

Oxfordshire County Council

Harwell Bypass

Initial route assessment

June 2009

Halcrow Group Limited

Oxfordshire County Council
Harwell Bypass
Initial route assessment
June 2009

Halcrow Group Limited

Halcrow Group Limited
Burderop Park Swindon Wiltshire SN4 0QD
Tel +44 (0)1793 812479 Fax +44 (0)1793 812089
www.halcrow.com

Halcrow Group Limited has prepared this report in accordance with the instructions of their client, Oxfordshire County Council, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

© **Halcrow Group Limited 2009**

Halcrow Group Limited
Burderop Park Swindon Wiltshire SN4 0QD
Tel +44 (0)1793 812479 Fax +44 (0)1793 812089
www.halcrow.com

Oxfordshire County Council

Harwell Bypass

Initial route assessment

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
	0	First draft	26/6/08	PJ Ridal
	1	Final	16/7/08	SJ Leach
	2	Final – revised due to typing error	17/7/08	SJ Leach
	3	Cost estimates updated to 2009 prices	12/06/09	M Robinson

Contents

1	Executive summary	1
2	Introduction	3
2.1	<i>Objectives of the Harwell Bypass</i>	3
2.2	<i>Purpose of this study</i>	3
2.3	<i>Policy and Strategy</i>	4
2.4	<i>Oxfordshire Structure Plan (2006-2016)</i>	4
2.5	<i>Vale of White Horse Local Plan 2011 (2006)</i>	6
2.6	<i>Vale of White Horse emerging LDF – particular focus on ‘Your Vale Your Future’ Issues and Options Report November 2007</i>	7
3	Road Standards & Other Requirements	8
3.1	<i>Type of road and design speed</i>	8
3.2	<i>Cross sections</i>	8
3.3	<i>Non-motorised users</i>	8
3.4	<i>Public Transport</i>	8
3.5	<i>Lighting</i>	9
4	Requirements & Route Constraints	10
4.1	<i>Requirements</i>	10
4.2	<i>Constraints</i>	10
5	The Indicative Route	11
5.1	<i>Drawing</i>	11
5.2	<i>Topography</i>	11
5.3	<i>Route description</i>	11
5.4	<i>Optional southern link</i>	12
5.5	<i>Link to Milton Park over A4130 & mainline railway</i>	12
5.6	<i>Crossing of Cow Lane</i>	13
5.7	<i>Junction with B4493 (Didcot Road)</i>	13
5.8	<i>Junction with A417 and link to Chilton</i>	14
5.9	<i>Utilities</i>	14
6	Capital Cost Estimates	15
6.1	<i>Quantities</i>	15
6.2	<i>Construction prices</i>	15
6.3	<i>Land and property costs</i>	15

6.4	<i>Preparation and supervision costs</i>	15
6.5	<i>Optimism bias</i>	15
6.6	<i>Inflation</i>	15
6.7	<i>Summary</i>	15

7 Appendices 17

7.1	<i>Appendix A</i>	17
7.2	<i>Appendix B</i>	18
7.3	<i>Appendix C</i>	19
7.4	<i>Appendix D</i>	20

1 Executive summary

- 1.1.1* The Harwell Bypass is sited to the west of Didcot and would link the A4130 at its northern end with the A417 at its southern end, a distance of 3.4 km. It has two strategic objectives, firstly to provide environmental relief to the village of Harwell and secondly to facilitate the planned development of Didcot including commercial development, housing and new transport links.
- 1.1.2* Oxfordshire County Council has shown a corridor for the bypass, but this is the first effort at the definition of an indicative route. The purpose of this short study is to demonstrate that a route is feasible in engineering terms and to provide a first estimate of cost. All findings are preliminary due to the short duration of the study and the limited information available. Please note that there are opportunities for refinement of the route if OCC should decide to progress further.
- 1.1.3* Traffic figures indicate that the road would be a single carriageway 2-lane all purpose road. Because of the rural nature of the route, the links between roundabouts have been designed for a speed of 100 kph (60 mph). Lighting would be provided at junctions but not elsewhere. A cycleway/ pedestrian way would be provided on one side of the road throughout.
- 1.1.4* An indicative route has been identified and priced. A plan is available in the appendices to this report. One of the main drivers in locating the route is the wish to provide as much land as possible for new housing between the road and the existing western edge of Didcot. An existing sewage works is affected and the road is close to two properties at the A417.
- 1.1.5* A link to the Milton business park has also been investigated. While it would be feasible to provide this link it would pass over a road and railway line and would require acquisition of land already in commercial use in Milton Park. Hence the costs are high for this short link.
- 1.1.6* There is also an alternative route to the south that could provide a link to Chilton. Due to time and cost constraints the estimates for this link do not include for upgrading the road over Hagbourne Hill. This would be a substantial additional cost.

1.1.7

A summary of the preliminary estimates in £million is provided below. Estimates are based on mid 2008 prices from Spon's Price Book 2009, and there is no allowance for further inflation. The budget totals include optimism bias of 44%, in line with Green Book advice. This is based on a statistical exercise carried out by the Treasury to allow for future price increases other than inflation.

Item	Harwell Bypass	Link to Milton Park	Southern link
Construction	12.2	13.4	3.4
Land & property	1.5	1.1	0.2
Preparation (15%)	2.0	2.2	0.5
Sub total	15.7	16.7	4.1
Optimism bias 44%	7.0	7.3	1.8
Budget total 2008 prices	£22.7 million	£24.0 million	£5.9 million

Summary of cost estimates

2 Introduction

2.1 *Objectives of the Harwell Bypass*

2.1.1 The Harwell Bypass is located to the east of the village of Harwell and to the east of the A34 trunk road. The initial planning corridor for the bypass is shown on the figure at Appendix A.

2.1.2 The bypass has three principal objectives as follows.

- To provide an alternative route for north-south traffic that currently passes through Harwell village thus providing environmental relief to this area
- To provide access for new housing development to the west of Didcot
- To be part of the development of new strategic routes to facilitate the further development for Didcot, as demonstrated by the figure at Appendix A.

2.2 *Purpose of this study*

2.2.1 An initial brief was received from Oxfordshire County Council (OCC) at the end of May 2008 and meetings were held on June 4 & June 18 2008 with officers from OCC and The Vale of the White Horse District Council to discuss the brief and determine the work that could be carried out within the time and budget available.

