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NRA - Flood Defence

Area 9 revision

attached at page 27A

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9

PLANNING APPLICATION FOR THE PROPOSED MAIDENHEAD, WINDSOR AND ETON FLOOD ALLEVIATION SCHEME JANUARY 1991



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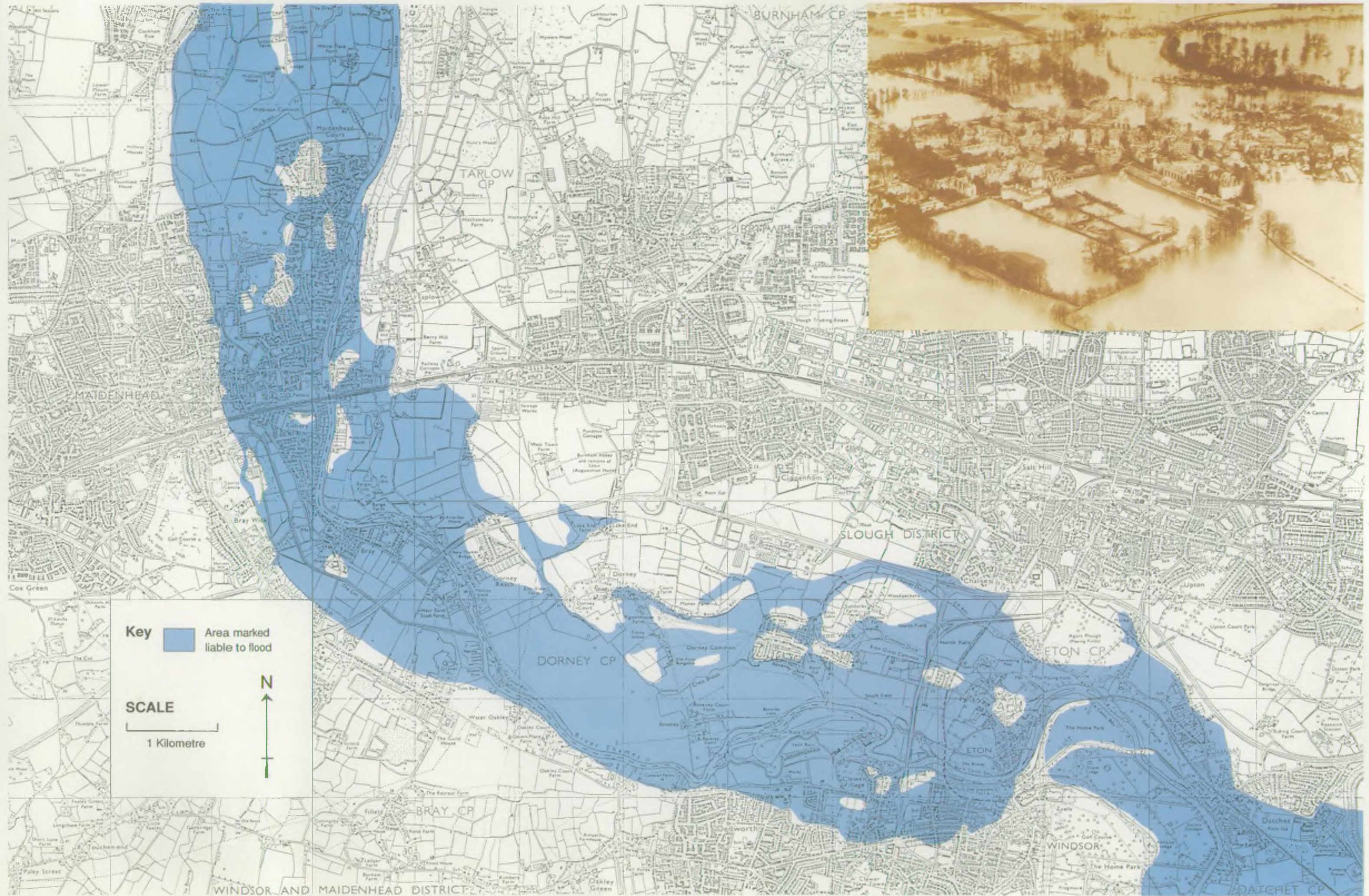
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THE PROBLEM

The towns of Maidenhead, Windsor and Eton and nearby villages have a very long history of flooding from the River Thames. The threat still exists and as 1990 so powerfully showed, it could happen again. Over the past six years, the NRA and its predecessor bodies have been working on a scheme to protect Maidenhead, Windsor and Eton from flooding disaster.

Flooding History

1894. Residents at that time reported the floods to be the highest in living memory. The Moor and the Strand in Maidenhead were flooded to great depth and the high Causeway was submerged.

1947. Although flood levels were 10cm to 20cm lower than in 1894, this flood is regarded as the bench mark for comparison with later floods because it is still recalled by residents. It was severe, widespread and lasted for many weeks. Thousands of properties were affected.

1974/1979. Appreciable flooding in Maidenhead and Bray although both floods were lower than 1947. The 1974 event lasted 3 days. The floods of 1979 were exacerbated by the partial blocking of Boulter's weir by a sunken barge which raised water levels as far as Cookham.

1990. Flood similar in intensity to 1974 but more serious because of a large amount of debris on Boulter's Weir which could not be removed during the flood. Of the 500 or so properties affected some were cut off by flood water, some had gardens flooded and the 40 worst cases had flooding over their floors.

Floods cause great distress and inconvenience.

The cost of flood damage can run into millions but no price can be placed on the stress and strain to those involved.

In 1983, the NRA's predecessor, Thames Water Authority appointed Lewin, Fryer and Partners, consulting engineers specialising in water engineering, to study options for the relief of flooding in Maidenhead. Later, Rural Planning Services plc, now RPS Clouston, environmental and planning consultants, were appointed to assess the impact of alternative schemes and to identify the opportunities for environmental enhancement associated with the flood alleviation work. Specialist sub-consultants were also engaged to deal with particular technical issues.

Design Studies

An extensive consultation exercise took place with the relevant planning authorities.

A wide range of alternative methods of alleviating flooding in Maidenhead was evaluated by the consultants, taking into account both engineering and environmental factors.

In September 1986, they reported to Thames Water on the three main groups of options:-

Options based primarily on a channel west of the Thames;

Options based primarily on major Thames widening and the provision of flood banks; and

Options based primarily on a channel east of the Thames.

The option, based on an East Bank channel from Taplow to below Boveney Lock with subsidiary work on the Thames and the existing West Bank channel, had clear advantages over the others. In November 1986, the Thames Water Regional Land Drainage Committee accepted their officers' recommendation that the flood study should



be progressed into a second stage giving detailed consideration to this option. The aim was to develop the best possible scheme balancing engineering, environmental and economic factors.

Early in this second stage of the study significant route changes for the East Bank channel were considered, including the possibility of routing the channel north of Dorney and Eton Wick. From these changes it became apparent that an opportunity existed to provide flood protection to Windsor and Eton by continuing the relief channel to the north of Eton, rejoining the Thames in Old Windsor Reach. Consequently, in March 1987, the Regional Land Drainage Committee, approved an extension of the study to include examination of alleviation for Windsor and Eton.

Physical and mathematical models were constructed to show the effects of development, and to predict probable flood levels. The results were dramatic. More than 5,000 properties would be affected by a repeat of the 1947 flood in Maidenhead, Windsor and Eton. Services and communications would be severely disrupted and extreme conditions could close the M4.

In January 1988, the Regional Land Drainage Committee agreed, in principle, that a scheme should be carried out to alleviate flooding in Maidenhead, but called for a full review of the various options. Following this, in January 1989, the Regional Land Drainage Committee agreed to promote and implement a specific scheme to alleviate flooding in and around Maidenhead and subsequently, in March 1989, to extend this scheme to include Windsor and Eton.



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 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

SCALE
1 Kilometre

WINDSOR AND MAIDENHEAD DISTRICT

THE SOLUTION

Outline of Proposals

The flood alleviation works proposed for Maidenhead, Windsor and Eton combine various methods of increasing river capacity through the towns, the most significant being a new seven mile (11.5 kilometre) flood alleviation channel to the east of the River Thames. This will be designed to carry a large proportion of the flood flow (more than 200 cubic metres per second).

Existing channels which pass through the centre of Maidenhead town will be upgraded to offer greater capacity during flood time, whilst their appearance under normal conditions will also be considerably improved.

The River Thames itself will receive attention to ensure that it is capable of carrying increased flows, without damaging the outstanding natural beauty for which the area is renowned. This will be achieved by the construction of modest flood banks and walls in discrete areas to ensure that the defence level is consistent. Although there are opportunities to increase further the capacity of the river by dredging, it is not the

intention to do so at present. This option will remain for future uprating of the scheme if considered necessary.

The new channel will leave the Thames upstream of Boulter's Lock, run to the north of Dorney and Eton Wick close to the M4, pass around the north and east sides of Eton College playing fields and rejoin the Thames downstream of Black Potts railway bridge.

Throughout its length the relief channel has been positioned where possible to avoid sensitive areas, offering many opportunities for environmental enhancement such as improving the landscape around Slough sewage works. The impact on the limited number of sensitive areas will be minimised. There is potential for the creation of wildlife habitat and recreational opportunities, in addition to landscape enhancements.

The channel will look like a natural river and will be fed at its upstream end by a small sweetening flow from the Thames and by groundwater. Water levels will be controlled by low weirs, thus maintaining existing groundwater levels. The banks will be as natural as possible and channel enhancements will include small islands, bankside planting,



reed beds and other individual features.

The scale and nature of the scheme requires full environmental assessment under the terms of the Department of Environment Circular 15/88, which implements the requirements of a European Community Directive. A very detailed environmental assessment thus forms a key part of the planning application.

Scheme Cost & Economic Considerations

Any engineering scheme should be economically viable. In the case of major proposals financed from the public sector, such as these for Maidenhead, Windsor and Eton, this benefit: cost ratio becomes essential. It demonstrates that money is being spent wisely and without it the scheme would fail to qualify for a grant from the Ministry of Agriculture, Fisheries and Food. In practical terms this means equating the cost of the likely damage caused by flooding to the cost of the project.



Very detailed studies were carried out to estimate what this damage would be under floods of different magnitudes and the recent floods of January 1990 enabled loss adjustors to obtain the actual damage figures applicable in Maidenhead. The net present value of these damages and hence the benefits accruing over the 60 year economic life of the scheme have been calculated using a number of variables and generally lie between £41M and £69M.

The estimated overall cost of the scheme is £51M. This sum includes all pre-planning approval and feasibility costs as well as construction and implementation costs. However, as the pre-planning figures cannot be included in the benefit: cost calculations, the implementation costs are actually estimated at £45M.

A comparison with the benefits referred to above produces an average benefit:cost ratio of 1.2:1 which is recognised as being satisfactory by the Authority and within the limits required by the Ministry.

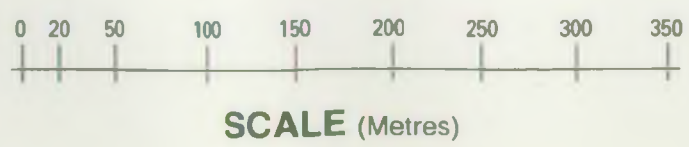
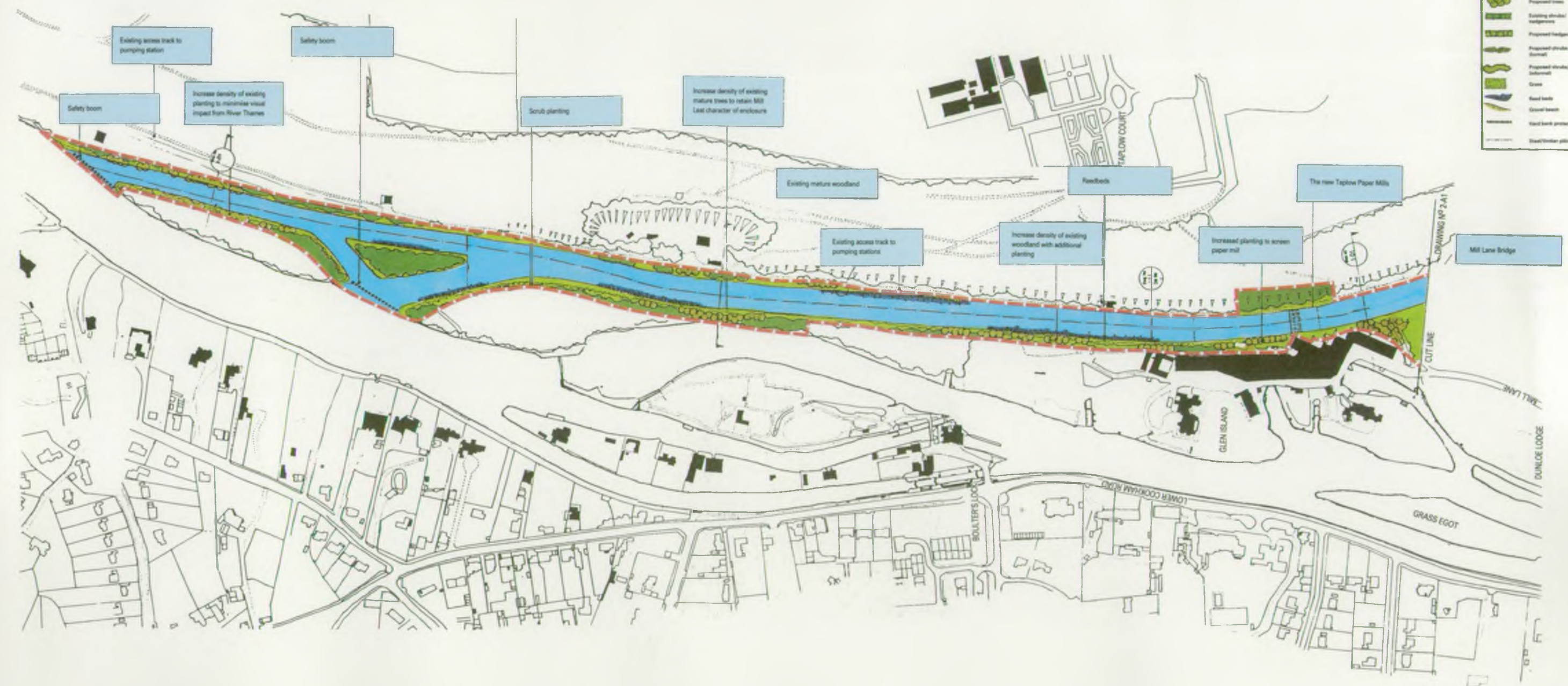
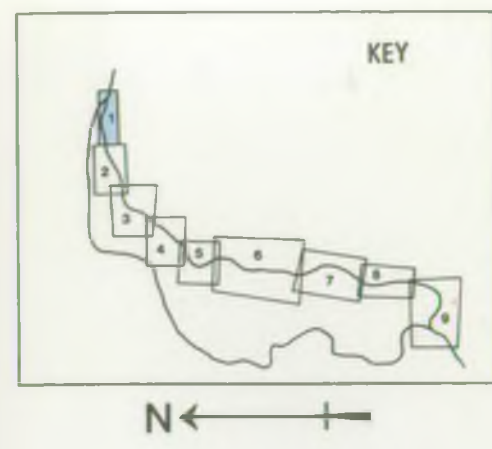
Key Issues

The various stages into which the scheme is divided are given in greater detail in the following pages. Other issues of major importance such as flood embankments, the construction programme, gravel strategy, noise control, channel operation, water quality and recreation are dealt with in separate sections.



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AREA ONE - RIVER THAMES TO MILL LANE

Engineering Factors

Width is severely limited along this route. The design gradient of the channel is, therefore, steeper in this area than further downstream in order to achieve the required hydraulic capacity. Although the existing Mill Leat channel will be dredged to a much greater depth than at present, the design will still result in high stream velocities which

banks and bed. This material will permit plant roots to grow through it and will not impede any flow of water from the Mill Leat into the underlying aquifer.

In certain areas, where channel width is very restricted, the banks will be of vertical piling (concrete or steel). This type of construction will be used in the new cut north of the existing Mill Leat. The top of the piling will



would erode the bed and banks of the new channel if they were left unprotected. The required protection will be provided by using a woven synthetic fabric, mattress or blanket known as a geotextile, suitably anchored to

be below water level, allowing a natural edge to the water to be achieved. Piling will also be needed part way down the Mill Leat, on Glen island, where a narrow strip of land separates the high level leat from the River

Thames, 2.40 metres lower. Further piling will take place along the face of Taplow Mill and the approach to the inlet control structure which will be sited adjacent to the Mill. Finally, the length of channel from that structure to Mill Lane will require vertical walls to enable it to be routed between existing constraints.

