

End of Project Documentation

Project Title:

Durngate Flood Alleviation scheme (Phase II)

Authors / Contributors:

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Andy Hickman (Head of programme)

Approvals & Sign-Off**Signed by Project Manager (can be electronically) and date:**

D.Lewis 14/12/21

Approved by Project Board and date:

End of project reported at PAC Board 18 January 2022

Achievement of Project Objectives**Summary of Objectives** *List your project's objectives, Including date and budget*

Following on from the flooding in 2014 funds were made available to help protect Winchester from Flooding.

Phase I objectives were to protect River Park/St Bedes/Park Avenue/Water Lane. This was a previous project and is out of scope for this report.

Phase II objective (Durngate) was to link the flood defences between Phase I to the west and the existing flood defences to the east on the main river, linking Phase 1 to the original flood defences to form a continuous 900m flood defence across the top of the city.

The programme manager (PM) for this programme of work (Phase II) was Darren Lewis.

The scheme provided three new sluice gates on the channels of River Itchen to help to protect the city centre, homes and businesses from high water levels. It completed the city's network of defences across the north of the city to help to control flooding, including the historic City Mill.

The sluice gates are adjustable so they can help to manage the flow of river water – the gates are able to hold back up to 250,000m³ of water, equivalent to around 3.2 million bathtubs of water.

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The off-site environmental work also has a positive impact on biodiversity at Clausentum Fen in St Cross and the Nuns' Stream at Abbotts Barton and Hyde, plus also provides flood refuges for otters and voles on Winnall Moors.

Objectives:

Please consider the following and refer back to your Business Justification Case:

- *Were the project objectives met?*
- *Were they clear?*
 - *If so, how? If not, how could they have been improved?*
- *Were they smart?*
 - *If so, how? If not, how could they have been improved?*

The project objectives as noted above were met.

The system of flood defences has been successfully constructed to defend the heart of the city.

The objectives were clear and 'SMART', with the exception of the time related targets as the complex programme of work needed to be fully assessed before the deadlines could be set. Once the deadline was set as November 2021, the target was met.

Time

Time:

Please consider the following:

- *Was the project completed on time?*
 - *If not, provide an explanation.*
- *Were the timings and milestones estimated well?*
- *Did we learn anything about scheduling that might help us in the future?*
 - *If yes, give details.*

The project was completed on time. Due to the high number of variables involved, the deadline date for full completion could not be set until the programme was fully formed. Once set, the deadline of the end of November 2021 was successfully met, by one day.

Lessons to be learned:

There were two possible routes to our solution that impacted on timings:

One option was to research the project before commencing with trial holes soil testing, flood mapping, design, contractor consultation, Environmental Impact Assessment, pre planning application and more. This involved approx. £250k project in feasibility costs.

The second option was to run the programme in stages – which was the chosen option due to the fact that the project outcome was engineered risk mitigation from flooding, and therefore was deemed urgent and important. To control the phasing and budget, each project within the programme was tackled by

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assessing the long-term solution, seeking engineering and technical solutions, gaining buy-in from key partners and arranging funding and budget, and then progressing once solution and budget were in place.

The lesson learned is that you can achieve the same objective in stages and do not always have to have all stages costed and mapped out before commencing the first stage. This approach worked on this occasion as each stage was independent, meaning if a cost for the next stage came in that was un-engineerable or unaffordable we could have stopped (but in that scenario we would not achieved the original objective).

Cost

Cost:

Please consider the following:

- *Was the project completed within budget?*
 - *If not, provide an explanation.*
- *Did we accurately estimate costs?*
- *Did we learn anything about costing and budgeting that could be useful in the future?*
 - *If yes, give details.*

NOTE: there was incomplete records of the flooding systems in Winchester on commencement of this project. There were also many unknown factors which had the propensity to vary the budget needed by significant amounts.

The initial budget set was £750K.

During the programme of work we established correct records for culvert diameters and flow coefficients, soil conditions and we came across a requirement to factor in climate change into the budget as guidance changed during this project.

We also found that part of the site needed a full Planning Application which had to go through Hampshire County Council and South Downs National Park. This in turn needed a full Environmental Impact Assessment; which takes time to deliver while environmental assessments are made, and was an unexpected cost.

A significant decision taken early on by the Environment Agency was that flood defences should be built to allow for climate change with an additional 40% capacity. This added height to the mitigation solution and therefore added cost.

When planning for budget risk, the normal level for a civil works project is 25%, but it was felt for a project of this complexity that 40% was more appropriate.

In light of these changes the Programme Manager was asked to fund raise and set a revised budget appropriately.

