

# Hampstead Heath Ponds Project

STRATEGIC LANDSCAPE  
ARCHITECT REVIEW

27th October 2013





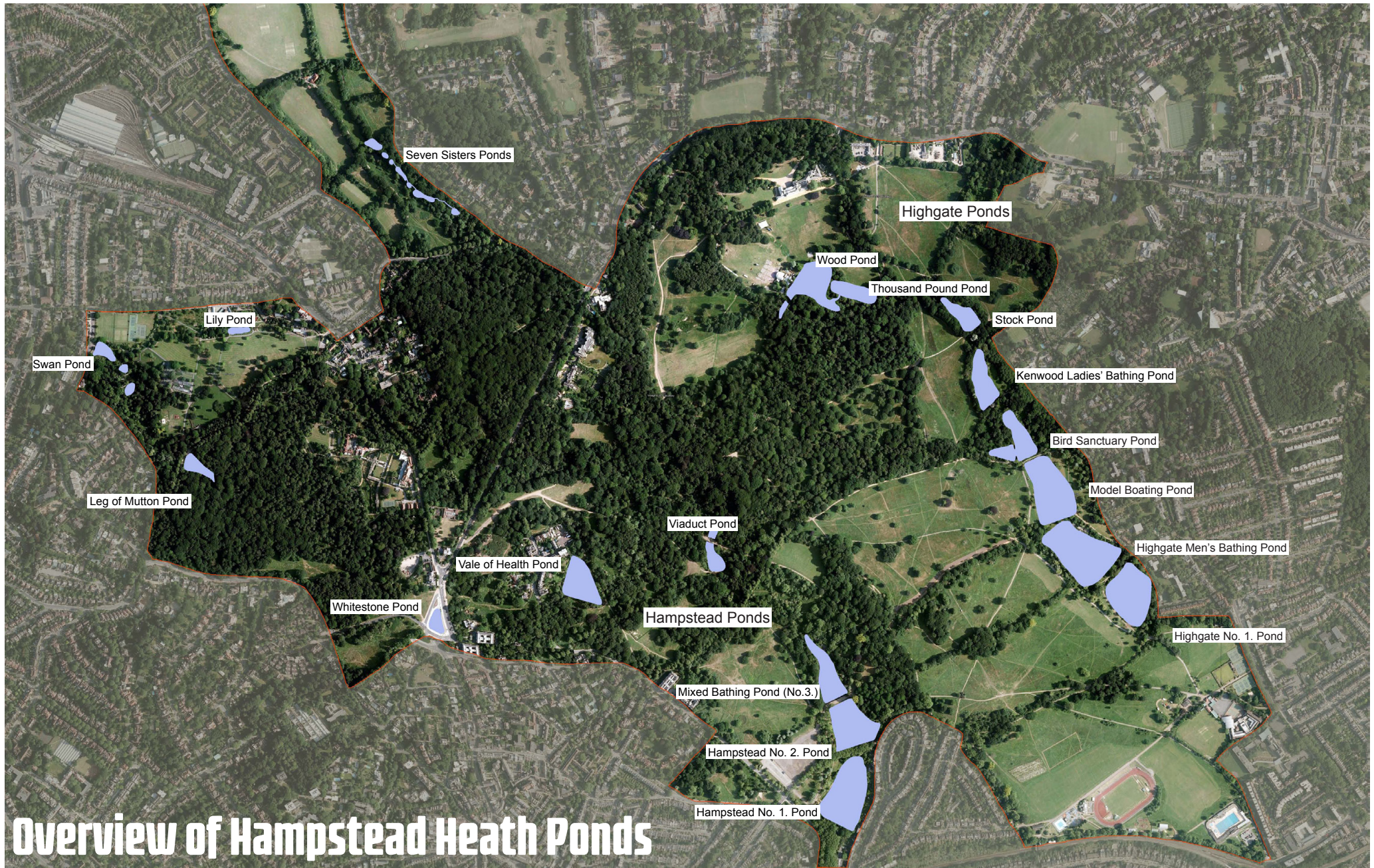
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# Overview of Hampstead Heath Ponds



# INTRODUCTION

Peter Wilder was appointed by the City of London in August 2012 to act as the Strategic Landscape Architect for the Hampstead Heath Ponds Project. The brief for this role was to act as an impartial representative of the Ponds Stakeholder Group and to challenge the design team to come up with the most sensitive and appropriate solutions for the Heath, taking into account the various nuances of the legislation, flood modelling and environmental considerations. This is a role that has continued to evolve as the project examines both the legal and moral obligations of the City of London to comply with the Reservoirs Act, Flood and Water Management Act and the Hampstead Heath Act.

One of the first initiatives undertaken by the Strategic landscape Architect was a workshop designed to consolidate the opinions, fears and aspirations of the Ponds Project Stakeholder Group (PPSG) into a cohesive document that could be formulated into a brief for the design team. This was to become an important milestone in the project as it provided a platform for the stakeholder groups to formalise their concerns into a powerful message both to the City of London and to the Atkins design team.

This report sets out the process that has ensued since the issue of the Critical Review of Key Issues by the Water Management Stakeholder Group in February 2013.

