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Survey & Inspection Report

Eura Ref: 4488:

The Hubert Fountain, Ashford, Kent.

Client:	Ashford Borough Council	Chris Dixon

Date:	01.February 2016.	
Report prepared by:	William Hatfield	Eura Conservation Ltd

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1. Introduction:

Chris Dixon is the Arts & Cultural Industries Manager for Ashford Borough Council, Project Manager and Lead Officer for the proposed Heritage Lottery Fund bid*: Heritage Grants – for grants over £100,000 "Engaging Ashford: Fountain of Delight".*
He has requested a specialist survey and inspection report from Eura Conservation Ltd to assist with the funding application.

Attendees at the survey meeting:

Chris Dixon:	Arts & Cultural Industries Manager (Ashford Borough Council)
Helen Wilson:	Street Scene & Open Spaces Officer (ABC)
Elizabeth Fagg:	Cultural Graduate Trainee (ABC)
William Wilson:	Senior Environmental Health Officer (ABC)
Gavin Richardson:	Senior Technical Officer (ABC)
Stuart Catchpole:	Senior technician (Precision Pipework)
Russel Turner:	Managing Director (Eura Conservation Ltd)
Bill Hatfield:	Heritage Conservation Manager (Eura Conservation Ltd)
Dane Henderson:	Rainbow Water services (RWS)

The agreed protocol for the survey visit was for Dane Henderson (Rainbow Water Services) to facilitate access to the Fountain, control water flow and to highlight areas of concern. Stuart Catchpole (Precision Pipework) was to carry out a detailed inspection of the pump room, access tunnel and the associated electro/mechanical components within the Fountain. Russel Turner (Eura Conservation) was appointed to provide detailed information on the external condition of the individual elements, the paint work finish and future maintenance conservation techniques. Bill Hatfield was appointed to collate all the relevant information and provide an inspection report with indicative budget costs.

A brief history of the Hubert Fountain:

The Hubert Fountain was first seen as a part of the Royal Horticulture Society's International Exhibition in London 1862. The Grade II Listed Hubert Fountain was

constructed in France and first seen as a part of the Royal Horticultural Society's International Exhibition in London 1862. It was displayed as a pair, alongside what is now known as The Ross Fountain which is located at the base of Edinburgh Castle. After the exhibition the Fountain was purchased by John Worley Sawbridge Erle-Drax- Grosvenor and was installed at his home in Wye, Ashford. In 1912, following a fire, the Fountain was acquired by George Harper who then gifted it to Victoria Park, Ashford and it was installed in its current position. The Fountain had minor repair work undertaken in 1977 and further repairs were considered in 1981 but were never completed due to the high costs. In 1997 a feasibility study concluded that repairs were needed as some of the fixings were showing signs of excessive corrosion and the expansion was causing localised splitting and cracking of the component parts. The pumping and internal plumbing was also defective and a new system was needed. In 1998 following a competitive tendering process Eura Conservation Ltd were invited to carry out an extensive schedule of works which included the dismantling of approximately 175 individual pieces, cleaning and re-painting with a twin pack epoxy resin with a copper dust additive and re-installation, a new internal plumbing system, pump room and Fountain lights. Work was also completed on the Fountain base walls to include water proof render. The programme of works were completed in late 1998 costing approximately £400,000.

2. Survey and Inspection detail:

The survey was undertaken by representatives from both Eura Conservation Ltd and Precision Pipework Ltd. Both of these organisations were involved in the major works programme in 1998 and fortunately both Surveyors/Engineers were extensively involved in the project at the time.

Precision Pipework's report is included as a part of this report and is shown at:
Appendix 1:

An inspection of the external aspects of the Fountain revealed the following:

The heritage merits of the Hubert Fountain denote that works should be undertaken taking into account best conservation practice and monitored by an accredited Conservator. (ACR)

The main issues discussed in this report are as follows:

- Partial failure to bowls and pools - partial leakage. Corrosion of internal plates and fastenings.
- Failure of current coating systems.
- Water treatment systems do not meet current standards.

Conservation Approaches:

Any works undertaken shall take into consideration current conservation best practice and guidelines, ultimately ensuring the preservation of the structure for future generations.

