

Mangawhai Golf Club

Water Re-use Project

September 3, 2021



Overview of Mangawhai Golf Club from Google Earth.

The purpose of this report is to provide a detailed description and costs involved in the provision of a fully automatic irrigation system using treated effluent water.

Background

It is understood that the Kaipara District Council are investigating the merits of making treated wastewater available to the Mangawhai Golf Club for re-use in its irrigation system. The intention is to investigate this scheme to determine if it can be mutually beneficial to both parties by providing solutions to help the water supply needs of the golf club while at the same time reducing the amount of treated wastewater needing to be retained by the Councils infrastructure. This report outlines the details of the required infrastructure at the golf club as well as the costs associated with its supply and installation. The intention of this report is to provide enough information for the council to be able to make an informed business decision of whether or not to proceed with this scheme.

Infrastructure Required

A complete new irrigation system will be required with a sophisticated control system allowing the golf club to manage the use of the water within a very tight daily time-frame. The system will start with a new pumping station that would take the treated water from a storage tank located to the south of the clubhouse near the overflow car park. Brief details and assumptions of the new system are described as follows;

1. **Pump Station** –The pump station shall provide a duty of 45 lps @ 7.0 Bar and a Secondary Duty of 1.5 lps @ 7.0 Bar. The main duty of 45 lps @ 7.0 shall be provided by a Triplex pump set consisting of 3 x 18.5 kW, 2900rpm, 3ph, 50Hz multistage pumps. The secondary duty shall be provided by a single 5.5 kW, 2900rpm, 3ph, 50Hz multistage pump. All pumps are to be controlled by Variable speed drive control fitted with thermal cut out, pressure sensors and pressure tanks. The Pump Distribution Panel shall have a single-entry power input complete with VFC Fault and Run relays with fault and run indicators. The pump station shall be fitted to a base platform complete with pressure gauges, isolating and check valves, and bolted to the 150mm thick concrete floor. Power to the building would be assumed as being provided by others.
2. **Pipe Network** – All pipe shall be PE100 10 Bar rated Medium Density Polyethylene. 63mm pipe can be either fusion welded or mechanical jointed, all other pipes shall be fusion welded. All fittings after the pump discharge shall be of SDR11-17 and all mechanical fittings shall be PN16 Rated

3. **Sprinklers** – All sprinklers would be water-lubricated gear drive rotors capable of part/full-circle adjustable operation. The sprinklers shall be supplied with an Integrated Control Module “ICM” providing valve-in-head single-station control. The sprinklers would have a built-in pressure regulator factory-preset to 80 psi (5.5 bars) and have a 24 VAC 50/60-cycle solenoid assembly that will actuate normally-closed control valve in the base of the sprinkler case.
4. **Control System** – This would include a computer assembly, a field hardware interface, an uninterruptible power supply and a grounding network grid with surge arrestors. The Control software shall operate continuous “real-time” communication between the central computer, interface units and the field satellite, decoder or IC modules and response at all times. *Dynamic Flo-Manager*® feature shall be included with the software and automatically distribute and limit flow within the system. *Smart Weather*™ shall monitor and respond to climatic conditions as they occur by tracking evapotranspiration (ET) rates and other sensory inputs such as moisture levels.

Impact to Golf Club

There are many considerations and implications for the golf club but it should be recognized that overall this should be seen as a benefit to the sustainability and conditioning of the golf course. The first significant impact to the golf course will be the disruption during the installation stage. Due to the logistics and health & safety considerations, the golf club will need to balance the disruption with the closure of certain holes on a rolling basis as the project progresses. The installation process is estimated to take approximately 6 months to complete. In addition to the disruption during construction, the next biggest challenge will be adhering to the requirement of restricting access to the course until approximately 4 hours after watering to allow the grass to dry. Although the system will allow for the entire course to be watered through the night well ahead of 4 hours before opening, the difficulty may be in the heat of summer when a cooling cycle of watering may be required in certain areas. To help mitigate the need to water in the day, we would suggest access to the existing bore be maintained to fill water tank-trailers which could be used for hand watering “hot spots”. Once the quality of the treated water improves to the level that it can be used without restriction, there will be no issue.