Some embanking will be needed along Glen Island to ensure that no overtopping occurs from the new channel to the River Thames. Flood banks already exist for this very purpose. However, in most areas, they will be removed in consequence of the works to widen the Mill Leat on the western side.

The new island that will be formed by the new cut will require a link channel at its downstream end in order to minimise the risk of siltation occurring at the upstream end of the present Mill Leat.

The inlet control structure for the new flood channel will be sited adjacent to Taplow Mill, to ensure that present water levels and flows in the leat can be maintained. The structure will comprise five sluice gates, each 4 metres wide and nearly 5 metres deep. These will normally be closed. One of these gates will include a fish pass. This gate will also be used to ensure that a sweetening flow of between 5 and 10 cubic metres per second can be passed down the channel at all times. Electrically operated, the sluice gates will have a mechanical standby operating system. A bridge deck across the structure will permit access for maintenance. A small building will be required for control gear and telemetry equipment. At Mill Lane, an in-

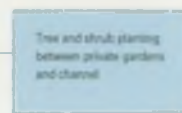
situ concrete bridge will be constructed across the channel to permit Mill Lane to cross at a skew angle to the channel.

Environmental Factors

The point at which the new channel leaves the Thames is one of great natural beauty. Consequently the design must reduce its visual impact to a minimum, both from Maidenhead and from the National Trust property at Cliveden. The channel entrance will create a new back channel and hence a new island. This has provided an opportunity to minimise any impact on the River Thames itself. The special character of the Mill Leat as a quiet backwater will not only be maintained but will be enhanced. Treatment of banks is designed to ensure the least possible disturbance to wildlife, aquatic biology, vegetation and quiet fishing interests. Boating will not be permitted because of the potential damage arising from rapid flows when control gates are opened. Possibilities exist for improvements to the screening of Taplow Paper Mill.



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AREA TWO - MILL LANE TO MAIN LINE RAILWAY

Engineering Factors

For 200m south of Mill Lane, the channel will have vertical piled walls to minimise the intrusion into both the paper storage area and the hillside. The present footpath, between Taplow and Maidenhead Bridge, will be carried across the new channel by a new footbridge. Downstream of this structure the channel will open out with sloping earth banks.

Due to the width constraints at Berry Hill gardens, the channel at this point will revert to vertical banks to minimise its impact on the gardens. The bed will also be solid in this area to provide structural strength for the walls and to prevent erosion during design flows.

A new service bridge will cross the channel on the north side of the A4. The road will be carried over the channel on a twin span bridge designed to minimise deck thickness and hence, the amount of road raising necessary.

The vertical walled channel will continue downstream of the A4 to the railway, under which it will pass, by thrusting twin 10 metre wide by 5 metre high concrete box culverts through the railway embankment from the south side.

Environmental Factors

The channel will run through locally important green space between Taplow and Maidenhead and, in part, close to designated Conservation Areas.

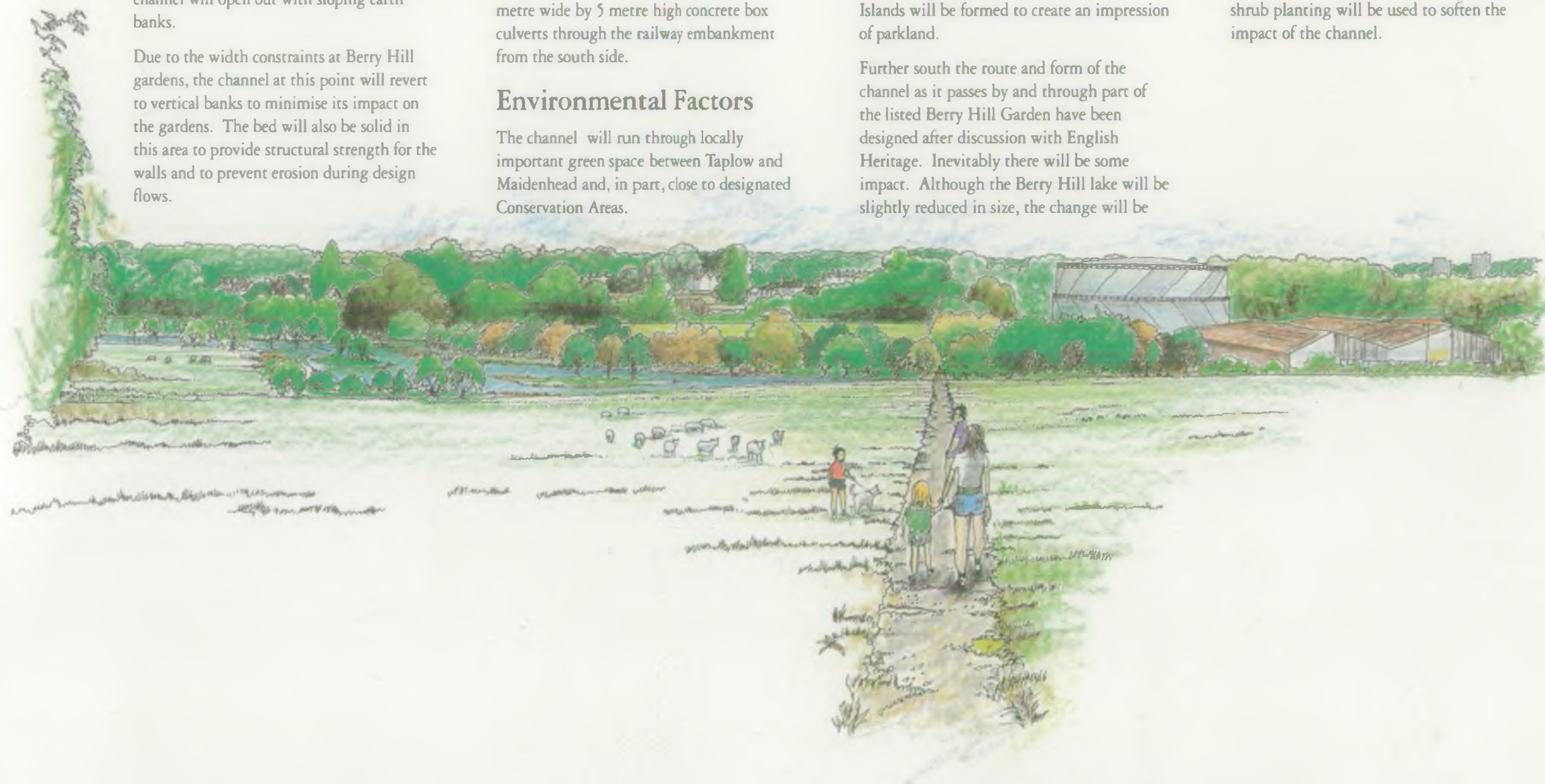
In its northern section, restricted on one side by the storage area of Taplow Paper Mill and on the other side by rising ground of visual importance the channel will, necessarily, be narrow. Local screening of the banks will be used to soften the channel impact.

Where the channel becomes wider between this section and Berry Hill Gardens, woodland will be planted on the banks. Islands will be formed to create an impression of parkland.

Further south the route and form of the channel as it passes by and through part of the listed Berry Hill Garden have been designed after discussion with English Heritage. Inevitably there will be some impact. Although the Berry Hill lake will be slightly reduced in size, the change will be

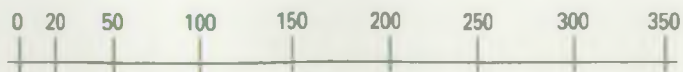
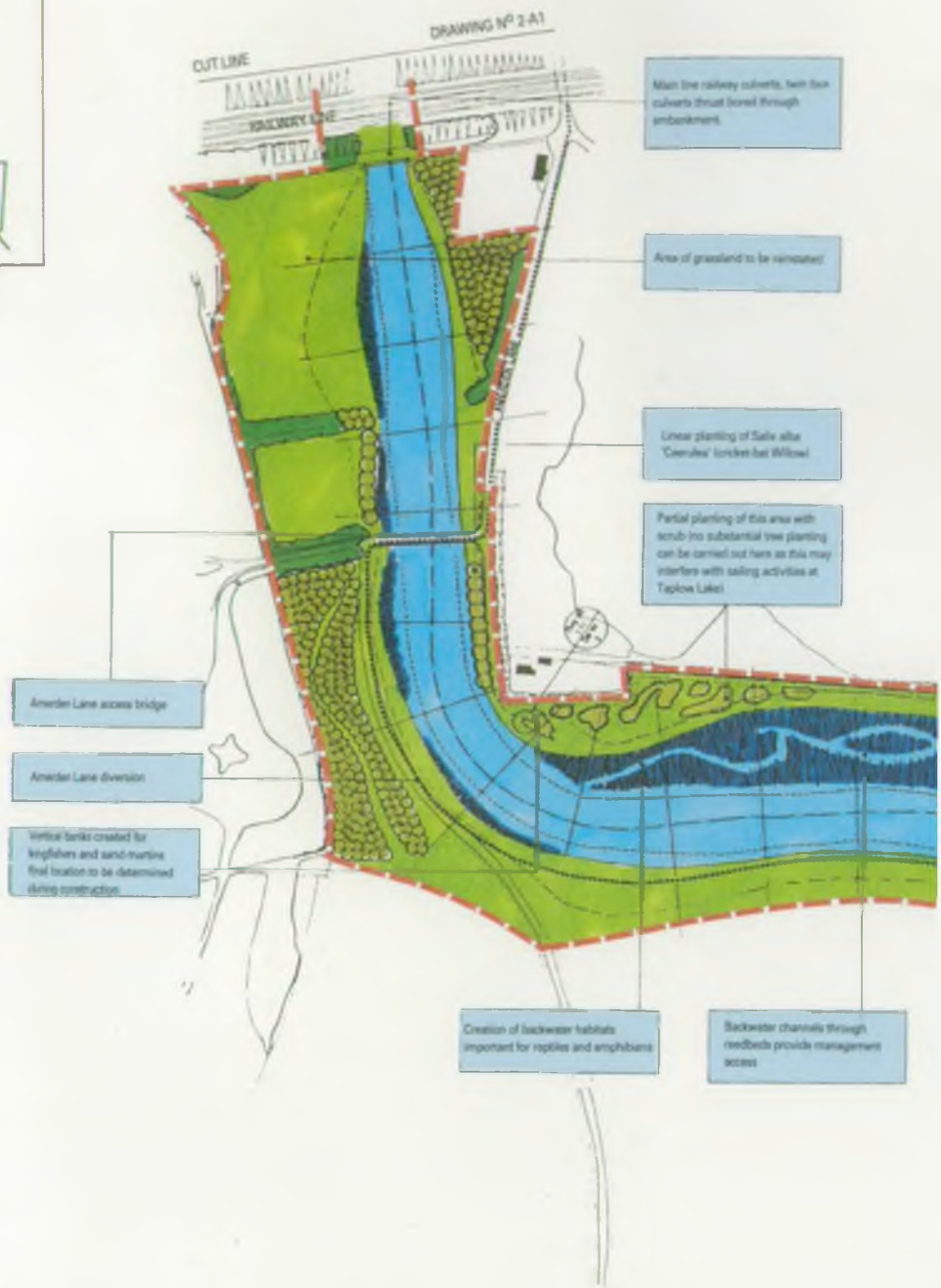
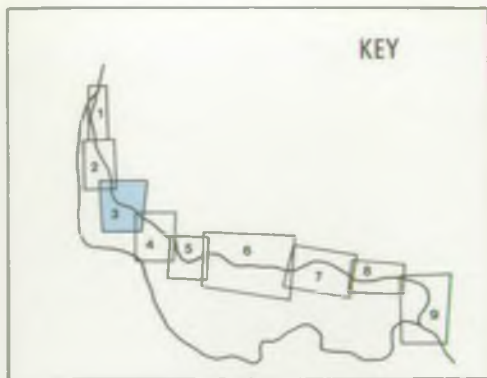
small. This will be achieved by restricting the width of the channel and reducing possible bank erosion by constructing it with a solid bed and vertical banks.

Similar construction, with vertical sides, will be necessary on the south side of the A4 and as far as the railway embankment, where the channel will run through a vacant plot between large residential properties. Tree and shrub planting will be used to soften the impact of the channel.



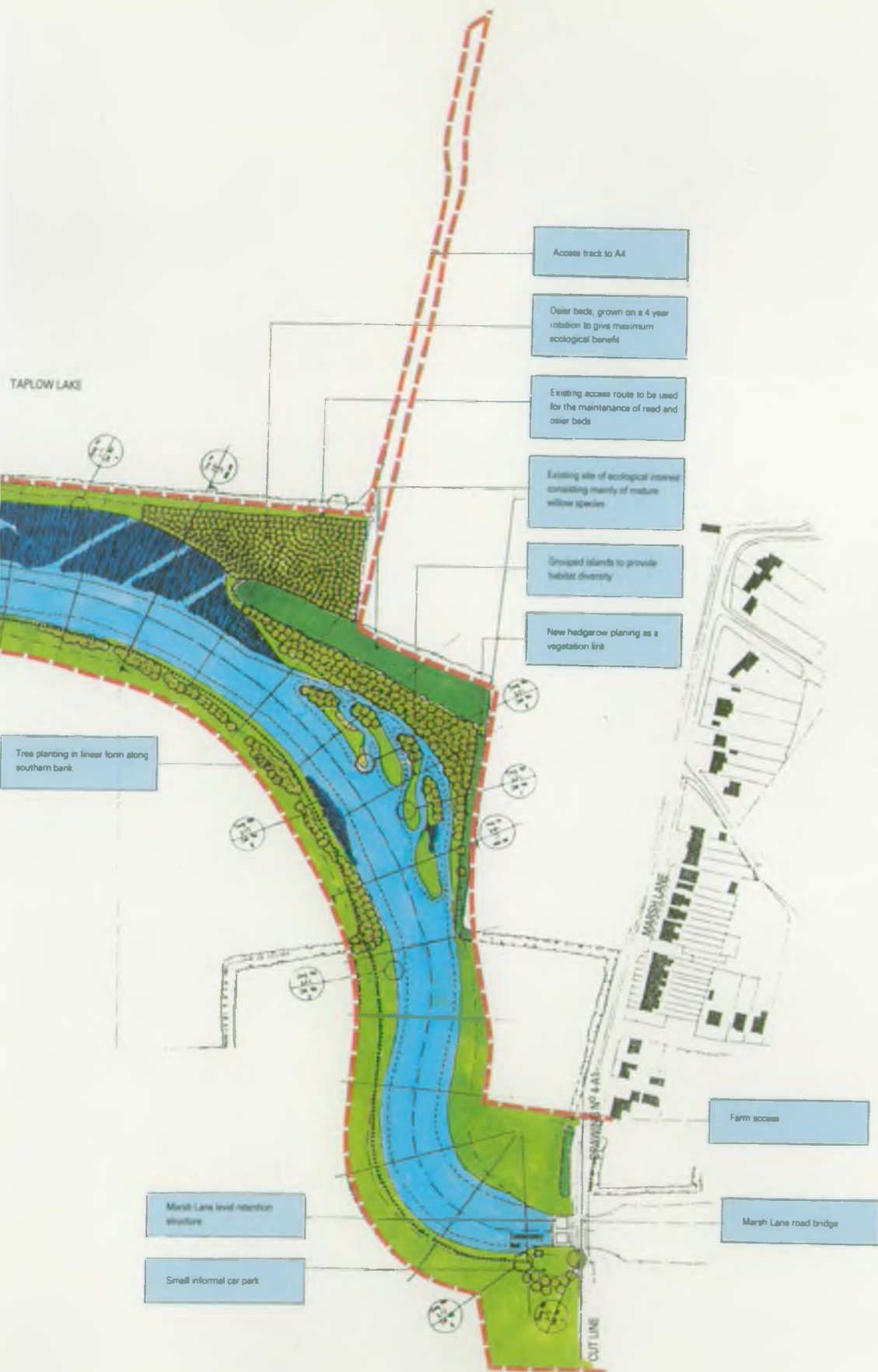
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SCALE (Metres)

LEGEND	
	Key levels
	Existing contours
	Proposed contours
	Proposed water level
	Existing line of channel
	Line where proposed ground level meets existing ground level
	Line where channel bank meets bed level
	Existing vegetation
	Existing fence line
	Existing buildings
	Accession boundary
	Roads
	Existing public right of way
	Proposed path
	Existing trees
	Proposed trees
	Existing shrubs/hedges
	Proposed hedgerow
	Proposed shrub small forest
	Proposed shrub/scrub (submerged)
	Grass
	Reed beds
	Coastal forest
	Hard bank protection
	Steel/timber piling



AREA THREE - BRITISH RAIL - WESTERN REGION

(MAIN LINE EMBANKMENT) TO MARSH LANE

Engineering Factors

The channel through this area will be unlined with earth banks cut to stable slopes. Some variations in channel width and bank slope occur for environmental reasons.