- Maximising the retention of the historic fabric.
- Treating the fabric to reduce further decay, (as far as is reasonable practical) Carry out remedial works using traditional materials and practices.
- If replacement is necessary using like for like materials.
- To carry out works to conserve rather than restore.

Often compromises may need to be made on such structures as this but the structure does need to be protected to reduce the effects of the environment and its location.

- Consideration should be given to modern regulations and applied where appropriate.
- The long term conservation of the object should be designed into the treatment and specification.
- All treatments and actions should be well considered, planned and then actioned.
- Treatments should not increase the risk of damage or loss to the structure or its component parts.
- Treatments should be detectable and reversible where possible.

Access was gained into the Fountain to carry out a visual inspection of all accessible components parts.

The overall condition was considered to be fair to reasonable given the severe exposed location, limited public realm and interpretation to help local people appreciate its beauty and importance, additionally the acts of vandalism that have occurred in the recent past.

As can be seen from the pictorial record below, the major concern is with the condition of the paintwork and “chalking” that has occurred which is most likely due to the fact that the paint finish has come to the end of its practical life.

There were signs of corrosion to the many of the connecting parts and in particular to spot areas which have occurred, most likely due to heavy objects being thrown from a distance and in many places, what appears to be fired lead pellets which have caused an excessive number of pop marks.

Fig 1: The Hubert Fountain: As viewed looking to the east.

From a distance the Fountain appears to be functional with only a few of the jets are not fully working. The most obvious observation is the change in colour (or discolouration) of the ironwork that has occurred since the major work programme in 1998.

Fig 2. Bowl base outer casing:

Signs of corrosion appearing and a number of paint chips which are likely to result in further and exponential corrosion.

Fig 3. The outer basin rim:

Typical chip, probably caused by a thrown objects, which will likely cause greater concern in the future.

Fig 4. Lower body South West God:

Although not visible in the picture, there are number of small paint chips but more interestingly the outer coating (two Pac Epoxy resin with a 2% Bronze dust additive) applied in 1998 is showing signs of wear due most likely to the environmental influences and possibly that the finish has come to the end of its functional life.

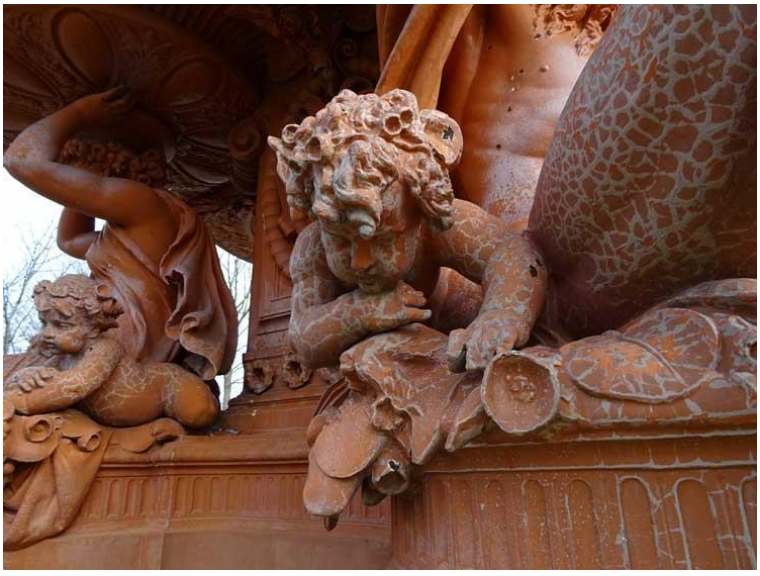

Fig 5.Lower body Small children.

Similar signs of degradation to the paint finish and a large number of paint chips.

Fig 6. Lower body South East Goddess.

Although the figure looks relatively well preserved, closer inspection reveals that paint repairs have been applied in the recent past to cover a corrosion mark. The match is excellent but unfortunately, unlikely to last.