Risks

As with any project, there may be unforeseen circumstances which can affect the ability to deliver the project within the estimated time-frame and budget. The usual variables of inclement weather are a given but other risks can include encountering ground conditions that are unexpected such as rock outcroppings or large buried stumps, however we expect the risk is low and mitigation if encountered would not be overly costly. Another unknown is the amount of restrictions placed on working adjacent to the wetland, however this should also not be overly difficult to mitigate. The biggest single risk to this project relates to the supply chain and the impact of volatile pricing and stock availability. It is unknown when this project, if approved would actually proceed to the construction stage so contractor and material availability would need to line up. We have already heard expectations of material increases of up to 20% are expected over the next 3-4 months. The cost estimate provided has been based on procuring the materials at today's prices and not factoring in those increases as they are unknown.

Summary

There is no question that this project represents the future as we move towards more sustainable and better use of treated wastewater. Golf courses comprise of large urban open spaces that require water to survive and the Mangawhai Golf Club is a good example of this. The golf course serves as a perfect filter to further clean the water before it enters the ecosystem and remove the need to rely on bore water. Countless studies across the world have shown the use of wastewater for golf course irrigation to not only be prudent but to be the best solution available.

Regards



Grant Puddicombe
Managing Director

MANGAWHAI GOLF CLUB
WATER REUSE PROJECT
COST ESTIMATE - September 2021



SCHEDULE "A"

ITEM	DESCRIPTION	QTY	UNIT	PRICE	EXTENSION	TOTAL
1	Soft Costs					\$70,000.00
	a) field layout & project co-ordination		LS			
	b) project management & admin.		LS			
2	Mobilisation					\$22,500.00
	a) equipment on site		LS			
	b) project safety		LS			
	c) site office/material storage		LS			
3	Pumping Station Supply & Installation					\$127,000.00
	a) Total Span Shed/Concrete Pad (6 X 4X 2.4)		LS			
	b) Electrical in Shed		LS			
	c) Pre-fabricated Pump Station (*see notes)		LS			
	d) Water Meter		LS			
	e) Discharge Pipe Network		LS			
	f) Suction Pipe Network		LS			
4	Pipe Supply & Installation					\$341,797.90
	a) 63mm MDPE PN9 Polyethylene	12,000	m			
	b) 90mm PE100 PN10 MDPE	2,150	m			
	c) 110mm PE100 PN10 MDPE	3,400	m			
	d) 180mm PE100 PN10 MDPE	1,200	m			
	e) 225mm PE100 PN10 MDPE	240	m			
	f) 315mm PE100 PN10 MDPE	30	m			
	g) 225mm Agriduct for Valve Box Support	100	m			
5	Pipe Fittings Supply & Installation					\$190,750.00
	a) Mainline fittings - cast iron & electrofusion		LS			
	b) Lateral Fittings - tapping bands, elbows, nipples etc.		LS			
6	Valve Assembly & Valve Box Supply & Install					\$39,865.00
	a) 50mm Isolation Ball Valves for Tees & Greens	82	each			
	b) 80mm Flanged Sluice Valve	12	each			
	c) 100mm Flanged Sluice Valve	15	each			
	d) 150mm Flanged Sluice Valve	4	each			
	e) 200mm Flanged Sluice Valve	1	each			
	f) 25mm Quick Coupler Valve Assembly	25	each			
	g) 50mm Air Relief Valve	6	each			
	h) 50mm Drain Valve Assembly	2	each			
	i) Solonoid Valve Assemblies		LS			
7	Sprinklers Supply & Installation					\$376,810.00
	a) Part Circle Green Sprinkler (16-20m @ 80PSI)	108	each			
	b) Part Circle Surround Sprinkler (16-20m @ 80PSI)	75	each			
	c) Part/Full Circle Fairway Sprinkler (18-22m @ 80PSI)	390	each			
	d) Part Circle Tee Sprinkler (12-14m @ 80PSI)	196	each			