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At the start of Phase II, Autumn 2017, the available funding for the phase was

Capital Funding	£147,000
CIL (CAB 2940 5 th July 2017)	£300,000
Grant In Aid (GIA) from the EA	£300,000
Total	£747,000

The revised amounts raised were:

Source	amount
Capital Funding	£147,000
CIL (CAB 2940 5 th July 2017)	£300,000
Grant In Aid (GIA) from the EA	£300,000
Additional CIL (CAB 3072 12 th Dec 2018)	£500,000
Additional Grant In Aid (GIA) from the EA	£248,000
NEW – Amount from the Southern Flood Alleviation Board Local Levy	£200,000
As a result of complications introduced by COVID, an additional amount was awarded by the EA.	£177,000
Total	£1,872,000

The costs were:

Supplier	Amount
Knights Brown Construction Limited	£791,028.38
Hampshire County Council	£455,926.03
Bentley Projects Limited	£138,445.83
Hampshire & IOW Wildlife Trust	£45,440.00
Worthy Tree Care	£9,100.00
Hydroplan	£6,505.74
Hamptons Tree Care Ltd	£6,040.00
Anthony Collins Solicitors LLP	£2,950.00
Robert Nicholas Limited	£2,767.20
Hampshire Ecological Services Ltd	£235.00
	£1,458,438.18

The current outcome is £413k of Capital funding which was planned to be drawn from Capital Funding and CIL which is no longer required to be called upon. Funding for the ‘follow on actions’ in the table on page 12 of this report will be drawn from this budget before it is considered complete and closed.

Lesson learned for finances is that the Programme Manager was able to revisit the sources of income when the project expanded and did exceptionally well in doing so, using the revised size and complexity of the project to make robust cases for further external funding.

Change Issues, Impacts & Risks

Change Issues & Impact: *Summary of changes & solutions received during the project. Please also state the effect on the original Business Justification Case of any that were approved*

Write your comments here:

1 - During the course of the scheme the Environment Agency (EA) were carrying out mapping of the entire Itchen catchment and it became clear that assumptions made by an external company in 2016, such as the size of the culverts under the city, were not accurate. The EA mapping firm JPS were retained to provide new mapping for the scheme. This cost an additional £30k but fundamentally altered the design of the scheme and gave valuable justification for a £248k increase in funding from the Environment Agency.

2 - The original design for the solution was a 1m wall with 2-3m foundations, the mapping showed it needed to be slightly higher (which breached the 1m limit of permitted development thus forcing planning permission).

3 - Soil investigations showed that the sub grade was of such low quality the foundations needed to be 13-14m deep and piled. It also showed significant levels of soil pollution which added £50k to the costs, as well as knotweed on site which added £25k. However, this design change also meant we identified a way of having 3 three sluice gates instead of 4 which saved approximately £250k.

4 - The mapping also showed how our solution would add to the flooding on Winnall Moor, a Site of Special Scientific Interest (SSSI), so that needed careful negotiation with stakeholders tenants and Natural England. The Planning Permission we required because of the wall height provided us with an Environmental Impact Assessment (EIA) which helped us demonstrate the impact so that the levels of flooding could be assessed. This was helpful evidence.

5 - The solution included 'plugging of the gap' in the flood defences which meant we were impounding the river i.e. blocking it, so we needed to get three impoundment licences from the Environment Agency.

6 - Due to the size of the reservoir that we needed to create, it became a class 1 high risk reservoir, so we needed to retain the services of a reservoir panel engineer to assist with the design, and inspect its construction, before signing it off as safe to use.

7 - Since the construction of phase 1 it was decided by the EA that flood defences should be built to allow for climate change with an additional 40% capacity. This significantly increased the construction costs due to the increased height required, and required a planning application to be submitted.

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8 – On analysis of the EIA, offsite mitigation had to be provided for wildlife. This mitigation was placed off site at Clausentum Fen and Nuns walk as initially the Wildlife Trust declined us use of their section of Winnall Moor. However permission for us to mitigate on the Moor was later given. Enabling us to mitigate on both sites added about £25k to the costs but enhanced the benefits.

9 – COVID - Lockdown started the week before we started on site, but Knights Brown provided an excellent service which meant it didn't affect the completion date. Costs were increased but the Environment Agency compensated us.

Risks: Risks identified during the project, which may affect the product(s) in its operational life

- 1 - Failure of the sluices/wall. This is mitigated with regular inspections/servicing by Special Maintenance staff and regular inspections by the reservoir engineer, either periodically or after every flood event.
- 2 - Overtopping. Ultimately the defence has been created to withstand a 1 in 100 year storm. However, in theory at some point this scheme could be exceeded. To prepare for that case general overtopping was considered preferential to a specific spillway discharging to the main channel. This is because shallow flooding/slow flow across the city was preferential to risking the collapse of City Mill by overloading the main channel which would instantly flood Mill and the City centre.
- 3 - Reputational risk from overuse/damaging Winnall Moor. A sluice protocol has been written as part of the planning conditions so that the use of the defences is a joint decision between WCC and the EA i.e. The gates are only used when they really need to be used.
- 4 - Damage to Winnall Moor. Ecological surveys, at every 5 years initially, will be carried out to assess the condition of the Moor and take mitigating action if there is damage identified.

