Northamptonshire Small Schemes Pathfinder Project Grafton Underwood Flood Risk Management Summary Report

Grafton Underwood was chosen as one of eight communities to participate in the Defra-funded Small Schemes Pathfinder Project, which aims to investigate ways to improve the development of Flood and Coastal Risk Management (FCRM) schemes in small rural communities. Northamptonshire County Council (NCC) has been working with technical experts WSP | Parsons Brinckerhoff (WSP|PB), who have undertaken a technical analysis of why the community floods and what could be done to reduce the impact of flooding, and David Smith Associates, who undertook the original Flood Investigation Report.

This report is a summary of the Northamptonshire Small Schemes Pathfinder Technical Report and provides an overview of the work undertaken as part of the Pathfinder project.

The aims of this report are to:

- provide a summary of the work to inform community members of the outcomes of the project; and
- to be used as a basis for further consultation, discussion, acceptance and agreement of the proposed way forward.

Summary of Flood Risk Issues in Grafton Underwood

Section 19 of the Flood and Water Management Act 2010 states that Lead Local Flood Authorities (LLFAs) (in this case NCC) should investigate flood incidents that they consider necessary. NCC investigates when a specific threshold is met. NCC publishes all Flood Investigation Reports on the Flood Toolkit at www.floodtoolkit.com/risk/investigations, which:

- Identify and explain the likely cause/s of flooding;
- Identify which authorities, communities and individuals have relevant flood risk management powers and responsibilities;
- Provide recommendations for each of those authorities, communities and individuals;
- Outline whether those authorities, communities or individuals have or will exercise their powers or responsibilities in response to the flooding incident.

The Flood Investigation Report undertaken for Grafton Underwood investigated the flooding that occurred at the village of Grafton Underwood on 25th November 2012, after 70mm of rain fell on the Grafton Underwood catchment in the week leading up to the 25th November. During the flood event three properties were flooded internally by flooding to ground floor living areas with a further case of back-up of effluent in a ground floor toilet. In addition, the garden of one property was also flooded.

Historically the catchment has experienced several flooding events of note: In 1982 and 1989 four properties were internally flooded; and on 4th November 2012 one property was reported to have flooded internally. In October 2013, heavy rainfall led to the flooding of two

residential properties: one of which had water coming up through the toilet and the other had water breach a bedroom wall (bungalow). The community was also affected by flooding on 9th March 2016, with the highway and one property reported to be affected.

The Flood Investigation Report concluded that the flooding that occurred in 2012 was a reflection of the intense rainfall that fell onto a saturated catchment over a short period of time. It was apparent that existing drainage systems and watercourses were unable to cope with the deluge of water. Water from Alledge Brook emerged within dwellings via a combination of surface water flow and the emergence of groundwater, and the highway drainage system and culverts beneath the highway serving Alledge Brook did not operate effectively, causing the road junction of Grafton Road and Geddington Road to flood.

Full details of the investigation can be found in the Flood Investigation Report, available at http://www.floodtoolkit.com/wp-content/uploads/2015/01/Grafton-Underwood-FIR.pdf

Grafton Underwood Small Schemes Pathfinder Project

The sections below summarise the work undertaken for the Small Schemes Pathfinder Project in Grafton Underwood and provides an overview of the outcomes.

1. Developing outline options

The project team developed a range of options that could help alleviate the flooding to the community, informed by a site visit and the Flood Investigation Report. Many of the options initially identified were considered to be unfeasible due to technical difficulties or overriding costs, but were not ruled out at this stage. Only an outline analysis was undertaken and therefore no costs or benefits were assessed at this stage.

Six options were developed for Grafton Underwood. These were:

1. Advice to land owners regarding land management practices.
2. Formalise run off ditches in the fields to the east of Grafton Underwood and formalise a flow path between properties.
3. Diversion ditch around the village.
4. Creation of upstream storage area to the north of Grafton Underwood.
5. Upgrade the highways drainage system.
6. Provide Property Level Resilience (PLR) for properties at risk from flooding.

2. Community engagement – visit to the community and formal consultation on the outline options

The project team arranged for a community outreach vehicle (COV) to visit the village and invited all those who may be affected by or benefit from the project to come along. The purpose of the session was to meet with the community members to get initial feedback on the project. This was followed up by a formal consultation to get written feedback. A total of two residents and landowners attended the COV.