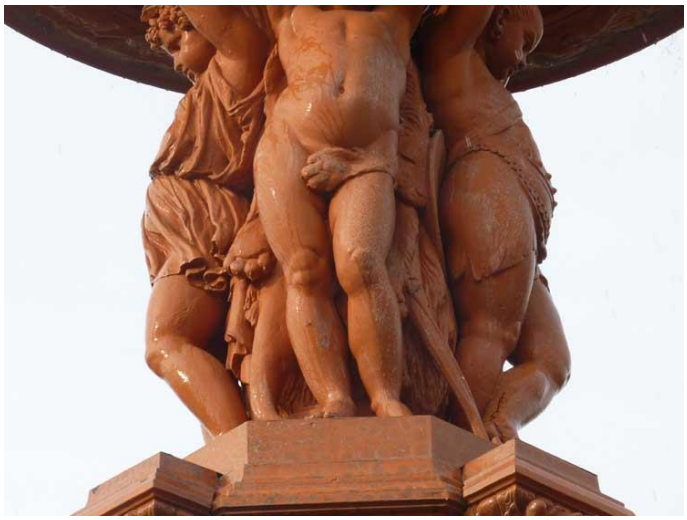

Fig 7. 4 Children (representing the 4 continents of the world)

The initial appearance of the condition is “reasonable” however closer inspection reveals a number of paint chips but fortunately, very little corrosion.

Fig 8. One of the 4 Grotesque heads.

Typical paint chip and some localised corrosion. Not a major problem now but the cumulative collection of paint chips will soon lead to excessive corrosion spots which will only extend over time.

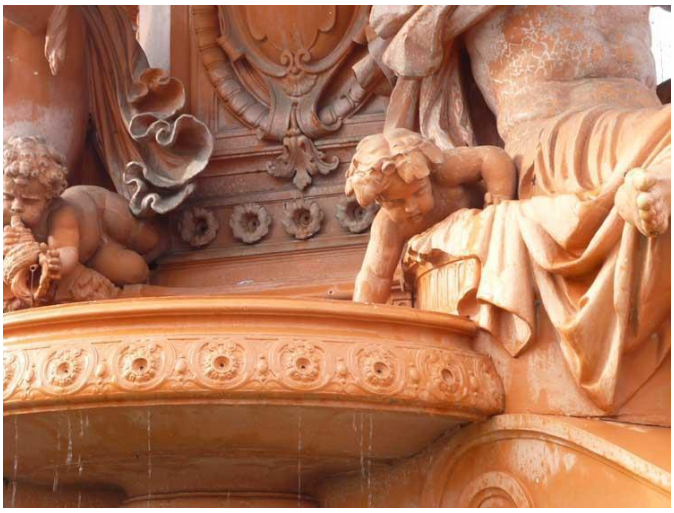

Fig 9. The Lower bowl.

Once again the paint finish in and around the Lower bowl is in a reasonable condition however, internally there is evidence of corrosion around the exposed connecting plates.

3. Recommendations and programme of work:

On the assumption that all necessary statutory consents are obtained and the client and their advisors are assured by the results of the testing and investigation work, the conservation work could commence.

Following our survey, local research and in-house discussions, the option we consider to be most practical, cost effective and offering a sustainable use of resource to conserve, preserve and refurbish the Fountain, is as follows;

There are number of health issues related to how the Fountain can be treated internally without creating a serious health and safety risk to all concerned. The Electrical and Mechanical Engineering report has identified a number of immediate, essential and desirable modifications and improvements to the current system. Rainbow Water Services have highlighted the need for a number of ancillary improvements to minimise water usage and provide additional facilities.

Therefore, it is proposed to carry out the following programme of works:

In summary;

1) Undertake necessary research and development work to establish the most effective treatment finishes for the structure and associated fitments. To assist the water Engineers to design the most effective and efficient water treatment processes.

2) Off a prepared and covered scaffold and protected site, dismantle the Fountain down to the central plinth, including the God and Goddess figures and return to Eura Conservation workshops, treat, repair, re-finish and return to site.

3) Whilst access is available to the inner Fountain undertake internal anti-corrosion treatment and repairs and provide attendance on the Electrical and Mechanical Engineer so to allow the installation of a new and as necessary upgraded pumping and plumbing system.

4) Carry out all necessary repairs to the lower masonry basin and complete waterproofing work.

