

CHARNWOOD BOROUGH COUNCIL

QUENIBOROUGH FLOOD ALLEVIATION SCHEME

PROJECT APPRAISAL REPORT

FEBRUARY 2004



LAND DRAINAGE ENGINEERING

TECHNICAL SERVICES

SOUTHFIELDS

LOUGHBOROUGH

LEICS

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1. BACKGROUND

INTRODUCTION

The village of Queniborough is located approximately 13km south east of Loughborough on the outskirts of Syston. The Queniborough Parish Dyke, a tributary of the River Wreake, drains a catchment of approximately 90ha in total as shown in Figure 1 below.

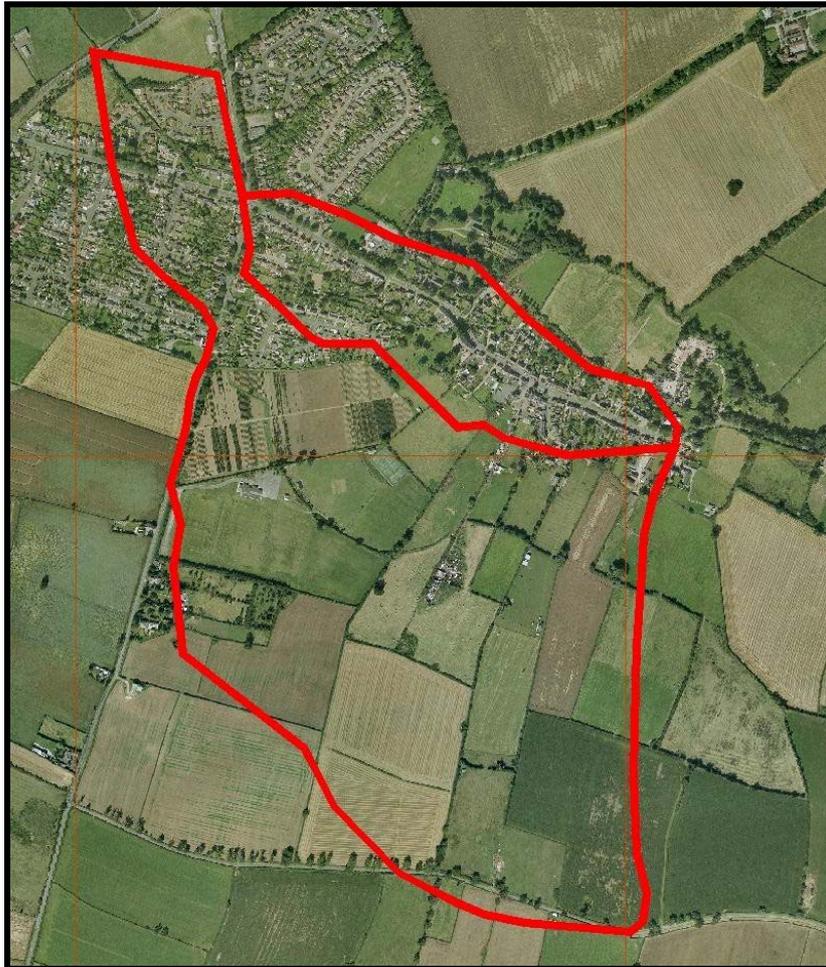


Figure 1- Catchment Plan

The northern most area of 17ha is entirely urbanised, however, the southern area is predominantly rural.

The Council is the Operating Authority and has a power, but not a duty, under The Land Drainage Act 1991 to maintain ordinary watercourses, but it can serve notice to execute maintenance. The DEFRA High Level Targets also require the Council to undertake inspection of all critical ordinary watercourses but the Targets do not require the Council to act where problems are identified.

In 2000 the council, by virtue of the powers and authority vested in them by Section

66 of the Land Drainage Act 1991, promulgated the Land Drainage Byelaws which were considered necessary to secure the efficient working of the drainage system in the District.