2.2.2 These meetings allowed the principal objectives for this short study to be defined as follows.

- To identify an indicative route for the Harwell Bypass within, or close to, the corridor defined by OCC, in sufficient detail to confirm that it would be feasible to build a new road
- To prepare an associated capital cost estimate for the road

2.2.3 This report sets out to describe the constraints and requirements that affect the route, the standards for new road, and its alignment and features. There is also an estimate of capital cost.

2.3

Policy and Strategy

2.3.1

There are a number of policy and strategy documents that should be referenced in respect to the economic, social and environmental justification for the development of this scheme. The list of documents that should be referenced are as follows:

- Draft South East Plan (2006);
- Regional Economic Strategy for the South East (2006);
- Oxfordshire Sustainable Community Strategy (2007);
- Oxfordshire Structure Plan (2006-2016);
- Oxfordshire County Council LTP2 (2006-2011) – particular focus on Central Oxfordshire sub-region, South Oxfordshire and Vale of White Horse chapters;
- Transport Networks Review (2004);
- Vale of White Horse Local Plan 2011 (2006);
- South Oxfordshire emerging LDF – particular focus on ‘Your Place Your Future’ Core Strategy Issues and Options Paper November 2007;
- Vale of White Horse emerging LDF – particular focus on ‘Your Vale Your Future’ Issues and Options Report November 2007;
- Didcot Integrated Transport Strategy (Phase 1) (2004);
- Didcot Integrated Transport Strategy (Phase 2) (2004);
- The Transport Networks Review;
- LTP2;
- Halcrow Technical Reports related to Housing Development at Didcot

2.3.2

The following provides a summary of the key policy documents.

2.4

Oxfordshire Structure Plan (2006-2016)

2.4.1

The Oxfordshire Structure Plan ‘sets out the proposed pattern of future development for Oxfordshire’. The County Council’s overall aims and underlying objectives for the Plan are set out in Table 1 below.

Table 1: Aims and objectives of Oxfordshire Structure Plan (2006-2016)	
Aim 1	To protect and enhance the environment and character of Oxfordshire.

Table 1: Aims and objectives of Oxfordshire Structure Plan (2006-2016)	
Objectives	To provide effective protection and enhancement for Oxfordshire's biodiversity, landscape and heritage; To reduce pollution and emissions of greenhouse gases; To maintain and improve the quality of surface and groundwater; and To protect the quality of soils and agricultural land.
Aim 2	To encourage the efficient use of land, energy and resources.
Objectives	To locate development where it can reduce the need to travel and encourage walking, cycling and the use of public transport; To minimise the use of Greenfield land; and To encourage the location and design and development which makes efficient use of energy and resources, and minimises waste for disposal.
Aim 3	To support progress towards a better quality of life for all Oxfordshire's people.
Objectives	To provide for sufficient new dwellings to meet the requirements of Regional Planning Guidance, of an appropriate size and type for Oxfordshire's residents, and to contribute to meeting affordable housing need; To support communities in which people have access to jobs, services, community and leisure facilities; To provide for a range of travel options to meet transport needs; and To provide safe and attractive places to live and work.
Aim 4	To sustain prosperity by supporting sustainable and appropriate economic development.
Objectives	To support the continued development of Oxfordshire's existing and emerging growth sectors and clusters; To provide for development to meet the economic needs of the county's residents and local businesses; and To support the diversification of the rural economy in Oxfordshire.

2.4.2

Finding the right balance between the objectives is at the heart of the Plan. The Strategy seeks to take forward the aims and objectives of the plan by:

- Providing for the development of new homes, jobs and services and facilities to meet the needs of Oxfordshire's people;

- Concentrating housing development in urban areas where it can be easily accessible to jobs, shops, services, community facilities and public transport;
- Providing for an increased number of affordable houses, including housing for key workers;
- Providing the framework to help sustain prosperity and develop Oxfordshire's economy;
- Protecting the countryside, towns and villages and the landscape setting and character of Oxford city;
- Providing in rural areas for development to support the economic and social well being of communities;
- Ensuring supporting infrastructure and services are provided to support development;
- Encouraging the location and design of development to promote high quality environments, make efficient use of energy and other resources and to help reduce the need to travel; and
- Providing the necessary raw materials, for example minerals to enable development to take place.

2.5

2.5.1

Vale of White Horse Local Plan 2011 (2006)

The vision of the Vale of White Horse District Council is to 'Build and safeguard a fair, open and compassionate community'. The overall aim of the Local Plan is 'In partnership with others find an acceptable balance between maintaining a thriving economy, enabling social progress which meets the needs of everyone and protecting the environment and character of the area for future generations'. In addition, 7 aims have been identified that relate to the environmental, social and economic agenda:

- Aim 1 – To safeguard the distinctive character of the Vale, and conserve and enhance the natural, built and historic environment for future generations;
- Aim 2 – To promote high quality, sustainable development;
- Aim 3 – To reduce the need to travel and the harmful effects of traffic on people and the environment;
- Aim 4 – To maintain and improve the quality of life of all members of the local community;
- Aim 5 – To encourage a strong, sustainable economy which is beneficial to all who live in, work in, or visit the Vale;

- Aim 6 – To ensure that the main settlements of Abingdon, Botley, Faringdon, Grove and Wantage are attractive places for living, working and pursuing leisure interests; and
- Aim 7 – To ensure that the countryside and villages of the Vale are prosperous and have a diverse economy.

2.6 ***Vale of White Horse emerging LDF – particular focus on ‘Your Vale Your Future’ Issues and Options Report November 2007***

2.6.1 The Issues and Options Paper, that will form the basis of the Core Strategy for the LDF, reflects the central theme of sustainability, specifically ensuring a better quality of life for everyone. Recognition is given to the three main themes of sustainability; however a significant amount of consideration is given to social issues.

2.6.2 The Vale of White Horse has a desire to create opportunities that will enable more people to identify with their local community. Specific reference is made to involve / help the ageing population, small but growing migrant population, young people and low income households.

2.6.3 As part of the social theme, accessibility is recognised as a key consideration. Reference is made to ensuring households without cars can access services and employment. Similarly, the importance of access to good quality open spaces, sport, recreation and cultural facilities for everyone is recognised.

2.6.4 There is a need to find ways to encourage and enable more young people to obtain qualifications and / or to take up training. This will contribute towards creating the right environment in which businesses and the local economy can flourish. The health and vitality of the Market Towns should be maintained and enhanced.

2.6.5 The importance of the environment is recognised, with specific mention given to climate change, extreme weather, waste, heritage and air quality.

2.6.6 When considering future development, it should be ensured that good quality and affordable housing is available to meet local needs. Furthermore, the need to secure infrastructure and services to meet future needs is recognised.

