RPS Planning, Transport and Environment

INDEX DATA	RPS INFORMATION
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Road Number M25	Date June 1994
Contractor RPS	
County Surrey / Kent	
OS Reference	
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THE HIGHWAYS AGENCY

(SOUTH EAST CONSTRUCTION PROGRAMME DIVISION)

M25 JUNCTIONS 5 TO 7: WIDENING TO DUAL 4 LANES

ENVIRONMENTAL STATEMENT
VOLUME I

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In Association with
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June 1994

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1.0 INTRODUCTION

1.1 Objectives of the Scheme

The Government White Paper 'Roads for Prosperity ' published in May 1989 announced an expanded motorway and trunk road programme to relieve congestion on major roads between cities and towns in England. Included in this programme were proposals to widen the M25 to dual 4 lane standard. The White Paper set out the following disadvantages of road congestion to the economy and the environment:

- it imposes high costs on industry and other road users, by wasting time, delaying deliveries and reducing reliability.

- it encourages traffic to use unsuitable roads, damaging the quality of life of people who live nearby, wasting fuel and increasing the number of accidents.

The White Paper has subsequently been superseded by the "Trunk Roads in England 1994 Review" (DoT, March 1994). The review is part of a package of measures to speed up delivery of trunk road improvements. The scheme is on the Priority 2 list for completion which means it is of sufficient priority to be taken forward, but may have a longer lead time than previously programmed.

This document relates to the proposal to provide an additional lane to each carriageway of the M25 motorway between Junction 5 and 2km east of Junction 7. The location plan is shown at Figure 1.1. This section of the M25 is part of the busy southern sector between the M26 at Junction 5 and the M3 and M4 to the west. The existing traffic flows exceed the design capacity of the road with the result that significant congestion occurs in peak hours and there is an increased risk to safety.

It is proposed that the motorway is widened from the existing dual 3 lane carriageway to dual 4 lane carriageway over a distance of about 17 kilometres (10.6 miles). All widening will be within existing highway boundaries.

The scheme includes modifications to existing slip roads and the introduction of additional signs and lighting.

1.2 Legal Framework for the Environmental Statement

This Environmental Statement is issued in accordance with the European Community Directive 85/337 as applied by Section 105A of the Highways Act 1980. The aim is to provide an objective assessment of the environmental implications of the proposal and to identify measures to avoid, reduce, and if possible remedy, significant adverse effects on the environment.

1.3 Key Environmental Effects

The direct environmental effects of the scheme are limited by the fact that all new works will be carried out within the highway boundary. The issues identified as being of concern and therefore requiring more detailed assessment are landscape and visual impact, soil contaminants, noise, and air and water quality. The effects on ecology, heritage and recreation are also considered. The impacts of construction and the use of the widened motorway have been addressed.

The principal environmental advantages of the scheme will be the relief of congestion, and improvements to road safety, noise conditions, water quality and drainage. Disadvantages will include temporary construction impacts, temporary loss of some areas of tree screening and the introduction of additional lighting and gantries in an area of high scenic quality.

1.4 Structure of the Statement

The Statement is structured as follows:

Volume 1 - The Statement and Non-technical Summary

Non-Technical - Summary	A summary in non-technical language of the environmental statement. This section is available separately as a free leaflet.
Section 1.0	Introduction
Section 2.0	Scope of the Environmental Assessment - describes the extent of the assessment and how significant impacts were identified.