The aims of this engagement were to ensure that the project team had a full understanding of the issues that needed to be addressed, to get feedback from the community on the six outline options presented (and in particular whether any of the options posed issues or additional benefits) and whether the community had any other options they would like to be considered.

During this community engagement session on the COV, discussions were had around funding limitations to the project, including the potential funding sources and whether the community would consider contributing towards the project (either financially or in-kind i.e. through offers to provide land, equipment or help with maintenance in the future). These discussions were extremely important to ensure the expectations were not unreasonably raised within the community in relation to delivery of any scheme.

A follow-up letter was then sent to all residents, affected landowners and the Parish Council in order to provide the details of proposed options and request any formal feedback to the options presented. A total of four formal responses were received.

3. Refinement of options

The outline options, plus others recommended by the community, were refined into three options. These options were deemed to have no significant constraints, determined through the consideration of additional information such as CCTV surveys, further assessments of topography and further drainage information. The designs of the three options were then refined, and the costs of construction and maintenance of each option estimated and compared to the financial value of the benefits that may be realised if the option was to go ahead.

The three refined options for Grafton Underwood were:

Option A – Installation of a non-return valve on a culvert in the garden of one property.
Option B – Diversion ditches to the east of the village.
Option C – Property Level Resiliance to properties with a history of flooding.

4. Cost/Benefit analysis

A comparison of the costs and benefits of each option provides an assessment of the viability of each option. The financial value of any contributions offered by the community during the engagement was calculated based on the discussion had on the COV and provided in the formal consultation and was included in the analysis. This determined which of the options would be most viable, and how much additional contributions would be required to make the other options viable, in terms of obtaining Flood and Coastal Risk Management Grant in Aid (FCRM GiA) (the funding mechanism available to NCC to secure funding for flood alleviation schemes).

The costs were calculated based on the Spon's Civil Engineering and Highway Works Price Book 2014[1] and the Environment Agency's Long Term Costing Tool for Flood and Coastal Risk Management[2]. These mechanisms allow for:

- construction costs;
- overheads and other costs including general site prelims, temporary works etc;
- professional fees/associated costs (assumed to be 50% of construction costs); maintenance costs (over 100 years); and
- optimism bias (assumed to be 30% of the construction cost)[3].

[1] http://www.pricebooks.co.uk/
[2] https://www.gov.uk/government/publications/long-term-costing-tool-for-flood-and-coastal-risk-management

A 50% uncertainty allowance has also been given for unknown costs such as site investigations, archaeology, compensation etc.

The costs have been calculated assuming that contractors would undertake the works in line with the current guidance for funding applications. However, if some of the proposed works are undertaken by the landowner/Parish Council then the costs would be reduced as they may already have the appropriate machinery on site or could, for example, provide labour at a much reduced rate compared to a contractor. The relative costs of the works offered to be undertaken by the community members have been included as a 'contribution in kind'.

The benefits are calculated by assessing the difference in the financial value of damages that would occur as a result of a flood before the works are in place and after the solution has been implemented. The method used is called the Weighted Average Annual Damages approach as outlined by the Multi-Coloured Handbook 2015[4].

A comparison of the costs, benefits and contributions provides a 'Partnership Funding score', which is a measure of the viability of the scheme to obtain FCRM GiA. Table 1 below outlines the option, associated cost and Partnership Funding (PF) score:

Table 1: Option Summary

OPTION	Cost	PF Score
Option A (Culvert non-return valve)	£7,000	104%
Option B (Diversion ditch)	£100,000	22%
Option C (Property Level Resilience)	£41,000	47%
Option A + Option B	£107,000	27%
Option A + Option C	£48,000	55%

5. Preferred option

The preferred option is based on the results of the cost/benefit analysis. Table 1 shows that Option A is the only option that has the potential to attract funding, but it should be noted that this option will only serve to protect one property and therefore will not resolve the majority of the flood risk issue in Grafton Underwood.