5) Re-install the dismantled Fountain and provide attendance for the Electrical and Mechanical Engineer to complete the first and second fix internal pumping and plumbing work

6) Make good all works disturbed, clear the site of contractor's equipment, commission and hand over to Ashford Borough Council.

Specialists Conservators work methodology:

1) Make safe the working area and decommission the Fountain and provide a working protection zone.

2) Carefully, by working within and externally remove the upper sections of the Fountain down to plinth the lower (4) lower dish castings only: and return to Eura HQ for a full paint removal and re-application, when complete and the programme permits return to site.

3) Working off fully enclosed scaffold, allow to carry out in-situ external blasting or Ultra High Pressure washing to remove all paint finishes, treat as necessary and re-apply as item 2.

4) When the upper sections of the Fountain have been removed, begin thorough treatment and replacement or repair of both the structural and decorated aspects of the Fountain. This will allow a relatively healthy environment for staff members to work using, as necessary odorous chemicals and other finishing materials.

5) During this process (see item 4) allow time and resource for the Electrical and Mechanical Engineer to both strip out and replace all necessary associated pumps and pipework and replace (to at least first fix position) as required.

6) Following the re-installation of the upper sections of the Fountain complete all associated works to complete the Fountain, including the Electrical and Mechanical Engineering (second fix).

7) Allow attendance on Electrical and Mechanical Engineer to complete work to Pump House and Tunnel.

8) Complete as necessary repair or reinstatement work to the Fountain base, check Sika renderings (previously applied) and improve as necessary.

9) Complete external renderings to the outside face of the Fountain base following completion of item 8 above.

10) Clear site of all contractors' plant and equipment.

11) Complete all final works and commission prior to hand over.

Ancillary preparatory, enabling and pre-commencement works:

12) Pre-commencement site meetings with the professional and site team.

13) Health & Safety Pre-tender and Construction Phase Health & safety plans prepared and agreed.

14) Attend site meeting and ad-hoc progress meetings as necessary.

15) Complete "Contractor side" Contract administration and other administrative requirements.

16) Site scaffolding with full cover and protection (as an option).

17) Safety hoarding, site security and site welfare provisions.

18) Site office provision.

19) Temporary electricity supply.

20) Temporary water supply.

21) Site skips, Hazardous and non-hazardous.

22) Hire all associated plant hire and equipment to complete the task.

23) Provide overnight accommodation and mileage allowance for staff and management.

Total budget costs: (Conservation & Refurbishment work) Say £480, 000

Specialist Electrical and Mechanical Engineering work:

1) See Appendix 1:

Contract period:

The above costs have been based on a twenty eight week contract period:

Note: The costing assume that the work programme involves the Fountain and pump work only, no allowance has been taken for any other contractors involved in ancillary projects.

4. Conservation & Refurbishment costs :

1. Professional and facilitation fees:

A)	Architectural	Say	£ 14,500
B)	Structural Engineers	Say	£ 8,000
C)	Quantity Surveying (Client side)	Say	£ 10,500
D)	Health & Safety (CDM 15)	Say	£ 6,500
E)	General Building Surveyor (Contractor side)	Say	£ 12,500
Total Professional fees:		**Say**	**£ 52,000**

2. **Research and development costs:** (see note below*)

A)	Paint analysis		
B)	Applied painting systems (options)		
C)	Feasibility of additional features (options)	Say	£ 11,000

3. Conservation and finishing works to the Fountain:

A)	See schedule of work (Eura Conservation Ltd)	Say	£480,000

Electrical and Mechanical Engineering works:

Pump House:

A) New pump

B) Reconfigure pipework

C) Discharge point

D) Vents and heaters

E) Re-configure pump house arrangements

F) Light replacement within the tunnel Say £ 40,000

Fountain:

A) Inlet screen

B) Security features in fountain head

C) Partial removal of low voltage equipment and upgrade

D) Replacement of valve diaphragms Say £ 17,000

General work:

A) Removal and replacement pipework Say £ 12,000

B) Additional Fountain heads (4) Say £ 12,000

C) LED flood lights (4) Say £ 12,000

D) LED flood lights (4) Lower bowls Say £ 15,000

Electrical & Mechanical Engineering (Additional features, optional costs :)