The Queniborough Parish Dyke is an “Ordinary Watercourse” as defined under the Land Drainage Act 1991. In 2001 parts of the Queniborough Parish Dyke were designated a ‘Critical Ordinary Watercourse’ in consultation with the Environment Agency under the DEFRA High Level Targets. A Critical Ordinary Watercourse is defined as a length of ordinary watercourse, where there is a flood risk to at least 25 housing equivalents per kilometre of one bank

As a result of the DEFRA Funding Review, it was anticipated that the ‘Critical Ordinary Watercourse’ from Barkby Road to Melton Road would be en-mained (i.e. it would be given Main River status as opposed to it’s current ‘Ordinary Watercourse’ status). Subsequent discussions with the EA have indicated that the Parish Dyke will now not be en-mained and will continue with its Ordinary Watercourse status.

PREVIOUS HISTORY

Heavy rainfall on the night of 15/16th January 1999 caused severe flooding due to the overtopping of the Queniborough Parish Dyke. The areas affected are indicated in Figure 2.

Prior to January 1999 little maintenance had been carried out on the watercourse either by riparian owners or Charnwood Borough Council, however, following the January 1999 event the council arranged for an inspection of the whole of the watercourse from Coles Nursery to Melton Road culvert and the removal of any obstructions.

It is understood that the Barrow upon Soar RDC culverted the watercourse between Coles Nursery to Syston Road, Charnwood Borough Council, as the current Operating Authority, have accepted responsibility for the maintenance of all but the ‘highway bridges’, perpendicular road crossings, which are the responsibility of Leicestershire County Council.

Riparian owners are responsible for maintenance of the remainder of the brook., including the culverted section at Wetherby Close which the Environment Agency confirmed had not been consented.

The Council carried out improvements to the existing inlet grillages at Coles Nursery and Wetherby Close after the 1999 event but prior to commencement of this study.

CURRENT FLOOD RISK STRATEGY

In addition to the improvement works carried out as detailed above, the Council has initiated a strategy to minimise the flood risk as follows: -

1. Promulgated Land Drainage Byelaws, which came into force on the 6th April 2000, to assist in the enforcement of the Land Drainage Act 1991.
2. Undertaken Regular Inspections with a view to advising riparian

owners of action required. The flood risk is exacerbated by encroachment, lack of maintenance of banks/retaining walls and dumping of rubbish. Following recent inspections the Council has requested riparian owners to improve maintenance of brook reaches down stream of Melton Road.

3. The action of the riparian owners and encroachment had made previous informal visits by the Land Drainage Gang less sustainable or effective. A copy of the “Joint Report of the Head of Legal and Democratic Services and the Head of Technical Services, Item 4 Flooding in the Borough Ordinary Watercourses Maintenance and Management Review” submitted to Cabinet, on the 10th April 2003 is enclosed as Appendix A. This item referred to these problems and the Cabinet approved Maintenance regime is restricted to the following: -

“All flood defence assets installed and or adopted by the Borough Council or its preceding operating authorities under the Act or preceding acts.

All watercourses where the council is riparian owner or through conveyance of land the Council retained the duty.

All watercourses or flood defence assets where an operating authority such as the County Council or the Environment Agency employs the Council at cost.

Watercourses where a Town or Parish Council, within the Borough, has public a open space or an amenity area next to a watercourse and is therefore a riparian owner similar to the Borough Council in Loughborough. Examples are the watercourse in the Glenmore Park at Shepshed or the Fishpool Brook in Barrow-upon-Soar.

Watercourses within the Borough, where there are no clearly defined riparian owners and the Borough Council has historically maintained the watercourse. Examples are the Rearsby Brook and Sileby Brook in the village centres, Brookside, Syston and Brook Street, Wymeswold, but in does not follow there is a responsibility for supporting the public highway or other infrastructure assets.”

4. Emergency action will also continue to be undertaken to remove major obstructions reported by the Parish Council, Flood Wardens and the public.
5. The Council will continue to monitor the watercourse and inspect the whole of the brook in Queniborough at regular intervals, which is part of the Council’s Policy Statement on flood defence under DEFRA High Level Targets.
6. The Council has implemented an early flood warning system. A high level alarm installed at Barkby Road has telemetry links to warn of

high water levels in the Queniborough Parish Dyke.

