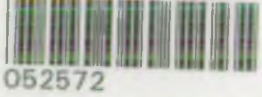
NATIONAL ASSOCIATION OF FLOOD DEFENCE CHAIRMAN VISIT TO THE MAIDENHEAD, WINDSOR & ETON AND COLNE FLOOD ALLEVIATION SCHEMES ON 1 MAY 1991



MAIDENHEAD, WINDSOR AND ETON FLOOD ALLEVIATION SCHEME

NATIONAL ASSOCIATION OF FLOOD DEFENCE CHAIRMEN

VISIT TO THE PROJECT SITE ON 1 MAY 1991

This short paper has been prepared for the Chairmen's visit to the route of the proposed Flood Alleviation Channel.

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NRA Project Office
Taplow House, Clivemont Road
Maidenhead, Berks SL6 7BU

April 1991

MAIDENHEAD, WINDSOR AND ETON FLOOD ALLEVIATION SCHEME

"THE COACH ROUTE" - ACCOMPANYING NOTES

The map on page 2 indicates the route planned for today's visit. Brief descriptions of the numbered points of interest are included below to supplement the detailed commentary provided during the site visit.

1. West bank channel
Also known as the Maidenhead Ditch, the downstream section of this channel was enlarged as a flood relief channel for central Maidenhead following localised flooding in the 1950s. Some improvements to this channel are planned as part of the Scheme.

2. Clappers Stream
This non "main river" watercourse outfalls into the River Thames downstream of Boulter's Lock. During February 1990, floodwater levels overtopped the road and caused severe local flooding.

3. Taplow intake
The intake structure to the Flood Alleviation Channel will be located here. An interesting feature is that two of Thames Water Utilities' deep abstraction boreholes will be incorporated into the intake structure. Flows into the Channel will be controlled by a series of gates.

4. The A4 crossing
The Channel will cross under the A4 at this point, passing through the vacant plot on the south side and through box culverts under the railway embankment. Because of the restricted working area, the Channel will narrow to 25 metres in this reach.

5. Marsh Lane bridge over the M4 motorway
A convenient vantage point for viewing the route of the Channel.

6. Manor Farm sludge spreading area
The Channel will pass through this area of Thames Water Utilities' land. Substantial landscaping works and environmental enhancements are proposed in this area.

7 & 8. Eton College playing fields & The Myrke
Particular attention will be paid to the environmental treatment to be applied to this unique area.

9. A332 slip road off Windsor Relief Road
A good vantage point for viewing the route of the Channel, and the area of the proposed gravel processing plant conveniently boxed in by embankments to minimise noise and disruption.

MAIDENHEAD, WINDSOR AND ETON FLOOD ALLEVIATION SCHEME

SOME BACKGROUND NOTES ON THE SCHEME

Introduction

The towns of Maidenhead, Windsor and Eton and nearby villages have a long history of flooding from the River Thames. The flooding during February 1990 clearly highlighted the existing problems.

Since 1983, engineering and environmental consultants have been engaged to study the problem and to propose options for flood alleviation. The decision was made during January 1989 to promote a specific Scheme for the flood alleviation of Maidenhead to provide protection to a minimum 1 in 65 years standard; this represents a flood flow of 515 cumecs. In March 1989, the Thames RLDC agreed to extend the Scheme to provide similar protection to Windsor and Eton.

Scheme description

In broad terms, the Scheme comprises a new flood relief channel on the east bank of the River Thames, some localised bank raising near to the river and improvements to the existing flood relief channel through Maidenhead. These are illustrated on page 5.

The Flood Alleviation Channel

The principal element of the Scheme is the proposed 11.5 kilometres long Channel on the east bank. It will leave the River Thames just upstream of Boulter's Weir, Maidenhead, via the existing Taplow Mill leat, to rejoin the river just downstream of Black Potts railway bridge, east of Windsor. In scale the Channel will appear almost as a second River Thames.

The Channel will carry 215 cumecs (42% of the flood flow) during a 1 in 65 years event. In conjunction with the proposed embankment works, the remaining 300 cumecs (58% of the flow) will be carried by the river and existing west bank channels, relieving property from flooding up to the design standard. It is anticipated that the Channel will only be operated during potential flood events, although a sweetening flow will otherwise be maintained and the channel will remain as a natural river.

Wherever possible the Channel has been routed to avoid sensitive areas, and as a result considerable opportunities exist for enhancement of the environment, consistent with the engineering requirements. To achieve as natural an appearance as possible, the Channel will be of irregular section with islands where appropriate. The working area will be landscaped and the banks and margins selectively planted to promote conservation of wildlife. Outline proposals for these enhancements are illustrated on page 5. Water levels within the Channel will be controlled by low weirs in order to maintain existing groundwater levels.

Structures

The Channel will cross the M4 motorway, several roads (both trunk and local) and three railway lines. Major structures will be necessary at all these crossing points which, together with the associated service diversions, represent the major cost element of the Scheme. Several footbridges will be necessary to provide continuity for severed footpaths.

Spoil disposal

Whilst the finished Channel will be a quiet and pleasant addition to the local scene, its construction will cause considerable local disturbance for a limited period of time. The major challenge will be the removal of excavated material, principally gravel, from the site. The majority of this material will be taken directly along the line of the channel to the M4 via Junction 6; material from the two end sections will be removed by barges on the Thames. This will avoid any use of minor roads for other than local construction traffic.