Subject to further research and agreement t is possible for further features could be included to install sets of whistles set with-in the fountain complete with sourced by air compressor, pipework and multi-tone controls – It is possibly up to 32 in four banks of eight whistles. Cost depends on the volume of sound required, type of sound, musical/ tonal arrangement. Say £ 40,000

Electrical & Mechanical Engineering work with options: Say £151,000

Summary of the project costs:	**Budget Cost:**
1) Professional and facilitation fees:	£ 52,000
2) Research and development costs (Development Phase Only):	£ 11,000
3) Conservation and finishing works to the Fountain:	£ 480,000
4) Electrical and Mechanical Engineering works:	£ 81,000
5) Electrical & Mechanical Engineering (without options):	£ 30,000
6) General contingency of project costs:	£ 80,000
Total Budget Project costs:	**£ 734,000**

Note VAT will need to be applied to all costs quoted.

*Research and development costs:

The research and development budget allows for research into what types of finishes should be used following the removal of the current paint system. This may include for samples to be removed and taken for expert analysis and to allow for further exploration. This work will include practical and theoretical research.

Work will also be undertaken to establish how the Electrical and Mechanical Engineering aspects can be improved to allow for improved features to be added and for any new engineering work to be as future proof as possible.

5. Conclusions:

The survey and inspection visit was requested by Chris Dixon from Ashford Borough Council. The final report, with budget costs is to be used to support a Heritage Lottery Bid. The package will include a number of associated projects to form a substantive community related bid. The survey was carried out on 26th January 2016 and was

undertaken by Stuart Catchpole of Precision Pipework Ltd, Russel Turner and Bill Hatfield of Eura Conservation Ltd.

In 1998 The Hubert Fountain underwent a major work programme including the complete dismantling, shot blasting and re-painting which included a two part epoxy resin finish with a bronze dust additive.

It would appear that even relatively soon after the completion the Fountain suffered a series of attacks of vandalism, including the removal of light fittings, graffiti and paint chips due to stones and other objects thrown from the basin edge. A survey report undertaken by Eura staff at the end of 1999 reported there were no less than 2000 individual paint chips which appeared to have been created by a small pellet gun fired at the Fountain.

Our survey revealed that there were relatively insignificant levels and areas of corrosion internally, those that were present appeared on a number of visible flange plates and connecting plates. The Electrical and Mechanical Engineer reported that generally the plumbing system was in good order (although a number of new flexi hoses have been recently installed) but the system is nearing 20 years old and is due for updating and certainly some of the pipework would need to be replaced if the fountain is dismantled. In addition, the Pump House will need updating with the potential of adding a number of features including, air compressed whistles using the depth of water for tone variation. I believe this feature could be extended to include public participation by using automated key boards to vary the sound if there was a will to do this.

Externally, the Fountain was similarly in a fair condition with the majority of the water jets working, however, the overall condition of the paintwork was poor. The paintwork and in particular the external coating has discoloured and certainly changed over time and a major variation from how it was finished in 1998. It is believed that the high levels of lime in the water may be an influencing factor.

The masonry basin is showing signs of water egress, the extent of which was unknown but the capillary action of water leaking through the walls may have had an effect on the

adhesion qualities of the sand and cement render externally (I believe the render was taken off by a local tradesman some few years ago and has revealed a very solid looking scratch coat render).

The programme of works discussed within this report will provide the necessary improvements to restore the Fountain for the local area and the community. This option allows for the safe execution of the works schedule and opportunity for the internal pumping and plumbing to be upgraded with the benefit of additional features to be included if they can be afforded. However, more significantly the process will allow for much needed research to be undertaken to establish the most appropriate paint system to be used which will withstand the rigours of the local climate and the environment.

The option of no intervention is quite significant for the long term conservation of the Fountain. The paint work condition is poor, and this is not helped by the number of stone and other chips created which has accelerated the levels of corrosion, which is not excessive currently, but the level of degradation is likely to increase exponentially, particularly to the working elements of the Fountain. It is difficult to say to what extent this will occur but the overall condition and appearance will suffer.