Although the route crosses both Amerden Lane and Amerden Ponds access track, only a single bridge is to be provided at the access track site. Amerden Lane will be diverted over the channel using this bridge, then follow the western side of the channel prior to rejoining its current alignment.

At Marsh Lane, there will be a level control

structure. This will comprise two 10 metre wide sluice gates of which one will incorporate a fish pass. Marsh Lane will be carried over this structure by a bridge. The channel width will be reduced to that of the structure, using curved vertical wing walls both upstream and downstream.

Environmental Factors

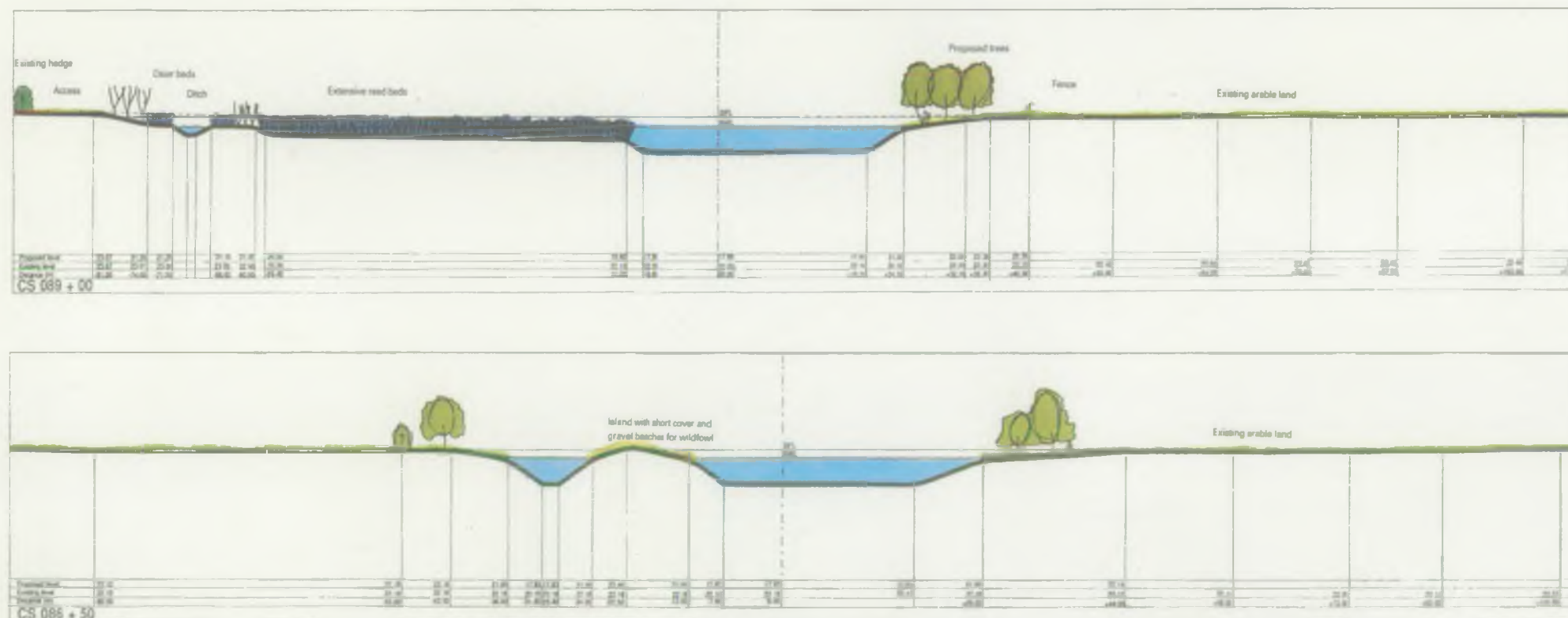
The northern section of the route will be fairly heavily disturbed during the construction period.

South of the railway, the channel will pass through agricultural land and across distinct

lines of trees. Disturbance will be reduced by adopting a line along the edges of fields, in the area between Amerden Lane and Marsh Lane. Any land cut off to the north of the channel will be used to increase its width by the creation of small islands and reed and osier beds.

To protect the habitats created the footpath on the southern side will be low key.

Trees will not be planted on the south side of Taplow Lake to ensure there is no disturbance to sailing facilities. A small car park will be built near the Marsh Lane control structure to discourage roadside parking.



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AREA FOUR- MARSH LANE TO M4 MOTORWAY

Engineering Factors

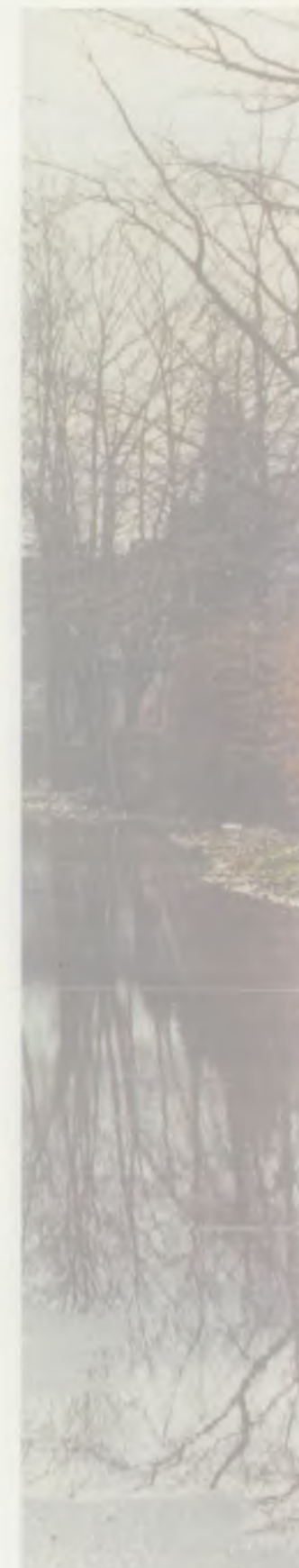
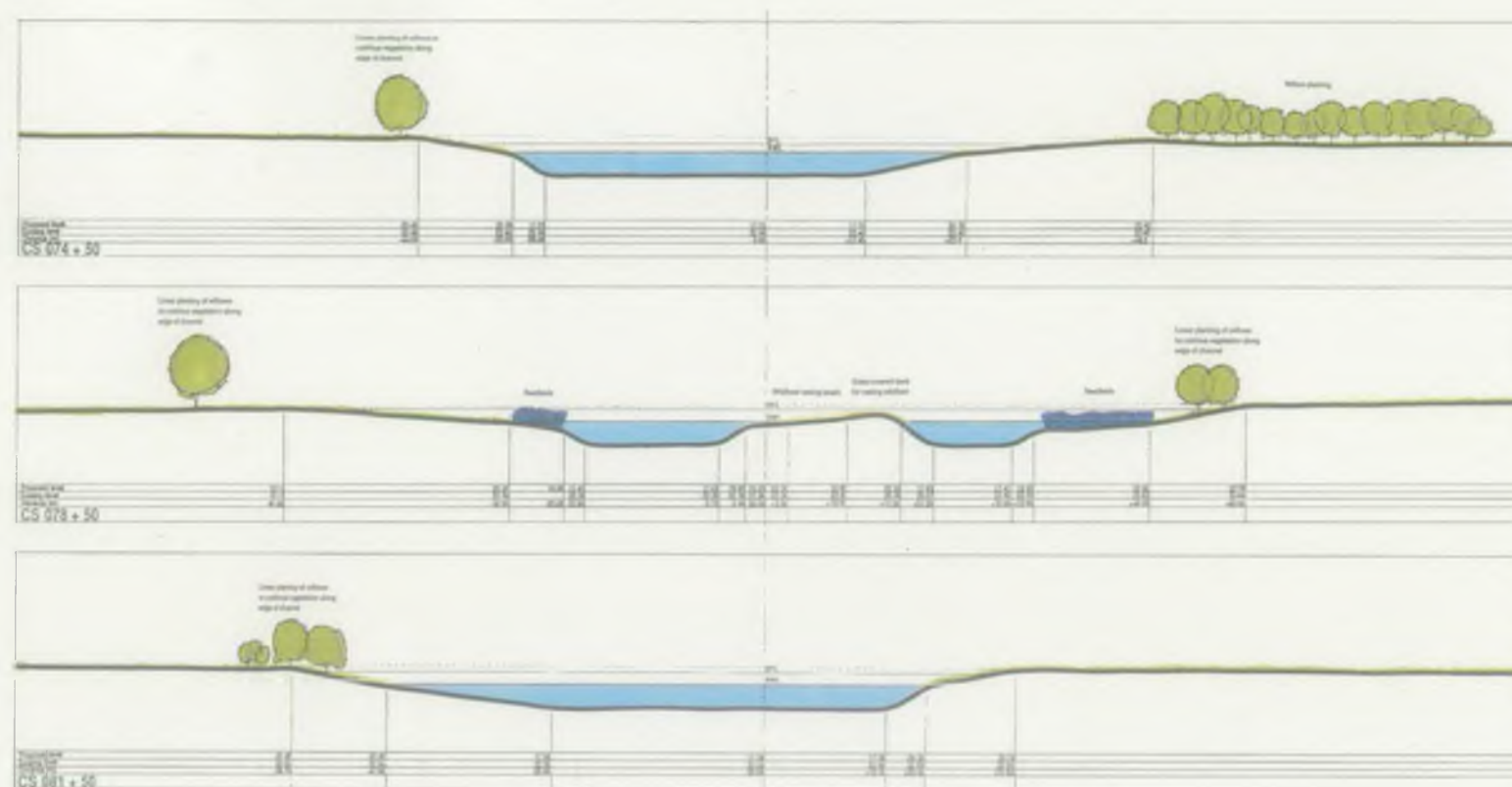
The channel through this area will be unlined with earth banks cut to stable slopes. Some variations in channel width and bank slope occur for environmental reasons.

Just north of the M4, a footpath will be diverted across the channel via a new footbridge. The motorway itself will be carried across the channel on a new three-span bridge. This will be built on bored piles installed from the existing carriageway in stages to preserve 3 lane traffic in both directions at all times. Excavation for the channel under the bridge will not start until the bridge is virtually complete.

Environmental Factors

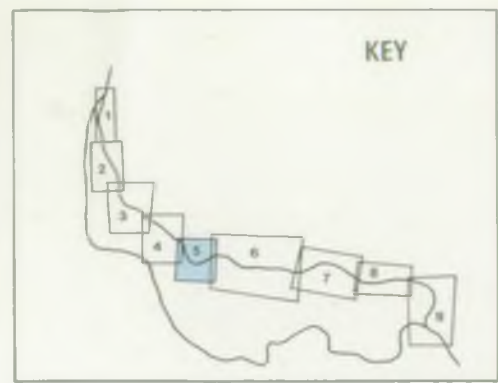
As much of the area is agricultural land, a route has been adopted along the edge of fields. It will traverse an area west of Marsh Lane and certain fields to the south of the residential area on the eastern side of the Lane. Some diversity in the character of the channel will be achieved by opening up its width to create new habitats, particularly to the north and east, up to the present woodland.

To protect the habitats created the footpaths on the southern part of this area will be low key whilst contributing to a through route along the channel.



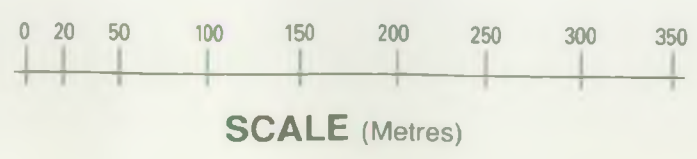
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LEGEND

	Key level
	Existing boundary
	Proposed boundary
	Retained water level
	Centre line of channel
	Line where proposed ground level meets existing ground level
	Line where retained bank meets existing bank
	Steep slope
	Existing fence line
	Existing building/structure
	Application boundary
	Road
	Existing public right of way
	Proposed path
	Existing trees
	Proposed trees
	Existing shrub/hedge
	Proposed hedge
	Proposed shrub/hedge
	Proposed shrub/hedge
	Grass
	Wood bank
	Ground level
	Wood bank protection
	Shrub/hedge



AREA FIVE- M4 MOTORWAY TO LAKE END ROAD

Engineering Factors

The channel through this area will be unlined with earth banks cut to stable slopes. Some variations in channel width and bank slope occur for environmental reasons.

A new footbridge will cross the channel west of Lake End Road, and footpaths will be realigned, where necessary, to link with it. Lake End Road bridge will comprise a three span concrete structure, built virtually on the line of the existing road.

Environmental Factors

Much of this area is used for agriculture. Unnecessary loss of this land will be avoided by routeing the channel along the edge of the fields. Common land, north of Ashford Lane, has also been circumvented. However the only convenient position for the crossing of Lake End Road imposes an unavoidable constraint upon the channel alignment.

Of varied width, the channel will be given an even more natural appearance by the

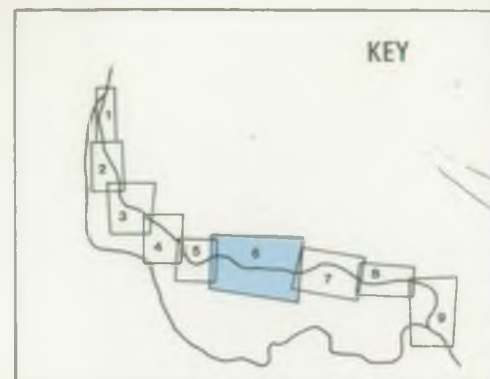
formation of islands and helped still further by the creation of a wide variety of bankside habitats.

Recognising local wishes that recreational use of this stretch of the channel should not be encouraged, footpaths will be kept low key and will only be provided on the south side. Certain existing paths will be diverted but the need to maintain access by footpath to Ashford Lane from the south requires a new footbridge over the channel, to the west of Lake End Road bridge.

A small car park will be built to the south west of Lake End Road bridge in an attempt to discourage parking on local roads.



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LEGEND

	Key level
	Existing contour
	Proposed contour
	Restored water level
	Centre line of channel
	Line within proposed ground level
	Line within existing ground level
	Line within channel bank
	Stream
	Drainage
	Existing fence line
	Existing structure
	Application boundary
	Road
	Existing public right of way
	Proposed path
	Existing trees
	Proposed trees
	Existing shrubs/hedges
	Proposed vegetation
	Proposed shrubs
	Proposed shrubs
	Grass
	Road track
	Gravel track
	Hard bank protection
	Steel/wooden piling

AREA SIX (A) - LAKE END ROAD TO BRIDLEWAY BRIDGE (WEST HALF)

Engineering Factors

The channel through this area will be unlined with earth banks cut to stable slopes. Some variations in channel width and bank slope occur for environmental reasons.

North of Dorney Village there will be a fixed crest weir designed to retain water levels between Dorney and Marsh Lane. It will comprise in-situ material with revetment of the upstream and downstream faces and a low flow control sluice to pass sweetening flows and to provide fine control on levels. The overall crest width will be 110 metres.

Environmental Factors

The extreme western part of this area is good agricultural land.

Apart from this the land has been heavily polluted by the long history of sludge disposal. This Scheme provides an opportunity to deal with the resulting toxic waste. The area will be used for the deposition of surplus material excavated in forming the channel. The resulting earth raising will be moulded to assist in screening the view of the Slough Sewage Treatment Works from Dorney village.

The entire area will be greatly improved by the creation of very extensive and diverse wildlife habitats. Existing woodlands will be enlarged. Large reedbeds will be developed along the north bank of the channel and smaller beds along the south bank.

Grassland will be established both on the



south west and north east banks.