Sale of the minerals will significantly assist in offsetting the cost of constructing the channel.

Current status

The planning applications were submitted to the three District Planning Authorities in January this year, but they will be determined by the two County Authorities because the Scheme involves considerable mineral working. Should the Scheme receive planning appproval as anticipated then construction work will start in Autumn 1992 and should be completed by 1996.

The estimated overall cost of the Scheme is £58M (91/92 prices). This sum, currently under review, includes all pre-planning approval and feasibility costs as well as construction and implementation costs. However, as the pre-planning expenditure (£4M) is termed a sunk cost and cannot be included in the benefit:cost calculations, the implementation costs are actually estimated at £54M (£46M construction works costs, £8M design and contract supervision costs). The cost of the flood damages avoided during the life of the Scheme, excluding intangible damages, is estimated to be in excess of £54M.

The Scheme is designed to alleviate flooding for about 5500 properties, benefiting some 12,500 people.

PR Office Copy

PROTECTING YOUR HOMES

QUAGGY RIVER IMPROVEMENT AND FLOOD ALLEVIATION WORKS

AS EXISTING

PROPOSED WORKS

LOOKING UPSTREAM AT WEARDALE ROAD

AS EXISTING

PROPOSED WORKS

LOOKING DOWNSTREAM FROM THORNWOOD ROAD

NRA
Thames Region

PROTECTING YOUR HOMES

For some time now we have been working on a scheme to improve the level of flood protection to homes and properties along the Quaggy River. We have had studies carried out by environmental experts and structural engineers and have consulted the local authorities concerned.

It is clear that any work we carry out will have an impact on the area during construction and thereafter. We have taken this opportunity to explain why work is necessary, what has been done so far and our future plans.

This leaflet is concerned with the 3km (2 mile) length of the Quaggy River between Clarendon Rise, Lewisham and Kidbrooke Park Road, Greenwich.

WHO ARE WE?

Responsibility for the area's flood defences passed to the Thames Region of the National Rivers Authority on 1 September 1989.

The NRA is an independent public body charged with safeguarding and improving the natural water environment. Alongside flood defence, we are responsible for regulating rivers and groundwaters, protecting and improving fish stocks and promoting water based recreation of all types. In carrying out our flood defence functions we are committed to improving wildlife habitats and conserving the natural environment wherever possible.

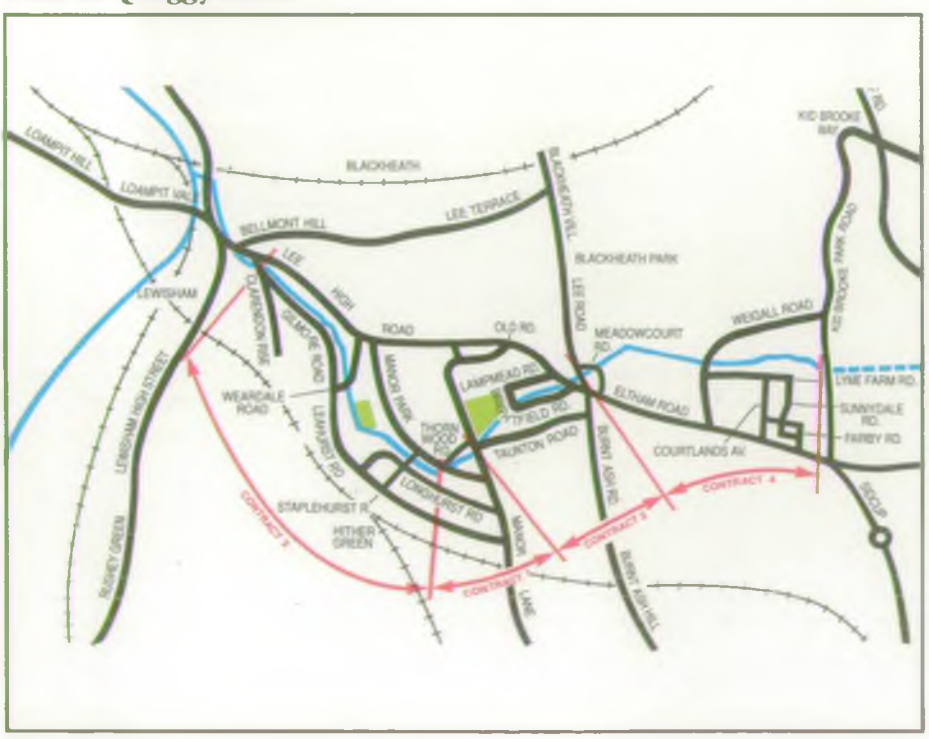
THE QUAGGY RIVER

The Quaggy River is a tributary of the River Ravensbourne. It rises as the Kyd Brook in Bromley and flows over a length of 13km (8 miles) through Bromley, Greenwich and Lewisham to join the River Ravensbourne at Loampit Vale. The River Ravensbourne joins the Thames at Deptford.

FLOOD RISK

Although serious flooding has not occurred in recent years properties along this length are still at risk.