3 Road Standards & Other Requirements

3.1 *Type of road and design speed*

3.1.1 Discussions with OCC and the Halcrow planning team have indicated the following requirements

- All purpose rural single carriageway road
- design speed of 100 kph for links
- design speed of 60 kph for short links approaching urban areas
- Carriageway width 7.3m with 1 m hard strips either side
- Footway/ cycleway to be included

3.1.2 The majority of the route has a design speed of 100kph, which corresponds to a speed limit of 60mph. However, in reality, due to the number of roundabouts proposed for the route, it is difficult to envisage motorists being able to achieve this speed. The exception to this is the link to Milton Park and the link to the A4130. To enable a design that fits across the railway and ties-in with the main route in Milton Park the design speed for this section needed to be reduced to 60kph, which corresponds to a speed limit of 30mph. Similarly, the short section that provides a link to the A4130 has also been designed for a speed limit of 30mph.

3.2 *Cross sections*

3.2.1 Please see Appendix B for typical cross sections.

3.3 *Non-motorised users*

3.3.1 Even though, the bypass is considered to be rural, provision has been made for cyclists and pedestrians to use the new route by providing a footway/ cycleway on one side of the proposed carriageway.

3.3.2 The existing bridleway, Cow Lane, crosses the indicative route and allowance has been made in the proposals for providing an over-bridge for cyclists, equestrians and pedestrians at this point.

3.4 *Public Transport*

3.4.1 The new bypass would probably form part of the local bus network. However, at this stage it is not anticipated that bus lanes or bus gates would be required.

3.5

Lighting

3.5.1

It is not anticipated that the road would require illumination since the route would be rural in nature for a good number of years until housing development reaches it. However, to comply with good practice and current standards it is assumed that the roundabouts would be lit and ducting could be provided to facilitate future lighting of the whole road.

4 Requirements & Route Constraints

4.1

Requirements

4.1.1

The new road would eventually provide an urban boundary for new development in western Didcot. In order to maximise the land available for development, it is prudent to locate the road as far to the west as possible. It should also therefore be located close to the A34 to avoid the creation of 'dead land' in the area between the two roads.

4.2

Constraints

4.2.1

At the north end of the indicative route, the positioning of the bridge to Milton Park is defined by the only possible space available. The roundabout on the A4130 has been positioned to attract traffic wishing to go south from the A34 interchange at Milton.

4.2.2

A desk study of environmental schemes and designations using the 'Magic' website indicates that there are no significant environmental constraints affecting the indicative route of the bypass.

5 The Indicative Route

5.1 *Drawing*

5.1.1 The indicative route is shown on drawing CTFANG/440/01 at Appendix B.

5.2 *Topography*

5.2.1 The topography at the northern end of the route is relatively flat; rising very gently as the route proceeds southwards, with a short section of steeper ground at the southern end as the route reaches the A417.

5.3 *Route description*

5.3.1 The indicative route starts in the north in Milton Park and crosses a bridge over the mainline railway and the A4130 and continues south until it meets the first roundabout junction. To enable a design that fits across the railway and ties-in with the main route in Milton Park the design speed for this section needs to be reduced to 60kph, which corresponds to a speed limit of 30mph.

5.3.2 In addition a link has been shown from this roundabout to the A4130. The position of the junction with the A4130 has been determined by the need to provide a link on the existing desire line. As with the section from Milton Park this section has been designed for a maximum speed limit of 30mph.

5.3.3 The remainder of the route, as it travels south, has been designed with a design speed of 100kph, which corresponds to a speed limit of 60mph. However, in reality, due to the number of roundabouts proposed for the route, it would be difficult to envisage motorists being able to achieve this speed.

5.3.4 Continuing southwards, the route is pushed as far towards the A34 as possible to maximise the land available for housing until it reaches a roundabout at approximate chainage 2180. This roundabout has been positioned at this location to serve the proposed housing development.

5.3.5 As the route continues it crosses over Cow Lane. a footbridge over the new bypass would enable pedestrians, equestrians and cyclists to cross.

5.3.6 The next junction on the route is a roundabout at Didcot Road (B4493). There are many properties along this road and the route has been positioned to miss all of

these properties, however, it does get very close to the two properties ‘Sunny Side’ and ‘Hill View’ and does cut through the sewage works.

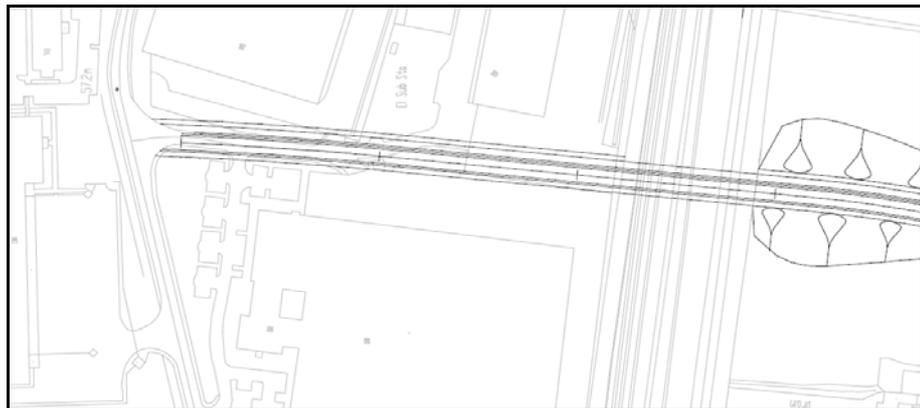
5.3.7 The rest of the route continues towards a new junction with the A417 which has been positioned as close as possible to the A34. There are two roundabouts on this final section, one at approximate chainage 550, which is positioned to connect to any future link to the south of Didcot, and the last roundabout which creates the junction with the A417.

5.4 ***Optional southern link***

5.4.1 In addition to this route an optional additional link has been shown in inset A of drawing CT/FANG/440/01. This link provides a junction further east on the A417 and a link to the road to Chilton. From the point where the proposed link joins it, the existing road to Chilton would need improving.

5.5 ***Link to Milton Park over A4130 & mainline railway***

5.5.1 As mentioned in section 4, a link over the A4130 and mainline railway line, into Milton Park has been shown. It was not possible to provide this link at the same design speed as the rest of the bypass due to the constraints on vertical alignment, however a solution is possible if the design speed is reduced to 60kph (30mph). There has been no ‘corridor’ reserved in Milton Park for a road link and although possible it would not be straight-forward to provide this link.