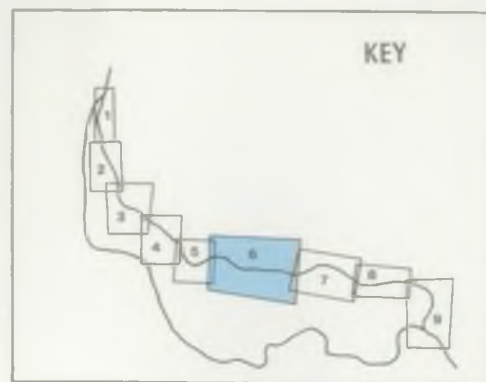
The National Rivers Authority will themselves provide a new public path on the south bank of this section of the channel. That part within Berkshire will be given bridleway status. An existing right of way,

running north from Dorney Village, will eventually be carried over the channel by a new bridge.



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AREA SIX (B) - LAKE END ROAD TO BRIDLEWAY BRIDGE (EAST HALF)

Engineering Factors

A similar structure to that north of Dorney, with a crest width of 95 metres, will be required at Manor Farm, north of Eton Wick. This will differ from the Dorney structure in that the crest will consist of a box culvert carrying the Roundmoor Ditch under the new channel.

A new three span concrete access bridge will be built to carry the farm access road across the new channel close to the present line of the road. Upstream of this bridge a new footbridge will carry existing footpaths across the channel. North of Eton Wick a

bridleway bridge will allow both footpaths and a bridleway to cross the channel to connect to Wood Lane. This bridge will also serve as a farm access.

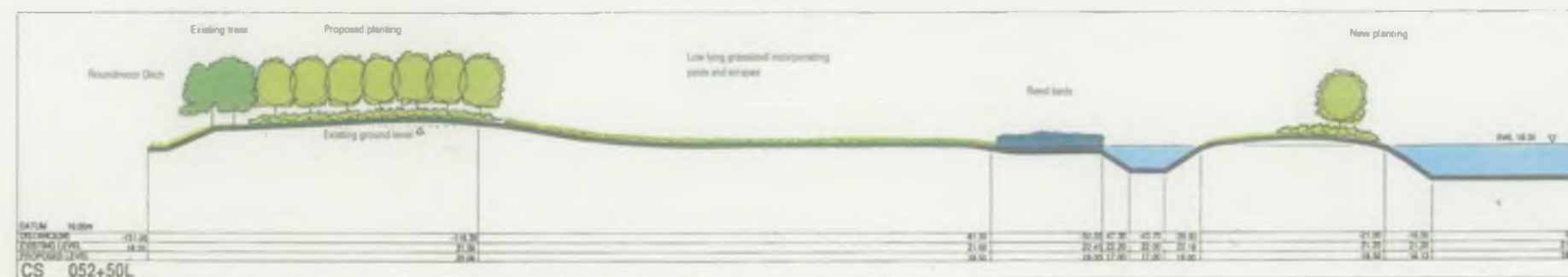
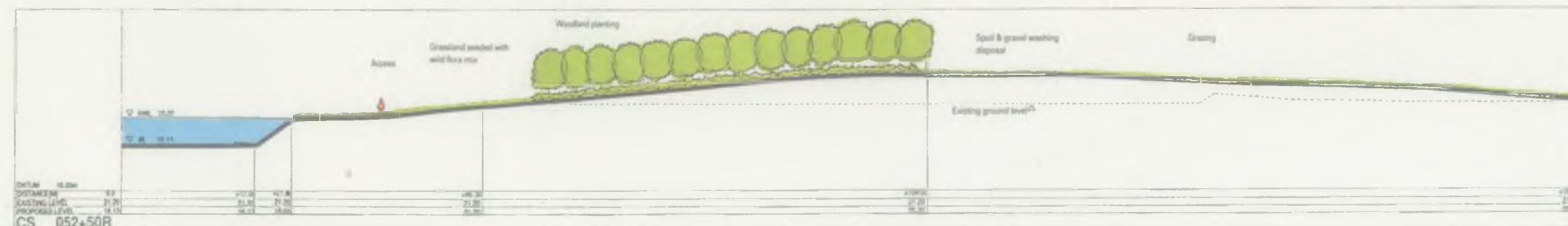
Environmental Factors

Environmental policies and issues relating to this area correspond closely with those already described in the statement covering Area 6A.

The plan associated with this area should, therefore, be studied in conjunction with that previous statement.

It should be noted, however, that special attention has been given to the problems of possible contamination arising from the previous use of Manor Farm.

The methods used to seal the ground and to prevent polluting materials from entering the watercourse have been developed very carefully. Nevertheless, the position will be constantly monitored during the construction period and thereafter.



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AREA SEVEN. BRIDLEWAY BRIDGE TO A355 ROAD

Engineering Factors

The channel through this area will be unlined with earth banks cut to stable slopes. There will be some variation in channel width and bank slopes for environmental reasons.

No excavation of the flood relief channel will take place within 35 metres of the toe of the M4 embankment.

The only structure in this area will be the crossing of the A355 which will comprise twin 10 metre wide by 5 metre high concrete box culverts cast in-situ.

Environmental Factors

The channel will enter from the west under a new bridge constructed to carry the bridleway and footpath from Eton Wick to Wood Lane.

Running diagonally north east for a short way it will then be aligned parallel and close to the M4, a course followed until shortly before reaching the A355.

Chosen to avoid and ecologically important area north east of the bridleway bridge, this route also minimises the use of land south of the motorway. Much of this is Common Land of good agricultural quality.

A route closer to the M4 has not been selected because of the possibility of future widening of the motorway. Reduction of land take will, nevertheless, be helped by the decision to restrict the channel width in this part with the added advantage of reducing

visual intrusion during construction.

Certain streams and ditches in the area, emanating from Slough, have a long history of pollution incidents. These watercourses will be separated from the channel. Among these is the Chalvey Ditch whose present course is both crossed and then followed by the channel alignment. For this reason, the Ditch will be diverted north of the channel before excavation is started.

New planting should more than compensate for the loss of part of a visually important hedgerow. One belt of trees will extend from Wood Lane to the A355 - M4 junction.

Linear planting will be made along the entire south bank of this section of channel.

Beneath it, for the entire stretch, a footpath and cycleway are proposed. Both will leave the area eastwards under the A355 using for this purpose the culvert which at present carries the Chalvey Ditch. This will, after diversion, occupy a new culvert north of the channel which will be positioned at the same time as the channel culverts through the A355 embankments are constructed.

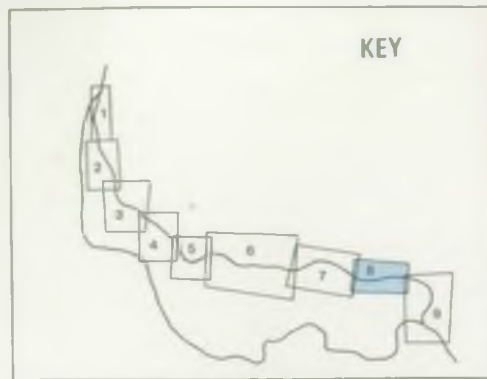


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KEY



LEGEND

	Key line
	Existing watercourse
	Proposed watercourse
	Retained water level
	Centre line of channel
	Line where proposed ground level meets existing ground level
	Line where channel bank meets field level
	Stepped channel
	Existing fence line
	Existing buildings/road works
	Application boundary
	Roads
	Existing public right of way
	Proposed path
	Existing trees
	Proposed trees
	Existing shrub/hedge
	Proposed hedge
	Proposed shrub/scrub
	Proposed shrub/scrub
	Grass
	Road beds
	Gravel/heap
	Hard bank protection
	Wood/limber piling



0 20 50 100 150 200 250 300 350

SCALE (Metres)

AREA EIGHT - A355 ROAD TO A332 SLOUGH ROAD

Engineering Factors

The channel through this area will be unlined with earth banks cut to stable slopes. Channel width and bank slopes will be varied for environmental reasons.

Immediately downstream of the A355 culverts an inverted syphon, comprising three 1.8 metre x 1.8 metre barrels, will carry the diverted Chalvey Ditch and Salthill Stream under the new channel.

The Windsor Branch Railway Line will cross the channel via a triple box culvert to be constructed to the east of the railway. This will be jacked into place during a weekend track possession. This bridge will include a cycleway, on its western side, which will be formed as part of the main structure.

To the east of the railway an existing footpath

will be diverted slightly to permit a new three-span footbridge to cross the channel at right-angles.

The A332 Slough Road crosses the channel at a skew angle. The channel will be carried in twin 10 metre wide by 5 metre high box culverts 70 metres in length. At the upstream end of the culverts adjustable sluice gates will be installed in order to control water levels in the reach to Manor Farm. A small control building, housing telemetry and control equipment, will be sited nearby.

Environmental Factors

Entering from the west under the A355 the channel will run between the high embankments of the M4 to the north and the dual carriageway A332 Slough Road to the south. It will pass under the British Rail

Windsor - Slough branch line before leaving the area through the box culvert under the A332 north of the roundabout junction with the road from Eton.

A small area of common land in the south west part of the site will eventually be restored for grazing. This land and the remaining area between the A355 and the railway have been greatly disturbed by previous motorway and road construction. The entire area will house the gravel processing site and temporary plant used during the channel excavation.

East of the railway the land is of good quality; a part is used for allotments and the remainder for arable farming.

The Chalvey Ditch and Salthill Stream, which have a history of pollution, will be merged and passed under the channel.

Within these constraints the channel will be given a natural appearance. The stream width will broaden and narrow irregularly. Gently shelving gravel beaches will provide shallows and will be interspersed with reed beds and stands of short cover and shrubs.

A number of small islands will also be introduced along the south bank of the channel and extensive tree and shrub planting will take place along both sides. In particular, an avenue of trees will follow the south bank of the reach up to the A355 providing a strong visual link with the western side of that road.

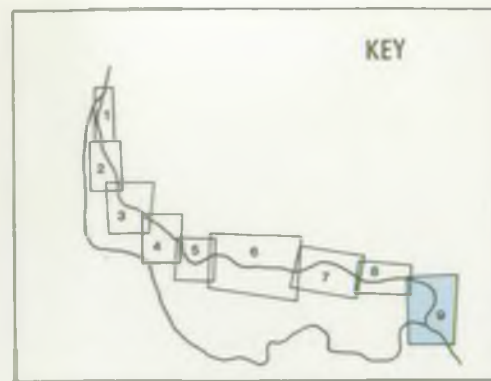
The design also provides much new and diverse habitat. East of the railway, paths, linked by a new footbridge, will be made on both banks. On the western side a north bank path will join that emerging from under the A355 through the underpass formed by the diversion of the Chalvey Ditch. A cycleway, integral with the new rail bridge, will maintain existing paths and rights of way which would otherwise be severed.

Following the dismantling of the gravel plant and site clearance the whole area will be landscaped.

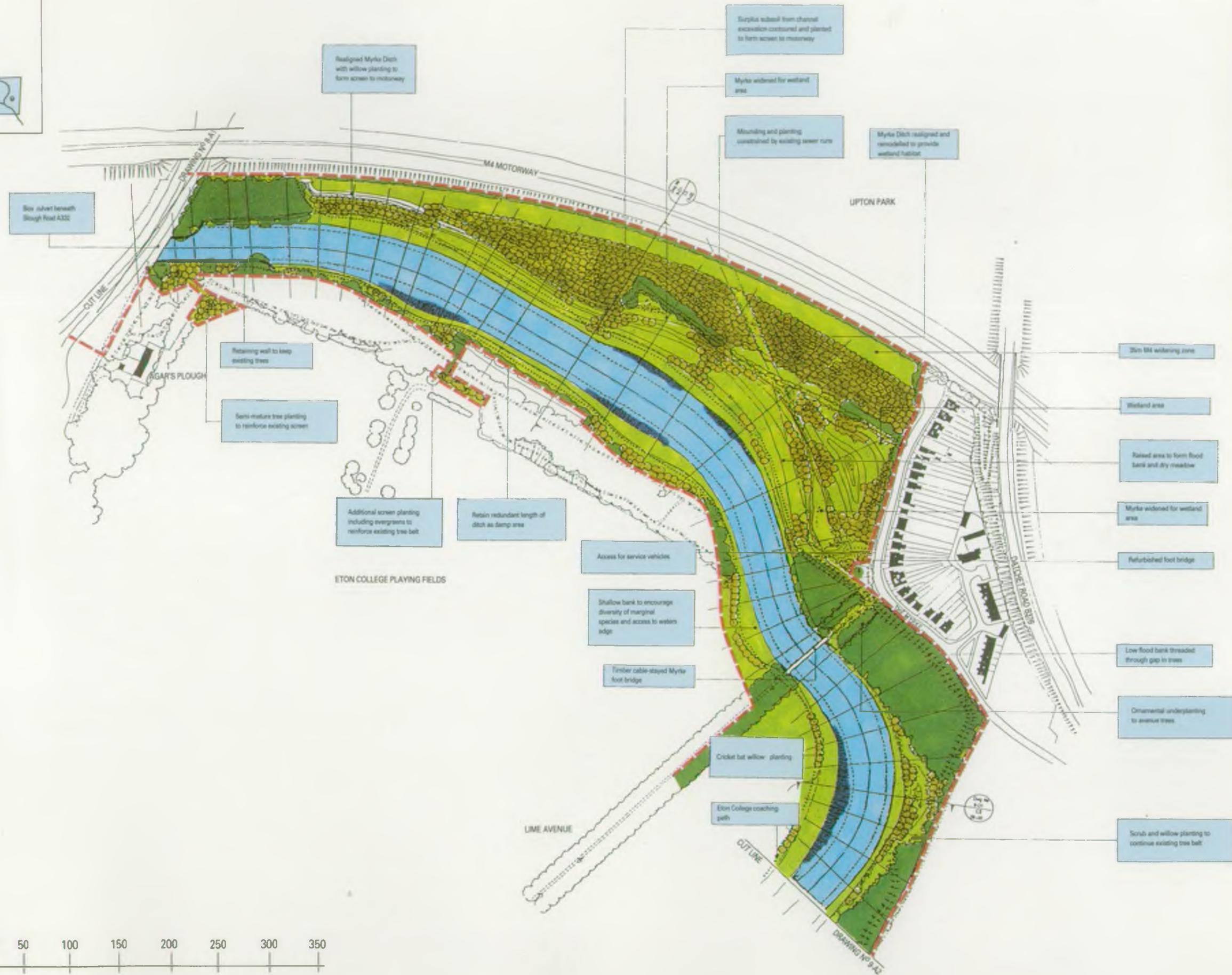


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KEY



0 20 50 100 150 200 250 300 350

SCALE (Metres)

AREA NINE (A) - A332 SLOUGH ROAD TO RIVER THAMES (NORTH HALF)

Engineering Factors

Almost the whole stretch of the channel will be an earth excavation, with banks cut to stable slopes. Immediately downstream of the A332 Slough Road, however, the south bank will continue as a vertical wall for 70 metres in order to minimise tree loss at the north of Agar's Plough.

Apart from the box culvert under the A332 Slough Road there are no structures in this area until that required to accommodate the

footpath running through the Avenue from Pococks Lane to the Myrke. This will be carried over the new channel by a feature footbridge of cable-stayed construction.

Environmental Factors

The principal design aims have been to minimise the land take from Agar's Plough, the main area of Eton College playing fields, keeping close to its boundary maintaining, as far as possible, the screen of trees forming its northern border.

Environmentally the most sensitive area and also the most restricted is that where the channel enters this section emerging under the A332 through an existing tree belt.

Impact on the south bank will be reduced to a minimum by keeping the channel narrow, thus avoiding unnecessary tree loss. In addition there will be new planting as early as possible. The other key factor in determining the alignment in this section has been the need to retain the maximum number of trees in the neighbourhood of the

Myrke. This objective has been attained although it will involve some small loss of the playing fields area. Between these two sensitive areas an alignment has been selected which adheres closely to, and north of, the tree belt which forms much of the boundary of Agar's Plough.