Plan of Quaggy River



Failed wall – looking downstream from Staplehurst Road

Our estimates show that a significant flood would effect approximately 364 properties and cause damage in the region of £6.7 million. In addition to the damage to homes, shops and offices roads would become impassable and telephone lines disrupted. Of course the estimated damage does not take into account the effect on resident's well being and the stress they will inevitably suffer.

THE SUGGESTED SCHEME

Most importantly, we must increase the river's capacity to carry away excess flood water. This means widening and deepening the channel in places. Also many of the walls and banks are in a very poor condition and these need to be replaced.

The work needed has been divided into four lengths which will be carried out as separate contracts.

CONTRACT ONE

This Contract extends from Manor Park to Manor Lane and is under construction. Work on this length has been carried out in advance because of the serious collapse of part of the river wall. The new walls are constructed of concrete and faced with brickwork to blend in with the surrounding buildings. The bed of the river will be covered with 300mm (12 in.) of stone. Landscape works are due to

commence soon and the whole Contract will be completed by Spring 1990.

CONTRACT TWO

This will extend from Clarendon Rise to Manor Park road bridge. Over most of this length we need to deepen the channel. Because of the limit on available space the channel will be constructed of concrete with stone covering half of the channel bed width. The walls will be partially faced with brickwork and will extend up to ground height or finish at a lower level with a sloping earth bank above. It is recognised that a considerable number of mature trees will be lost, however we will be replanting trees and shrubs as part of the landscaping scheme.

For a 200m length in the region of Staplehurst Road bridge the capacity of the channel is adequate although the existing walls are in a poor state of repair. This length

Looking downstream from Lee Road.

could be excluded from the works but owners which back onto the river should be aware that if collapses do occur they could be responsible for the cost of repairs themselves. This could run into thousands of pounds.

Within Manor Park itself we have opportunity to provide environmental improvements by constructing a new natural channel thereby creating an island which will form a nature conservation area. Construction of an access bridge and weir, and new landscaping will also improve the park.

Manor Park roadbridge and the footbridge at Weardale Road will also be reconstructed.

CONTRACT THREE

This Contract extends from Manor Lane to Lee Road. The reconstruction of the channel will be similar to Contract Two. For the length between Brightfield Road and Lee High Road it is suggested that the widening be mainly on the Lampmead Road side as site access will be gained from this side and it would allow a screen of trees to be maintained on the left bank adjacent to Brightfield Road.

Within Manor House Gardens the widening will be on one side in order to retain as many trees as possible. The existing weir just downstream of Brightfield Road bridge will be moved downstream into the park. Extensive landscaping will be carried out to enhance the area.

CONTRACT FOUR

Extending upstream from Lee Road to Kidbrooke Park Road the scope of the work is considerably reduced from that of the other contracts.

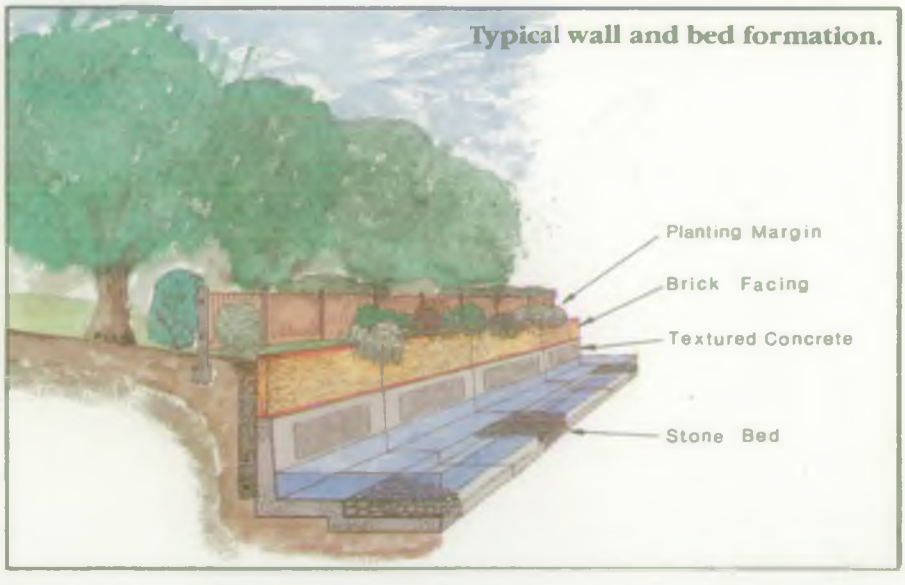
Between Lee Road and Meadowcourt Road both topping up of the existing left bank walls and construction of a new section of right bank wall are required.

Upstream of Meadowcourt Road a natural channel will be maintained and water allowed to spill over onto the sports grounds to provide flood storage. A low brick wall along the boundary will protect those Meadowcourt Road and Lyme Farm Road properties adjacent to the sports grounds. A new natural channel will be established downstream of Kidbrooke Park Road.

WHAT WILL IT LOOK LIKE?

It is our intention to carry out all work in a manner that is sensitive to the local environment and to improve it wherever possible.

In residential and commercial areas lack of space means a lined channel constructed of concrete with a textured finish and brick facing up to ground level. However if property owners are prepared to concede some land, a sloping bank with selected trees can be incorporated into the design. Brickwork will be of similar colours and style to that predominant in the area.



Typical wall and bed formation.

Within the parks there is considerable scope for environmental enhancement by incorporating natural channels with stone beds and landscaping with plants typical of those found next to a river.