Section 3.0	Development of the Proposed Scheme - describes the traffic problems and the proposed engineering works.
Section 4.0	Existing Environmental Conditions - describes the character and value of the environment within the study area.
Section 5.0	Mitigation Measures Incorporated in the Proposals - details the measures which will be taken to avoid, reduce or offset the potential impacts.
Section 6.0	Environmental Effects of the Proposals - discusses the change to the environment as a result of the proposals.
Section 7.0	Summary of Significant Issues - summarises the positive and negative effects of the proposals.
Appendix A	Environmental Impacts Table
Appendix B	Land Use Tables
Appendix C	Mitigation Measures Table
Appendix D	Deposit Locations - a list of locations where the Environmental Statement is available for inspection.
Appendix E	References
Appendix F	Glossary of Terms

Volume II - Specialist Reports

There are seven separately bound specialist reports, which provide detailed information on specific topics. The information has been summarised in this Statement. A full list of the titles of these documents is given in the Contents to this Statement. The specific topics are:

- landscape and visual impact
- ecology and nature conservation
- water quality
- noise
- air quality
- soils
- cultural heritage

1.5 Timetable for Comments and Representations

1.5.1 The Environmental Statement has been placed on deposit at the locations listed in Volume I, Appendix D. The Agency would welcome any comments on the environmental aspects of the proposals before a decision is taken on the final form that engineering works should take.

Copies of this Environmental Statement can be obtained from the Highways Agency (South East Construction Programme Division) at the following address:

Highways Agency
South East Construction Programme Division
Federated House
London Road
Dorking
Surrey RH4 1SZ

Copies of the Non-Technical Summary are available separately free of charge from the above address.

Comments on the Environmental Statement should be sent to the Highways Agency at the above address.

LIMIT OF STUDY AREA

ORIGINAL IN COLOUR

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RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: LOCATION PLAN

date: April '94

Not to scale

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fig.no. 1.1

2.0 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

2.1 Scope

In determining the scope of the Environmental Assessment, particular attention has been paid to the nature of the engineering proposals and the receiving environment. The Environmental Assessment was prepared in accordance with the EC Directive on "The Assessment of Effects of Certain Public and Private Projects on the Environment" (85/337/EEC) as implemented by section 105A of the Highways Act 1980.

a) Relevant Information

Annex III of the EC Directive sets out the information that may be required in an Environmental Statement (ES). Section 105A (2) of the Highways Act offers guidance that the information contained in the ES should be:

"a) *that relevant to the specific characteristics of the project and of the environmental features likely to be affected by it*".

In this context the main effects have been identified and those of potential significance have been considered in detail. This information is summarised in Tables 2.1 and 2.2.

Since the road is to be widened entirely within the motorway boundaries, there will be no direct physical impact on the surrounding environment. The only exception to this is the possible temporary use of adjacent land for construction and storage areas. The locations of these areas are determined between the company contracted to carry out the works and the local planning authorities. The provision of offsite mitigation measures such as bunds and tree planting will also take place on land outside the highway boundary, but will be in agreement with land owners.

b) Methodology

The methodology adopted in undertaking this Environmental Assessment has also followed guidance in Section 105 A (2) of the Highway Act 1980 as below:

"b) *that (having regard in particular to current knowledge and methods of assessment) the information may reasonably be gathered, including at least:*

i) a description of the project comprising information on the site, design and size of the project;

ii) a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;

iii) the data required to identify and assess the main effects which the project is likely to have on the environment;

iv) a non technical summary of the information mentioned in paragraphs (i) to (iii) above"

Information was obtained using available data from previous studies, where appropriate. This was supplemented by additional desk studies and field surveys following the relevant guidance in the current version of the Design Manual for Roads and Bridges (DMRB) Volume 11, Environmental Assessment (DoT, 1993). It should be noted that the methodology adopted is consistent with that necessary for widening (within landtake) of an existing road. This is a *special* situation for the following reasons:

- there are few new *effects* caused by the road widening except the introduction of lighting and gantries;
- the *effects* are generally only a change in the degree of the *effect* over and above the existing situation and many of these are not significant;
- the widening provides opportunities to improve the existing situation, where practical and appropriate, by the introduction of new technology such as full cut off luminaires for lighting and porous asphalt.

Within this special situation the methodology adopted for the assessment of effects has concentrated on those areas relevant to the scheme under consideration.