Quality

Quality:

Please consider the following:

- *Did the project outcomes meet the specification? Give Details.*
- *Was additional work required?*
 - *If yes, please state what was needed and why?*
- *Did we learn anything about specifications and quality standards?*
- *Were there any products / elements that were missing or didn't meet the original requirements?*
 - *If yes, provide details of these and how these issues were overcome.*

The project aim was very simple and that was to provide a flood defence from

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the Durngate sluice to the end of the Phase 1 defences behind the College of Art. This has been achieved.

Due to insufficient legacy engineering information and reports, the project size was expanded once the correct information was received to ensure a quality outcome.

The scheme was so unique that all of the project could be considered to be a lesson learned on how to mitigate flooding in Winchester City.

At the end of the project, there are no products/elements that are missing or didn't meet original requirements.

Performance Monitoring

Performance Monitoring:

Please consider the following:

- *Was performance monitored well?*
- *Were we effective in identifying and taking corrective action?*
 - *Give examples.*
- *Did we learn anything about monitoring, control and corrective action?*
 - *If yes, provide details.*

NOTE: this project was commenced before the Councils current approach to programme management was established. Therefore some earlier project products are not available as they were not part of our process at the time the project was started.

The project was solo managed by the Special maintenance Manager. As this was a specialist engineering programme there wasn't anyone else internally employed to monitor the work programme. The project was PM monitored and was double checked against the HCC Programme Management methods as the project developed. The project was challenging and required significant amounts of additional hours to keep on top of it, 60-70 hour weeks during critical phases. A lesson learned was that, due to the time critical nature of the project, and the day job, many issues were 'firefighting' going from urgent issue to urgent issue. Time for reflection or recording was limited. The Programme Manager had assistance from Michelle Wells in the project office with regards to taking formal meeting notes with external agencies and updating the financial spreadsheet. This 'lesson learned' was considered by PAC Board. Mitigation is in place in the new project methodology where milestones and gateways come to the PAC Board and resourcing issues can be discussed and resolved.

As the project was so specialised and so time critical the Programme Manager was authorised to make independent decisions in order to keep the project on track. Andy Hickman, Simon Finch and Richard Botham were consulted for planning experience or for 'WCC ethical' guidance.

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When work started, due to COVID the Programme Manager wasn't allowed on site, so having worked extremely hard to get this programme commenced, once it had started, the PM had to rely on WhatsApp video calls from site for progress and performance updates.

One lesson learned was that the PM felt they could have had additional support on financial management of the project. As a PM managing the budget was a priority, and it was actively checked. Additional support would have allowed the PM more time to focus on the objectives of delivering the solution. This Lesson Learned is mitigated in the newer project management approach where projects will be planned in full including corporate resources.

Stakeholders

Stakeholders:

Please consider the following:

- *Were they satisfied with the project outcomes?*
- *Did we communicate well with, and manage, the stakeholders?*
- *Did we work effectively with other organisations, suppliers & professionals?*
 - *Provide details for positive and/or negative associations.*
- *Have we learned anything new about maintaining effective stakeholder relationships?*
 - *If yes, provide details.*

The PM engaged with Partners on a wide scale. Engagement included site meetings, public meetings, door knocking and presentations at stakeholders HQ's.

The outcome of this wide engagement was a high degree of understanding, resulting in no objections during the planning process.

A summary of Partners:

Natural England - Their initial consultation response for the scheme was written on their understand that we would be flooding the Moor every year. The scheme was a 1 in 100 years scheme so we needed to explain to them that the frequency was planned for 1 in 100 years. However, despite not fully appreciating the technicalities of the scheme they did provide enough feedback to enable the planners to make a determination on the required conditions. Discharge of the conditions was also challenging as NE did not fully understand that the conditions could not be renegotiated. The lesson learned with NE was to try and find consistent people to work with and to explain complex engineering at a clear level to ensure understanding of process and outcome.

The Hampshire and Isle of Wight Wildlife Trust – Initial engagement was tricky with the HIOWWT. They remained unengaged until after the Planning Permission was granted. They then sought design changes which could not be delivered without seeking a replacement planning permission. Their strategy

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appeared to be to protect the site at the expense of the project outcomes, which led to a negative PR campaign being run by them. To provide further controls to ensure the scheme was not damaging the area (as was being reported by the HIOWWT), we placed groundwater monitoring stations installed in the Moor which provided data that we were not flooding the Moor when accused of doing so. It took considerable time and an escalation to Strategic Director Richard Botham to resolve the position. The PM finally managed to get the Trust management onside by persuading them to let us carry out the environmental mitigation on their section of the Moor site by WCC paying the Trust to do the work (which was a benefit for us as well as they can attract volunteer assistance we can get far more work done for the same amount of money).