The following features of protection and enhancement are included in the scheme:-

- Safety fences and railings at the ends of gardens and exposed places.
- Improved maintenance access by the provision of ramps and access ladders.
- Landscaping of public parks to improve light, access and the natural habitat.
- Landscaping to replace lost trees.
- Reinstatement and landscaping of disturbed land.

CONSTRUCTION AND ACCESS

Inevitably there will be some disruption and noise. However your local authority places strict limits on noise levels and hours during which work can take place and these conditions will be adhered to.

The Contractor's site offices will possibly be located in fenced off compounds within the two parks.

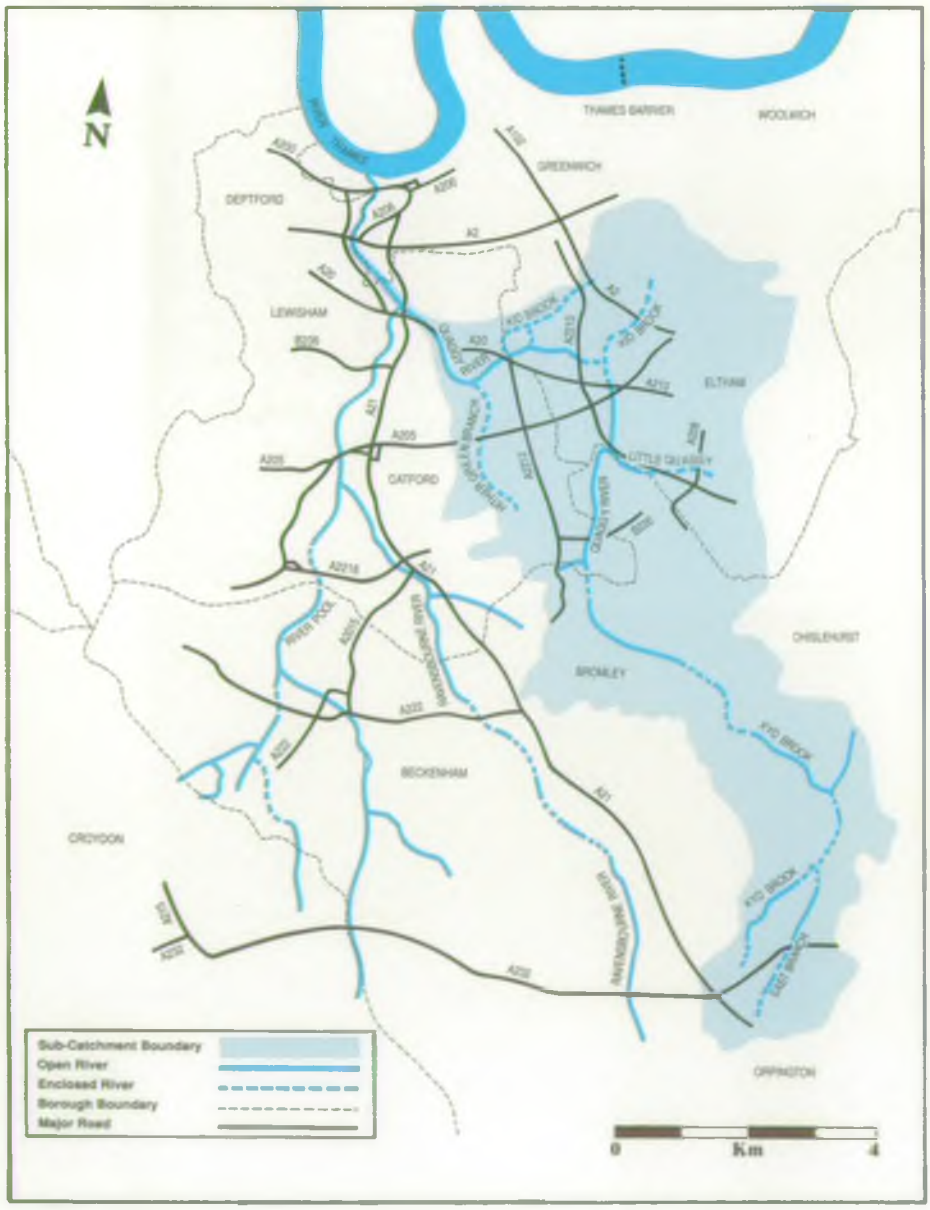
Roads to be used by the Contractor will be agreed with the local authority. Our intention is to restrict routes used by heavy traffic. Access and working space will be required alongside the channel. This will be kept as narrow as possible. Some garden space will have to be used but we will try to keep the disturbance to a minimum. All disturbed land will be reinstated and landscaped.

THE NEXT STEP

Contract One will be substantially complete in spring 1990. We hope to begin work on Contract Two late in 1990 and we expect the contract to last about two years.

Further studies and designs for Contracts Three and Four will be undertaken and we hope to begin work on these contracts in summer 1991. At all stages we will continue discussing the scheme with everyone affected by or interested in it.

Quaggy River catchment.



Please direct all enquiries to:

Mr. A. A. Meadley
Project Leader
National Rivers Authority
Thames Region
10/11 Albert Embankment
London SE1 7TG.

Produced by the Public Relations Department, National Rivers Authority, Thames Region 1990.