On the 6th October 2012 Peter Wilder accompanied the PPSG (formerly known as the Water Management Stakeholder Group) with Simon Lee, Superintendent of Hampstead Heath, on a walk of the Hampstead chain of ponds to discuss possible approaches and issues regarding the proposed works on the Heath. In subsequent visits The Panel Engineer, Dr. Andy Hughes, also joined the group to discuss possible options in addressing the issue of dam safety. The issues discussed ranged from potential impacts of the dam works or more sensitive parts of the Heath to how the proposals by Haycock might be mitigated through the work of the newly appointed design team (Atkins). Dr. Andy Hughes proposed a number of possibilities including works on less sensitive areas of the Heath such as the Catchpit on the Hampstead Chain and the Model Boating Pond on the Highgate Chain. As a result of these discussions the Strategic landscape Architect, Peter Wilder, proposed a workshop in order to gather all of the ideas, thoughts, opportunities and fears of the stakeholder group into a

single and coherent document that would provide a guideline for Atkins in their approach to the Hampstead Heath Ponds Project.

The workshop which took place on the 10th January 2013 involved a virtual walk through both chains of ponds in order to review specific concerns for each pond and to review the perceived shortfalls of the Haycock proposals. The following is a summary of the outcomes of the workshop and the subsequent report produced by Wilder Associates for the PPSG.

# GENERAL OVERVIEW

There was an general consensus, among the PPSG, that much of the proposed works in the Haycock report were aimed at creating water storage high up in the Heath for flushing the lower ponds in order to improve water quality. It was deemed that the impact of such development on the more sensitive ponds was disproportionate to the benefits. It was also felt that other means of achieving water quality, such as re-circulation, de-silting and bio-filtration would be a more appropriate and far less intrusive. It was also felt that the main objective of the ponds project, to ensure the resilience of the dams, was not best served by increasing water storage at the top of the pond chain.

Other key objectives of the PPSG were the prevention of tree loss on the more intimate ponds, such as Stock, Bird Sanctuary and Kenwood Ladies Bathing Pond and the protection of critical views. There was general consensus among stakeholders that in order to improve the overall resilience within each pond chain and to lessen the impact on the Heath, the focus of works should be aimed at the middle of each pond chain. The possibility of major works at the Catchpit on the Hampstead Chain and the Model Boating Pond on the Highgate Chain was agreed on the basis that only minor works would be required to improve the dam structures and spillway capacity of the remaining ponds.

The **Critical Review of Key Issues by the Water Management Stakeholder Group** (PPSG) identified possibilities and principles that were broadly acceptable to the group based on feedback from site walks and the 10th January workshop.

The following is a brief summary of the points made by the PPSG on each of the ponds likely to be affected by the Ponds Project:

## Highgate Chain

### Stock Pond

A small and intimate pond, third in the chain, this pond has a very small capacity for storage and its dense vegetation means that any changes to the dam height or water level would result in tree loss. The small causeway that crosses over the dam is one of the most delightful experiences on the Heath and it was felt the value of the pond character far outweighed the relatively small gains that might be made through works to improve storage capacity. It was felt that works here should only address resilience of the dam to overtopping and improved ecology through some light clearing of base vegetation but retention of the tree canopy structure.

### **Kenwood Ladies Bathing Pond**

The screening of the Ladies Pond by trees is fundamental to the secluded setting and the location of the changing facilities on the dam crest provides the lifeguards with the best possible views over the pond. It was therefore felt that minimal changes to the dam height and the retention of existing entrances and access arrangements were important considerations. Retention of key views from the south meadow and improvements to water quality were also considered important issues to address along with improved resilience to overtopping during extreme rainfall events.

### **Bird Sanctuary Pond**

The Bird Sanctuary Pond receives water both from the Ladies Bathing Pond and surface water runoff from Heath which feeds its western arm. Any change in water level here would dramatically change the character of the shallow wetlands and emergent vegetation that have made this a rich ecological environment. It was considered that any disturbance of this pond through dam improvements may have a detrimental effect on the wildlife and biodiversity which surrounds this pond. Many considered that further management, including the removal of invasive species and expansion of bird nesting areas, could be enabled through the Ponds Project. It was considered that a raising of the dam here would have little benefit, particularly



Front cover of the Critical Review by the Water Management Stakeholder Group (now Ponds Project Stakeholder Group)



as the raising of the dam at the Model Boating Pond would result in the temporary flooding of the causeway between the ponds without a long term detrimental effect to the wildlife.

### Model Boating Pond

One of the largest ponds on the Heath, the Model Boating Pond is also one of the most open and formal with hard edges and pathways to the entire perimeter. This pond offers the greatest opportunity for expansion through raising of the dam and expansion towards the west. There are still concerns however about the loss of openness and the ability for the pond to continue to function as a boating pond. Existing trees on the west side of the pond should be retained and incorporated into an island or peninsula of the pond and a new spillway on the south-western corner of the pond should aim to minimise tree loss.

### Highgate Men's Bathing Pond

The largest pond in the Highgate chain, the Men's Bathing Pond has limited room for expansion due to large groups of trees on its east and west banks and a relatively narrow dam on its southern perimeter. Works on the Model Boating Pond are likely to have an impact on the setting of this pond and any raising of the dam on the Men's Bathing Pond should avoid any loss of trees. The ponds project should also aim to create improvements in water quality, either through

dredging or aeration systems and to improve disabled access to facilities.