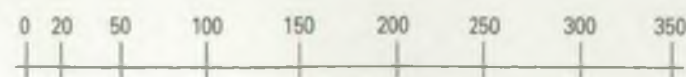
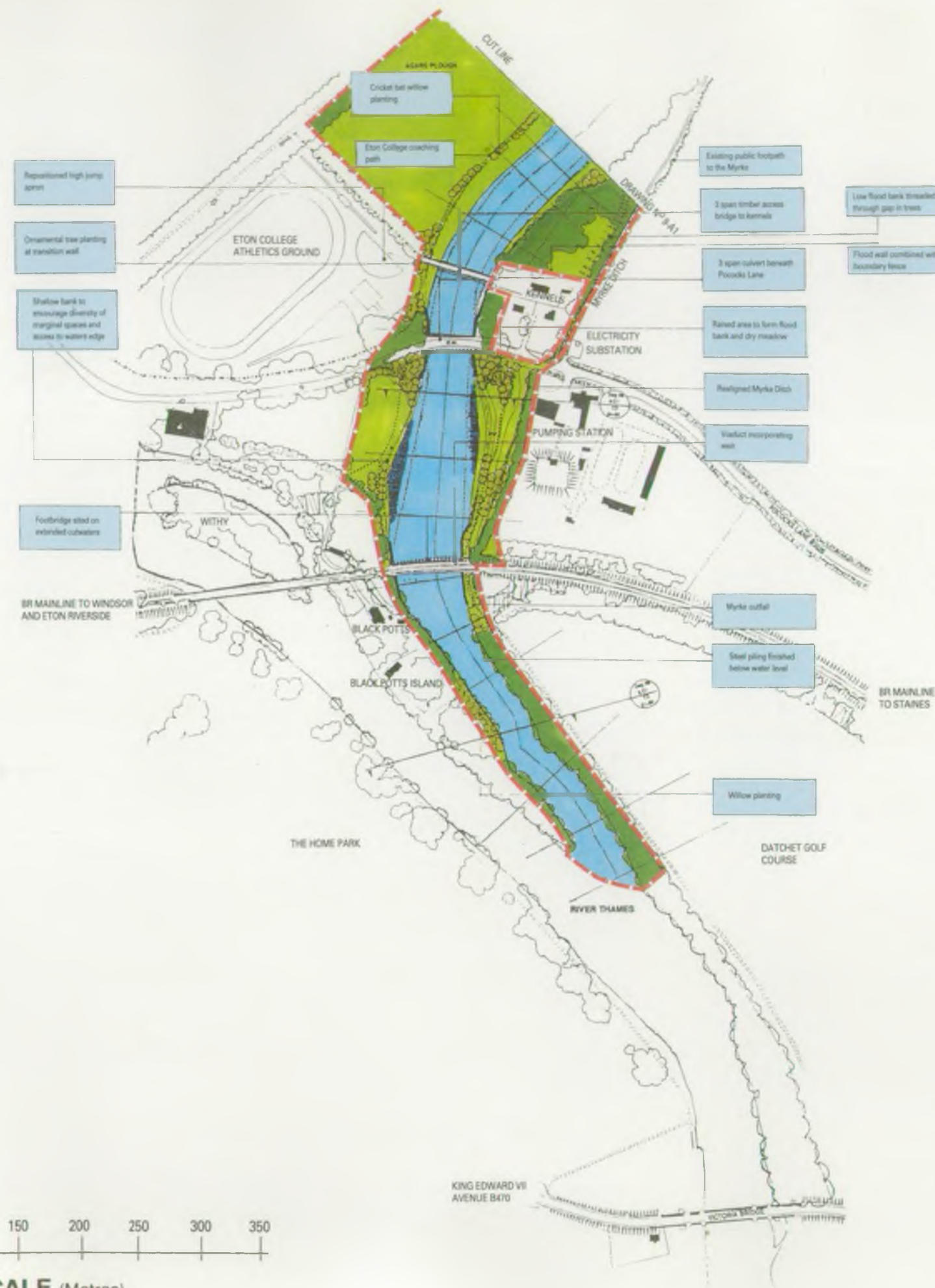
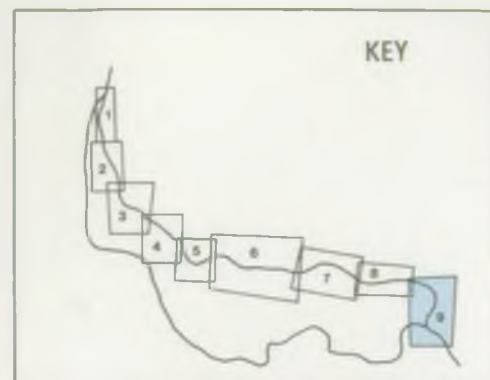
North west of the Myrke all land will be used for disposal of overburden except that reserved for possible widening of the M4. This area will be raised considerably. Later, it will be planted thickly with trees to form a substantial screen between the motorway and all areas to the south. At this point the channel will be given a natural, riverine appearance embracing small reed beds and shallows but without islands.

An existing footpath from the A332 to the Myrke will be diverted from the northern side of the trees bordering Agar's Plough. A new path upgraded to become a footpath/cycleway will preserve the link but will run on the north bank of the channel. Another bankside path will be constructed along the Agar's Plough side of the channel. The present path between Eton College and the Myrke will remain served by an attractive bridge over the channel which will then run south through a small part of Agar's Plough not used for playing fields.



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SCALE (Metres)



PART AREA NINE (A&B) · THE LIME AVENUE, AGAR'S PLOUGH TO BLACK POTTS VIADUCT

REVISED JANUARY 1992

General

This document should be read in conjunction with the Summary submitted with the original Planning Application in January 1991. It addresses amendments made to that Application to avoid a site of valuable archeological interest in Agar's Plough revealed by the third stage of the Archeological Study.

The revision runs from the lime avenue, Agar's Plough to Black Potts viaduct and is a diversion of the channel to the east by a maximum of 100m. This alignment runs through the existing kennels and a separate Planning Application is expected to be submitted for their relocation.

Engineering Factors

The engineering design and construction of the channel is the same as in the original Application. The access bridge serving the kennels will no longer be required and the Pococks Lane Bridge will cross the channel at an increased skew; it will also have an increased span.

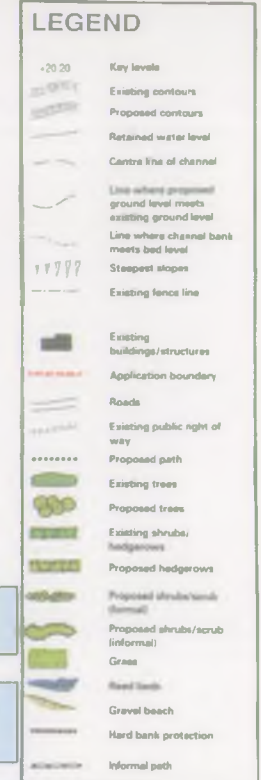
The Myrke Stream will also be diverted to the east and will be separated from the channel by an earth bank. A pumping station will be provided on the Stream just upstream of the viaduct. This will permit Myrke water levels to be held within banks even with high water levels at the outfall to the River Thames.

Environmental Factors

The channel will now run through the line of the kennels and, therefore, will be more remote from the athletics facilities in Agar's Plough the disturbance of which will be reduced. In its northern part the channel will cut through the existing trees and vegetation adjoining the Myrke Stream, and then run to the east of it. Additional trees will be planted to extend the existing tree screen.

The principal change and the main reason for the diversion is to avoid important sites of archeological interest identified in surveys and investigations, including the site of what is believed to be an early Iron Age settlement which was affected by the original line.

Between Pococks Lane and Black Potts railway viaduct the channel reverts to its original line and south of the viaduct there is no change.



AREA NINE (B) - A332 SLOUGH ROAD TO RIVER THAMES (SOUTH HALF)

Engineering Factors

Virtually the entire length of channel will be an earth excavation with banks cut to stable slopes.

However, downstream of Black Potts viaduct the banks will be vertical, piled to below water level. This construction will minimise the excavation of Black Potts Island and will ensure that suitable habitats are available on both banks.

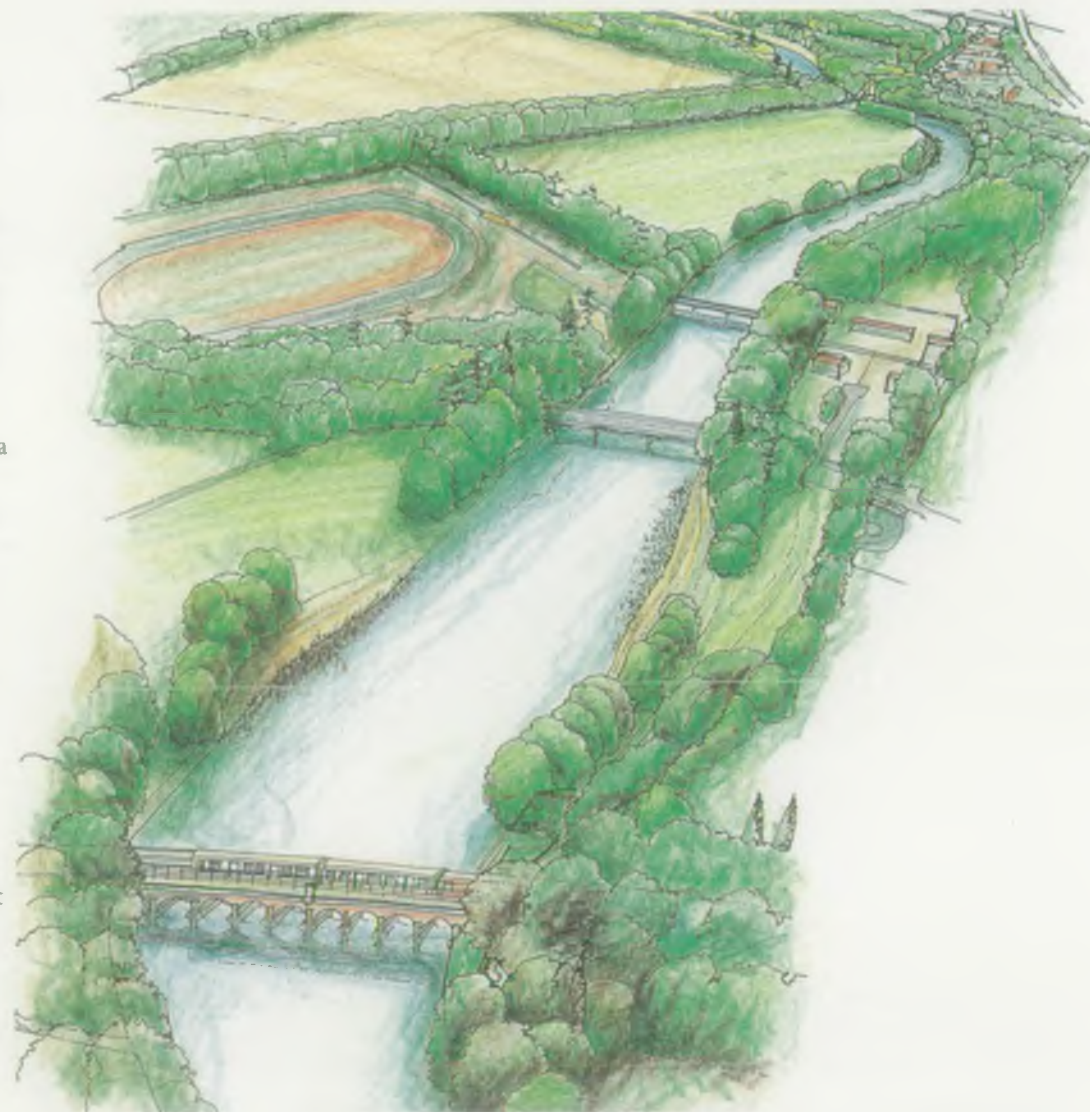
Pococks Lane will cross the new Channel via a three span bridge which will raise the road level above the post-scheme flood level. The road will be on a curve as it crosses the channel, necessitating a wider bridge than a crossing at right angles.

Further south, near Eton College's kennels, a new access bridge will be constructed to provide access between two parts of Eton College land.

At the British Rail Black Potts viaduct the inverts of nine of the arches will be reduced in level and underpinned to form a fixed crest level retention weir. This will hold water levels in the reach to Slough Road above normal Thames retention level. The piers between these arches will be extended on the upstream side to provide support for a separate footbridge crossing the channel at the viaduct.

Environmental Factors

The channel will run between the Eton College kennels and the recently upgraded athletic facilities on Agar's Plough. It will



then pass under Pococks Lane towards the railway, where it will be directed under the existing flood arches of the Black Potts railway viaduct. Finally, downstream of Black Potts Island it will rejoin the River Thames.

In its northern part, as far south as Pococks Lane, the channel will be directed to the west of the present tree screen. Downstream of this, near the College athletics ground, additional trees will be planted to form a new screen.

Between Pococks Lane and Black Potts railway viaduct the channel will cross a paddock which is now used for grazing horses.

In this area a new environment will have to be created throughout. This will be made attractive in its own right and will provide an opportunity to form wildlife habitats.

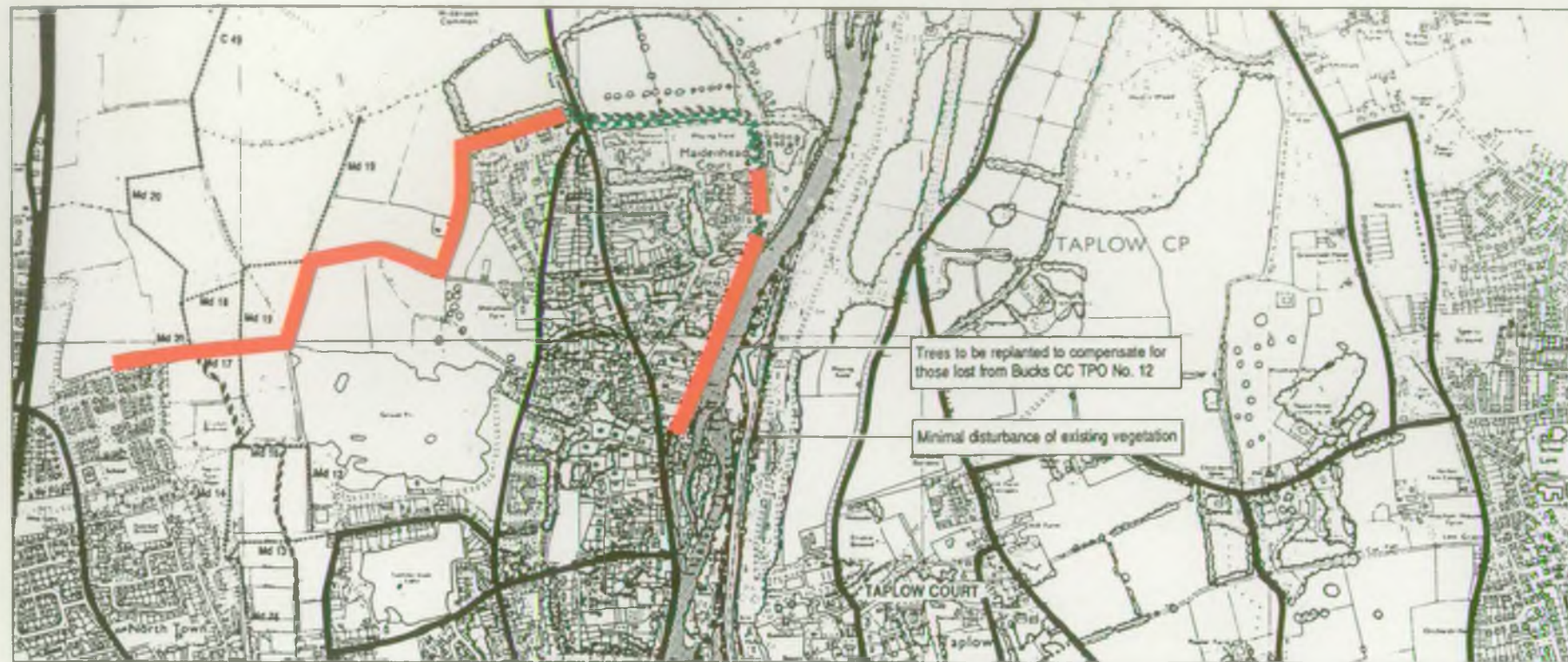
South of the railway viaduct the impact on vegetation will be kept to a minimum by constructing the channel between underwater vertical piles. This minimises the land take on Black Potts Island. It also ensures that the greater length of the river bank of Black Potts Island will be unaffected. This will also enable the channel to be constructed without any land take from, or other impact on, Datchet Golf Course.

On the channel bank of the Island new planting will enhance its value to wildlife.