1
Trees to be replanted to compensate for those lost from Bucks CC TPO No. 12
Minimal disturbance of existing vegetation

2
Parkland area
Small islands for wildfowl habitat
Major tree replanting to compensate for those lost from Berry Hill garden
Grazed meadow reinstated

3
Extensive reedbeds
Otter beds
"Braided channel" with islands for wildlife and scenic interest
New woodland to enhance existing vegetation and form a "green chain" from Taplow to Dorney

4
5
High quality agricultural land retained
Woodland planting

6a
6b
Herb-rich pasture retained
Marsh fishing along north bank
New footpath under trees along south bank

7
8
Reedbeds and small islands for habitat and scenic value
Increased footpath access through wildlife area
Small islands for wildfowl habitat
Woodland buffer along M4

9a
9b
Channel aligned to edge of Agar's Plough
Sports grounds and running track

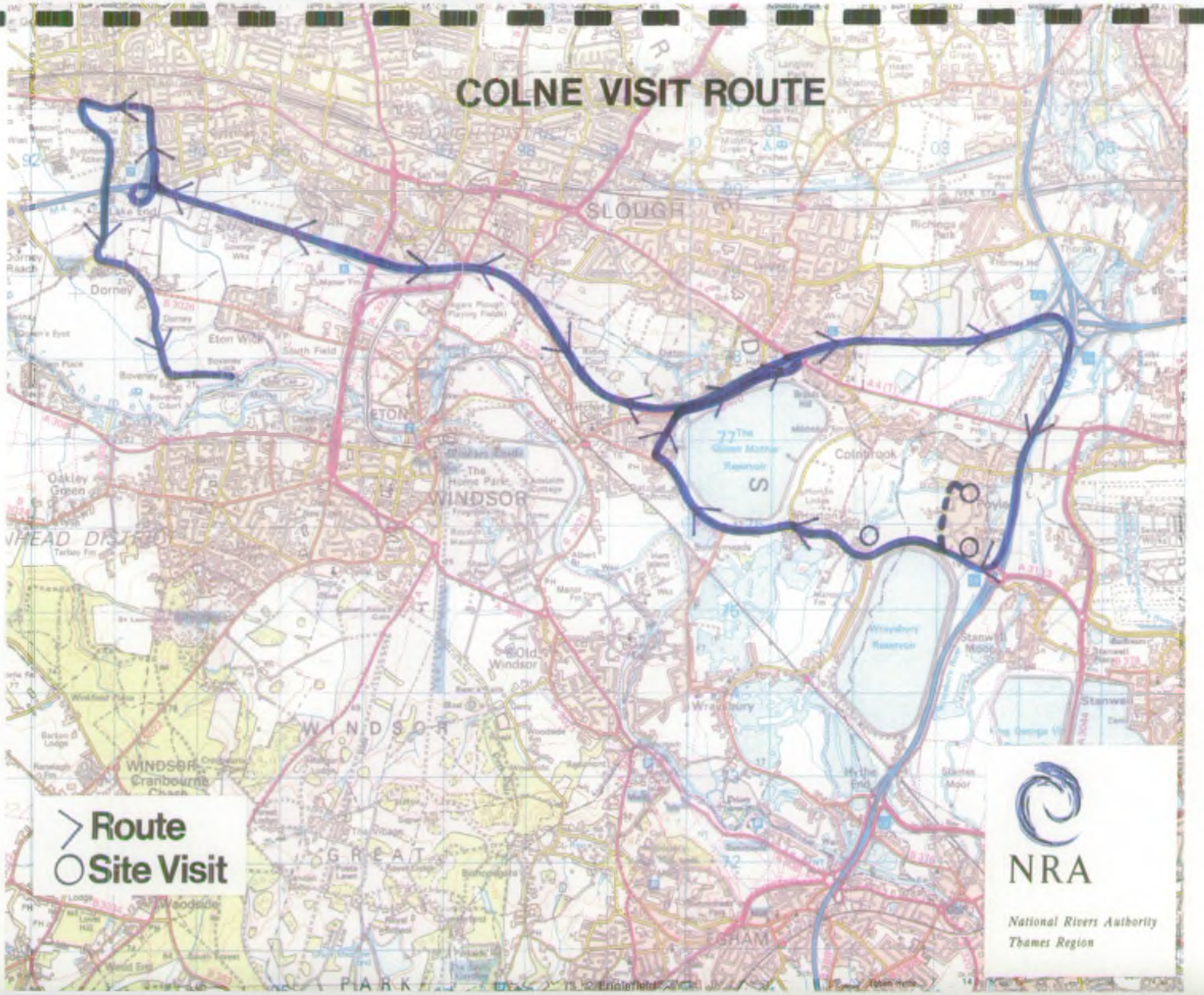
TAPLOW CP
TAPLOW COURT
COOKHAM
MAIDENHEAD
DORNEY
DORNEY CP
ETON
ETON CP
ETON COLLEGE
SLOUGH
CHALVEY
WINDSOR AND MAIDENHEAD DISTRICT
BRAY CP
WINDSOR CASTLE