### Highgate No.1 Pond

This pond, the lowest in the Highgate Chain, sits in close proximity to residential properties including Brookfield Mansions to the east. The dam has a large number of trees on it which provide screening to the Heath. Whilst raising of the dam is not the preferred option here, due to loss of tree cover and impact on adjoining properties, there is a strong desire to improve the flood resilience of this pond and to avoid flooding of nearby and downstream properties. Whilst major works to the Model Boating pond would help to improve the flood resilience and reduce the incidence of overtopping, some work should be carried out on this pond to improve its capacity to pass water safely on and past Brookfield Mansions in the event of a major storm.



The PPSG review the setting of the Model Boating Pond



Dr. Andy Hughes discusses dam safety at Highgate No.1 Pond.



## Hampstead Chain

### Vale of Health

Lying at the head of the western branch of the Hampstead Chain, the Vale of Health Pond is an integral part of the Vale of health community. As such it was felt that very little should be done to disturb the setting of the pond and that increased storage capacity here would be of little benefit to the flood resilience of the chain. Minor improvements to the dam crest (crest restoration) and improved spillway capacity would help to ensure that the pond can safely pass flood water downstream in a peak storm event. Loss of trees and access to the water's edge were key concerns of residents.

### Viaduct Pond

Lying at the head of the northern branch of the Hampstead Chain, the imposing structure of the viaduct makes this one of the most photographed of all ponds on the Heath. This pond suffers from silt problems due to the largely untreated runoff from the Heath and the dam suffered damage in the 1975 storm. Since then the dam has had repair work carried out and is now considered to be one of the more resilient structures in the chain. Therefore the major concerns for this pond are around loss of vegetation and alteration of the scene if major dam works were proposed. Potential for de-silting and reed bed filtration at the northern end of the pond should be

considered as part of the ponds project along with improved overflow capacity for major storm events.

### Catchpit

Although not currently a dam, the Catchpit currently acts as an interceptor for silt before it enters the Mixed Bathing Pond. There is scope and space for a potential new dam here that would relieve pressure on lower dams in the event of a major storm event. There is an opportunity for the new dam to remain well concealed and to act as a semi-permanent wetland in the centre of the Hampstead Chain. The main concerns around this proposal were about loss of significant trees and the route across the Heath as well as the proximity of the works to the Mixed Bathing Pond.

### Mixed Bathing Pond

The Mixed Bathing Pond is well concealed from the east and the west side with a low and open causeway to the south that affords views into and out of the pond. While there is an opportunity to raise the dam on this pond due to the absence of trees, there is a strong view that this should be no more than 1m in order to preserve the openness to the south. There are concerns about water quality on this pond and the introduction of cascades and biofiltration beds as well as dredging of the pond should be considered as part of the

ponds project. There is also concern about loss of swimming area if the dam works were to further encroach into the pond.

### Hampstead No.2 Pond

This pond is bounded by residential properties and woodland to the east, open meadows to the west and a spectacular avenue of Plane trees to the south. There is concern that any raising of the dam would result in certain loss of trees and therefore any raising of the dam here should consider the use of a wall or internal dam structure to prevent such loss. The creation of an improved overflow will also have a potential impact on trees and should be considered carefully.

### Hampstead No.1 Pond

This is the lowest pond in the chain and lies in close proximity to housing on its eastern edge. There are therefore limits to how high the dam can be raised without affecting neighbouring properties and without a loss of trees on the dam. Tree loss may be necessary in order to improve dam resilience and overflow capacity of the dam. However efforts should be made to retain or improve screening beneath the toe of the dam and to reduce the impact of tree loss on the crest of the dam.

## PROBLEM DEFINITION

Following the submission of the Critical Review Atkins produced their Problem Definition report which provided an assessment of the Probable Maximum Flood (PMF) event and the capacity of water that was likely to flow through the chains in such an extreme event. The report examined the methodology of approach used in the Haycock report and compared it with new estimations on the rate of runoff from the site and likely overtopping heights of water at each dam during a PMF event. The report found that whilst the Haycock report may have exaggerated the scale of the problem, there were still substantial shortfalls in the capacity of the dams to safely pass a PMF event through each respective pond chain and that works would be required to alleviate pressure on those pond that were likely to fail during shorter return periods.

The second iteration of this report entitled **Assessment of Design Flood** provided a more detailed assessment of the hydraulic modelling for the Highgate and Hampstead catchments. The report looked at both the current capacity of the ponds and standard of protection as well as predicted scenarios of failure during a PMF event. This initial report illustrated the height at which each dam would overtop in a PMF event and provided evidence behind the calculation methodologies. The report concluded that whilst the flood estimations by Atkins were

some 30% to 50% lower than those produced by Haycock, the volume and duration of overtopping during a PMF event combined with the uneven nature of the dams led to increased likelihood of erosion and potential dam breach.