The most practicable approach to managing the main source of flooding to the community (surface water run-off from the fields in the east) would be though a series of drainage ditches running along the eastern boundary of the properties (Option B). This must therefore be considered as the ideal solution as it would provide benefit to the wider community rather than just the four properties with a history of flooding. However, this option would require agreement with the land owners which has not yet been forthcoming. If agreement can be sought, then further investigation would be required in order to identify the optimum

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191507/Optimism_bias.pdf
[4] http://www.mcm-online.co.uk/handbook/

alignment, and the most suitable flow route to the watercourse. Alternative funding would also be required to support this option. Currently there are no offers of support from the community and so further consultation regarding the maintenance and construction works could help to make this option more viable.

If landowner agreement cannot be reached then Property Level Resilience (Option C) should be considered further, provided alternative funding could be found. This would provide protection to those properties with a history of flooding, but would have no impact on flooding to the highway, gardens and other areas of the community.

If either Option B or C are progressed then there is benefit in combining them with the implementation of the non-return valve (Option A). This would mean that all four properties with a history of flooding could benefit from the works.

Table 2 is indicative of the additional contributions required to increase the Partnership Funding score to 100% for each of the options. The contributions do not necessarily have to be cash sums; they can also be benefit-in-kind.

Table 2: An indication of the additional contributions required to increase the Partnership Funding score to 100%

OPTION	ADDITIONAL CONTRIBUTIONS REQUIRED (PF SCORE = 100%)	POTENTIAL BENEFIT-IN-KIND
Option A (Culvert non-return valve)	Already over 100% with contributions - additional contributions would improve the chances of funding	
Option B (Diversion ditch)	£74,000	Majority of the construction works would be required.
Option C (Property Level Resilience)	£12,000	Majority of the construction works would be required.
Option A + B	£73,000	Majority of the construction works would be required.
Option A + C	£12,000	Majority of the construction works would be required.

For Option A alone:
The total cost has been assessed to be **£7,000**.

To date, the value of contributions offered is **£0**.
The Partnership Funding score is therefore **104%**.

For preferred Option B, in combination with Option A:
The total cost has been assessed to be **£107,000**.
To date, the value of contributions offered is **£0**.
The Partnership Funding score is therefore **27%**.

For Option C, in combination with Option A:
The total cost has been assessed to be **£48,000**.
To date, the value of contributions offered is **£0**.
The Partnership Funding score is therefore **55%**.

6. Technical Report and Lessons Learnt Report

The outputs required by Defra for the Pathfinder Project are a Lessons Learnt report summarising the project and the lessons learnt in terms of the process, and any accompanying tools that other authorities can use should they wish to repeat the process for other communities. These outputs are now available online at http://www.floodtoolkit.com/how-to-guides/run-partnership-scheme/ > How to run a small scheme pathfinder project.

The Technical Report covering the options analysis process is not a required output, but has been prepared by the project team in order to provide a suitable business case for potential funding bids.

Next Steps for Grafton Underwood

The next phase for Grafton Underwood involves re-engaging with the community with the results of the project and in particular consulting with those who were not involved or did not engage in the previous round of consultation (such as additional landowners).

The 2016 deadline for submitting bids for FCRM GiA funding was June 2016. Therefore to ensure the momentum of this project, NCC submitted a bid to the Environment Agency based on the Option C in combination with Option A, and the contributions offered to date. There will be plenty of opportunity to revise the bid as costs are developed or if the next phase of community engagement reveals an alternative option that is preferred by the community, or if landowner constraints limit the feasibility of the option put forward.

Due to the agreed 6-year programme of works, there is no guarantee that the project will be allocated any funding within the next 6-years to 2021. However the bid submitted by NCC indicated that preference would be for the project to commence at an earlier date (2020) if funding is available. The lower the value of the bid, and the higher the Partnership Funding (PF) score, the more likely it is for funding to be accelerated to within the 6-year programme.

The Environment Agency will not be able to confirm whether or not the bid has been successful, and if so what year funding has been allocated, until October 2016 at the earliest. The project may only be partially funded by GiA at this point, and therefore the community may need to consider the alternative funding options set out below, in order to fill any gap in the funding.

Only once confirmation of funding availability has been received can NCC progress with the detailed design, undertake further community engagement to confirm contributions and maintenance agreements, and eventually implement works on the ground.

Potential Funding Options

The following section provides further information about the various funding options that may be available to support a scheme in Grafton Underwood. It should be noted that the main mechanism for funding these projects is Flood and Coastal Risk Management Grant in Aid, however due to the potentially lengthy timescales involved in obtaining funds through this process, the community may prefer to wholly or partially fund the project through alternative means.