N

SCALE
1 Kilometre

LEGEND
- PROPOSED FLOOD RELIEF CHANNEL
- RIVER THAMES
- MAN-MADE LAKE
- EXISTING WOODLAND AND TREES
- PROPOSED WOODLAND AND TREES
- PROPOSED REEDBEDS/MARGINAL AQUATICS
- PATH
- APPLICATION BOUNDARY
- RAILWAY
- ROAD
- COUNTY BOUNDARY
- PROPOSED FLOOD DEFENCES

LOWER COLNE SCHEME



NAFDC VISIT TO

LOWER COLNE IMPROVEMENT SCHEME

1 MAY 1991

Background

The Lower Colne river system is located just to the west of London extending from Rickmansworth in the north to the River Thames, at Staines, in the south. The system is complex with 75 km of interconnecting channels involving five main watercourses (River Colne, Colne Brook, Frays River, Wraysbury River and the Poyle Channel) and the Grand Union Canal. Chalk forms most of the upper catchment with clay, overlain with gravel, in the lower reaches. The catchment area of the Colne System is 1016 km^2 of which the Lower Colne forms about 40%.

Early development of numerous mills has given way to gravel extraction, urbanisation and is subject to further development pressures, for example, to the M25 widening and Heathrow Terminal 5. Although the last major flood occurred in 1947 (estimated 1 in 50 year event) it was clear that a repeat would cause extensive damage and disruption to communications.

A study to investigate the problems was undertaken involving mathematical modelling of the system and extensive liaison with interested parties. The latter was particularly important as the system has a very high conservation value which was to be retained as far as possible in any flood alleviation scheme.

For convenience the area was divided into three namely : Area 1 - Rickmansworth to M40; Area 2 - M40 to Main W.R. railway; Area 3 - W.R. railway to Staines.

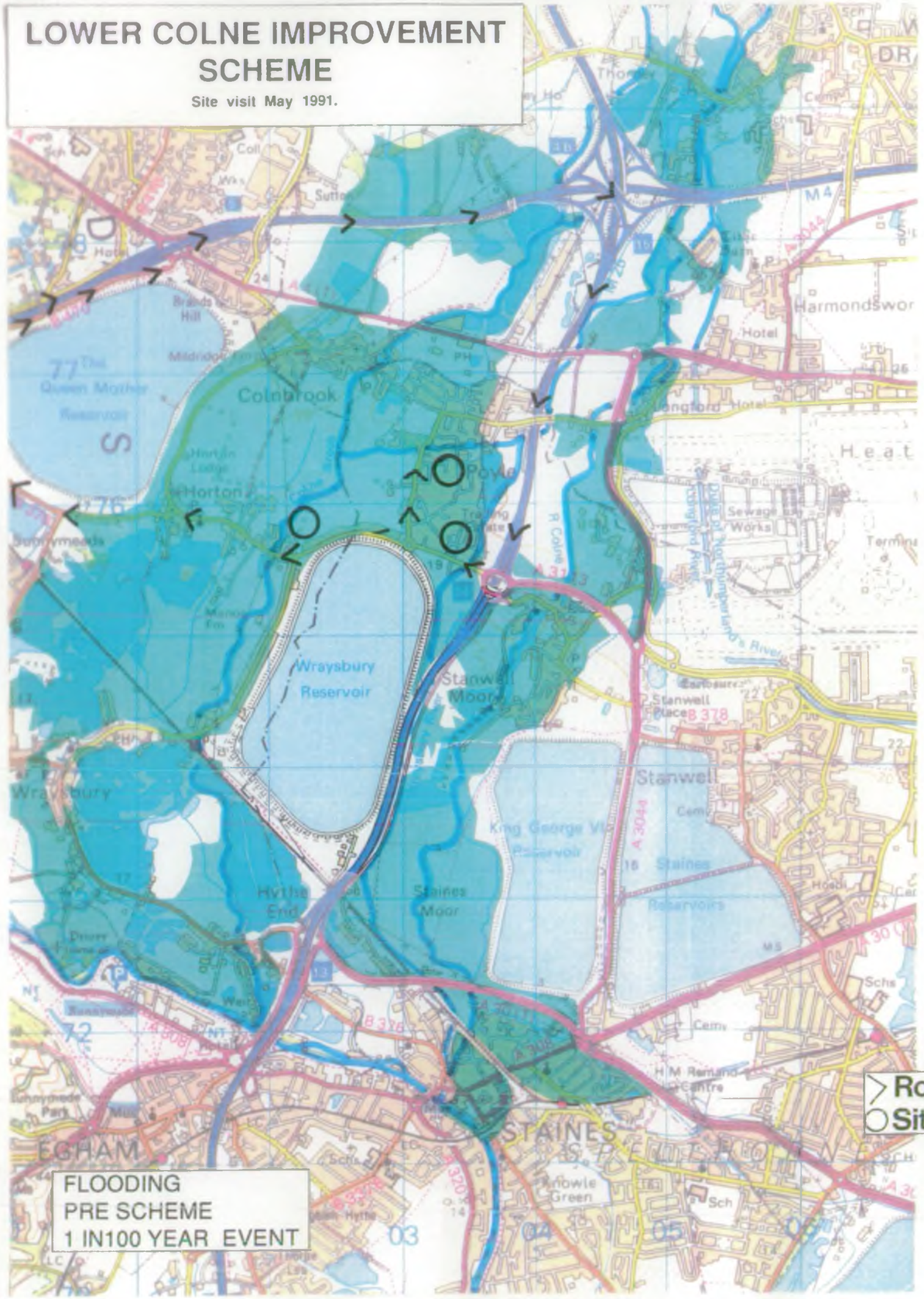
The design strategy was to achieve a 1 in 100 year level of flood protection whilst maintaining the highest environmental standards practicable, using the following principles in decreasing order of priority.

i) Maintain storage where practical
ii) Remove bottlenecks
iii) Transfer flood flows between channels as appropriate
iv) Construct flood relief channels
v) Construct flood banks and channel widening/deepening
vi) Protect isolated properties

As a result of the above, work was proposed at over fifty sites with a total cost of over £13.5 million. Construction started in 1988 and completion is due in 1995 although it should be noted that there are many implementation problems as several areas are subject to redevelopment proposals.