8	Control System Field Supply & Installation		\$90,500.00
	a) Communication cable (manufacturers recommended	19,000 m	
	b) Wire Connections	LS	
	c) Pump Sensor (low flow alarm)	LS	
	d) Surge Protection Grids & Earth Rods	100 each	
9	Computer Control System Supply & Install		\$70,000.00
	a) Central Computer, software, UPS & interface	LS	
	b) Moisture Sensors & out/in device	LS	
	c) Weather Station & Direct Connect	LS	
	d) Rain Can + IC IN Sensor for Central Control Comm	LS	
10	Miscellaneous Items		\$115,000.00
	a) Supply spare parts and specialized tools	LS	
	b) Marking Flags, Paint, Thread Tape, Pipe Lube	LS	
	c) As-Built Drawings	LS	
	d) Turf Restoration Allowance	LS	
	e) Freight Allowance	LS	
TOTAL SCHEDULE "A" - Excluding GST			\$1,444,222.90

Notes: No provision has been made for backflow prevention
Water filtration at pump station has not been allowed for.
No allowance for council fees (inspections etc)



Designer:

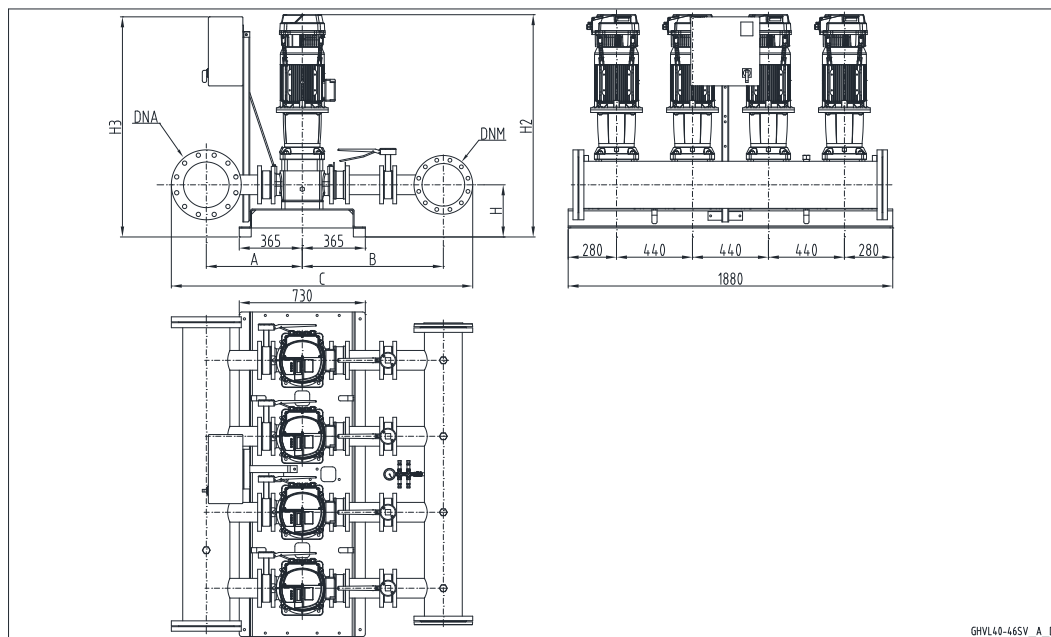
Date: 20/08/2021

Scale: 1 : 30000

File: Pump Base

GHV40/A/46SV5G185T/4

Company	Brown Brothers Engineers Ltd	Customer	Date
Contact	Nigel Webber	Contact	Item no.
Phone number	07 847 5280	Phone number	Project
Email	nigel.webber@brownbros.co.nz	Email	Project no.