A footbridge providing continuity to the present footpath link between Eton and Datchet will be placed alongside the railway viaduct. New footpaths to Pococks Lane bridge will be provided to maintain the link across the new channel.



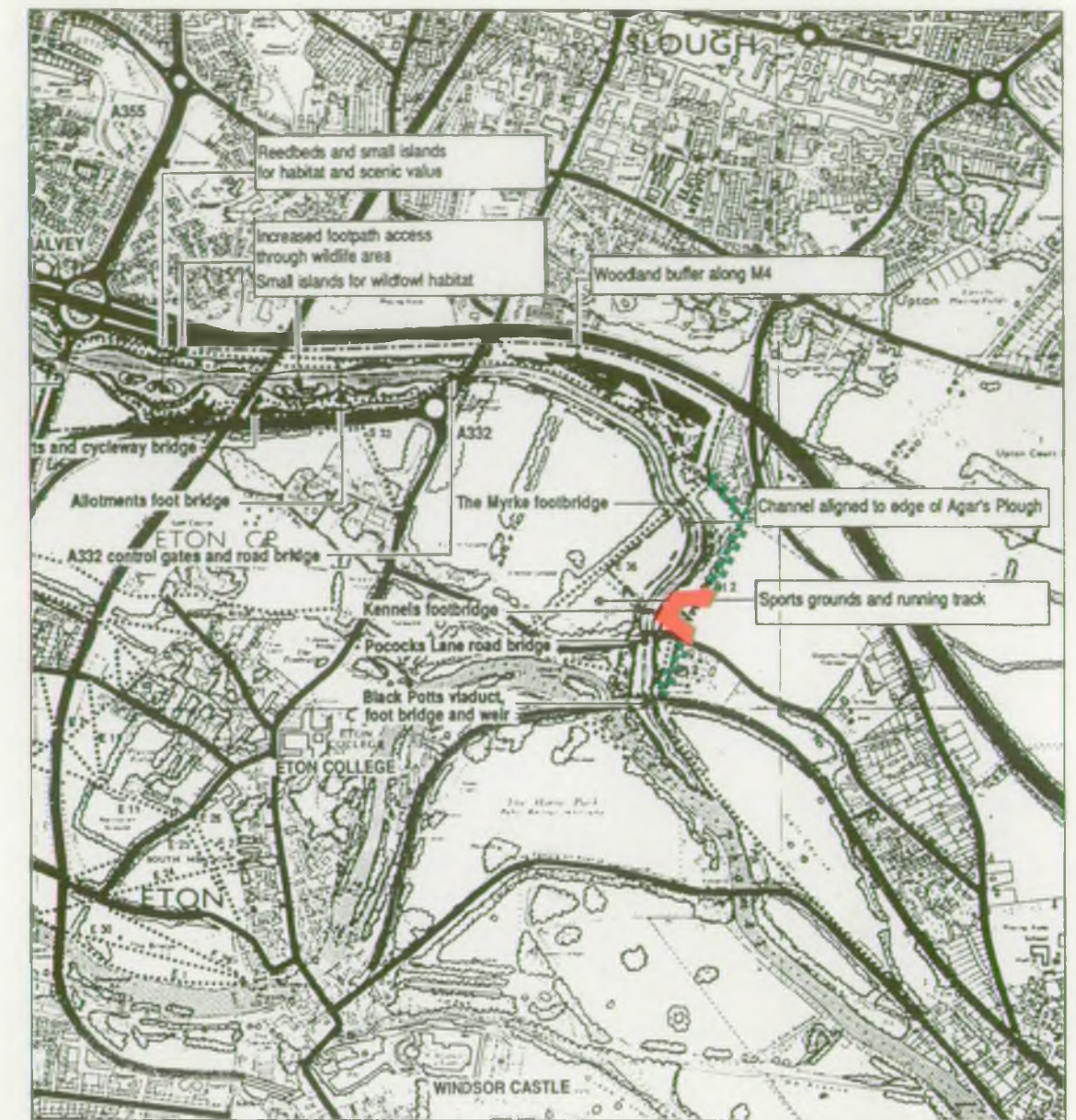
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Area A



Area B



Area C



KEY

Walls



Banks



EMBANKMENTS

Limited areas alongside the River Thames will need protection from overtopping during the higher floods. These areas are situated at Cookham, North Maidenhead and Eton.

Cookham

Although part of Cookham was built on slightly raised ground and thus not flooded in 1947 the western edge of the village was inundated.

The proposals for the new control sluice at Taplow Mill, feeding the flood channel, will reduce peak head water levels in the River Thames at Boulters Weir. This reduction will have some benefit upstream at Cookham. However there still remains a need to construct walls and banks on the western side of the village.

The choice of either wall or bank has been made on the grounds of environmental rather than engineering suitability. They are all low, the typical height being about half a metre and neither walls nor banks will be higher than one metre in any place.

North Maidenhead

Flooding in Maidenhead always commences with overtopping of the River Thames bank just upstream of Boulters Weir in the Maidenhead Court, Islet Park area. Almost simultaneously water backs up the White Brook from east to west across the floodplain and greatly increases the flow of the brook as it enters the northern end of the town. The next stage is for the White Brook to overflow

into the town, joining the water from Maidenhead Court. This is what occurred in 1974 and 1990.

The new Taplow sluice will reduce flood water levels in the River Thames above Boulters Weir but will not be sufficient to prevent some inundation during higher floods.

To combat this problem flood banks and walls will be constructed. A sluice will be built on the White Brook to ensure that the flow entering the town does not exceed the capacity of the channel. The channel capacities of the White Brook and the Maidenhead Ditch through the town are also to be increased to accommodate a greater flow than at present without overtopping.

Maidenhead Bridge and the Fisheries

Although at the feasibility stage it was envisaged that flood banks may have been required in the Fisheries Area, south of the railway in Maidenhead, more detailed study and the experience of the 1990 flood has shown that these will not be necessary. In the event of a flood comparable to that of 1947 occurring after scheme completion, the maximum water level in the Thames opposite the Fisheries would be 0.25m below the 1990 level.

Windsor & Eton

Similarly, more detailed investigations have shown that flood banks are not now required

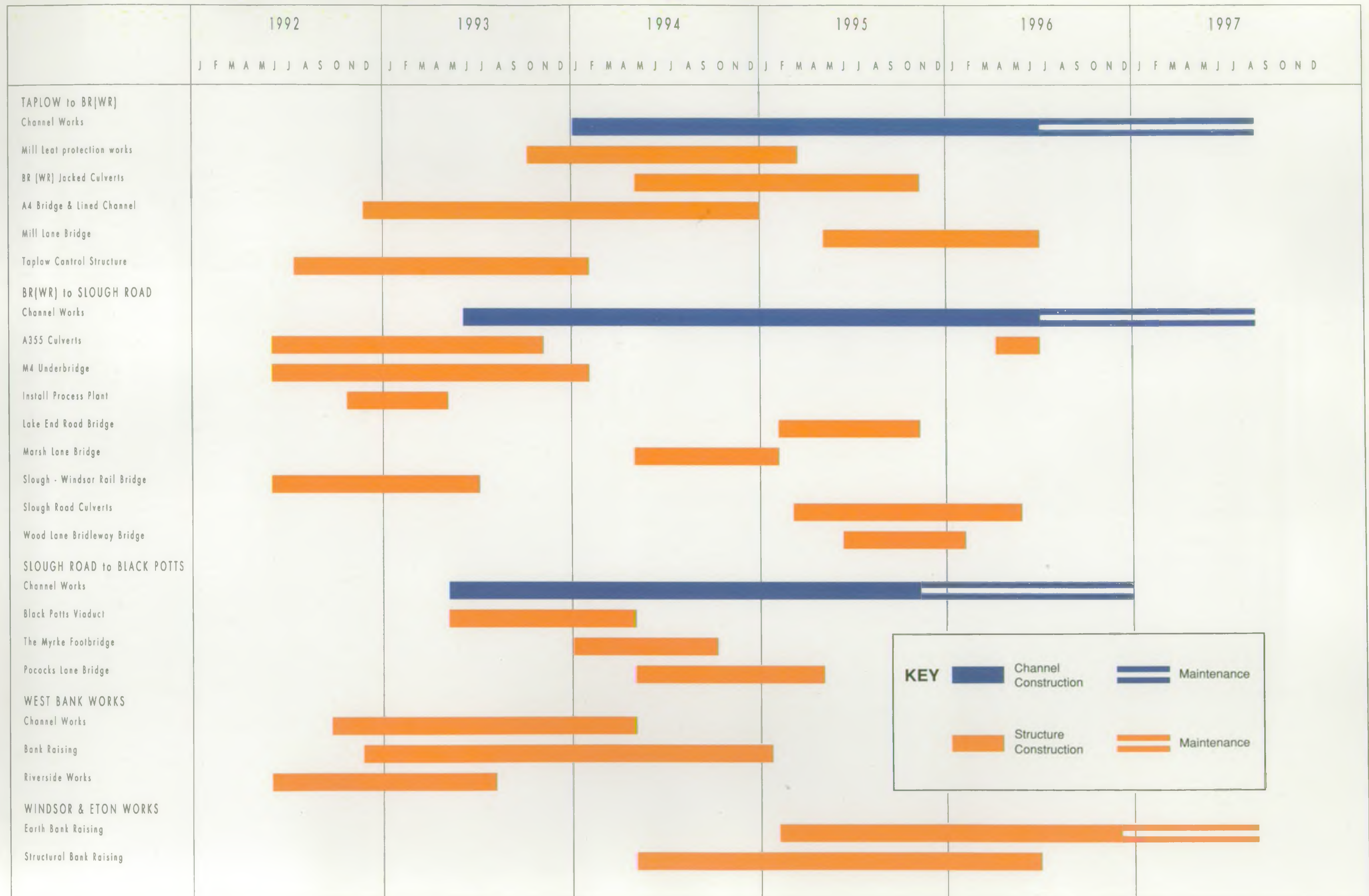


in Windsor and Eton to the extent originally envisaged. The exception is a bank along the eastern side of the new flood channel between the Black Potts railway bridge and the Myrke.



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CONSTRUCTION PROGRAMME

Construction Programme

The work falls naturally into three principal sections created by the barriers formed by the British Rail, Western Region (BR (WR)) embankment at Maidenhead and the A332/Slough Road. Other small sections of the programme are concerned with work on the west bank and with flood embankments at Maidenhead and at Windsor and Eton.

It is proposed that these sections shall proceed simultaneously, with progress in each being dependent to some extent on the associated structures.

In the northern section, from Taplow to BR (WR), apart from fencing and service diversions, not shown on the programme, the first major work to be started will be the new control structure at Taplow Mill. Work on the A4 road bridge and the adjoining lined channel will commence soon after, as will the



construction of the hard roads. Channel excavation will commence after 18 months, as will the various other structures, including the twin box culverts under the BR (WR) embankment.

The programme for the centre section, from the BR (WR) embankment to the Slough Road, is dominated by the need to construct the M4 underbridge and the A355 culverts for use on the haul routes taking the excavated material to the process plant. Channel excavation is programmed to start after 12 months, when these structures are substantially complete, the gravel being

carried by dumper truck to the plant from both ends of the section. Other work and the fabrication of structures will follow.

Excavation on the southern section from Slough Road to Black Potts is also programmed to start after 12 months. The major structural elements are Pococks Lane Bridge and the works at Black Potts viaduct.

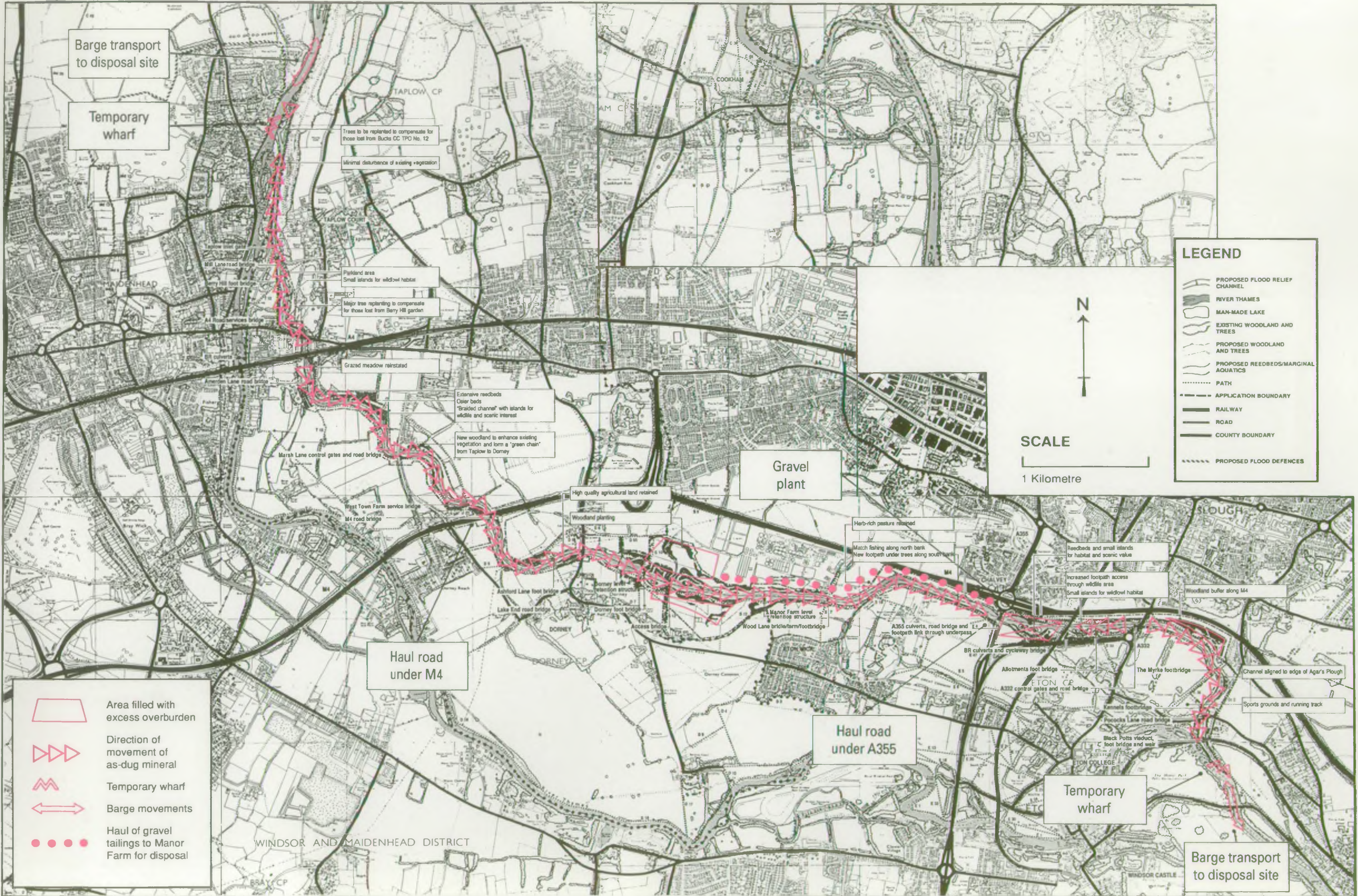
Work on the West Bank will consist largely of channel excavation and bank raising with associated structures.

In Windsor and Eton limited bank raising works will be necessary.

The methods of working and the programme have been designed to reduce public inconvenience to a minimum. By thrusting the twin culverts beneath the BR (WR) embankment the track can be kept open and the trains kept running as normally as possible. In the same way the M4 underbridge will be constructed so that lane closures are avoided. Almost the entire work will be carried out within the site. Local roads will be used only for access to bridgeworks on them.



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Thames Region



Barge transport to disposal site

Temporary wharf

Trees to be replanted to compensate for those lost from Bucks CC TPO No. 12

Minimal disturbance of existing vegetation

Parkland area
Small islands for wildfowl habitat

Major tree replanting to compensate for those lost from Barry Hill garden

Grazed meadow reinstated

Extensive reedbeds
Oyster 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

Marsh Lane control gates and road bridge

West Town Farm service bridge
M4 road bridge

High quality agricultural land retained

Woodland planting

Gravel plant

Herb-rich pasture retained

Match fishing along north bank
New footpath under trees along south bank

Reedbeds and small islands for habitat and scenic value

Increased footpath access through wildlife area
Small islands for wildfowl habitats

Woodland buffer along M4

Channel aligned to edge of Agar's Plough

Sports grounds and running track

Temporary wharf

Barge transport to disposal site

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



SCALE

1 Kilometre

Area filled with excess overburden

Direction of movement of as-dug mineral

Temporary wharf

Barge movements

Haul of gravel tailings to Manor Farm for disposal

WINDSOR AND MAIDENHEAD DISTRICT

GRAVEL

East Bank Channel

The methods of excavating and handling material involved in creating the main flood alleviation channel have been chosen to minimise inconvenience to residents and users of the area. Measures ensuring public safety and road cleanliness will be implemented from the start.