Table 2.1 Potential Construction Impacts

Activity	Potential Impact
Removal of motorway verge vegetation	Loss of existing screening and wildlife habitat
Stripping of topsoil	Effect on soil's capacity to support vegetation
Excavations	Damage to adjacent tree roots and branches
Construction Traffic	Noise impacts, temporary increase in congestion
Construction storage areas outside boundary	Noise, ecological and visual effects
Plant and machinery operations and other construction activities	Noise/visual impacts to residential, recreational and ecologically sensitive areas. Nuisance from dust
Drainage improvement works	Effect on watercourse and aquatic ecology
Disposal of waste materials	Effect on local waste disposal capacity and increased traffic on local road network
Use of raw materials	Effect on local supplies and impact from supply of new materials

Table 2.2 Potential Operational Impacts

Activity	Potential Impact
Increase in road surface area	Increase in visual impact and effects on watercourses and adjacent vegetation and soil from increased run-off of water
New lighting system	Visual impact from columns during daylight and lights during darkness
New drainage works	Effect on types and quantities of pollutants in run-off water. Improvement in efficiency of system
New gantries	Increase in visual impact
Retaining walls, embankments and fencing	Change in visual character
Landscape planting	Alterations to landscape character
Change in traffic conditions	Effect on noise levels, air quality and visual impact

2.2 Consultation with Local Authorities

Informal consultations have been held with Surrey and Kent County Councils and Tandridge and Sevenoaks District Councils. The main issues of concern identified as potentially arising from the proposals are:

- potential increases in noise;
- the visual impact resulting from the introduction of lighting and gantries into an Area of Outstanding Natural Beauty;
- potential effects on water quality and drainage;
- potential effects on air quality; and
- short term construction effects.

2.3 Consulting the Public

The Highways Act 1980 at Clause 3 states:

"3) *If the Secretary of State publishes an environmental statement he shall ensure that the public concerned is given an opportunity to express an opinion before the project is initiated"*

This Environmental Statement has been published to coincide with a Public Exhibition. The aim is both to inform the public and to provide an opportunity for the public to express an opinion before the project is confirmed.

3.0 DEVELOPMENT OF THE PROPOSED SCHEME

Summary

- *The section of M25 between Junctions 5 and 7 is part of the south east Quadrant of the M25 between the Dartford Crossing and the M23.*

- *The existing heavy traffic flow results in congestion during peak hours and an increased risk to driver safety.*

- *The existing dual three lane motorway was designed to carry up to 79,000 vehicles both ways per day, whilst the current average daily flow is about 101,500 vehicles both ways per day. With traffic volumes predicted to continue to grow, congestion will increase unless the motorway is widened.*

- *It is proposed to widen the motorway, to dual four lanes, within the existing highway boundaries. This will be achieved by converting the existing hard shoulders into running lanes and constructing new hard shoulders alongside. Existing embankments and cuttings will be steepened and retaining walls will be constructed where necessary.*

- *The works will also include the provision of lighting and new signs.*

- *Where possible, the existing landscaping, drainage and noise mitigation measures will be retained or improved.*

3.1 Study Area and Existing Motorway

3.1.1 Location of Study Area

The study area under consideration is the corridor of the M25 motorway between Junction 5 and 2km east of Junction 7. This section of the M25 crosses the boundary of the County of Surrey with the County of Kent and passes close to Godstone, Oxted and Westerham. (see figure 1.1).

3.1.2 The Existing Motorway

The section between Junction 7 and Junction 5 was originally constructed between September 1976 and November 1979 to dual 3 lane standard. Junction 5 is a major intersection with the M26 and the A21 and was completed in July 1980. Figures Nos. 3.1 a-e illustrate the existing motorway features.

The motorway is constructed with a mix of cuttings and embankments but also includes long sections at grade. There are 27 bridges in the corridor, of which one carries the motorway over a railway, six carry footpaths and the remainder carry roads over or under the motorway.

The existing lighting at Junctions 5 and 6 consists of 10 and 12m columns with low pressure sodium lanterns. Other lighting sources within the highway include illuminated signs, gantries and variable message signs.

