

Mercury Five Islands Fountain

Refurbishment Assessment

Wollongong Botanic Gardens
Murphys Avenue Keiraville NSW
34°24' 32"S 150°52'38"E



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31 August 2017

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1. Project Overview

E L Williams has been commissioned by the Woodward Family to undertake a renovation assessment of the Five Islands Fountain (fountain) for consideration by the Wollongong Botanical Gardens (WBG) and Wollongong City Council.

The project has involved several onsite inspections including meetings with Paul Tracey and Wayne Locke from Wollongong Council, online research, assessment of current fountain status, considerations of the various renovation options and initial costing of the preferred renovation proposal.

2. Fountain Description

The Mercury Five Islands Fountain was designed by Bob Woodward. It consists of ten half-pipes arranged as five pairs, each rising and terminating in a larger half dome at a height 1.75m above water level. The half-pipes are made of solid cast iron and set in concrete pools cascading down the hill. Either side of the ridge pools are 54 identical terrace pools, 27 on each side.

The water is recirculated from a plant room directly beneath the fountain and thrust in vertical jets through the ten 38mm dia stainless steel nozzles at the base of each half-pipe towards the half domes above. The main water play is formed as the water jets spray in hemi-spherical form from the half-domes falling to the pools below before flowing over simple weirs at the base of each half-pipe pair. The terraces are each filled by a notch on their upper side and also from the main turbulent flow overspray.

The fountain is situated in the north-east corner of Wollongong Botanical Gardens (WBG) on a hill facing north with views to the west of Mt Keira. It is a feature of WBG, centred on the Northfields Avenue entry axis with students walking past on their way to university across the road to the north and picnickers walking up from BBQs close to the carpark at the south eastern corner of WBG.

3. Fountain History

The Illawarra Mercury commissioned Bob Woodward to design the fountain in the late 1970s as part of their 125 years of publication celebration. It was opened on 27 November 1980, with its original site being in Rest Park, Burelli Street Wollongong. It is notable that only two of the ten halfpipes were carrying water on commissioning.

Around that time retailer David Jones required an extension of their car park and began negotiating with Wollongong Council to acquire Rest Park. Alternative locations for the fountain considered included the WBG, Osborne Park, Flagstaff Point and McCabe Park.

In 1984 the fountain was moved to WBG with the Illawarra Mercury's support. As Kern Corporation was redeveloping the shopping mall which included David Jones they were responsible for the fountain's relocation. Once positioned at the chosen site in WBG the recirculation tank was found to have insufficient capacity causing the pump to run dry. An additional tank was added alongside and the fountain was recommissioned in WBG on 14 June 1986. In 2009 the fountain ceased operation due to high maintenance costs including excessive water and power consumption.

The WBG Mercury Fountain is significant in the context of Bob Woodward's body of work as an internationally recognised Australian fountain sculptor. The fountain is one of 16 remaining of Woodward's completed fountain installations in a portfolio of projects dating from 1959 to 1988. Woodward's projects are typically column-supported nozzle water plays or water cascades. Five Islands is distinct as the only completed example of another Woodward fountain design type – vertical water jets producing a powerful deflected water display. Hence returning it to full operation would preserve one of Wollongong's significant contributions to Australian design. Three of Woodward's works are listed on State Heritage Registers: the El Alamein Memorial Fountain, King's Cross (1959) & the Darling Harbour Spiral (1988) in NSW and the Lyric Theatre Fountain, Queensland Performing Arts Centre Brisbane (1984).

4. Current Fountain Status

As noted above, the fountain has not operated since 2009 due to the power required and excessive water consumption. This has resulted in no damage to the fountain structure but there is degradation of the concrete pools. Specifically, the current state of the fountain is as outlined below.

i. Half-pipes and nozzles

The ten half-pipes and nozzles are in good condition with a patina of rust evenly covering the half-pipe exposed surfaces.

ii. Concrete weirs and terraces

All the concrete weirs now have their aggregate exposed from weathering and grout degradation. The deterioration of the grout between the terraces has meant that whenever the fountain is turned off the stored water in the terraces is lost through the many leaks into the plant room and surrounding gardens.

iii. Light fittings

The light fittings in each ridge pool leak and are not waterproof.

iv. Tanks

There are currently two tanks. This resulted from the non-optimal fountain installation in WBG and has resulted in an ineffective tank system where the water level is not always above the pump intake during operation.

v. Pump

E L Williams have been advised by staff at WBG that the pump is not effective or operational. The current pump's age and condition is unknown. Due to the large nozzle diameter the filter/screen appears effective in eliminating sufficient debris.

vi. Copper plumbing

The copper plumbing in the plant room is serviceable.

vii. Plant room

There is evidence of considerable leakage into the plant room. This is understood to be a result of the failed waterproofing in the pools above.

viii. Wind impact

E L Williams has been advised that when the fountain was running there was considerable water loss from spray which was exacerbated by any wind present.

ix. Stormwater Drain

The stormwater drain to the creek appears serviceable.

x. Electrical Services

The current switchboard location visually intrudes on the fountain and negatively impacts the original design intent.