Haul roads on the channel alignment will be absorbed as the channel is created. Other haul roads and structures needed for the excavation will be removed on completion of the channel.

British Rail's operating constraints and the necessary investment in track and rolling stock make it impractical to use the Slough - Windsor railway for spoil movement.



Use of local roads will be minimised and, whenever possible, the River Thames will be used to transport excavated material.

Some 2.1 million cubic metres of material will be excavated of which two thirds,

comprising sand and gravel, will be processed locally. These minerals will be handled, in the main, at an on-site plant built close to and east of the A355 Windsor Relief Road. This plant will be dismantled on project completion. Existing off-site plants will also be used, upstream of the channel inlet at Taplow and downstream of the outlet at Black Potts.

Most of the remaining material, topsoil and clay overburden, will be used for local environmental enhancement. Much will be employed to seal off the former sludge dumping and heavily contaminated area at Manor Farm which eventually will be returned to agricultural and amenity use.

Taplow Mill to British Rail - Western Region

The A4, and the British Rail embankment at Taplow form a barrier to southward movement of spoil. Material not needed for local environmental enhancement will be moved to an upstream disposal point ultimately by river. On-site wharves, removed later, will serve barges.

Excavated material from south of Mill Lane will be brought to the loading wharf by articulated dumper trucks whose free crossing will be secured by temporary closure of Mill Lane.

A4 disruption will be minimised by hauling spoil from the channel, later to be concrete lined, between Berry Hill and British Rail, under a new bridge, carrying the A4 over the channel. During that construction a

temporary diversion of the A4 will reduce traffic disruption.

British Rail - Western Region to Slough Road (A332)

A temporary gravel processing plant, with an annual capacity of about 600,000 tonnes, will be established between the A355, Windsor Relief Road, and the Slough to Windsor railway, close to Junction 6 on the M4. Working for up to 16 hours a day the plant will be subject to full public security and safety measure. These measures will also be applied to nearby roads and footpaths.

An on-site haul road along the line of the channel between Amerden Lane and the gravel plant will pass under the M4 and the A355 using channel structures erected earlier. Other local roads will be crossed at grade under traffic light control.

The channel will be dug from north west to south east by dragline loading to articulated dumper trucks. Sand and gravel for processing will be moved to the plant, and other material, not required for local enhancement, transported to Manor Farm.

Waste fine material from the plant will be moved to Manor Farm for general landscape work along a temporary haul road.

Department of Transport improvements at the Junction 6 roundabout of the M4 and provision of traffic lights will be funded by the National Rivers Authority. A controlled site exit will be provided for gravel lorries

entering the motorway junction. All improvements will be retained permanently except for the site exit.

Slough Road (A332) to Black Potts

The A332 dual carriageway forms a barrier to westward movement of spoil. However, the bulk of topsoil and overburden will be used locally for ground raising and landscape improvement between the channel and the M4. Excavated material requiring processing, not needed locally, will be moved down the River Thames by barge to a disposal point. Temporary wharves on-site will serve barges.

Articulated dumper trucks will move excavated material, largely mineral, to these wharves. The crossing of Pococks Lane will be controlled by temporary traffic lights. A short conveyor may be required to move spoil through the arches of Black Potts railway viaduct.

West Bank Channel













Excavation of the northward extension of the existing Maidenhead ditch will be relatively small in volume comprising some 3,300 cubic metres of mainly topsoil and clay overburden.

Flood embankments around the north of Maidenhead will be formed from a proportion of the clay. The remainder will be disposed of in nearby gravel pits. Local environmental enhancements will absorb the topsoil.



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 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

1 Kilometre

WINDSOR AND MAIDENHEAD DISTRICT

NOISE

From the noise and vibration point of view, there are four main aspects to the construction works, as follows:

- The construction of the bridges to take the channel underneath the A4 and M4, under the two railway lines, and under a number of other road and footpath crossings.
- The construction of lengths of rectangular lined channels at locations along the route.



- The excavation of the channel and the transportation of excavated material.
- The processing and export of the excavated material.

There are additional works on flood defences proposed in Cookham and the north of Maidenhead.

A matter that has also been considered is noise from the operation of the channel, principally from flow control structures.

How noise is measured

Noise is measured on construction sites using the dB(A) units. It is usually calculated over the working day and for night time over a shorter period. The normal limit is 75dB (A) which is a level which just permits conversation inside a room with single-glazed closed windows. As a general rule one may assume that the difference between outdoor and indoor noise measurements is about 10dB (A) for open windows, 15 to 20dB (A) for closed single windows and 25 to 30dB (A) for secondary glazed windows.

If it is assumed that noise insulation is provided in the dwellings concerned, then external limits for construction noise may be increased by a figure of 10dB (A). On this basis, the following table may be constructed of suggested limits of acceptability:-

Duration of noisy works: External noise limit	Several weeks	Several months
	dB(A)	dB(A)
Daytime, no noise insulation	75	70
Daytime, with noise insulation	85	80
Night-time, no noise insulation	55	45
Night-time, with noise insulation	65	55

It follows from the table that an external daytime average of 85 dB(A) represents an upper limit above which either noise control measures to reduce external noise levels should be instituted or other mitigatory action, such as re-housing should be taken.

It is considered that the noise limits for 'several months' should apply to works in the Taplow Mill Leat area, the A4 area, the construction of the bridges and the works in the Black Potts area, while the limits for 'several weeks' apply to the excavation of the channel. Noisy operations will be limited to normal daytime working hours, except for the gravel processing plant, which will operate two shift working. All works will be subject to the requirements of the Environmental Health Officers.

Existing background noise

A study had been carried out of the existing background noise in various parts of the area and it was found to be of three different kinds. In the eastern section, from Marsh Lane to Black Potts, the noise environment is dominated by the M4 motorway. In the centre section noise from the British Rail Western Region Main Line is a major feature, coupled with noise from the A4. North of the A4 noise levels are more typical of a suburban residential area and in areas on the riverfront, protected from traffic noise, are to be found the lowest noise levels along the route. The area is affected to a certain extent by aircraft noise.

Typical results were:-

Area	dB(A)
Mill Lane, Taplow	53
A4, Hawthorns	73
Marsh Lane	60
Lake End	63
Dorney	62
Chalvey	67
Eton College Masters' Houses	67
Pococks Lane (The Kennels)	64
The Myrke	63

The noise generated by the works has to be seen against the background of the existing background noise.

Noise predictions

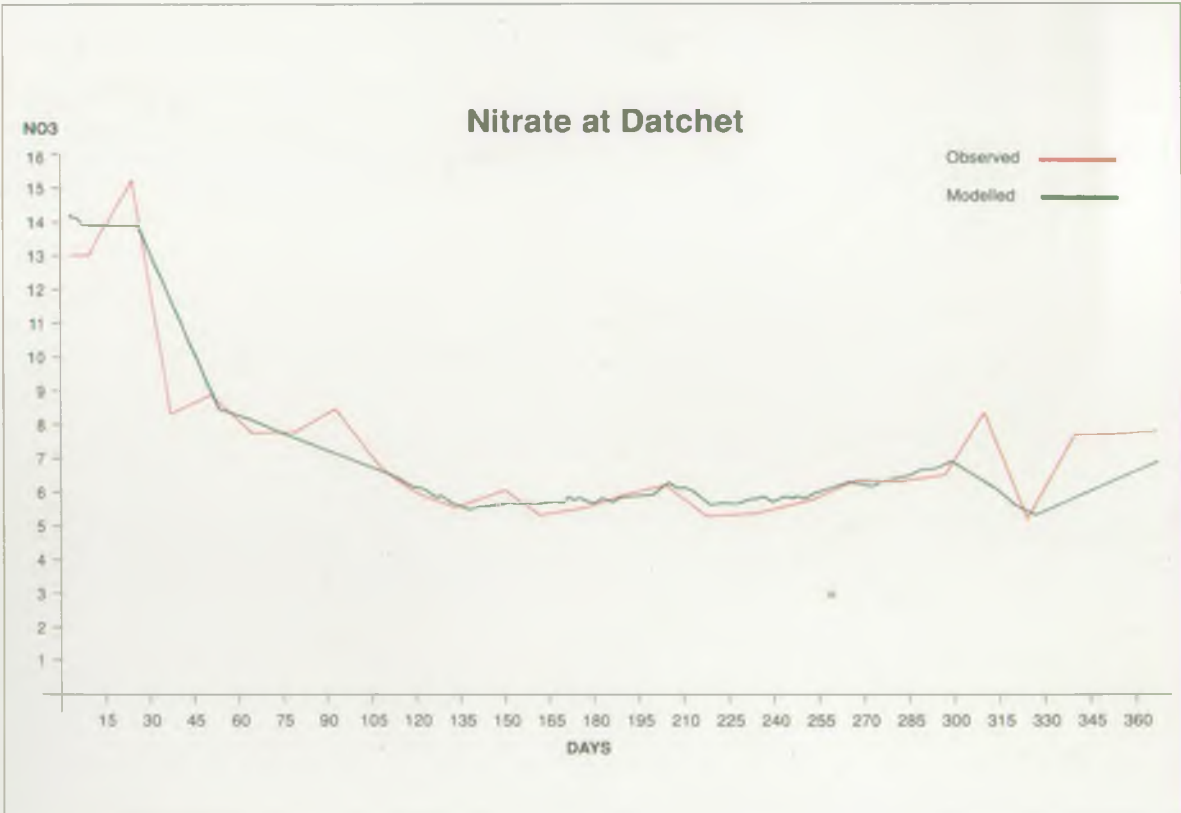
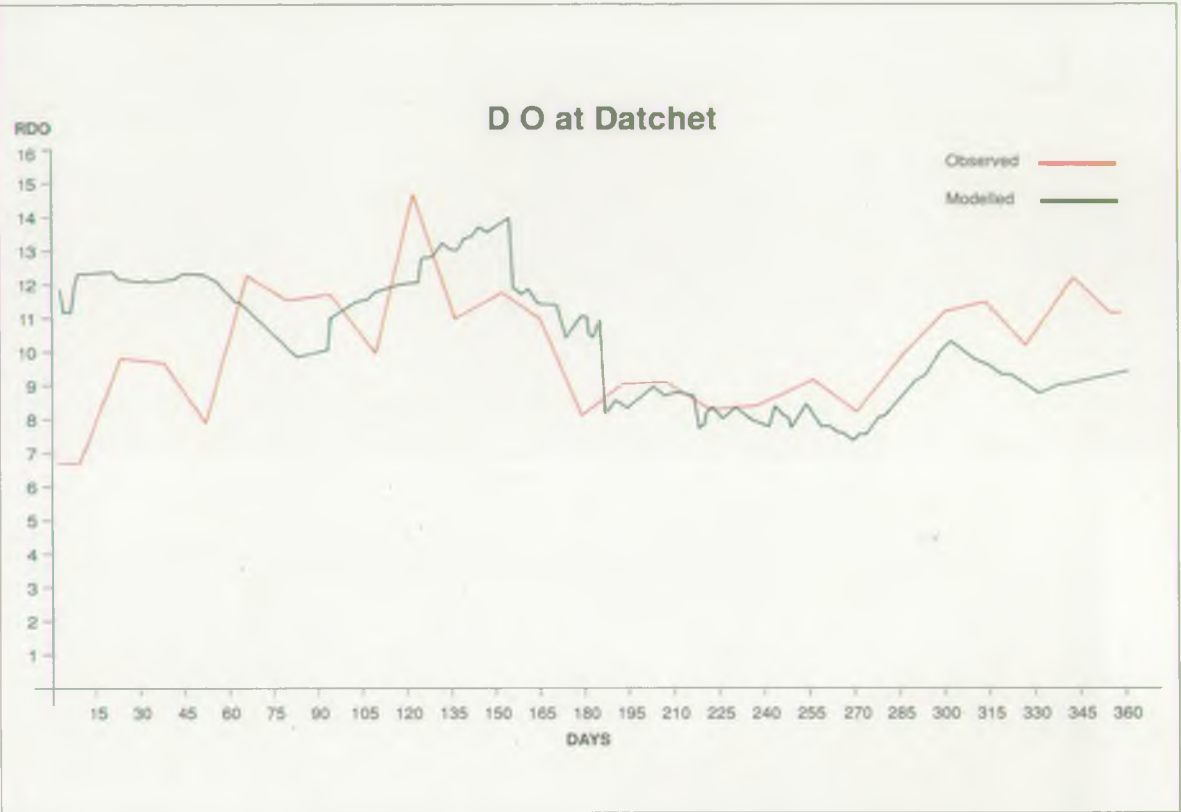
On the plan on the previous page we have shown the predicted 65 and 75 dB(A) noise contours. These are the worst noise levels calculated to be generated by the works; they will in practice be reduced by specific local noise control measures in the form of banks, fences etc. The existing background noise levels are shown in the black squares; it can be seen that over most of the length of the works the predicted noise levels will rarely exceed the existing levels.



National Rivers Authority
Thames Region



Output from groundwater quality models showing concentrations of nutrients



Results from river and channel models

OPERATION & WATER QUALITY

Water Quality

The quality of the water in the Channel will be the best possible at any time.

Groundwater and River Thames quality have been modelled, predictions made of possible problems and operating methods devised to eliminate them or reduce them to an unavoidable minimum.

The groundwater carries high concentrations of nutrients, mainly nitrogen products. Around the Manor Farm area these are in the form of ammonia or nitrates arising from the sludge disposal practised for many years at Slough Sewage Treatment Plant. This activity has now ceased and the concentrations of pollutants are rapidly diminishing. Elsewhere the nitrate-rich groundwater is due to agricultural practice and it seems likely that the levels will remain relatively high. The Thames receives large volumes of treated sewage effluent contributing both nitrates and phosphates.

If exposed to sunlight for prolonged periods such nutrient-rich water stimulates the growth of plants and algae. These can cause deterioration in water quality when they die, as their decay depletes oxygen concentrations.

In hot dry summers there could be large variations in dissolved oxygen concentration. This will be controlled by weirs providing maximum re-aeration. All weirs and control structures will incorporate fish passes.



Mathematical Modelling

The hydraulic and water quality models of the Channel and the Thames have been verified against historic data for the River and extrapolated to include the Channel. Groundwater models examine flows and quality and have been verified against observed levels and conditions.

Three possible operating strategies were considered:-

- (a) Equal flows through the Channel and the River Thames.
- (b) Zero flow in the Channel except in flood conditions.
- (c) The maintenance of a minimum sweetening flow in the Channel except in flood conditions.

The Channel will be operated under Strategy (c) with a minimum flow of 5 cubic metres per second.

Whenever there is sufficient water this flow will be increased to 10 cubic metres per second. A surge of flow will be allowed through the Channel each winter to control emergent vegetation. In most years this is likely to occur naturally; if not the greatest available flow will be contrived. Although restraining plant growth this is unlikely to remove totally the need for weed cutting.

Channel and River Management

The function of the Channel is to carry flood water. It is also designed to enhance the landscape and local environment. The aim of the management systems will be to ensure that these ends will be achieved.

The NRA Thames Region maintains thousands of miles of rivers and the Flood Channel and River Thames will be operated as a single unit within the existing management structure.

As flood flows develop the Channel will be brought into phased operation, by the NRA, controlled locally and monitored centrally at the Region's Flood Control Room. This steadily increasing use of the Flood Channel will ensure there are no sudden changes in flow or levels.

Quality Management

The Channel will have the same Water Quality Objective as the Thames. Water quality will be sampled and analysed by the NRA and these results will be available for public inspection.

In extreme cases when river flows are very low the NRA will resolve the conflicting demands of water quality, navigation and water levels in both channels. The objective will be to achieve a water quality which at all times is equal to that of the Thames.

