

6-XQ074.01 Ladies Mile HIF Concept Design Report Revision 0A - Addendum 1

To	Warren Ladbrook
Copy	Ulrich Glasner, Simon Leary, David Sommerville, Reece Gibson and Richard Hilliard, Derek Chinn, Peter White, Steve Kerr
From	Brandon Ducharme
Office	Queenstown Office
Date	29/06/2018
File	6-XQ074.01 Ladies Mile HIF Concept Design Report 28 06 2018 Rev 0A: Addendum 1
Attachment	(1) Appendix D - Three Waters Alignment and Capacity Maps 29 06 2018 Revision E (2) Appendix F - Three Waters Estimate 29 06 2018 Revision 5
Subject	Ladies Mile HIF 3 Waters addendum to further share costs with the Queenstown Country Club

Dear Warren and further reviewing agencies,

Executive Summary

Following the recent technical meeting held on 29/06/2018 with Rationale, WSP Opus and the QLDC at WSP Opus offices at request of the QLDC and in preparation for final submission of the Ladies Mile HIF DBC submission, WSP Opus has been asked to assess and report via addendum to the concept design the inclusion of the Queenstown Country Club in the water supply concept design. As such, please consider the enclosed provisions as an addendum to the concept design package Rev 0A dated 28 06 2018.

Technical Detail

The Queenstown Country Club (QCC) is currently serviced by a booster pump station to achieve the necessary pressure for the development. However due to the proposed construction of the reservoir and water mains in the Ladies Mile development, un-boosted water can be made available to QCC at optimal pressures. This presents an opportunity to allow the decommissioning of the booster pump station, reducing costs to QLDC.

The number of properties at QCC is 332, which in addition to the 3 waters design basis of 1100 gives a total revised number of 1432 properties for the design basis of the reservoir and water mains. The two reservoir sizes have been proposed in concept design to be 1000 m³ per reservoir, which can accommodate the increase in service without requiring any further revision or increase in size.

The water mains have been sized in concept design for the 3 waters original design basis of 1100 properties, and any further increase in flow will create additional head losses that fall outside the QLDC allowable design range per the QLDC Land Development and Subdivision Code of Practice. Therefore, revising the 3 waters design basis to 1432 to include the QCC requires an increase of one pipe size for both the rising main and falling mains.

Table 4 – Summary of Water Design Calculations [from Concept Design report rev 0A]

Calculation of Reservoir Sizing:	
Water Demand per dwelling	1000 l/day

Fire Demand from reservoir	3000 l/min
Total number of dwellings	1100 1432
Average water usage	1100 m³/day (13 l/s) 1432 m ³ /day (17 l/s)
Average water usage including fire demand	63 l/s 67 l/s
Storage of 6 hours average demand + fire demand	1360 m ³
Calculation of pipeline sizing:	
Peak flow (rising main to reservoir)	33 l/s 44 l/s
Peak flow (falling main from reservoir)	51 l/s 66 l/s
Pipe size – Rising main to reservoir	DN280 PE DN315 PE
Pipe size – Falling main from reservoir	DN315 PE DN355 PE (allows for fire demand flow)
Velocity of rising main	0.75 m/s
Velocity of falling main	0.9 m/s

Cost Detail

The revised rising and falling main pipe sizes are shown in the table above (DN315 PE and DN 335 PE respectively). These pipe size increases result in a change to the cost estimate (Appendix F – Ladies Mile 3 Waters Cost Estimate Rev 5 (attached)).

The length of the DN355 PE falling main required to service the QCC development, assuming a connection point near Stalker Road, is 750 m. This leaves 560 m of DN315 PE pipe to service the further sections of the Ladies Mile development.

The cost estimate has been updated to show three pipes – the rising main and the first section of falling main, which are contributing to both Ladies Mile and QCC, and the second section of falling main, which is only servicing Ladies Mile HIF site developments.

Table 5 – Cost Summary [from Concept Design report rev 0A]

Cost Components	Programme Options			
	1	2	3	4
Programme Description	Do-Minimum	Intermediate	preferred	Full Ladies Mile Master Plan Development
ROC - Transportation (Construction)	\$5,050,000	\$5,050,000	\$5,050,000.00	\$10,750,000
ROC – 3 Waters (Construction)	\$7,015,000	\$7,015,000	\$7,015,000	\$7,015,000
ROC - Total (Construction)	\$12,065,000	\$12,065,000	\$12,065,000	\$17,765,000
Professional Fees (Design, Tendering & Evaluation)	\$939,100	\$939,100	\$939,100	\$1,382,800
MSQA	\$313,000	\$313,000	\$313,000	\$460,900
Total Base Estimate	\$13,317,100	\$13,317,100	\$13,317,100	\$19,608,700
Normal Contingency (30%)	\$3,995,100	\$3,995,100	\$3,995,100	\$5,882,600
High Risk Contingency (50%): Reservoir	\$480,000	\$480,000	\$480,000	\$480,000
Queenstown Country Club Stormwater Agreement (No Contingencies)	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000
Total Estimate with Contingencies	\$19,492,200	\$19,492,200	\$19,492,200	\$27,671,300

Please see the attached Appendix F – 3 Waters Cost Estimate and Appendix D - Three Waters Alignment and Capacity Maps which reflect the revision details discussed herein.