NEW DEVELOPMENT & PPG25

In July 2001 the DTLR issued Planning Policy Guidance Note 25 (PPG25). This introduced the sequential tests and the risk based approach to flood risk and development. Development priorities are to be based on flood zones as outlined in PPG25.

The responsibility for determining whether land is suitable for a particular development proposal rests with the developer. In particular, the developer is responsible for: -

- ❑ Determining whether any proposed development will be affected by flooding and whether it will increase flood risk elsewhere; and
- ❑ Satisfying the local planning authority that any flood risk can be successfully managed with the minimum environmental effect to ensure the safe development and secure occupancy of any site.

It is in the developer's interests to deal with these matters, since they may well affect the value of land and the cost of developing it, as well as any future liability for adverse impacts leading to flood damage elsewhere in the catchment.

| <i>Flood Zone</i> | <i>Flooding Frequency</i> |
|-----------------------------------|---|
| Zone 1: Little or No Risk | Annual probability of flooding <0.1% (1 in 1000 yr) |
| Zone 2: Low to Medium Risk | Annual probability of flooding 0.1% to 1.0% (1 in 1000 to 1 in 100yr) |
| Zone 3: High Risk | Annual probability of flooding, with defences where they exist, 1% or greater (<1 in 100yr) |

Table 1- PPG25 Flood Risk Zones

The Land Drainage Engineering Section currently monitor all planning applications for proximity/sensitivity to watercourses and, in conjunction with both PPG25 and the Environment Agency, require all such new developments to be carefully managed with respect to flood risk. A recent development on Wetherby Close allowed the Council the opportunity to improve the watercourse between Wetherby Close and Melton Road at the developers cost funded by a S106 Agreement.

2. DESCRIPTION OF THE PROBLEM

AREA UNDER CONSIDERATION

Heavy rainfall on the night of 15/16th January 1999 caused flooding due to the overtopping of the Queniborough Parish Dyke. The areas affected are indicated in Figure 2.



Figure 2 - Area Affected 1999 Event

The scope of this report covers the watercourse from Coles Nursery, Barkby Road to Melton Road culvert.

EXISTING CONSTRUCTION

The lengths of natural open watercourse construction are approximately 0.75m deep x 1.5m wide trapezoidal natural channels. The culverted lengths within the public highway vary from 450-600mm diameter pipes. The unconsented culvert in Wetherby Close is 375mm diameter pipe.

STRUCTURAL ASSESSMENT

Since 2000 Charnwood Borough Council has carried out periodic inspections of the watercourse in order to comply with the DEFRA High Level Targets. Currently no locations have been identified as having serious structural degradation. Charnwood Borough Council, in conjunction with Leicestershire County Council, have subsequently arranged for the Melton Road culvert to be desilted and riparian owners downstream have been contacted in respect of their own responsibilities. The Wetherby Close unconsented culvert and the culverts in Syston Road/Barkby Road have been inspected using CCTV (closed circuit television camera) and were found to be in good structural condition despite being heavily silted. Regular jetting has restored and maintained the full hydraulic capacity. See Figure 3 for location details.



Figure 3-Culvert & Grillage Locations

HYDRAULIC ASSESSMENT

The Council instigated a feasibility study of the existing watercourse following the flooding events in 1999.

Modelling confirmed that the severity of flooding reported in January 1999 was partly attributed to a blockage of the grillage at Coles Nursery, severe restriction in capacity of the culvert section in Wetherby Close due to siltation downstream and a fence at the entrance to Wetherby Close culvert. See Figure 3 for location details.

If the highway culvert under Melton Road becomes obstructed it constitutes a flood risk for properties in the Wetherby Close area although the football field is able to store any out of bank flooding.

Provided the watercourse is well maintained, hydraulic modelling indicates that the actual critical bank full flow is less than the 1 in 20 year return for the majority of the watercourse although internal flooding of properties will not occur until flows exceed the 1 in 100 year return.