Appendix 1:

Electrical and Mechanical Engineering report:

History:

The fountain was dismantled in its entirety around 1997 and this included the complete removal of the existing pump and pipework system. A new building was the erected close to the fountain and new pipework was run underground from the new plant room, via the tunnel to the inside of the fountain. With-in the fountain, a series of distribution pipes were installed to enable the flow to the various outlets to be regulated.

At the time of the refurbishment, new modern equipment was installed to enhance the appearance and to address some of the water quality issues.

New equipment installed in 1997 included;

An automatic level filling
system UV water treatment
Variable speed pump control based on wind speed
A frost protection sensor with auto shut-down
Heated, force air transfer into the fountain structure
A larger filter inside the main water holding area
A manual back-wash sand filter, bromine injector and pump unit
A large main pump complete with an additional filter basket
Individual control valves for the upper and lower sections of the fountain.
Approx 40 low voltage flood lights hidden with-in the middle & upper bowls

Since the 1997 works, some of this new equipment has been removed, replaced or added to thus;

UV water treatment	(removed)
A manual back-wash sand filter, bromine injector and pump unit	(removed)
Variable speed pump control based on wind speed	(replaced)
Water softener	(addition)
Hand wash basin	(addition)
Lakos centrifugal sludge filter	(addition)

Low voltage flood lights hidden with-in the middle & upper bowls (removed / stolen

Sections for reference in this report:

1E – Plant room electrical equipment

1M – Plant room mechanical equipment
2E – Tunnel electrical equipment
2M – Tunnel mechanical equipment
3 E – With-in fountain structure, electrical equipment 3M
- With-in fountain structure, mechanical equipment

Current status:

1E – The electrical systems have seen some changes along with some components failure thus;

1Ea The duct blower along with the duct heater are defective.

1Eb The original sand filter pump has been removed and the power cable remains – further investigation required to determine how this has been removed with-in the control panel.

1Ec The power distribution board and all electrical circuits will require an inspection and test in accordance with BS7671.

1Ed The automatic filling system will require investigation to confirm its correct operation so as to be sure water consumption is reduces where possible.

1Ee Since the unplanned removal of the low voltage lights, the transformers for these lights will require investigation as to their current status should lights be required once more.

1Ef The pump speed was not responding to the anemometer during the visit thus indicating this is not operating correctly. The 1997 design included for the pump speed to be reduced during period if high winds to reduce the water losses – currently understood to be 4m3/day

1Eg The temperature display system was not operational thus no frost protect is currently in place.

1Eh Generally the main control panel will require a complete replacement as it is unclear what has been replaced since the panels original construction.

1M- The mechanical pipework has been changed over the years

1Ma The pump is said to be 'whining' therefore consideration should be given to the replacement of the entire pump unit.

1Mb The addition of a sludge removing vortex unit is a welcome sight however this has the effect of reducing the pumps output such that whilst the pump is operating at full speed (50Hz), the discharge flow rate is noticeably lower than as designed.

1Mc An additional pump is required to generate the motive water for the bromine injector along with a flow interlock to prevent over dosing due to a flow loss from the main pump. The existing system does not generate sufficient differential pressure over the bromine injector to make if effective.

1Md The two main control valves in the plant room require replacement diaphragms as does the incoming isolation valve into the pump.

1Me The pump plinth has crumbled thus this will require breaking-up and recasting prior to the pump being refitted.

1Mf The pump can be difficult to prime due to the current pipework configuration, therefore an automatic air release valve should be fitted

2E – electrical services with-in the tunnel

2Ea – The tunnel illumination is currently defective thus the entire luminary requires replacement.

2Eb – The emergency tunnel illumination is currently defective thus the entire luminary requires replacement.

2M - mechanical systems with-in the tunnel

2Ma – All systems appear to be in good working order. All of the brackets are in their original positions and there is little or no sign of corrosion (all brackets are made from stainless steel 41mm channel section with stainless nuts, bolts and plastic pipework clips.

2Mb – the access ladder is in good condition and again no signs of rust or impending failure

3E – electrical services with-in the fountain

3Ea – the lights are no longer present in the bowls of the fountain therefore the electrical power distribution boards either need to be serviced / inspected for re-use or removed along with the associated cables.