5.5.2 As the extract above shows, the only feasible location to bring the link into Milton Park is between two existing buildings; to enable this, a car parking area would need to be purchased from the owners of the buildings. From site inspection there would appear to be adequate space for a road, but not the associated earthworks. Therefore, the road on the north side of the railway would need to be retained by

something such as a reinforced earth wall. As the proposed carriageway would be 10m higher than the adjacent ground at its highest point this would be a substantial and very expensive wall. The alternative would of course be to purchase the whole site, and not just the car park, and demolish the existing buildings.

5.5.3 The current occupant of one of these buildings is a haulage firm. Currently large HGV vehicles are using the junction with the Milton Park main road very successfully, so from an engineering viewpoint the new route could tie-in with the current junction without the need for alteration.

5.5.4 As mentioned earlier the proposed carriageway is approximately 10m above existing ground either side of the railway/road. On the south side, as space is not limited, an earthwork embankment has been shown. At 10m this is extremely high, apart from the cost of importing this amount of fill material, there may be issues with ground stability. As a general rule any embankment higher than 5m needs special consideration in relation to the ground it sits on. This does not make the solution un-buildable just slightly more complicated and would place restrictions on working method.

5.6 ***Crossing of Cow Lane***

5.6.1 Cow Lane is an existing bridleway that crosses over the existing A34 via an over-bridge. To prevent severance of this route a bridge could be constructed which would enable all non-motorised users to cross over the proposed new bypass. However, if this route needs to remain open to motorists then the bypass would need to be raised to enable vehicles to pass underneath. For the purpose of the cost estimate a bridge over the bypass has been assumed.

5.7 ***Junction with B4493 (Didcot Road)***

5.7.1 As the route progresses towards Didcot Road it passes through the existing Sewage Works. It should be noted however, that from site inspection this sewage works has been reduced from that shown on the OS mapping, to what appears to be only a pumping station. Any attempt to miss the sewage works has a detrimental effect on the properties on Didcot Road itself. The route chosen has made it possible to miss all the properties on Didcot Road, however the route does get very close to the two properties 'Sunny Side' and 'Hill View'; and as the proposed roundabout would have street lighting, the negative impact on these properties can not be removed altogether.

5.8

Junction with A417 and link to Chilton

5.8.1

As mentioned earlier, two routes have been shown at the A417 tie-in of the indicative route. The aim of the alternative option is to improve the route through to Chilton. The proposal is to upgrade the existing road through to the roundabout on the outskirts of Chilton. However, by inspection it is evident that both the horizontal and vertical alignments of the existing road are consistently below current standards. For example the route as it passes over Hagbourne Hill has a gradient in excess of 10%.

5.8.2

The alternative would be to construct an off-line solution immediately to the west of the current route that generally follows the existing route but with an alignment that meets current standards.

5.8.3

Further work is necessary in this area to determine the feasibility and cost of such improvement.

5.9

Utilities

5.9.1

No allowance for utility diversions has been included; evidence was noted of overhead electricity company apparatus that may be affected. However, the A4130, B4493 and A417 are likely to have utilities' apparatus buried within their boundaries, but it is not possible, at this stage, to estimate the cost of any potential utilities diversions that may be required.

6 Capital Cost Estimates

6.1 *Quantities*

6.1.1 Global quantities have been measured from the indicative route drawing and the typical cross sections. It is only possible to make very broad estimates of earthwork quantities at this stage although the measuring of items like paving and structures is likely to be more accurate for the indicative route.

6.1.2 Changes to the indicative route would affect cost estimates but some flexibility in the alignment is possible without making a huge difference to the estimates.

6.2 *Construction prices*

6.2.1 Current prices of engineering construction work have been taken from Spon's Civil Engineering and Highway Works Price Book 2008. The breakdown of construction cost is attached at Appendix D.

6.3 *Land and property costs*

6.3.1 For the purpose of this estimate land is estimated to cost £11,000 per hectare, in line with the average value of agricultural land from the latest 2007 RICS survey. Property costs are based on estimated market prices. Such estimates are very preliminary.

6.4 *Preparation and supervision costs*

6.4.1 For this early estimate, preparation costs, which include studies, planning approvals, negotiation with other authorities, public consultation and inquiries, design and construction supervision, are estimated to be 15 per cent of construction costs.

6.5 *Optimism bias*

6.5.1 In line with current practice optimism bias of 44% has been added to allow for statistically observed increases in cost after the first declaration of cost estimates.

6.6 *Inflation*

6.6.1 Estimates are prepared at 2008 prices with no allowance for future inflation.

6.7 *Summary*

6.7.1 A summary of costs is presented in the table below.

Item	Harwell Bypass	Link to Milton Park	Southern link
Construction	12.2	13.4	3.4
Land & property	1.5	1.1	0.2
Preparation (15%)	2.0	2.2	0.5
Sub total	15.7	16.7	4.1
Optimism bias 44%	7.0	7.3	1.8
Budget total 2008 prices	£22.7 million	£24.0 million	£5.9 million