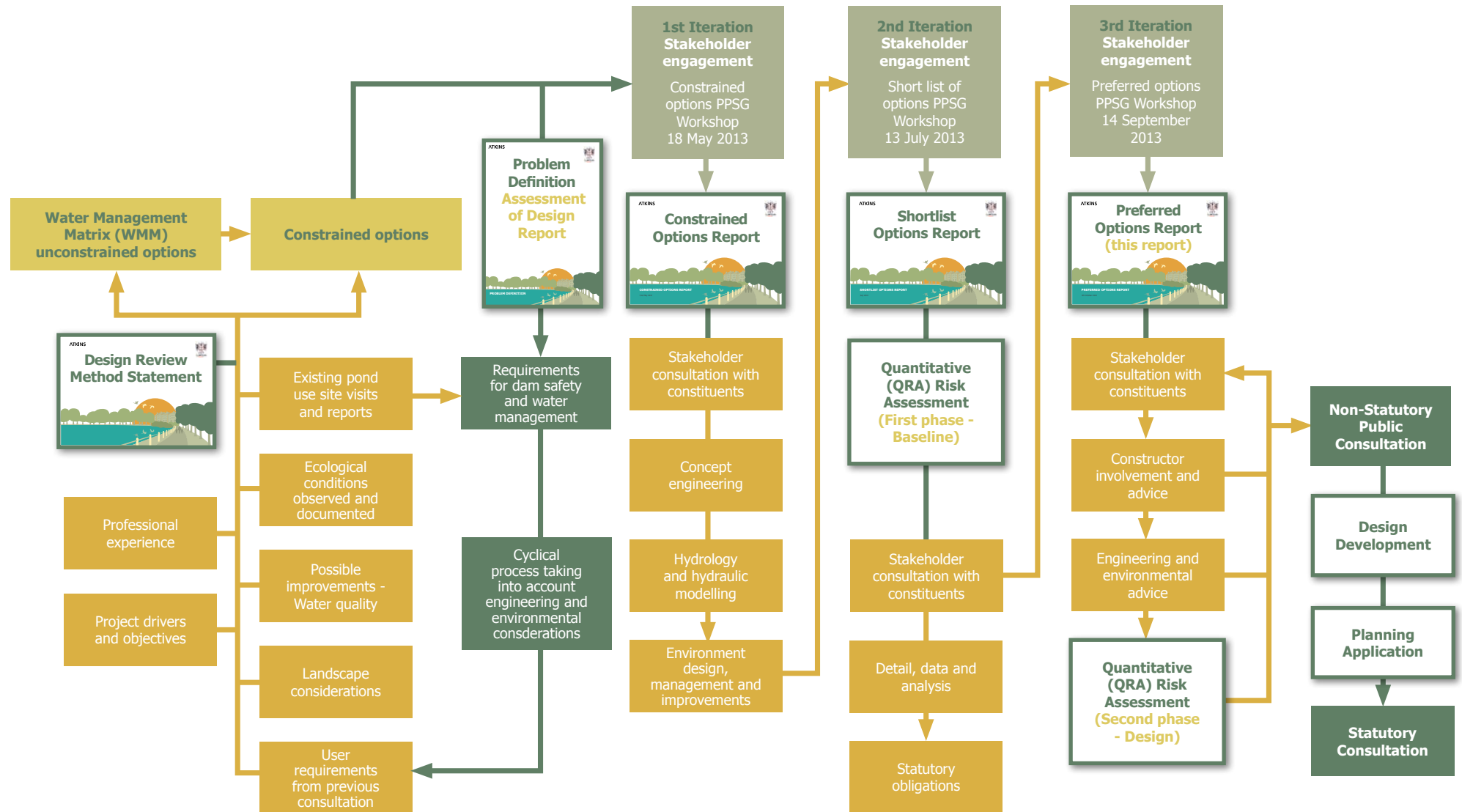
Whilst not strictly part of the brief, Atkins pointed out that a benefit of increasing storage capacity in order to control the overtopping of dams within the two chains would provide an enhanced level of protection for residents downstream of Hampstead Heath during lesser return periods.

The Problem Definition/ Assessment of Design Flood report became the first in a series of reports designed to explore all of the options available to the design team and to eliminate those which were less likely to satisfy the objectives of the PPSG and the flood modelling carried out by Atkins.

The diagram opposite outlines the iterative process agreed by the design team, CoL and the PPSG in arriving at a shortlist and final preferred options for the project.



## Overview of options development process



# DESIGN

Atkins proposed that the first step in responding to the Problem Definition was to produce a matrix of Unconstrained Options for the Highgate and Hampstead pond chains. This matrix considered options for each pond that ranged from doing nothing to raising dam levels and expanding the pond in order to accommodate increased storage capacity. Each option was reviewed in the context of habitat, ecology, landscape, water quality and the concerns of the PPSG, Heath Staff and the wider public. Whilst the matrix was useful in capturing all of the related issues and conflicts it was found to be difficult to read and provided too many irrelevant or non viable solutions.

It was also at this stage that there was particular concern from the PPSG that there was insufficient time being provided to consult with members and to provide meaningful digestion and feedback of reports being produced by Atkins. After much deliberation, a new programme was devised that created greater length of time between reports, time for feedback and re-issue of reports at each stage of development and a full day workshop at each design stage in order to provide direct feedback to the design team on concerns or questions about the approach.