3.1.3 Environmental Mitigation Measures

The existing motorway is integrated into the local environment by false cuttings and landscape planting to minimise visual intrusion, and noise fences and mounds to lower the effects of noise pollution. These measures were designed as part of the original motorway, within the constraints and objectives that existed at that time.

3.2 Existing Traffic Conditions

The M25 London Orbital Motorway is the hub of the national motorway network. It provides a complete bypass of Greater London and in doing so links together the main routes to the north (M1, M11, M40, A1[M]), to the south (A21, M23), to the west and southwest (M4, M3,

A3) and to south east (M26, M20, M2). It provides a surface link between the main international airports at Heathrow, Gatwick and Stansted, it links Kent and Essex via the Dartford Tunnel and Bridge, and will act as a collector road for most of the nation's road traffic to the Channel Ports.

As a result, the M25 carries a considerable volume of traffic. This traffic is made up of long distance through traffic using the motorway to bypass the London conurbation, London bound traffic using the motorway to switch between radials into and out of London, and local traffic using the motorway to travel around the Home Counties. Recent data from the 1991 London Area Travel Survey reveals that almost 700,000 vehicles use the M25 during the course of a typical day and that 69% of traffic uses the motorway for relatively short journeys.

The section of M25 between Junctions 5 and 6 is part of the southeast quadrant, which extends from Junction 1 at the Dartford Crossing to the M23 at Junction 7. Within this quadrant is the link to the M20 motorway, at Junction 3, and the M26 motorway at Junction 5.

The Annual Average Daily Traffic flow (AADT) on the section of M25 between Junctions 5 and 6 was 101,500 vehicles, two way flow, in 1993. Of this traffic some 47% was coming from or continuing on the M25 at Junction 5, with the other 53% leaving or joining the M25 at Junction 5 from either the A21 or M26 motorway. To the north of Junction 5, the 1993 AADT two-way flow was 77,000 vehicles. West of Junction 6, the 1993 AADT two-way flow was 108,000 vehicles.

In the Department of Transport's Design Manual for Roads and Bridges Volume 5, Section 1, the recommended design capacity of a dual 3 lane motorway is no more than 79,000 vehicles AADT two-way. This design capacity has already been exceeded, and it represents a theoretical capacity consistent with stable conditions of traffic flow and safety. Flows above this level become unstable with the result that significant congestion may occur at peak times and there is an increased risk to safety.

The southeast quadrant has a high percentage of heavy good vehicles (HGVs). Between Junctions 5 and 7 the average percentage of HGVs is 17%, which is above the 14% national average for motorways.

Average daily traffic flows on the M25 are predicted to increase in the future. Department of Transport National Road Traffic Forecasts (NRTF), modified in the Southeast to represent the pace of development in the region, were used to derive future traffic predictions for the M25. The forecasts show increases in traffic of between 6% and 9% by 1996, the anticipated opening year, and between 34% and 56% by 2011, the design year. Between Junctions 5 and 7 this growth would give rise to AADT flows of up to 111,000 vehicles by 1996 and 161,500 vehicles by 2011.

The provision of an additional lane on each carriageway will increase capacity, help reduce the level of congestion and improve driver safety. If the scheme were not implemented, congestion on this section of the motorway would continue to grow as the traffic increases. This would result in a deterioration in road safety and increase pollution along the motorway corridor. As congestion increases more traffic would divert back to the local road network, such as the A25, with the consequence that traffic levels on these roads would increase significantly. This would inevitably lead to a deterioration in the quality of the local environment and in road safety.

3.3 Options for Widening and Proposals

In examining options for widening the motorway to four lanes, three methods were considered:

a) parallel or asymmetrical widening, which involves the construction of a new carriageway alongside the existing motorway;

b) symmetrical widening to full standards which involves widening the existing carriageway to provide full width traffic lanes and hard shoulders and reconstruction of bridges;

c) symmetrical widening or slight asymmetrical widening (moving the centre line by up to approximately 1m) within existing highway land boundaries, without reconstruction of existing bridges, which may require hard shoulders to be omitted in places and existing traffic lane widths to be reduced.