Summary of cost estimates

7 Appendices

7.1

Appendix A

7.1.1

Figure showing planning corridor for Harwell Bypass

Map 4 Didcot EIP Areas 3 and 4

 District boundary

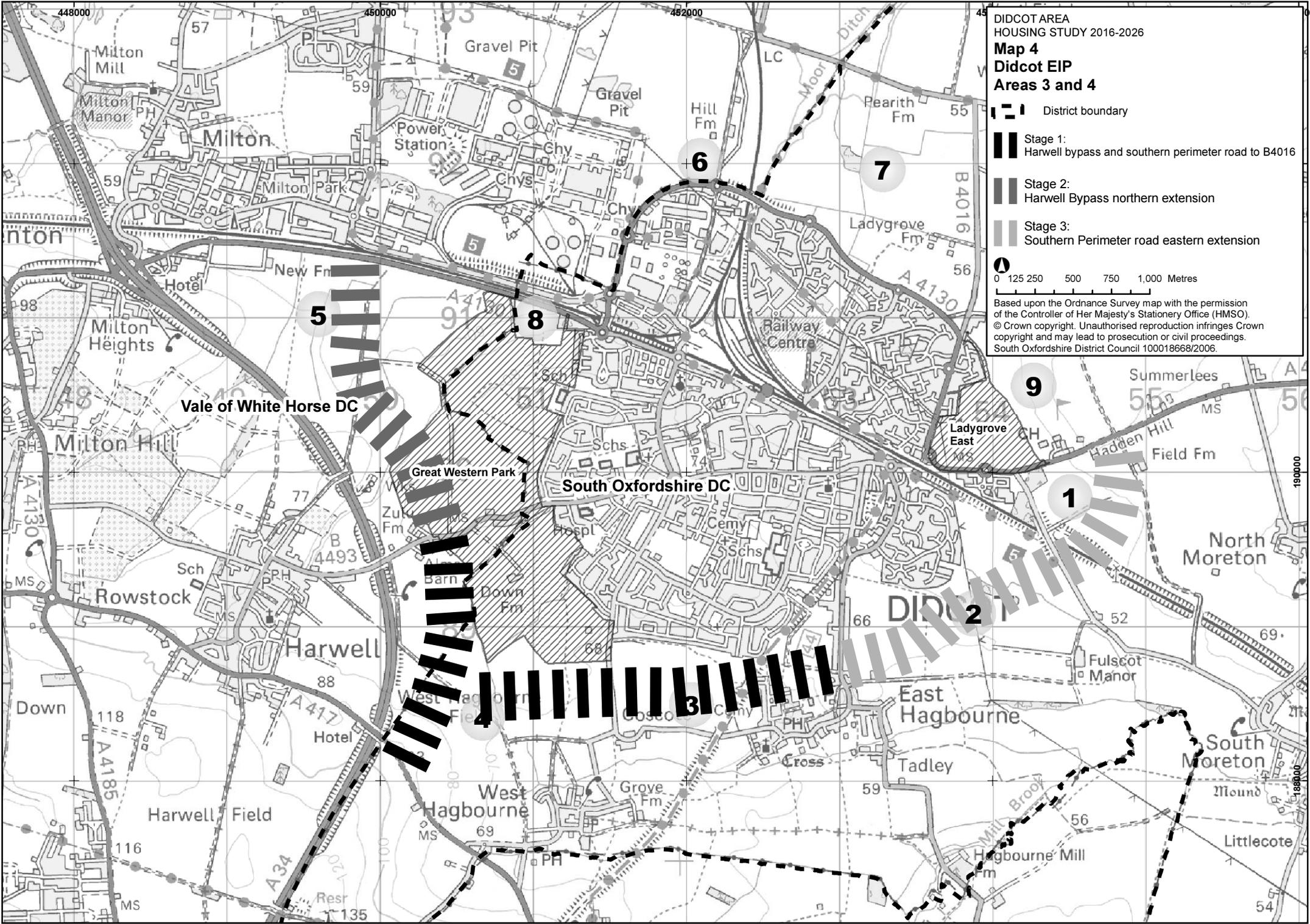
 Stage 1:
Harwell bypass and southern perimeter road to B4016

 Stage 2:
Harwell Bypass northern extension

 Stage 3:
Southern Perimeter road eastern extension

 0 125 250 500 750 1,000 Metres

Based upon the Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office (HMSO).
© Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
South Oxfordshire District Council 100018668/2006.