5. Refurbishment

The proposed fountain refurbishment plan is outlined below.

i. Halfpipes & Nozzles

No work is needed on the half-pipes or nozzles.

ii. Concrete weirs and terraces

The concrete weirs require re-grouting and the terrace pools require sealing.

iii. Light fittings

The light fittings in each ridge pool will require replacement if fountain lighting is required, with new waterproofing around each lens.

iv. Tanks

Install one new tank of 6000 litres to replace the current two tanks. This would not only reduce water consumption and simplify maintenance but also ensure the water level is well above the pump intake during operation.

v. Pump

Replace the current pump. A suitable replacement would be a SOUTHERN CROSS 125x100-200 with a Variable Frequency Drive (VFD) to adjust the flow rate.

vi. Copper plumbing

No work is needed on the copper plumbing in the plant room.

vii. Plant room

Check for leaks in the plant room. This should be undertaken at the commencement and conclusion of the refurbishment. Pool waterproofing is expected to reduce current leakages.

viii. Wind impact

Install an anemometer and associated controls to automatically turn off the fountain in windy conditions.

ix. Stormwater Drain

If the tank is replaced the stormwater drain to the creek will need regrading.

x. Electrical services

Switchboard relocation and replacement, anemometer installation, and associated works.

xi. Plumbing Services

Pump and tank replacement.

6. Costing

The cost of refurbishing the various fountain elements as noted above in Section 5 is shown below. Note estimate excludes associated project costs that may apply such as: engineering design, documentation, contract administration, contractor preliminaries & overheads, demolition, contingency sum. We also note below the scope for ongoing running expenses.

a) Refurbishment

The estimated fountain element refurbishment costs for supply and install, excluding GST, are:

Grout terrace pools and seal weirs	[Item ii]	\$5000
Replacement of light fittings	[Item iii]	\$2000
Replace tanks	[Item iv]	\$5000
Replacement of pump	[Item v]	\$3600
VFD	[Item v]	\$1900
Anemometer	[Item viii]	\$ 500
Replacement of switchboard	[Item ix]	\$4000
Replacement of stormwater drain	[Item x]	\$2000
Electrical services	[Item xi]	\$5000
Plumbing services	[Item xii]	\$2000
Total		\$31,000

b) Running costs

The ongoing costs for the fountain are predominately water and power.

The VFD and anemometer which have been recommended above should assist in containment of these running expenses in addition to the reduction in leaks.

7. Conclusion

The Mercury Five Islands Fountain sculptural half-pipe elements and nozzles are in good repair however the pools allow substantial water leakage. Efficient water usage can be implemented with an increased storage tank capacity and wind control. Electrical and plumbing fittings are generally in need of replacement and upgrade.