Given the information above, Rationale will advise proportional costings and HIF funding requirements that result from the revised water supply capital costs of the additional 332 units to the 3 waters design basis (totalling 1432 units).

If there are any further questions or concerns regarding the above, please feel free to contact me directly.

Cheers,

Brandon Ducharme

Senior Project Manager
PMP MBA CMEngNZ CPEng P.Eng

Ladies Mile HIF
 Concept Design Engineers Estimate - 3 Waters

By AP and HT
 Date: 29/05/2018
 Reviewed By AP
 Date: 29/06/2018

Issued for Addendum 1

Item	Description	Unit	Total Quantity	Rate	Total
1	PRELIMINARY AND GENERAL				
1.1	Establishment	%	6%	\$ 5,331,700	\$ 319,902
1.2	Overhead	%	15%	\$ 5,331,700	\$ 799,755
1.3	Traffic Management Plan (TPM)	%	1%	\$ 5,331,700	\$ 53,317
1.4	Manage TMP	%	4%	\$ 5,331,700	\$ 186,610
1.5	Survey and Setout	%	6%	\$ 5,331,700	\$ 319,902
	Sub-Total				\$ 1,679,485.50
2	WATERMAIN INSTALLATION				
2.1	Pipe Installation				
2.1.1	Supply, weld and lay DN315 PE100 PN12.5 rising watermain (includes all valves and fittings and reinstatement)	m	2030	\$ 450.00	\$ 913,500.00
2.1.2	Supply, weld and lay DN315 PE100 PN12.5 falling watermain (includes all valves and fittings and reinstatement)	m	560	\$ 450.00	\$ 252,000.00
2.1.3	Supply, weld and lay DN355 PE100 PN12.5 falling watermain (includes all valves and fittings and reinstatement)	m	750	\$ 510.00	\$ 382,500.00
2.2	Testing & Inspections				
2.2.1	Pressure Testing and Commissioning	LS	1	\$ 50,000.00	\$ 50,000.00
2.3	Water Reservoir				
2.3.1	1000m3 Steel Reservoir	ea	2	\$ 400,000.00	\$ 800,000.00
	Sub-Total				\$ 2,398,000.00
3	WASTEWATER INSTALLATION				
3.1	Pipe Installation				
3.1.1	Supply and lay DN225 PE100 Pressure Pipe (includes all valves and fittings and reinstatement)	m	1720	\$ 360.00	\$ 619,200.00
3.1.2	Supply and lay DN160 PE100 Pressure Pipe (includes all valves and fittings and reinstatement)	m	750	\$ 280.00	\$ 210,000.00
3.1.3	N/A	LS	0	\$ -	\$ -
3.2	Pump Stations				
3.2.1	12 l/s Capacity (~4.5kW)	ea	2	\$ 550,000.00	\$ 1,100,000.00
3.2.2	Upgrade to Country Club pump station	LS	1	\$ 50,000.00	\$ 50,000.00
3.3	Storage for Pump Stations (provisional item)				
3.3.1	Tank of approximately 70-75 m3	ea	2	\$ 200,000.00	\$ 400,000.00
3.3	Testing & Inspections				
3.3.1	Testing and Commissioning	LS	1	\$ 50,000.00	\$ 50,000.00
	Sub-Total				\$ 2,429,200.00
4	STORMWATER INSTALLATION				
4.1	Pipe Installation				
4.1.1	Supply and lay DN1050 RCRRJ	m	150	\$ 1,600	\$ 240,000.00
4.1.2	Supply and lay DN525 RCRRJ	m	220	\$ 950	\$ 209,000.00
4.2	Stilling Basin				
4.2.1	Construct SW stilling basin at discharge of DN525 pipe	LS	1	\$ 50,000	\$ 50,000.00
4.3	Testing and Commissioning				
4.3.1	Testing and Commissioning	LS	1	\$ 5,500.00	\$ 5,500.00
4.4	Queenstown Country Club Agreement (See Below U.1)				
	Sub-Total				\$ 504,500.00
	SUMMARY SCHEDULE				
S.1	PRELIMINARY AND GENERAL				\$ 1,679,485.50
S.3	WATERMAIN INSTALLATION				\$ 2,398,000.00
S.4	WASTEWATER INSTALLATION				\$ 2,429,200.00
S.5	STORMWATER INSTALLATION				\$ 504,500.00
	TOTAL AMOUNT OF Estimate				\$ 7,011,185.50
	Contractors Margin 12%	%	12%		\$ 841,342
	Contingency	%	30%		\$ 2,355,758
U.1	Stormwater Cost share with Country Club	LS	100%	1700000	\$ 1,700,000
	Total including contingency				\$ 11,908,286.09