Landscape Maintenance and Management

Maintenance under the Contract will last for three years, then become the responsibility of the Flood Defence Manager. In many areas the Authority will offer land back to the original owners with the sale agreements ensuring the continuance of the landscaping in the state originally planned. Some footpaths and bridleways will be adopted by the Highway Authority.

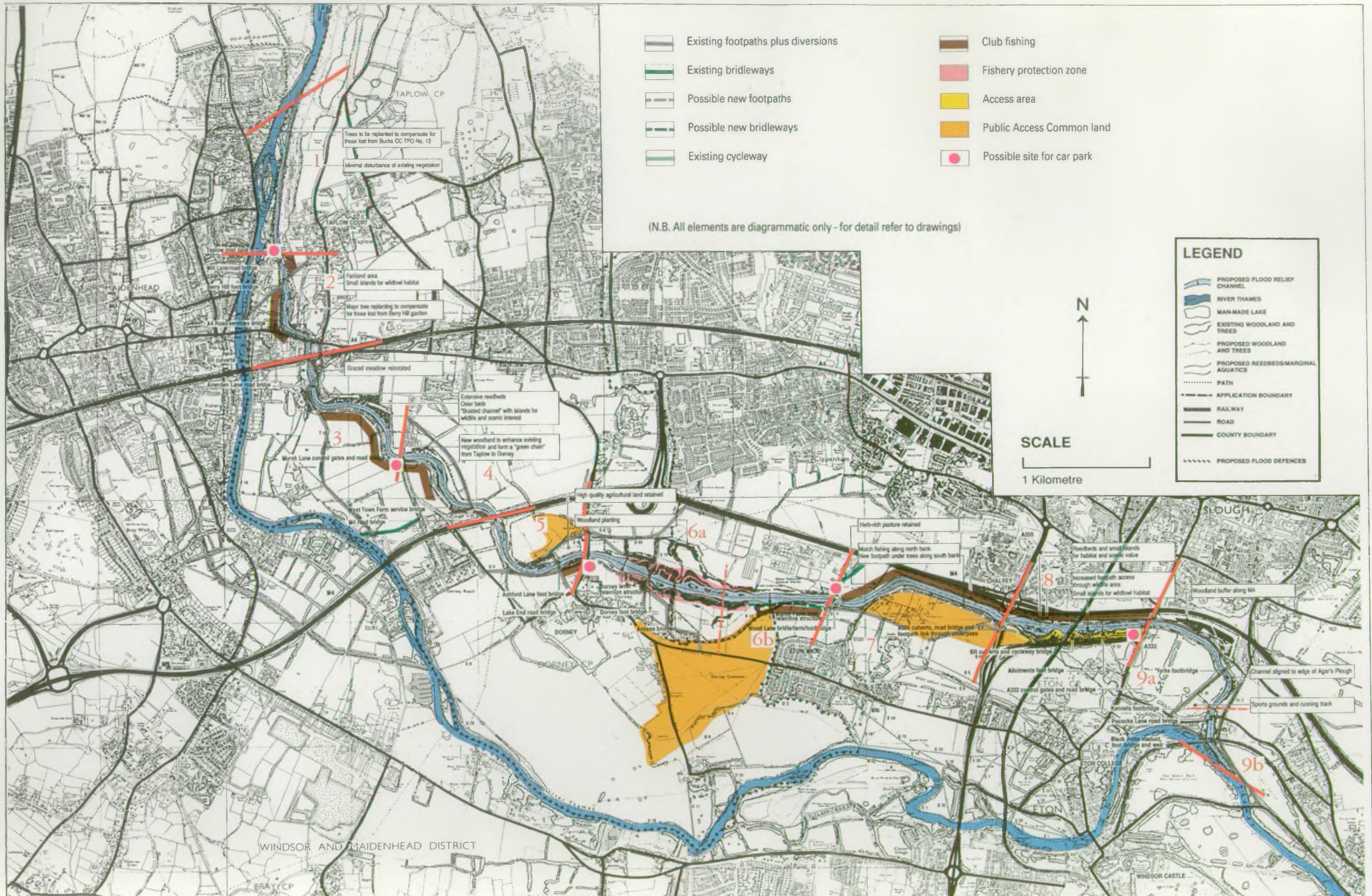
Fisheries will be leased to angling associations responsible for the control of anglers, litter, parking etc.

The same good management practice will apply to flood walls and embankments.



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RECREATION & WILDLIFE

The NRA will make proper provision for passive recreational uses of the flood alleviation channel. These will include such activities as walking, angling, ornithology, picnicking etc. This will mean identifying sensible locations for car parks, picnic-areas, circular walks, including selected lengths of the channel, and areas where fishing will be permitted either by the sale of NRA permits or lease of the stretch to a club.

The NRA has taken this stance in order to manage properly those uses which it believes will take place even if no specific facilities are provided. It will allow the NRA to direct where and how the activities take place and will thus minimise conflicts both between users and with local people.

In adopting this policy, the NRA accepts a commitment to maintain the facilities and to meet any costs associated with this.

The NRA will make no specific provision for active recreation such as canoeing, rowing, cruising etc. However, it is possible to incorporate a straight length of channel in the design that could be utilised for rowing and canoeing at some future date.



This approach is considered to be the best compromise between the aspirations of all parties concerned. These include conservation interests, recreation bodies and local people. The NRA has taken note of its statutory environmental and recreational responsibilities in a way that does not jeopardise acceptance of the scheme.

Extensive consultation has taken place regarding the level of recreation provision to be accommodated within the scheme design. The NRA's own recreation staff, local authorities, local people and interested organisations have all been consulted. Their comments have been assessed, together with those from all other environmental, planning and engineering disciplines. Relevant local authority policies have also been considered.

There is some local opposition to any recreational afteruse of the channel. However, it is felt that the NRA would be failing in its duty if it did not provide the opportunity for some form of recreational use of the completed channel.

Wildlife Policy

NRA will promote and ensure an ecologically sound scheme which is well integrated with surrounding areas. These objectives will be met by:

- Promoting a significant increase in habitat diversity along the channel corridor.
- Establishing wide variety in local ground modelling throughout the corridor both within and without the channel.

- Incorporating a wide range of plant species and communities attractive to wildlife.
- Varying the depth and composition of substrate and topsoil in the project area.
- Re-creating habitats which have been lost along the Thames.
- Relating new habitats to existing habitats nearby.
- Designing for wildlife needs throughout the channel corridor.
- Establishing islands, scrapes, bays and other areas suitable for wildfowl feeding, nesting and breeding wherever possible.
- Limiting public access to especially sensitive wildlife areas.
- Using plant species which support invertebrate populations.
- Using plant species with seasonal attraction for wildfowl.
- Providing variety in landform, soil composition, plants and other factors especially at the most minute scale.
- Encouraging the development of viable self-sustaining ecological communities within the channel corridor
- Monitoring herbicide and pesticide use in and around the channel.



- *Establishing diversity in vegetation layers*
- *Modelling the structure and species mix of new communities on existing indigenous habitats nearby.*



- *Providing a management scheme to perpetuate the integrity and viability of the original planning intent.*
- *Designing with regard to the long-term management of introduced vegetation.*



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SUMMARY



This document has described the many activities necessary to implement the Maidenhead, Windsor and Eton Flood Alleviation Scheme. At the end of the day it must be borne in mind that the sole purpose of the work is to protect life and property from flooding; this is the first duty of the National Rivers Authority.

In the event of a major flood, comparable to that of 1947, 5,500 properties and 12,500 people would suffer directly. Many times that number would suffer indirectly as a result of disruption to communications and loss of services. A major event of this sort

could last for several weeks but the inconvenience to those directly affected would last considerably longer. That this would be so was adequately demonstrated in early 1990 by the disruption and suffering caused by that relatively minor flood event.

The scheme is designed to contain flows of 515 cubic metres per second (cumecs). This intensity of flow is not likely to be exceeded more than once in sixty-five years. By comparison, the 1990 flow was 320 cumecs and is expected to be repeated approximately once in six years. At maximum capacity the River Thames will carry 283 cumecs, the

Flood Channel 215 cumecs and the Maidenhead Ditch 17 cumecs. At flows greater than 515 cumecs there will remain the risk of flooding from the River but its effect will be greatly lessened by the Scheme.

The flood Channel will be attractively landscaped to blend into the local environment. It will provide wildlife habitats, replacing those lost over the years on the River and will give opportunities for recreation and enjoyment.

The construction of the works will entail the removal of large quantities of material, much of it valuable sand and gravel. This will be taken to a processing plant and removed from the site via the M4, thus avoiding local roads. Major civil engineering works will be required, road and rail bridges, control structures and footbridges. It will be necessary for the construction of these to use local roads but this disruption will be kept to a minimum with careful attention to traffic movements, noise and dust suppression.

The scheme will cost some £45M to implement and this cost will be met by the NRA and Ministry of Agriculture, Fisheries and Food. Set against this the cost of damage from flooding during the life of the scheme is estimated to be in excess of £50M. In flood defence terms the saving of damage costs is counted as a benefit and so the ratio of benefit to cost is well in excess of 1.00. Thus the scheme is thoroughly justified financially.

If the current Planning Application is approved, construction is planned to start in July 1992 and the scheme should be completed by the end of 1996. This period

of four and a half years will see intense construction activity but, when it comes to an end, peace and quiet will return, a pleasant environment will have been created and, most important of all, many thousands of people will be protected from the risk of serious and frequent flooding.



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CONTACT ADDRESSES AND DOCUMENTATION

Local Authorities involved

These planning applications have been submitted to three Local Authorities: Royal Borough of Windsor & Maidenhead, South Bucks District Council, and Slough Borough Council. Since this application involves the extraction of minerals these three Authorities have referred these applications, for determination, to the two County Planning Authorities as under:

Director of Highways & Planning
Royal County of Berkshire,
Department of Highways & Planning,
Shire Hall, Shinfield Park, Reading,
Berks RG2 9XG

County Planning Officer
Buckinghamshire County Council,
Planning Department,
County Hall, Aylesbury, Bucks HP20 1UX

Comments on these applications may be submitted to the two County Planning Authorities, and copied to the District Local Authorities

National Rivers Authority Project Office

Further information may be obtained from the National Rivers Authority's project office, (where there is a public display of the scheme proposals), at the following address:

Project Manager, National Rivers Authority,
Taplow House, Clivemont Road,
Maidenhead, Berks SL6 7BU
Tel: 0628 777533

The documents and drawings may be inspected at the County Planning Authority offices, or at the NRA's project office.

Summary of Planning Application Documents and Drawings

The documents and drawings relating to the planning application are as follows:

Main documents

- Application forms.
- Notices to accompany application.
- Scheme specification.
- Scheme justification.
- Environmental statement.
- Archaeological survey.
- Property and land (including description of powers and duties of NRA and progress on legal agreements).
- Gravel and spoil.
- Access routes and construction programme.
- Maintenance and management strategy:
 - (a) channel operation and water quality;
 - (b) Structures.
- Scheme brochure (this A3 document).

Summary documents

- Index to documents.
- Environmental statement summary.
- Engineering and economic summary.
- Implementation and policy framework.
- Description of sub-contracts and comments on their results.

Plans and drawings

- Key plan.
- Application plans (red line).
- General arrangement drawings of:
 - (a) East bank channel - Areas 1 to 9;
 - (b) Embankments and flood walls;
 - (c) Improvements to existing west bank channel.
- Cross sections of east bank channel.
- Environmental analysis drawings (part of item 5)
- Impact drawings (part of item 5)
- Typical details of environmental works.
- Artist's impressions.
- General arrangement drawings of structures.
- Construction phasing plans.
- Geological and borehole drawings.
- Contour plans.
- Existing services.

Drawing numbers for individual areas

Study Area	General Arrangement Plans	Contour Plans	Impact Plans	Cross Sections	Management Plans	Typical Details	Artist Impressions	Analysis Diagrams	Scheme Site Plans	Longitudinal section	Construction Phasing Plans	Structures	Services Plans	
	A Series	B Series	C Series	D Series	E Series	F Series	G Series	H Series	M Series	N Series	P Series	Q Series	S Series	
Overall	0-A1 to 3					0-F1			0-M1	0-N1 to 3	0-P1 to 3			
Area 1	1-A1	1-B1	1-C1 to 3	1-D1		1-F1	1-G1	1-H1 to 7	1-M1		1-P1 to 4	1-Q1-1 to 3 1-Q2-1,2	Taplow intake structure Mill Lane Bridge	1-S1
Area 2	2-A1	2-B1,2	2-C1,2	2-D1	2-E1	2-F1,2	2-G1	2-H1 to 7	2-M1			2-Q1-1,2 2-Q2-1 to 7 2-Q3-1 to 3 2-Q4-1,2	Berry hill footbridge A4 bridge Berry Hill lined channel BR (WR) Dorney bridge box culverts	2-S1
Area 3	3-A1	3-B1	3-C1	3-D1	3-E1	3-F1,2	3-G1	3-H1 to 7	3-M1		3-P1 to 4	3-Q1-1 to 3	Amerden Lane bridge	3-S1
Area 4	4-A1	4-B1	4-C1	4-D1	4-E1	4-F1,2		4-H1 to 7	4-M1			4-Q1-1 to 3 4-Q2-1,2 4-Q3-1 to 6	Marsh Lane control structure West Town Farm service & footbridge M4 underbridge	4-S1
Area 5	5-A1	5-B1	5-C1	5-D1	5-E1	5-F1,2	5-G1	5-H1 to 7	5-M1			5-Q1-1,2 5-Q2-1 to 3	Ashford Lane footbridge Lake End Road bridge	5-S1
Area 6	6-A1,2	6-B1 to 4	6-C1,2	6-D1,2	6-E1,2	6-F1,2	6-G1	6-H1 to 14	6-M1,2			6-Q1-1,2 6-Q2-1,2 6-Q3-1 to 3 6-Q4-1 to 3 6-Q5-1,2	Dorney level retention structure Dorney footbridge Sewage Works access bridge Manor Farm level retention structure Wood Lane bridleway bridge	6-S1,2
Area 7	7-A1	7-B1,2	7-C1	7-D1	7-E1	7-F1,2		7-H1 to 7	7-M1		7-P1 to 4	7-Q1-1 to 5	A355 culverts	7-S1
Area 8	8-A1	8-B1,2	8-C1	8-D1,2	8-F1	8-F1,2	8-G1,2	8-H1 to 7	8-M1		8-P1 to 4	8-Q1-1 8-Q2-1 to 3 8-Q3-1,2 8-Q4-1 to 4	Salihill inverted syphon Chalvey railway bridge BR (WR) Allotments footbridge Slough Road culverts	8-S1
Area 9	9-A1,2	9-B1 to 4	9-C1 to 4	9-D1	9-E1,2	9-F1,2	9-G1,2	9-H1 to 14	9-M1,2		9-P1 to 4	9-Q1-1,2 9-Q2-1,2 9-Q3-1 to 3 9-Q4-1 to 3	Myrke footbridge Kennels footbridge Pococks Lane bridge Black Potts viaduct & footbridge	9-S1,2
Area 10	10-A1													
Area 11	11-A1 to 6	11-B1,2										11-Q1-1 11-Q2-1,2 11-Q3-1,2	West bank inlet sluice West bank footbridges West bank access bridges	11-S1

Note: Area 10 - Cookham
Area 11 - North Maidenhead

The illustrations and drawings in the brochure are illustrative only. Reference should be made to the definitive drawings included in the planning submission and listed above

Organisations Consulted

In addition to the five local Authorities involved the following organisations have been consulted, although this does not imply endorsement of the scheme:-

BBONT
Countryside Commission
Council for the Protection of Rural England
National Farmers Union
Open Spaces Society
RSPB
Mid-Thames Fisheries Consultative Council
Association of Thames Valley Sailing Clubs
British Canoe Union

Institute of Fisheries Management
National Trust
Ramblers Association
The Sports Council
Thames Amateur Rowing Council
Upper Thames Passenger Boat Federation
Thames Hire Cruiser Association
Association of Thames Yacht Clubs
Country Landowners Association

Ministry of Agriculture, Fisheries & Food
Nature Conservancy Council
River Thames Society
Cookham Parish Council
The Cookham Society
Eton Town Council
Maidenhead & District Civic Society
Taplow Parish Council
Bray Parish Council

Dorney Area Preservation and Conservation Society
Eton Wick Residents
Thames Planning & Amenities Forum
Hitcham & Taplow Preservation Society
Dorney Parish Council
River Users Group 6
River Users Group 7
Windsor & Eton Society



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