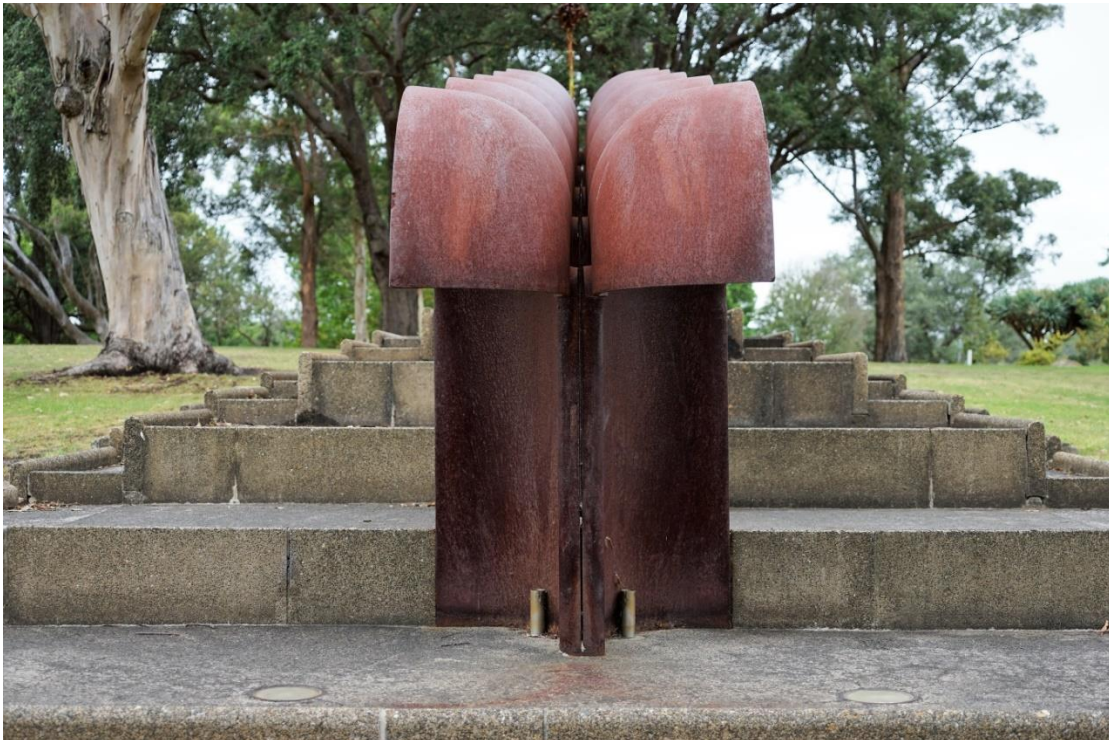
Attachments

Attachment A: Fountain Description Photos

A1: View from the northwest. The additional tank is under the concrete slabs on the left.



A2: View from the north showing the nozzles and half pipes bracketed by the main weirs.



A3: WBG sign in carpark at the south eastern entrance



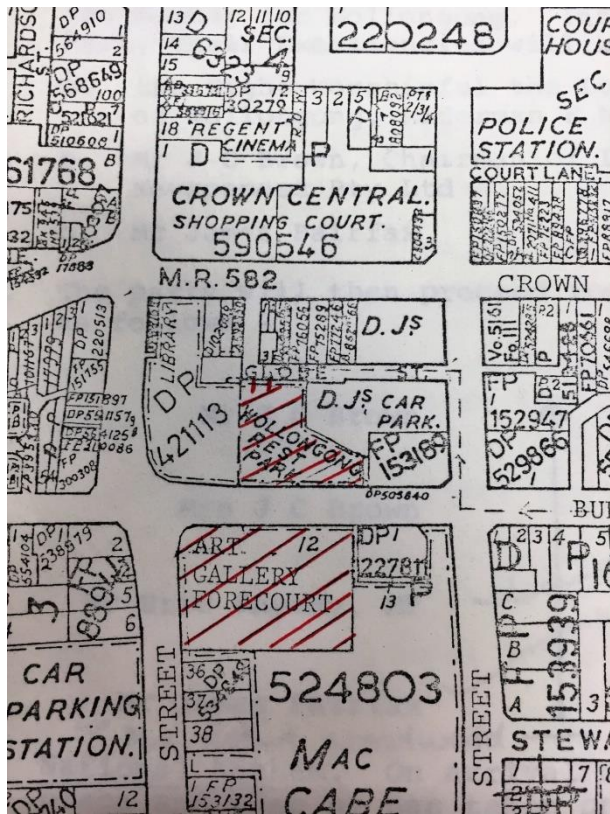
A4: Map showing the "Mercury Fountain" in the top right hand corner



B1: Fountain Opening in Rest Park

B2: Fountain Opening – Article from *Illawarra Mercury*

B3: Map showing the original site in Rest Park Wollongong adjoining David Jones car park



B4: Fountain relocation to WBG. After excavation and prior to relocation



B5: Fountain relocation to WBG. After excavation and prior to relocation



B6: Original design intent of water play.



B7: Similar Woodward design



Attachment C: Fountain Current State Photos

C1: Plant room from the base of the access ladder. The main tank is at the far end. Filtering tank on the left.



C2: Main switchboard in plant room



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V	Hz	kW	min ⁻¹	A	cos ϕ
380 Δ	50	15	1450	29.4	0.86
380 Y	50	15	1450	16.5	0.84
400 Δ	50	15	1455	28.4	0.84
690 Y	50	15	1455	16.5	0.84
415 Δ	50	15	1460	27.8	0.83
440 Δ	60	17	1750	28.8	0.86
460 Δ	60	17	1755	28.0	0.84

Δ W2 U2 V2 W1 U1 V1 L1 L2 L3
Y W2 U2 V2 W1 U1 V1 L1 L2 L3

+6309-C3 POLYREX EM-ESSO 123 kg
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