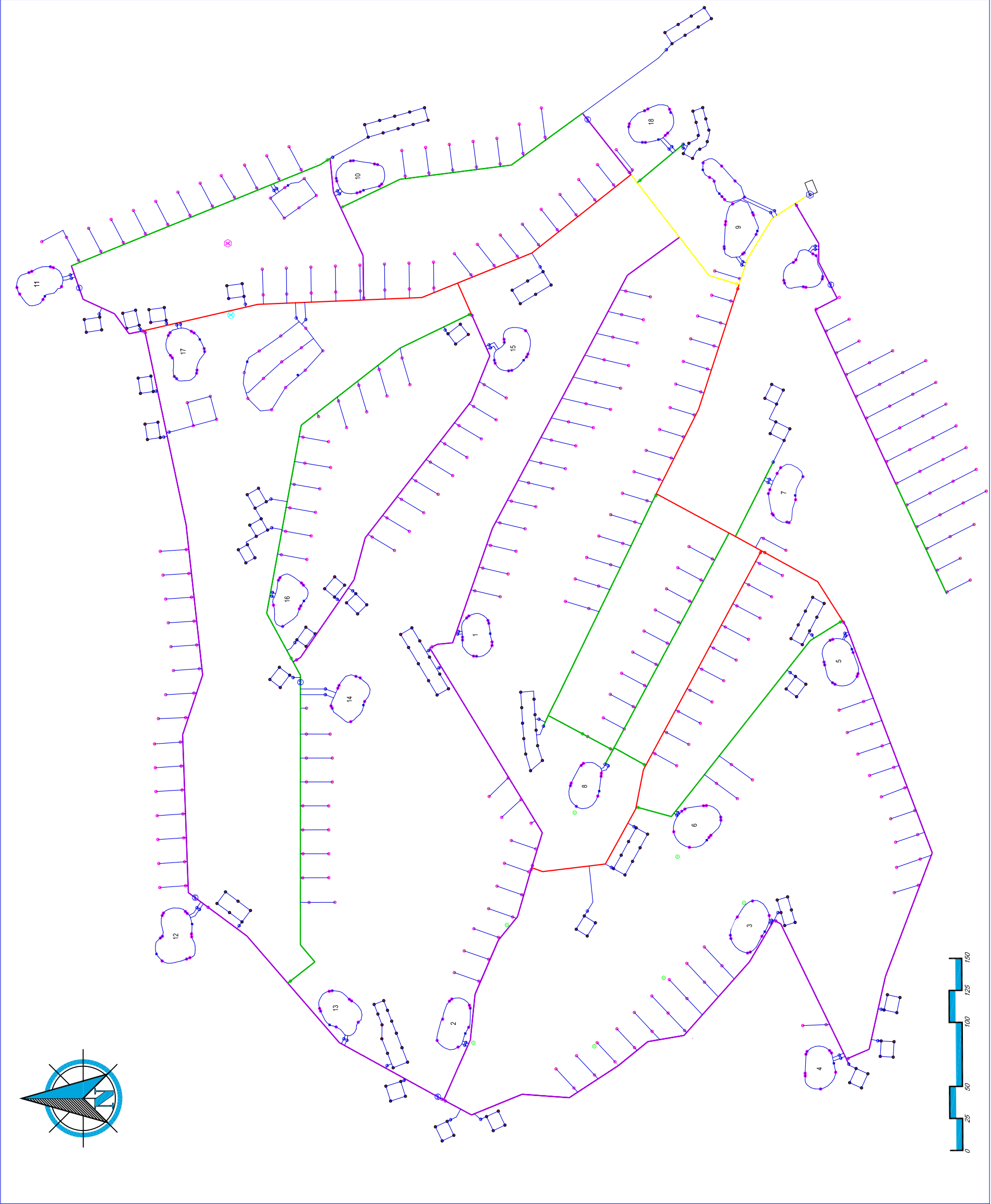


PLEASE NOTE:

Dimensions

mm

A	497.5					Weight (Include external package) On demand
B	765.5					
C	1548					
DNM	150					
DNM	150					
H	300					
H2	1738					
H3	1201					



LEGEND

Pipe Key

- 63mm - MDPE 9 Bar
- 90mm - MDPE 9 Bar
- 110mm - MDPE 9Bar
- 180mm - MDPE 9 Bar
- 225mm - MDPE 9 Bar

Control & Electrical

- Central Control
- Weather Station
- Moisture Sensor

Sprinkler / Valve Key

- Air Relief Valve
- Quick Coupling Valve 25mm
- 50mm NB Valve
- 80mm Sluice Valve Flanged
- 100mm Sluice Valve Flanged
- 150mm Sluice Valve Flanged
- Surround Sprinkler 16 - 18 mtr
- Green Sprinkler 16 - 18 mtr
- Fairway Sprinkler 18 - 22 mtr
- Tee Sprinkler 8 - 14 mtr
- Water Supply

No.	Revision/Issue:	Date:

Project:

Mangawhai Water Re-use Project

Client:



Designer: Graeme Beets

Date: August 31, 2021

Scale: 1:1500 on A1





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