On the 18th May 2013 the first design workshop took place on the unconstrained options for the Heath Ponds. At this meeting

Mike Woolgar, Managing Director of Atkins, explained that the principle of creating storage on the Heath was not in effect to prevent flooding downstream, although flooding in smaller return periods would be reduced, but to reduce the impact of flood events on those ponds lower down in the chain where it was difficult to carry out any major dam works. By attenuating water higher up the chain where more space is available for significant works, the scale of works on the more sensitive ponds could be reduced and still achieve the required standard of protection during a PMF event. This was summed up most eloquently by Karen Beare who said "By storing water higher up the chain you are taking the energy out it by reducing the force and velocity out of the storm surge".

During this session many questions arose about whether increasing storage volumes would lead to a greater risk of flooding downstream and how the proposed dams would impact upon the Heath. At this stage no actual design had commenced and only a methodology of approach was being discussed. Nevertheless Atkins were asked if they could start to illustrate some of the concepts that they had in mind and to illustrate some of the terminology they were using such as Crest Restoration, Spillways, Overflow Pipes and Box Culverts. The final part of the workshop involved the Strategic Landscape Architect asking each member of



Above: Stakeholder Workshop on 13th July 2013 discussed the merits of the shortlisted options and the general approach to dealing with a major storm event on the Heath.



the PPSG to identify their main concern on each of the pond chains to gauge whether there was consensus or divided opinion over the key issues. This provided a useful insight into key concerns that ranged from loss of trees to loss of key views on the Heath which was fed back to Atkins to help in their refinement of the design principles.

Whilst some members of the PPSG were not satisfied that a proper case for the works had been established through the Problem Definition or a Quantified Risk Assessment, Atkins were asked to proceed with developing a Constrained Options report that looked more closely at viable options rather than focus on those which were considered non-viable. At the same time they were asked to continue developing their hydraulic modelling and landscape and environmental solutions to address both mitigation of the works on the heath and water quality issues.

On the 7th June 2013 Atkins issued their draft Constrained Options Report. This report set out for the first time the likely scale of the works at the middle of each pond chain and on the 17th June ranging poles were used to demonstrate the likely scale of the new dam heights proposed at Catchpit and at Model Boating Pond. This exercise was met with a mixed response that ranged from incredulity to acceptance of the scale of works required if the upper and lower ponds were to remain

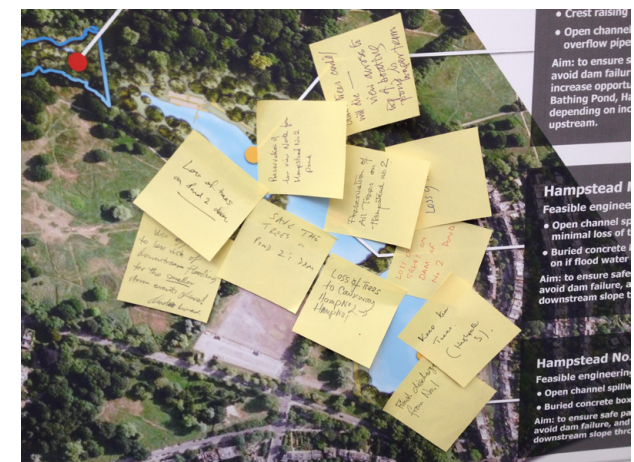
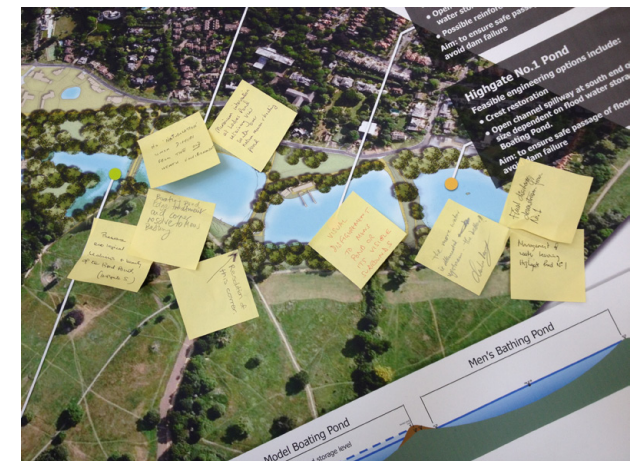
largely untouched.

The general consensus from this exercise was that:

- 3m was too high for the Model Boating Pond
- 5.6m high was acceptable for the Catchpit as long as it was relatively concealed and did not impact on significant trees or views north from the Mixed Bathing Pond.

The initial Constrained Options report also set out key heights and variations for other ponds including some of the residual works (those works aimed at improved dam resilience rather than the creation of storage) including crest restoration and spillway types. The Constrained Options Final Report was issued on the 11th July 2013.

On the 13th July 2013 the second stakeholder group workshop was held with the objective of debating the merits of the constrained options and a method of arriving at a series of short-list options. At this meeting Atkins presented their flood modelling and dams options along with the work their environmental team undertaken with regards to landscape and water quality issues. As further information was revealed about the flood modelling and hydrology approach the more questions it raised from the PPSG with regards to the methodologies applied. It was decided that the best way to address this would be through a series of offline meetings involving a handful



Above: Stakeholders were asked by the Strategic Landscape Architect to identify their one main concern on each pond chain in order to distil the major issues from the minor ones. This exercise showed that most concerns centred around the lower ponds (since minimal intervention was proposed for the upper ponds) and that loss of trees and important views were key issues. Other issues around standard of protection downstream and design detail were also considered important.

of PPSG members with particular interest in the technical aspects of the dam breach modelling.