DO-NOTHING SCENARIO

The open sections of the watercourse are generally natural earth channels and without regular maintenance can rapidly become overgrown. The culverted watercourse within the highway boundary generally consists of an artificial concrete pipes, whilst receiving little maintenance other than regular removal of silt/debris, it is unlikely to degrade to the same extent as the natural sections. Lack of regular maintenance on the natural channels will inevitably result in a significant degree of over-topping during even very minor storm events, giving rise to flooding of residential and commercial property in the Wetherby Close and Glebe Road areas. After several years of ‘Do Nothing‘ the result could be a partial blockage within any of the culverted sections. The flood risk would be equivalent to that existing in 1999.

AIMS AND OBJECTIVES

Government policy for flood and coastal defence is set out by the Ministry for Agriculture Fisheries and Food (MAFF) in its *Strategy for flood and coastal defence*, which aims to reduce the risks to people and the developed and natural environment from flooding by:

- 1) Encouraging the provision of adequate and cost-effective flood warning systems,
- 2) Encouraging the provision of adequate and technically, environmentally and economically sound and sustainable flood defence measures,
- 3) Discouraging inappropriate development in areas at risk from flooding.

The main aims and objectives for a flood alleviation scheme in Queniborough may be summarised as follows:-

- 1) Reduce the risk of flooding to residential and commercial property in both the Glebe Road & Wetherby Close areas.
- 2) Be acceptable technically, environmentally and economically.

3. BENEFITS AND IMPACTS

GENERAL

The main objectives of a flood alleviation Scenario for Queniborough may be summarised as follows:

1. Reduce risk of flooding to people and property in the village.
2. Avoid increasing the risk of flooding elsewhere.
3. Be acceptable technically, environmentally and economically.

VALUATION OF BENEFITS

J.B. Chatterton & Associates (JCA) was appointed by the Head of Technical Services of Charnwood Borough Council to undertake a benefit/cost appraisal.

SUMMARY OF BENEFIT/COST ANALYSIS

Several Options were considered including enlargement of the existing culverts and flood storage, however, the following is reproduced from the report produced by J B Chatterton: -

“The summary illustrates the fragility of the scheme in economic terms. As indicated above there are no benefits from implementing a more rigorous maintenance regime, and the benefit cost ratio for culvert replacement is somewhat less than unity (0.75:1). If the garden damages were doubled for both the Do Nothing and culvert replacement scenarios then the benefit cost .ratio just nudges above 1: 1 (1.05).”

DEFRA PRIORITY SCORING

The DEFRA scoring summary is set out below:

| | |
|--------------------|----------------|
| Economics | 0 |
| People | 8.00 (0 DEFRA) |
| Environment | 0 |
| Total score | 8 |

DEFRA scoring using their interactive spreadsheet gives zero points as it is assumed that if economics is less than 1: 1 (i.e. zero points) then people is automatically zero too, although with some 15 out of 18 properties directly benefiting from the scheme, even though the economics score is at best extremely shaky, a people score of 8 should be considered. Nevertheless with a social deprivation index of 6,926 it might be argued that public money should not be spent on minor garden flooding with little stress or anxiety attached to these minor flood events.

At the time of production of this report the DEFRA total score requirement for

2004/5 is 20 and for 2005/6 is 10.

4. CONCLUSION & RECOMMENDATION

CONCLUSION

It is concluded that: -

1. The project be deleted from the Councils Capital Programme for flood alleviation. as no scenario for a flood relief project will achieve a favourable benefit/cost ratio and DEFRA Priority Score that will justify promotion of a scheme to DEFRA. Even modest or minor improvements to the watercourse will not generate a Priority Score above 10.
2. Benefit/Cost analysis indicates the current maintenance and enforcement regime is extremely cost effective with significant hydraulic benefits and must be continued. If this regime is not continued at its present level the watercourse will deteriorate and performance will fall to a level similar to that which existed during the event in January 1999.
3. Leicestershire County Council, in conjunction with Charnwood Borough Council, should install a correctly designed and consented grillage at the entrance to the Melton Road culvert.

RECOMMENDATION

It is recommended that: -

4. The project is deleted from the Councils Capital Programme for flood alleviation.
5. The existing maintenance and enforcement regime is continued as confirmed in Cabinet Minute 345 dated 10/04/03
6. The County Council be advised of the need to install a correctly designed and consented grillage at the entrance to the Melton Road culvert.