LOWER COLNE IMPROVEMENT SCHEME

Site visit May 1991.



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Thames Region

Introduction to Site Visit

The visit will be to sites in part of Area 3 of the Lower Colne Improvement Scheme which lies immediately to the west of the M25 near Heathrow.

In this area the Wraysbury River, Poyle Channel and Colne Brook form a system of interlinked channels, see figure attached.

At present the main flood threat is from the Poyle Channel affecting Poyle and Colnbrook to the north and the industrial estate to the south.

In recent history the flow from the Poyle channel at the Wraysbury offtake has been very restricted, although in times of flood, additional overload flow to the Wraysbury River takes place.

An essential feature of the Lower Colne scheme in this area is to reconstruct the Wraysbury offtake and to upgrade the Wraysbury River to allow approx 50% of the flood flows to be diverted from the Poyle Channel.

The advantage of this approach is that it eliminates the need for substantial bank raising along considerable lengths of the Poyle Channel and Colne Brook and also reduces other works on these channels. The disadvantage is that major work is required to sections of the Wraysbury although this is considered to be of lesser scale and impact than the alternatives.

Wraysbury Diversion

This is one of the major sections of work required to allow for the increased flow in the Wraysbury River. The new works have been designed for a flow of 15 cumecs of which 12 cumecs are diverted from the Poyle Channel and the remainder from other sources.

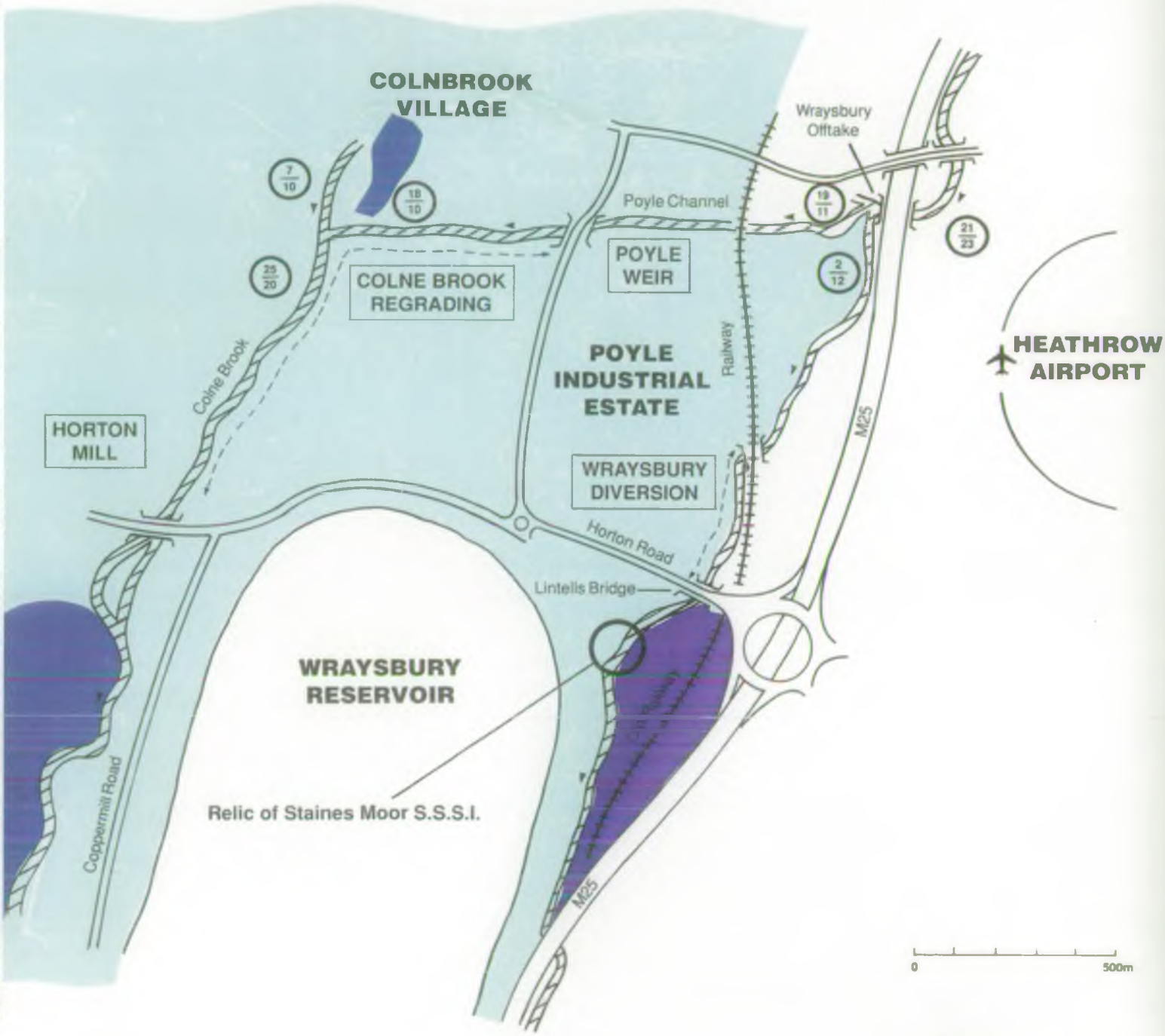
The site is restricted by the Skyway 14 estate on one side and a disused but not abandoned railway on the other. Further restrictions are imposed by the presence of high voltage electricity cables and a 700mm diameter high pressure gas main.