At the PPSG meeting on the 22nd July 2013 Atkins were asked to consider further options in their constrained options report, including the likely impact on other ponds if the height of the Model Boating Pond dam were lowered to 2m and to 1m. Ben Jones, Senior Engineer from Atkins, presented the options as a flowchart which illustrated the implications of certain decisions taken higher up the chain. One such option involved the implications of not raising the Model Boating Pond and the likely consequences to the downstream ponds and a reduced standard of protection. At this stage, as anticipated, some of the options began to drop away as they were shown to be less viable and less acceptable with regards to their impact on the Heath. The implication of spillways on the character of the Heath was also a key concern and Atkins were asked to avoid the loss of trees, particularly on Hampstead No.2 Pond.

On the 5th August Atkins published their Shortlist Options Report which included further options as discussed in the stakeholder workshop and the flowcharts options for both pond chains. Crucially this report also provided the first photomontage work of how the proposed dams might look in the different scenarios proposed. Unlike the ranging

pole exercise carried out on the Heath, the PPSG were able to see how the view might vary depending upon the viewpoint. Whilst these views provoked more debate, they illustrated how some viewpoints would be marginally affected. Most of the viewpoints chosen were focussed around the ponds that would be most affected by the works including the Model Boating Pond, Men's Bathing Pond, Mixed Bathing Pond and Hampstead No.2 Pond. The report also provided a number of options and illustrations of environmental treatment systems including types of revetment, ecological management and water quality systems for the ponds. Biological control and floating islands were considered to help balance the biological oxygen demand within the ponds and to reduce the level of nitrates and phosphates present. Significantly the report still lacked information on water quality and silt testing. Also lacking at this stage was the Quantified Risk Assessment, which Atkins were then requested to provide as a legal imperative for the works.

The summer hiatus meant that while there was an extended period for the PPSG to review the Shortlist Options Report, there were also a large number of people away on holiday. This made it difficult to obtain input from members of most stakeholder groups. Some meetings, such as the one with Brookfield Mansions and EGOVRA, did take place over the summer period and a



representative from the Hampstead Heath Anglers Society was briefed ahead of joining the PPSG.

At the Preferred Options Stakeholder Workshop on the 14th September the early part of the meeting focussed on the lack of time for consultation and comments from Heath and Hampstead Society on the Draft Quantative Risk Assessment issued on the 29th August. Simon Lee agreed to provide more time for comments on the Shortlist Options Report and that issues surrounding the QRA would be dealt with in a separate meeting with representatives from the Heath and Hampstead Society.

Mike Vaughan gave a presentation on water quality issues and the results of water testing which revealed high levels of phosphates and nitrates and poor dissolved Oxygen content. He stated that this made some of the water quality options such as biological control difficult to implement.

Ben Jones talked through options for each pond chain in turn and stated that the design for PMF in the Highgate chain had resulted in a greater standard of protection, 1:1000, than the current standard of protection which is 1:100. It was explained that the ponds would safely pass all water down the chain during a PMF event but that during a shorter return period the greater attenuation capacity of

the ponds would ensure that more water was stored on the Heath rather than being passed down the chain. This was in fact is good news for members of Brookfield Mansions and EGOVRA who had been requesting this since the beginning of the design exercise.

On the Hampstead chain Ben Jones, Senior Engineer from Atkins, explained that the only way to reduce tree loss on Hampstead No.2 Pond from 2 down to 1 would be to increase the height of the Mixed Bathing Pond from 1m to 2m, an equally unpalatable option. When asked why raising the height of the Catchpit would not further alleviate the situation. Ben explained that the dam at Catchpit would never fill due to its position in the upper catchment and that at 5.6m it was already accommodating the PMF volume for this part of the chain.

One of the issues that emerged from this workshop was a feeling from the stakeholders that questions being raised were not being properly addressed in writing by Atkins. The SLA suggested that although many of the questions being asked had been answered in previous reports by Atkins, a useful reference to where to find them or a written response would help to resolve any queries. Further important meetings took place between the workshop of the 14th September and the stakeholder meeting of the 30th September. The first was a meeting between

legal representatives on the City of London and Heath and Hampstead Society to the discuss the legal precedent for the dams project on the 18th September.

The second was a meeting on the 27th September between PPSG representatives, the City of London and Atkins to discuss the methodology of approach used in the Quantitative Risk Assessment. Both meetings argued the moral and legal obligations of the City of London to protect the Heath and those residents downstream at risk of flooding during both catastrophic and regular storm events. Jeremy Wright expressed his frustration that early warning systems did not constitute a greater part of the risk assessment methodology and that manual release mechanisms and early evacuation procedures should be considered to reduce reliance on the dams during a PMF event. The City of London's response was that the MET Office are still not able to warrant the accuracy of weather forecasts for early warning systems and that manual procedures may also prove unreliable during such events due to the risk that it places on staff and emergency services. The City of London reinforced their position that any designed system must be passive and not rely on human intervention to prevent failure of the dams. They also stated that whilst it was reasonable to assume there might be a loss of life from flooding downstream during a severe

storm event that the City of London were legally bound to prevent any likely loss of life from a dam breach during such an event.