Flood and Coastal Risk Management Grant in Aid (FCRM GiA)

Defra has the national policy responsibility for Flood and Coastal Risk Management (FCRM) and provides funding through Grant in Aid (GiA) to the Environment Agency, who then administers grants for capital projects.

The approach to funding capital projects aims to encourage communities to take more responsibility for the flood risk that they face, and aims to deliver more benefit by encouraging total investment to increase beyond the levels that Defra alone can afford.

The level of funding available through FCRM GiA is related directly to benefits (in terms of the number of households protected), the damages being prevented, plus other scheme benefits such as environmental enhancements, amenity improvement, agricultural productivity and benefits to business.

Local contributions raised towards a project will help release the FCRM GiA by demonstrating community ownership of the project. These contributions can be either money towards the scheme, or a benefit-in-kind e.g. a landowner offering to undertake part of the works.

Under this system some schemes may receive complete funding, if the benefits significantly outweigh the costs, however for most schemes only partial funding would be available, with the gap needing to be filled by other sources.

The Partnership Funding score gives an indication as to whether the option has met the threshold for potential FCRM GiA funding. A score of less than 100% means that further contributions will be required or revisions made to the scheme to reduce the costs. A score of greater than 100% means that the scheme could go onto the list of potential schemes for funding, but it does not guarantee funding. Schemes on the funding list then require approval from the Environment Agency. The greater the additional contributions that can be secured, the greater the resulting PF score, and therefore the greater the scheme's chances of obtaining an FCRM GiA allocation.

Local Levy

Local Levy funding is a locally-raised source of income, gathered by way of a levy on Local Authorities and collected via the council tax. The levy is used to support (with the approval of

the Regional Flood and Coastal Committee) flood risk management projects that are not considered to be national priorities and hence do not attract national funding through FCRM GiA. Local Levy funding can also be applied to FCRM GiA projects, at the discretion of the Regional Flood and Coastal Committee, to meet the partnership funding requirements.

Section 106

This is a contribution from developers, linked to specific developments and the infrastructure required to make them acceptable in planning terms. Its use is very specific to the issue being addressed and is negotiated separately for each development. It can be used to pay for flood defences that specific developments need in order to be safe and so acceptable in planning terms. These flood defences can however be designed to also benefit the local area and therefore become part of a wider mitigation scheme.

Community Infrastructure Levy (CIL)

This is a locally agreed sum levied upon developers. Once combined over time, large sums of money could potentially be raised. It is flexible in its approach as local authorities can adjust spending plans to meet priorities. Local authorities are required to use this funding for infrastructure needed to support the development. It can be used to construct new infrastructure, increase the capacity of existing infrastructure or repair failing existing infrastructure including flood defences.

Parish Precept

Parish precept can be raised for projects that improve the quality of the area. Parish precepts are typically used for maintenance of playing fields, recreation grounds, village halls, car parks, footpaths, etc. The Parish Council can also spend money on anything that they consider would be a benefit to the community that is not covered by their specific responsibilities. This could include raising funds for flood risk management purposes.

Northamptonshire – Empowering Councillors and Communities Scheme

Northamptonshire County Council grants a small amount of funding a year to each councillor to spend within their electoral division. Councillors can fund large or small schemes or activities of benefit to local people and the local community, as well as supporting local voluntary and community organisations.

Riparian Owner/Landowner Funding

Landowners in some circumstances may be willing to contribute funds to FCRM maintenance where they can see a direct benefit to reducing their flood risk or improving their land drainage. In certain circumstances local interest groups may step in to fund FCRM where there is no available funding from public bodies.

People's Postcode Lottery – Dream Fund

Grants are available for local voluntary and community organisations for projects and activities that benefit local people and the local community. Projects must be innovative and applications must meet one or more of the following funding themes:

- Early child development;
- Helping refugees in our community;
- Conserving our marine environment;
- Reconnecting with the natural world; and,
- Engaging people with arts' culture and heritage

Reaching Communities England

Reaching Communities funding is for projects that help people and communities. The fund can cover salaries, running costs, a contribution towards core costs and equipment, or up to £100,000 for land, buildings or refurbishment capital costs. Grants are available from £10,000, upwards and funding can last for up to 5 years.