

Committee(s):	Date(s):
Hampstead Heath, Highgate Wood and Queen's Park Management Committee	15 th April 2013
Subject: Hampstead Heath Ponds Project – Assessment of the Design Flood	Public
Report of: Superintendent of Hampstead Heath	For Decision

Summary

This report sets out the results on the first major task undertaken by the Design Team in relation to the Hampstead Heath Ponds Project. The City of London agreed that before any work commenced on preparing options and detailed design solutions the Design Team would undertake a Fundamental Review of the basis for the whole project. This work was deemed necessary following the independent peer review of the original feasibility study and was also requested by the members of the Stakeholder Group.

The review utilises industry standards and software, ensuring that the work is in line with current industry best practice to determine “extreme rainfall events” and their impact on the earth dams across the Hampstead and Highgate chains of ponds. The work undertaken by Atkins follows the methodology set out in their Design Review Method Statement approved in December 2012.

The results show that, in adopting industry best practice and nationally derived data-sets, there remains an unacceptable risk from overtopping the dams. This could potentially result in their failure thereby releasing the stored water to inundate communities south of the Heath, with potential loss of life.

The new study has revealed that flood peaks are between 30-50% lower than those that were modelled by previous hydrologists, which used locally derived data-sets, as the basis to determine the maximum floods.

At this stage Atkins believes these results could reduce the overall impact on the Heath but that storage is still necessary, to help hold back water in major rainfall events, mitigating impacts on other ponds.

Over the next few months utilising these results the Design Team, with support from the Stakeholder Group, will refine the long list of potential design solutions to arrive at two or three preferred schemes. These will be subject to wide public consultation.

Recommendation

It is recommended that the Committee receive Design Flood Assessment Report and endorse it as the basis for the continuation of the Hampstead

Heath Ponds Project and development of the two preferred design options that will be subject to wide public consultation over the summer and early autumn period.

Main Report

Background

1. Approval was given by the Court of Common Council on 14 July 2011 for the project to upgrade the pond embankments on the Hampstead and Highgate chains. The aims of the project are to reduce the current risk of pond overtopping, embankment erosion, failure and potential loss of life downstream; ensure compliance with the existing requirements of the Reservoirs Act 1975 together with the additional expected requirements under the Flood and Water Management Act 2010 while meeting the obligations of the Hampstead Heath Act 1871; and improving water quality. At the same time it seeks to achieve other environmental gains through, for example, habitat creation.
2. In October 2012 the City of London Corporation appointed a Design Team to undertake the task of preparing designs, achieving planning permission and implementing works to meet its duty of care and mitigate its liabilities.

Current Position

3. The first major task undertaken by the Design Team in relation to the Hampstead Heath Ponds Project was to undertake a Fundamental Review of the basis for the whole project. This work was considered necessary following the independent peer review of the original feasibility study that identified some concerns about deviation of methods from industry standards and also concerns from the Hampstead Heath Ponds Stakeholder Group. It was agreed that this work be undertaken before any proposals on design options and detailed solutions commenced.
4. The review utilises industry methods and software, ensuring that the work is in line with current industry best practice to determine “extreme rainfall events” and their impact on the earth dams across the Hampstead and Highgate chains of ponds.
5. The work undertaken by Atkins follows the methodology set out in their Design Review Method Statement approved in December 2012. The results of this study have shown there remains an unacceptable risk that in extreme rainfall events the Heath ponds will fill with water and overtop the dams, potentially resulting in their failure and thereby releasing the stored water in the ponds to inundate communities south of the Heath, putting people and property at risk.
6. The results, utilising nationally derived data-sets for rainfall estimation, percentage of run-off of water across the Heath and estimation of the size of a range of floods was then passed through a mathematical model (considered to be one of the most reliable packages in the reservoir industry). The results

have shown that flood peaks are between 30-50% lower than the levels that were modelled by previous hydrologists, who used locally derived data-sets as the basis to determine the maximum floods.

7. Given the complex and critical nature of this threshold stage of the design process, in addition to the detailed Technical Report, Atkins have also produced a Summary of their findings. Both papers are appended to this report.

Proposals

8. It is important to recognise that these results do not necessarily mean a 30 to 50% reduction in the mitigation requirements on site compared to the original feasibility ideas and concepts. Atkins have however stated that they believe these results could reduce the overall impact on the Heath, but that storage capacity is still necessary to help hold back water in major rainfall events and assist with mitigating impacts on other ponds across the Heath.
9. The next stage of the design process is for the Design Team to compile a list of all potential options. These will then be refined to those that are technically feasible. The Design Team have indicated that coarse modelling of one or two options for each chain of ponds where additional storage capacity could be considered would greatly assist in helping understand the impacts on other dams.
10. Before modelling of any design options, Atkins will first revisit the dam breach scenario utilising their mathematical model. This will allow improved representation of the dam breach and its routing and hence improved accuracy, so that the systematic failure of the whole cascade will be properly simulated and hence understood, based upon the revised flood design assessment.
11. This modelling will review the impact on populations downstream and assess those at risk and potential loss of life calculations. This will be undertaken for both the current situation and ultimately the preferred design solution option.

Consultation

12. The Heath Ponds Project Stakeholder Group received a presentation from Dr Andy Hughes Panel Engineer on the Fundamental Review at its meeting on the 18th March 2013. The Group were able to seek clarification on a number of detailed technical issues arising from the study. Members were asked to submit in writing any further clarifications on the technical aspects of the project, these are included as a separate document and have been provided to Atkins so that they can formally respond. The Hampstead Heath Consultative Committee held a special meeting on the 8th April 2013, a copy of the draft minutes of that meeting will be circulated separately.

Corporate & Strategic Implications

13. The works support the strategic aim 'To provide valued services to London and the nation'. The scheme will improve community facilities, conserve/enhance landscape and biodiversity and contribute to a reduction in water pollution whilst meeting the City Corporation's legal obligations. The risk of any dam breach and serious downstream flooding of communities (and consequent harm to the City's reputation) is mitigated.

Implications

14. The risk of embankment failure at Hampstead Heath is assessed as a high risk on the City of London Corporations strategic risk register. In addition to the current measures to mitigate risks, there are other risks that also need to be considered, including the resources needed for on-going consultation and the potential threat of legal challenge that could still potentially delay the project.

Conclusion

15. Utilising industry based standards and adopting best practice, Atkins have undertaken a Fundamental Review of the basis for the project and have determined that whilst works are still essential to reduce the City of London's liability and meet its duty of care to communities south of the Heath, the size of potential floods in "extreme rainfall events" is less than those derived by previous hydrology consultants.

Appendices

- Appendix 1 and 2 – Hampstead Heath Ponds Project - Flood Design Assessment Summary & Detailed Technical Reports
- Appendix 3 – Queries from Hampstead Heath Ponds Project Stakeholder Group

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