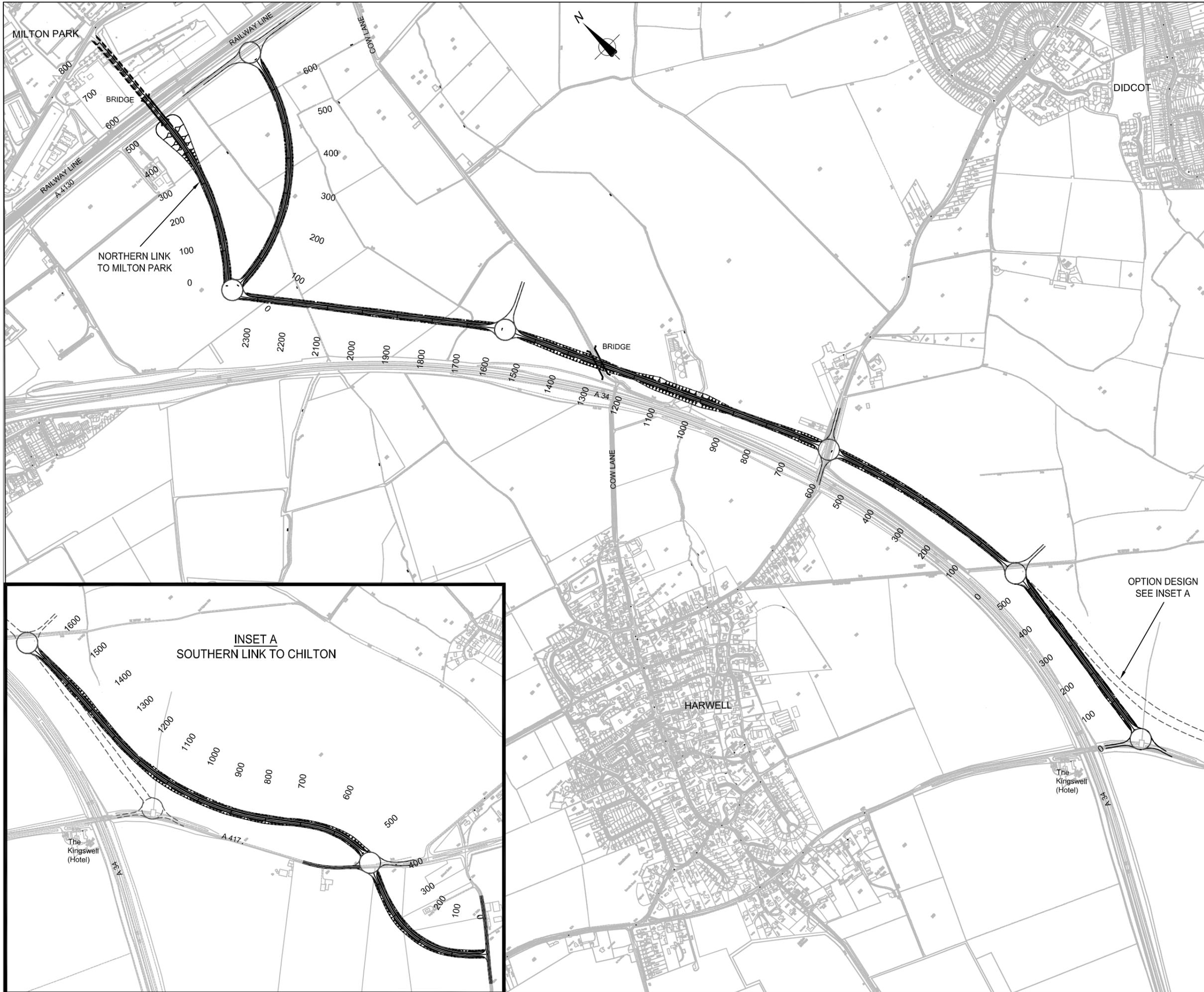


7.2

Appendix B

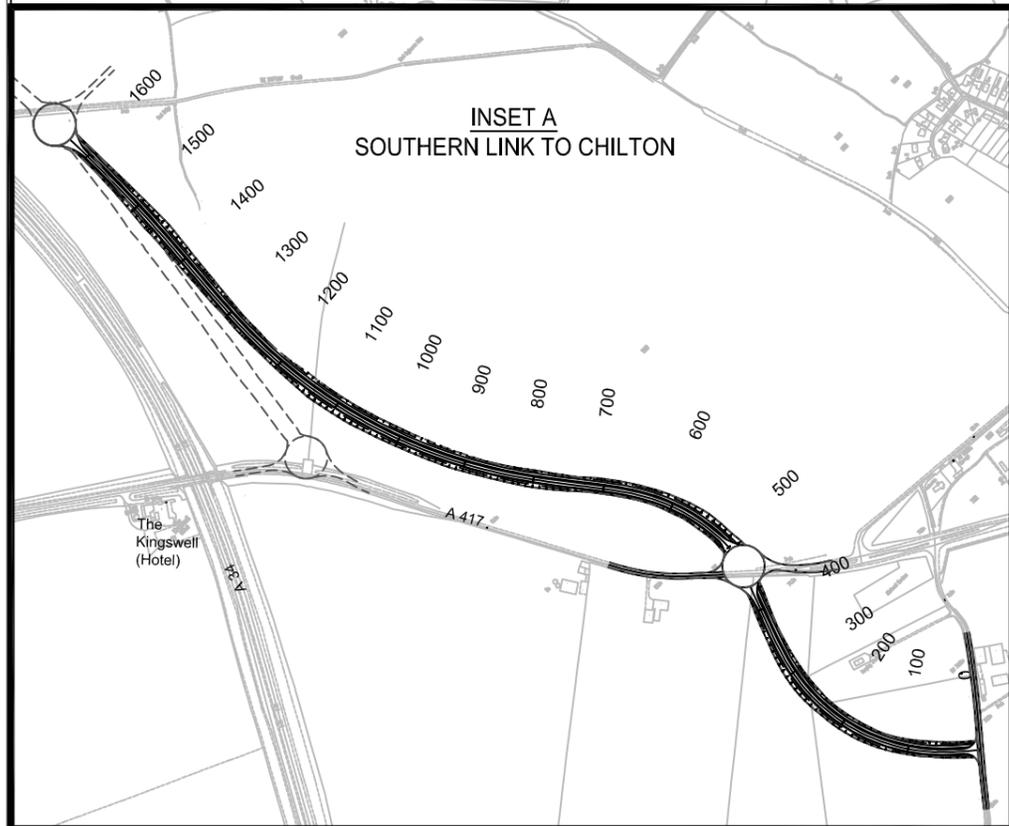
7.2.1

The attached drawing shows a plan of the indicative route.



NOTE:

1. All dimensions are in metres unless shown otherwise.
2. Speed limit = 60mph (design speed 100kph). Links from roundabout south of New Farm to Milton Park and A4130 speed limit = 30mph (design speed 60kph).



OPTION DESIGN
SEE INSET A

Rev	By	Chkd	Appvd	Date	Description

Client



**OXFORDSHIRE
COUNTY COUNCIL**

Halcrow Group Limited
Burdens Park Swindon Wiltshire SN1 9GD
Tel +44 (0)1753 812479 Fax +44 (0)1753 812089
www.halcrow.com



Project
HARWELL BYPASS

Drawing
**INDICATIVE
ROUTE LAYOUT**

Drawn by : PL	Date : 25/06/08
Checked by : SJL	Date : 25/06/08
Approved by : SJL	Date : 25/06/08

Drawing No.	Revision
CT/FANG/440/01	-

Drawing Scale : 1:10000 at A3

Project Name: Harwell Bypass; Project No: CT/FANG/440/01; Date: 25/06/08; User: SJL; Plot Date: 26 Jun 2008 12:25 pm

7.3

Appendix C

7.3.1

The attached figure shows typical cross sections for the road.

KEYS:



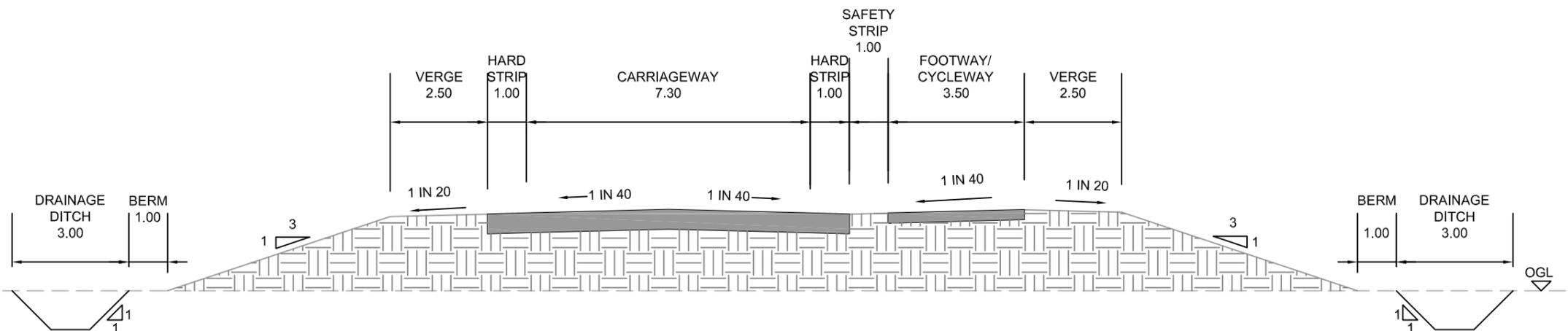
EMBANKMENT FILL



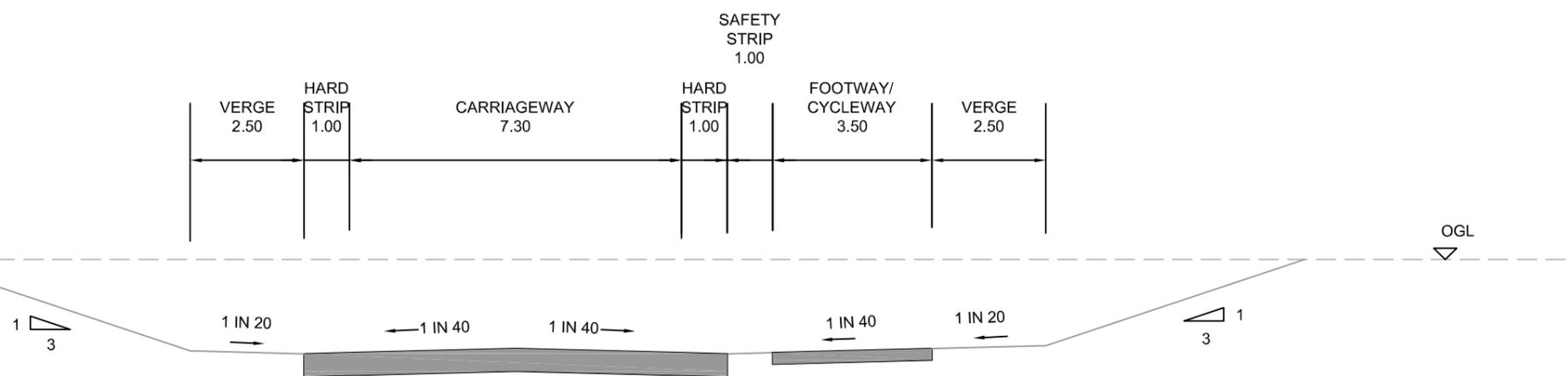
PAVEMENT

NOTE:

1. All dimensions are in metres unless shown otherwise.



TYPICAL FILL CROSS SECTION DETAIL



TYPICAL CUT CROSS SECTION DETAIL

Rev	By	Chkd	Apprvd	Date	Description
-----	----	------	--------	------	-------------

Client



Halcrow Group Limited
 Burdett Park, Swinford, Wilshire, SM1 0DD
 Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
 www.halcrow.com



Project

HARWELL BYPASS

Drawing

TYPICAL CROSS SECTIONS

Drawn by: PL Date: 25/06/08

Checked by: S.J.L Date: 25/06/08

Approved by: S.J.L Date: 25/06/08

Drawing No. Revision

CT/FANG/440/02 -

Drawing Scale: NTS

7.4

7.4.1

Appendix D

The attached bills of quantities show quantities and prices for construction work for the following three options at 2008 prices:

- Mainline
- Northern link to Milton Park
- Southern option

A4130 to A417 Harwell Bypass - Mainline Cost Estimate

Description	Unit	Rate	Quantity	Cost (£)	
General Site Clearance	ha	£1,104.80	20.7	£22,869.36	
Fencing					
Timber 4 rail fence	m	£22.09	7834	£173,053.06	
Earthworks ⁽¹⁾					
Excavate acceptable material 5A -topsoil	m ³	£2.87	16763	£48,109.81	
Excavate acceptable material	m ³	£4.49	23363	£104,899.87	
General Fill	m ³	£1.15	23231	£26,715.65	
Topsoiling	m ³	£15.00	7547	£113,202.30	
Drainage Ditch (Excavation and Disposal)	m ³	£61.58	13320	£820,245.60	
Export/ dispose acceptable material	m ³	£22.00	132	£2,904.00	
Export/ dispose topsoil	m ³	£22.00	1787	£39,314.00	
Pavements					
Remove existing carriageway	m ³	£80.30	1018	£81,745.40	
Carriageway					
Type 1 sub-base – 350mm thick	m ³	£31.09	18879	£586,948.11	
Basecourse – 190mm DBM	m ²	£35.65	52996	£1,889,307.40	
Binder course – 55mm DBM	m ²	£12.48	52996	£661,390.08	
Surface course – 35mm TWCS	m ²	£9.49	52996	£502,932.04	
Footway/ paved areas	m ²	£21.83	11655	£254,428.65	
Kerbing – type SP	m	£15.00	1228	£18,420.00	
Kerbing – type HB	m	£15.00	1228	£18,420.00	
Precast concrete edgings	m	£12.00	6660	£79,920.00	
Safety Barriers					
Single sided OBB	m	£43.09	340	£14,650.60	
Short posts in concrete foundations	nr	£53.82	142	£7,642.44	
Terminal Sections	nr	£588.16	16	£9,410.56	
Drainage					
225mm dia. filter drain	m	£74.33	6746	£501,430.18	
225mm dia. carrier drain	m	£81.77	1890	£154,545.30	
Gullies	no	£400.00	110	£44,000.00	
Chambers 0-2m deep	no	£1,534.57	40	£61,382.80	
Chambers 2-4m deep	no	£3,634.41	32	£116,301.12	
Chambers 4-6m deep	no	£9,538.72	7	£66,771.04	
Signs & Lighting					
Signs – cost/ m2 carriageway	m ²	£3.50	52996	£185,486.00	
Street Lighting	no	£1,054.01	60	£63,240.60	
Structures					
Footbridge over Cow Lane	m2	£2,000.00	1200	£2,400,000.00	
Miscellaneous					
Landscaping (linear metre)	m	£16.00	3653	£58,448.00	
Utilities					
Other construction costs not listed above ⁽⁴⁾	%	sum		£1,000,000.00	
		Sub-total		£10,128,133.97	
		insurance	1%	£101,281.34	£10,229,415.31
		prelim	7%	£716,059.07	£10,945,474.38
		overheads	6.50%	£711,455.83	£11,656,930.22
		margin	5%	£582,846.51	£12,239,776.73
		TOTAL			£12,239,776.73

-1 The cost does not include 'capping' of the underlying material, however, due to the high cost of combined excavation and (assumed) disposal off-site, it is uneconomic to dig out a further 400mm below the pavement, a low 2.5% CBR with low water table has been assumed in the pavement design.