Environmentally a major concern was the effect on the Stanwell Moor SSSI to the south of Horton Road. This is a semi wet grassland area which is important because of the loss of many similar areas to urbanisation. Investigation showed, however, that occasional flooding could be beneficial provided that the area did not become waterlogged. Diversion of flows will only take place during flood events thereby generally maintaining the existing regime in the area. NCC have agreed to the project.

The significance of the works was such as to require an Environmental Statement under the SI1217 procedures with some elements requiring planning permission.

LOWER COLNE IMPROVEMENT SCHEME
Works in Poyle area.

Site visit May 1991.



KEY

Main works

7/10 before after — Peak flow in cubic metres per second for 1 in 100 year flood

Improvements

Before

After

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Features of the scheme include:

. An additional culvert and diversion channel under the railway.

. Widened and regraded channel containing features to ensure environmental and geomorphological acceptability.

. Use of soft or natural stone revetments.

. Reconstruction of vehicular access bridge to Fulcrum House.

. Lowering and protection of the invert of Lintells Bridge.

. Trees retained on islands.

After full consultation with the landowners, notices of entry under the Water Act were served before commencement of the works.

The project has been managed by TR NRA and designed by Dobbie and Partners. The main contract which was awarded to Geoffrey Osborne, commenced in mid April and is due for completion in 9 months. The total cost of the project including landscaping and service diversions is £760K with construction supervision by TR NRA.

Poyle Weir

This was formerly the site of Poyle Mill with a typical complex layout of small sluices and bypass channels which were prone to blockage and caused a major obstruction to flow in the Poyle channel. The replacement of these by a single long crest weir substantially reduces flood levels upstream.

The new weir, which was designed to discharge the Lower Colne Improvement Scheme 1 in 100 year design flow of 11 cumecs, was constructed in 1987/88 by the developers of the Poyle Mill area as part of their programme of works on this site without cost to NRA or its predecessor Authority.

Responsibility for maintenance has been taken over by NRA in return for a commuted sum from the developer.

Colne Brook Regrading

The length of 1.2 km of the Colne Brook and Poyle Channels between Horton Mill and the Poyle Road is one of the few areas where substantial dredging of an existing channel is being carried out under the Lower Colne Improvement Scheme.

The channels have been designed to carry within banks the 1 in 100 year design flows of 10 cumecs in the Poyle Channel and 20 cumecs in Colne Brook. The bed has been lowered by an average of 400 mm. The reductions in water levels achieved prevents flooding direct from the Poyle Channel and contributes to the protection of Colnbrook village further upstream on the Colne Brook.

The environmental impact of the works was considered sufficient to require a statement under the SI.1217 procedures and a number of features were included to reduce and offset the impact as far practicable, that is:-

- Works restricted to the period between November and March (avoid fish spawning).

- In general, excavation of material from bed only to avoid disturbance to tree lined banks.

- Limitation of working areas to avoid important features and working from bed where necessary.

- Variations in channel section and re-creation of pool and riffle sequence in Poyle Channel.

- Creation of marginal planting shelves.

- Close specification and control of tree surgery.

The scheme was project managed and designed in house by TR NRA and constructed under a 24 week contract by E G Harris which commenced in December 1990. Contract cost, £86K. Construction supervision by TR NRA.

Horton Mill

This area has now been redeveloped for housing but was the former site of another mill with river control works consisting of small gates and an overfall in a semi-derelict condition. As with Poyle Mill these constituted a major obstruction to flood flows.

At this site however, the gates and their associated eel trap (which was the most complete of the few remaining on the Colne system) were considered to be of such historical importance that they should be preserved and refurbished. This work together with the installation of a fish pass was carried out as part of the environmental enhancement measures in the Colne scheme.

The design 1 in 100 year flood flows of 19 cumecs are passed over a new 12.5m long side overfall into a new stilling basin. The site here is restricted by an electricity pylon on the left bank which determined the area available for the works.

The operation of the gates improves the freeboard under a flood situation but is not essential to the protection of properties upstream to the desired design standard.

The developer of the Mill area contributed to these works but at present retains ownership of the site. Discussions are taking place to regularise the long term maintenance and asset responsibility on a similar basis to Poyle Weir.

The scheme was project managed by TR NRA and its predecessor Authority, designed by Halcrow Water and constructed by Murphy Construction under a 4 month contract. The work was substantially completed April 1990 at a cost £140K with site supervision by TR NRA.