND CONSTS - PARKER ROAD SOUTH OPTION</u></b>				
	Allowance for all property purchase costs - say 135% of CV	sum	1	23,132,000.00	23,132,000
	Allowance for legal fees (say \$25,000 per property)	no	15	25,000.00	375,000
	Allowance to sell Existing and Manuka sites	sum	-1	4,500,000.00	-4,500,000
	Demolition of existing plant at Existing Woodlands Park site before selling the land	sum	1	2,000,000.00	2,000,000
	Rounding	sum	1	3,000.00	3,000
	<b>Sub Total **</b>				<b>21,010,000</b>
	<b>Totals for Section '5'-'Land Costs'</b>				<b>21,010,000</b>