A further meeting was held on the 27th September with members of the Mens Bathing Pond Association to discuss proposals that they had put forward for a dry channel to run between the Model Boating Pond and Highgate No.1 Pond in order to alleviate the need for a 3m high dam raising at Model Boating Pond. Atkins had stated previously that this option would accelerate the rate at which water reaches the end of the pond chain and provide a lower standard of protection than the current situation. They also stated that the channel would have to be around 50m wide in order to accommodate water in a PMF event and that this would be a greater intrusion on the Heath than the proposed dam increase. Atkins suggested that where proposals had been offered by the stakeholder group but not adopted they would provide reasons why the option had been discarded.

At the Stakeholder meeting of the 30th September 2013 issues around options were again discussed and the option of the normally dry channel flanking the Men's Bathing Pond was discussed and debated with mixed views on how it improved on the current scheme offered. Geoff Goss stated that the Highgate Men's Bathing Pond Association were adamant that they did not want a 3m increase in height of the dam adjacent to their facility. Whilst there was some debate over whether this was an appropriate time to be introducing new ideas or going over old ground, Ben Jones confirmed that the 3m option for the Model Boating Pond was no longer being considered and instead there were two new options as outlined in table 1.1.

Table 1.1

Highgate Chain

	Option 4	Option 6
Model Boating Pond	2m	2.5m
Men's Bathing Pond	1.5m (wall)	1m (wall)
Highgate No. 1 Pond	1.25m (wall)	1.25m(wall)
Standard of protection	1 in 1000 year	1 in 1000 year

On the Hampstead Chain some work has been done to show the two main options which centred around the raising of the Mixed Bathing Pond by 2m or the loss of 2 trees on Hampstead No.2 Pond. These options are summarised in table 1.2.

Table 1.2

Hampstead Chain

	Option M	Option P
Mixed Bathing Pond	1m	2m (embankment or wall combination)
Hampstead No. 2	3x 3m box culverts	0.5m wall, 1x4.5m box culvert
Hampstead No. 1	1x4.5m box culvert	1x4.5m box culvert
Standard of Protection	1 in 1000 year	1in 10,000 year
Tree loss on Hampstead No. 2	2	1



# PREFERRED OPTIONS REPORT

On the 7th October 2013 Atkins issued their **Preferred Options Report** in 3 parts. Volume 1 contained the main body of the report, Volume 2 contained comments received on the Shortlist Options Report and Volume 3 contained a compilation of all stakeholder comments received and answers provided by Atkins. The Preferred Options Report acts as a summary of the design decisions taken to date and although it is not intended as the final solution, it sets out the broad principles of a viable scheme. It includes a section on suggestions by stakeholders that have been incorporated into the preferred options and a summary of the consultation process undertaken to date. Importantly the report contains plans for each pond that indicate the dam works proposed, the proposed location of spillways or box culverts and a range of environmental considerations designed to reduce the impact of the works or improve the water quality and biodiversity credentials of the pond.

The Preferred Options Report contains more visualisations of the main works proposals than previous reports and aims to capture key views for each chain including views across the Model Boating Pond, Men's Bathing Pond, Highgate No.1 Pond, Catchpit (aerial locations), Mixed Bathing Pond and Hampstead No.2 Pond. The report also includes a section on discounted options, including those put forward by the PPSG,

with reasons why they were not considered viable or appropriate.

## Summary of the report

The design process that has been undertaken by Atkins has paid close attention to the Critical Review offered as a guideline by the PPSG back in February 2013. The preferred options leave the upper ponds largely untouched with only minor remedial works proposed for the dam structures. Ponds considered more sensitive, such as the Bird Sanctuary Pond and the Kenwood Ladies Bathing Pond, would only receive minor reinstatement of the dam crest in the current scenario. The majority of the works would occur in the middle of both pond chains, as suggested by the Critical Review. Whilst the proposal for a new dam near the Catchpit has met with relatively little resistance, it is the proposals centred around the Model Boating pond that have attracted most criticism. It is surprising that the one pond labelled as 'sterile' and requiring softening by the PPSG should meet with such resistance to change. However, as with all things on the Heath, it is a matter of context rather than scale of operations that seems to be under most scrutiny. The proximity to the facilities of the Men's Bathing Pond and the fact that the Model Boating Pond is one of the most open a visually accessible ponds means that any changes should be in keeping

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## Hampstead Heath Ponds Project



with the context and setting of the Heath. The options developed by Atkins to reduce the dam height increase from 3m to 2m and 2.5m respectively, demonstrate a willingness to adapt to the opinions of the stakeholders. With further environmental mitigation, the impact of a 2.5m dam height increase could be further softened and blended into the existing landscape. The opportunity to soften the western edge of the pond and create an island from the current tree group would add a feature to the pond which feels instantly old and in keeping with the rural nature of the Heath.