3Eb – The internal fountain illumination is currently defective thus the luminaries' requires replacement.

3Ec – The internal fountain emergency illumination is currently defective thus the entire luminary requires replacement.

3M – mechanical services with-in the fountain

3Ma – all of the water distribution pipework is in very good order as are the supports and clips. Some of the outlet are not operational or have reduced flows therefore the diaphragms and handle wheel mechanisms should be replaced.

3Mb- bromine appears to have had an adverse effect on the copper pipework feeding the twenty lower level roses. The pipework has been replaced with plastic pipework and stainless steel braided in each case. This change to the material is an improvement given the introduction of bromine that was not originally anticipated.

3Mc I understand there have been instances where some of the pipes have been tampered with that discharge out from the fountain. Whilst this was not observed at the time of the inspection, it is clear where this occurring and fix should be arranged to resolve this issue.

3Md I understand that from time to time the filter screen with-in the outer water bowl becomes blocked therefore consideration should be given to installing a much larger intake to reduce the likelihood of this occurring in the future.

Guide costs are shown below;

Section 1 – pump house:

New pump – note the increase in pump size from 9.2kW to 12kW to match the vortex / centrifugal filter
New Lakos DN80 centrifugal / vortex filter – 33 to 66m3/hr
New bromine motive water pump with flow interlock safety sensor
Reconfigure the pipework layout to accept the full flow through the vortex filter and to include a new automatic air release valve.
Install a 3" discharge point to enable the pump to be used to empty the fountain
Install a replacement control panel complete with a new wind speed controller, variable speed drive (12kW), PLC controller, temperature sensor, time clock, flow sensor (bromine safety) and bromine motive water pump control.
Replacement axial flow vent and inline heater
Replacement top-up solenoid and controller system
Note: Ideally, all barriers and none essential components should be removed from this plant room as they restrict access to the equipment for

Section 2 –Tunnel:
Replacement of the lights and test for correct operation

Section 3 – Fountain:
Fabricate and install a new inlet screen in place of the existing screen
Remake the outer bowl pipework in a more durable material and include fabricated bulkhead connector flanges with-in the bowls to make them tamper proof – eight in total
Removal of the low voltage power distribution boards with-in the fountain – this assumes the lights are no longer required or considered for re-instatement. Alternatively – overhaul these if lights are to be reinstalled
Replacement of the valve diaphragms and hand wheel mechanisms

Options / enhancements:

Replacement of the internal pipework thus enabling the fountain to be dismantled. Includes the cost to return to site upon the fountains return and re-plumb the pipework with-in the fountain.

Additional cost – materials and labour
The addition of four fountain heads located in the middle bowls
Additional cost - materials and labour
Four LED flood lights for the above with security features
Additional cost - materials and labour
Four LED flood lights for the lower bowls with security features
Additional cost - materials and labour

An arrangement of whistles set with-in the fountain complete with air compressor, pipework and multi-tone controls – possibly up to 32 in four banks of eight whistles. Cost depends on the volume of sound required, type of sound, musical / tonal arrangement.

Additional cost - materials and labour

Note:

Specialist security fasteners can be used to vastly reduce the risk of the lights and nozzles being stolen. I can't recall the existing fixing inside the bowls however it may be necessary to drill and tap these or bolt through existing holes to ensure secure fixing points. Secure fasteners will then be used to enable the security covers to be removed for maintenance. Bespoke security bolts can be used to prevent even the most determined thief. The use of LED lights would further reduce the need to regular maintenance / lamp replacement as these would be sealed units.

Conclusion:

Overall the pipework installation with-in the fountain and tunnel is generally in very good order. However, should work should be undertaken in the plant room as a minimum to ensure the fountain remains operational regardless of what other visual work on the fountain is carried-out as the fountain is not currently able to achieve the effect as designed due to modifications to the pipework system to reduce the sludge build-up.

The tunnel works remain in good working order other than the lighting.

Remedial work is required with-in the fountain to maintain service however this level of work will depend on the question of the fountain being A) repaired in situ or B) dismantled, repaired and returned. This will have a bearing on costs.