-2 The cost of utility diversions is not included

-3 Design Fees are not included

-4 Planning permissions etc. are not included

-5 The cost of land & property is not included

A4130 to A417 Harwell Bypass - Northern Link to Milton Park Chilton Cost Estimate

Description	Unit	Rate	Quantity	Cost (£)	
General Site Clearance	ha	£1,104.80	3.1	£3,424.88	
Fencing					
Timber 4 rail fence	m	£22.09	1108	£24,475.72	
Earthworks ⁽¹⁾					
Excavate acceptable material 5A -topsoil	m ³	£2.87	3164	£9,080.68	
Excavate acceptable material	m ³	£4.49	0	£0.00	
General Fill	m ³	£1.15	40375	£46,431.25	
Topsoiling	m ³	£15.00	1582	£23,730.00	
Excavation Drainage Ditch	m ³	£61.58	1000	£61,580.00	
Import acceptable material	m ³	£22.00	38793	£853,446.00	
Pavements					
Remove existing carriageway	m ³	£80.30	142	£11,402.60	
Carriageway ⁽²⁾					
Type 1 sub-base – 350mm thick	m ³	£31.09	2775	£86,274.75	
Basecourse – 190mm DBM	m ²	£35.65	7955	£283,595.75	
Binder course – 55mm DBM	m ²	£12.48	7955	£99,278.40	
Surface course – 35mm TWCS	m ²	£9.49	7955	£75,492.95	
Footway/ paved areas	m ²	£21.83	2790	£60,905.70	
Kerbing – type SP	m	£15.00	0	£0.00	
Kerbing – type HB	m	£15.00	1613	£24,195.00	
Precast concrete edgings	m	£12.00	1594	£19,128.00	
Safety Barriers	m				
Single sided OBB	m	£43.09	120	£5,170.80	
Short posts in concrete foundations	nr	£53.82	50	£2,691.00	
Terminal Sections	nr	£588.16	4	£2,352.64	
Type 048 connection to bridge parapet	nr	£67.92	4	£271.68	
Drainage					
225mm dia. filter drain	m	£74.33	1613	£119,894.29	
225mm dia. carrier drain	m	£81.77	1613	£131,895.01	
Gullies	no	£400.00	40	£16,000.00	
Chambers 0-2m deep	no	£1,534.57	15	£23,018.55	
Chambers 2-4m deep	no	£3,634.41	12	£43,612.92	
Chambers 4-6m deep	no	£9,538.72	3	£28,616.16	
Attenuation devices	no				
Signs & Lighting					
Signs – cost/ m2 carriageway	m ²	£3.50	7955	£27,842.50	
Street Lighting	no	£1,054.01	20	£21,080.20	
Structures					
Reinforced earth walls - facing panels	m ²	£578.00	2466	£1,425,348.00	
Backfill to wall including straps	m ³	£98.00	24660	£2,416,680.00	
Composite steel bridge deck	m ²	£2,000.00	720	£1,440,000.00	
Abutments & pier	sum	£1,200,000.00	1	£1,200,000.00	
Crane hire etc.	sum	£1,000,000.00	1	£1,000,000.00	
Miscellaneous					
Landscaping (linear metre)	m	£16.00	1594	£25,504.00	
Utilities ⁽³⁾					
Other construction costs not listed above ⁽⁴⁾	%	sum		£1,500,000.00	
		Sub-total		£11,112,419.43	
		insurance	1%	£111,124.19	£11,223,543.62
		prelim	7%	£785,648.05	£12,009,191.68
		overheads	6.50%	£780,597.46	£12,789,789.14
		margin	5%	£639,489.46	£13,429,278.59
		TOTAL		£13,429,278.59	

-1 The cost does not include 'capping' of the underlying material, however, due to the high cost of combined excavation and (assumed) disposal off-site, it is uneconomic to dig out a further 400mm below the pavement, a low 2.5% CBR with low water table has been assumed in the pavement design.

-2 The cost of utility diversions is not included

-3 Design Fees are not included

-4 Planning permissions etc. are not included

-5 The cost of land & property is not included

A4130 to A417 Harwell Bypass - Southern Link to Chilton Cost Estimate

Description	Unit	Rate	Quantity	Cost (£)	
General Site Clearance	ha	£1,104.80	7.2	£7,954.56	
Fencing					
Timber 4 rail fence	m	£22.09	3148	£69,539.32	
Earthworks ⁽¹⁾					
Excavate acceptable material 5A -topsoil	m ³	£2.87	7655	£21,969.85	
Excavate acceptable material	m ³	£4.49	9451	£42,434.99	
General Fill	m ³	£1.15	9672	£11,122.80	
Topsoiling	m ³	£15.00	3546	£53,193.00	
Excavation Drainage Ditch	m ³	£61.58	3148	£193,853.84	
Export/ dispose acceptable material	m ³	£22.00	893	£19,646.00	
Pavements					
Remove existing carriageway	m ³	£80.30	484	£38,865.20	
Carriageway ⁽²⁾					
Type 1 sub-base – 350mm thick	m ³	£31.09	6746	£209,733.14	
Basecourse – 190mm DBM	m ²	£35.65	19274	£687,118.10	
Binder course – 55mm DBM	m ²	£12.48	19274	£240,539.52	
Surface course – 35mm TWCS	m ²	£9.49	19274	£182,910.26	
Footway/ paved areas	m ²	£21.83	5721	£124,889.43	
Kerbing – type SP	m	£15.00	1635	£24,525.00	
Kerbing – type HB	m	£15.00	1635	£24,525.00	
Precast concrete edgings	m	£12.00	1635	£19,620.00	
Safety Barriers	m				
Single sided OBB	m	£43.09	45	£1,939.05	
Short posts in concrete foundations	nr	£53.82	19	£1,022.58	
Terminal Sections	nr	£588.16	4	£2,352.64	
Drainage					
225mm dia. filter drain	m	£74.33	1635	£121,529.55	
225mm dia. carrier drain	m	£81.77	1635	£133,693.95	
Gullies	no	£400.00	97	£38,800.00	
Chambers 0-2m deep	no	£1,534.57	15	£23,018.55	
Chambers 2-4m deep	no	£3,634.41	12	£43,612.92	
Chambers 4-6m deep	no	£9,538.72	2	£19,077.44	
Signs & Lighting					
Signs – cost/ m2 carriageway	m ²	£3.50	19274	£67,459.00	
Street Lighting	no	£1,054.01	10	£10,540.10	
Structures	no	£2,000.00	0	£0.00	
Miscellaneous					
Landscaping (linear metre)	m	£16.00	3269	£52,304.00	
Utilities ⁽³⁾					
Other construction costs not listed above ⁽⁴⁾	%	sum		£300,000.00	
		Sub-total		£2,787,789.79	
		insurance	1%	£27,877.90	£2,815,667.69
		prelim	7%	£197,096.74	£3,012,764.43
		overheads	6.50%	£195,829.69	£3,208,594.11
		margin	5%	£160,429.71	£3,369,023.82
		TOTAL			£3,369,023.82

-1 The cost does not include 'capping' of the underlying material, however, due to the high cost of combined excavation and (assumed) disposal off-site, it is uneconomic to dig out a further 400mm below the pavement, a low 2.5% CBR with low water table has been assumed in the pavement design.

-2 The cost of utility diversions is not included

-3 Design Fees are not included

-4 Planning permissions etc. are not included

-5 The cost of land & property is not included