There are certain aspects of the report by Atkins that do not tend to sit comfortably with the character of the Heath. These include proposals to improve water quality through the removal of overhanging trees in order to reduce the build up of organic matter from leaf drop into the ponds. This is very much part of the character of the heath and it is likely that large volumes of material will still be washed or blown into the ponds. The creation of islands from excavated sediment or floating islands in the ponds is also uncharacteristic of the Heath and apart from reducing the view of open water could in fact accelerate the build up of litter within the ponds. Floating islands should at least be kept out of swimming ponds where they may block views of swimmers from lifeguard positions.

The creation of reed beds at the head of each pond would only contribute to increased water quality during periods where there is an active flow of water. This usually occurs during the winter months when algal blooms and water quality are less of an issue. Mechanical aeration of ponds through pumps or aeration curtains result in a relatively short term improvement of dissolved oxygen content. Significant improvements in water quality could be obtained through a combination of reed beds and pond recirculation through Flowform cascades. These devices, which operate on low flow volumes, help to provide improved aeration at a molecular level and could be concealed within reed beds.

Testing of pond sediment has revealed relatively low levels of toxicity meaning that material gained from dredging could be used or disposed of on site. Though the material is unlikely to be suitable for the construction of dams, due to its lack of cohesion and structural qualities, it could be swapped with material extracted from borrow pits to create a net balance. Conveyor systems could be used to transport materials in order to reduce the impact of vehicle movements during this process.

Ultimately some of these issues could be the subject of a management plan for the Heath, but it is essential that any opportunities for long term improvement of water quality is considered as part of the Ponds Project. Early contractor involvement in the design process may also lead to further solutions that have not yet been identified by the design team.

## THE NEXT STAGE

Negotiations with contractors have already commenced and it is likely that a contractor will be appointed in as early as December to assist in the design process. Members of the PPSG have been involved in the selection process and we hope to have the contractor engage directly with the stakeholder group once they are appointed.

Public consultation is due to commence at the end of November 2013 and run through to February 2014 to ensure sufficient time for all users to have their say in the future of the Hampstead Heath ponds. A further stakeholder group meeting is planned for 2nd December 2014.

This is by no means the end of the design process, and further dialogue is likely to happen once a contractor is appointed and the design team commence detailed design for the project. This will be a time when many other questions previously raised by the PPSG around site access, circulation, security, noise, vibration, timing of works, phasing and type of equipment used could be dealt with directly by the contractor.



Above: Members of the PPSG, City of London, Capita, Atkins and the Strategic Landscape Architect visit projects by shortlisted contractors as part of the tender evaluation process.



# CONCLUSION

The introduction of the Flood and Water Management Act 2010 has altered the risk categories of dams from A,B,C and D to either High Risk or Not High Risk depending on the likely loss of life during a PMF event.

In addition to this the Flood and Water Management Act will introduce the evaluation of water bodies as cascades so that the cumulative volume of water within a chain can be dealt with under the Reservoirs Act if it exceeds 25,000m<sup>3</sup>.

In order to address this legislation the City of London have undertaken to review the Hampstead and Highgate chain in their entirety in order to ensure current and future compliance with the Flood and Water Management Act 2010 and the Reservoirs Act 1975.

There is currently a statutory obligation to have regular dam inspections by a Panel Engineer and recent inspections have highlighted the inadequacy of the Hampstead and Highgate chains to safely pass a PMF storm event without a risk of collapse.

The City of London have no alternative but to embark on a process to undertake statutory works to the dams in a manner that is, as far as possible, in keeping with the sentiments of the Hampstead Heath Act of 1871.

Whilst it is conceivable that the Panel Engineer could impose a solution to rectify the dams at Hampstead Heath, it is in the interest of all parties to work towards a solution that is both sensitive and warrantable. This involves first recognising that the problem is real and the works justifiable.

The commitment shown by the City of London to deliver an acceptable scheme has been matched by the Hampstead Heath Ponds Project Stakeholder Group who have shown incredible resolve and determination to make this scheme as subtle as possible. The consultation process, which has engaged with an organised and articulate community, has had a noticeable impact on the depth and breadth of information provided by the design team. The design team in turn have responded by putting forward a range of options that are broadly aligned to the key issues identified in the Critical Review by the PPSG.

Whilst there are still concerns among the stakeholders that the proposals are disproportionate to the scale of the problem, we need to be mindful that the design is catering for extreme events. There are still many iterations to follow before a final scheme is decided. The important issues at this stage to be decided by the PPSG are the following:

- Has the design provided sufficient resilience for the pond chains on the Heath.
- Has the design taken account of the special character of the Heath and preserved where possible that character.
- Have the solutions provided gone far enough to minimise the impact of the works within the constraints of the required works.
- Have stakeholders been given sufficient input into the key decisions that have been made.

The Preferred Options Report provides a basis on which the City of London are able to take the current proposals to wider public consultation. The options provided are an indication of the types of solutions that would address the problem identified. They are however not final design solutions and there is still scope for review once a contractor has been brought on board.

I look forward to working with the Ponds Project Stakeholder Group and the City of London in the further refinement of Atkins preferred options in order to ensure that the best possible outcome is achieved for future generations who will come to know and cherish Hampstead Heath.