We had very good working relationships with contractors, other stakeholders, residents, and an exceptionally good relationship with HCC who were designing the scheme. In fact, this was such a challenging scheme that it's fair to say the principal officers involved from WCC HCC EA etc have now a close professional working relationship having worked through these difficult challenges together for four years.

The main learning point stakeholder wise is to engage early and widely on engineering projects such as this one. This gave us the best chance to get people onside, it also gives stakeholders a chance to influence the design with local knowledge which can sometimes be crucial and save significant amounts of money.

New Developments / Improvements

New Developments:

Please consider the following:

- *As a result of the project, were there any advances in Service / technology / knowledge / skills?*
 - *Provide details and examples.*
- *Were any useful methods, tools or techniques developed that will be helpful in the future?*
 - *Provide details.*

This project was ground breaking for a flood defence scheme in the middle of a City. Its objectives were met and appropriate funding sourced so that the cost was met by appropriate partners as well as the Council.

Final press release information is found [here](#), and subsequent local press article [here](#).

Post Implementation Review

Measuring Achievement of Expected Benefits: *List your projects expected benefits and explain how the achievement of these Benefits will be measured*

Expected benefits were the ability to control the flows of water in different channels during a flood, or hold back a body of water for up to 7 additional days to stop the city flooding.

The only way of measuring these benefits is when the water level in Water Lane reaches 1.6m and we're forced to operate the gates to protect City Mill, but the flood mapping was extensive so the results can be widely expected to be accurate.

Timing of Measurements: *Explain when and how often the various benefits can start to be measured*

Generally the gates were built for a risk of 1 in 100 years but that's statistically, so they could be used this winter (we do have high groundwater and a wet winter has been forecast), or it could be in 200 years.

The benefits of the scheme are to protect Winchester City from flooding. Therefore the measure we can use to explain the benefit is to look at the damage caused when flooding occurs. To give scale of the 'risk costs avoided', the national impact of the 2013/14 floods in England and Wales were analysed by the environment Agency:

[The costs and impacts of the winter 2013 to 2014 floods](#)

Extract from Executive Summary

The best estimate of total economic damages is £1,300 million in England and Wales for the winter 2013 to 2014 floods, with a range to take account of uncertainty of £1,000 million to £1,500 million). Damages in England accounted for 91% (£1,200 million, with a range of £930 to £1,400 million) and in Wales for 2% (£28 million with a range of £23 to £33 million). Disaggregation by country was not possible for the categories making up the remaining 7%. The greatest proportion of damages was felt by residential property holders, with 25% of total damages occurring in this sector (best estimate of £320 million incurred by up to 10,465 properties)...

Required resources: *Explain what resources are needed to carry out the review work*

- A reservoir engineer will periodically check the structures safety.
- Ecologists will regularly survey the moor to make sure it's unaffected.
- Special Maintenance staff will regularly service and test the equipment.
- Financial analysis will be conducted by WCC finance.
- Environment Agency will constantly monitor its use.
- The sluice operating protocol document which contains the operating protocols will be annually reviewed/ updated to keep it relevant.

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Other Areas for consideration: *Explain any other areas of the project that may need consideration, such as ease of transition, usability, external factors etc which might have an effect on the Expected Benefits*

N/A

Outstanding Actions and Follow-Up

Summary of Outstanding Actions:

Write your summary here – use Appendix 1 for more detail:

Offsite/onsite environmental mitigation by the wildlife trust needs to be completed. That work is determined by spawning season's migration patterns weather patterns etc so will happen over the course of one year.

The sluice at 50lb garden needs to be repaired after it was used to control water levels during construction. This is scheduled to be completed by March 22.

Initial (first) ecological survey will be completed in the summer/autumn of 2022.

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Appendix 1 – Follow On Actions Report

	Description	Who	When
Outstanding Actions: <i>include items that should have been done as part of this project but have not. Include who to handover and when</i>	Offsite/onsite environmental mitigation The sluice at 50lb garden needs repair Initial ecological survey needs completion. (6 months)	HCC/HIWWT D.Lewis dealing HCC/HBIC	By 12/2022 By 03/2022 By 09/2022
Outstanding Requests for Change: <i>requests for change that were considered to have merit but were not implemented during the project</i>	None		
Off Specification: <i>missing items or items that do not meet the original requirements</i>	None		
Training Needs: <i>any identified training needs</i>	Project Management training	Wider WCC issue already being assessed K.Shaw	In progress
Future Enhancements: <i>areas identified for future development</i>	N/A		
Any Other Action: <i>any other activities needed to take the product to the next stage of its life</i>	None		