The third method, symmetrical widening within existing highway boundaries, has been chosen because it:

- minimises environmental damage;
- avoids costly and disruptive bridge reconstruction;
- enables the required additional capacity to be achieved more quickly;
- requires a shorter construction programme than other options and is less disruptive to traffic.

3.4 Provision of Additional Lanes

3.4.1 Method of Widening

Figure 3.2 shows a schematic layout of the motorway with the proposals in place. The proposed dual 4 lanes will tie into the new dual 4 lane section at the western end and directly into the existing eastbound 4 lane area approaching Junction 5. The westbound fourth lane will commence at the point where the M26 merges with the M25.

Widening will generally be achieved by constructing the extra road width to the outside of each carriageway. Due to the limitations of existing land boundaries, however, there are lengths where reduced width central reserve and verges, combined with varying degrees of reduced width lanes and hardshoulders, will be used to fit the proposals within the existing fencelines.

The minimum width of central reserve will be 2.6m using a concrete safety barrier. Traffic lanes will be 3.65m wide except at pinch points where lane 4 will be reduced in width to a minimum of 3.25m. Lanes 1 and 2, which are mainly used by heavy good vehicles, will be maintained at or close to the full 3.65m width.

3.4.2 Hardshoulders

Hardshoulders will normally be 3.3m wide but with reductions to a minimum of 3.0m over short lengths at bridges.

There will be a loss of hardshoulder at some locations, for example at overbridges, in order to fit four lanes within the existing land boundaries. At most of these locations an alternative route will be provided for emergency vehicles behind the bridge piers and connected to the

hardshoulder. At underbridges consideration will be given to widening the structures to provide space for a hardshoulder. In one or two locations, this will not be possible, and the hardshoulder will be deleted for a short distance and replaced by a minimum width emergency access.

3.4.3 Pavement and Carriageway Levels

In all areas the pavement will be strengthened as necessary to achieve a full design life of 20 years and this may entail full reconstruction.

Proposed carriageway levels will be based largely on the existing motorway levels, but will be subject to the requirement to strengthen the pavement to achieve a 20 year design life and the need to maintain headroom clearance at the overbridges.

3.4.4 Junction 6

The carriageway through Junction 6 will be widened to dual 4 lanes to allow for the heavy traffic flows through the junction. The slip roads will be extended with auxiliary lanes within the limits of the motorway boundaries to cope with the traffic joining and leaving the motorway at this junction.

3.5 Earthworks Widening

The earthworks widening will involve the removal of material from the toe of cuttings and the addition of material to the sides of embankments.

3.5.1 Cuttings

Where widening will involve the removal of material from a cutting a retaining structure will be required to support the slope. Since much of the existing cuttings have shallow side slopes between 1 in 4 and 1 in 6 gradient, the retaining walls required will often be 500mm high or less it may be possible in some areas to simply cut the verge to a slope between the fence and the back of the hardshoulder. Where this produces too steep a slope a low concrete retaining wall or reinforced soil slope will be used. Where higher walls are needed a conventional reinforced concrete structure or alternatively a wire basket retaining structure (gabion wall) could be used.

3.5.2 Embankments

Generally there is insufficient space within the motorway boundaries to permit the existing embankments to be widened by adding material at the same side slope angle, but several alternatives are possible:

- widening the embankments by adding material at a steeper side slope angle. This would involve integrating the embankment extension into the side of the existing embankment by benching in and including geogrid reinforcement.

- providing retaining structures on the sides of the existing embankments to support the widening. Such structures will be founded sufficiently deep into the sides of the embankments to ensure stability. The embankment side slopes are such that the exposed height of retaining structure would be 1 to 1.5m.

Visually, option 1 would probably be the most satisfactory in that following construction and the re-establishment of vegetation the appearance of the widened embankment would be virtually the same as before.

3.6 Bridges

All overbridges will be retained with the exception of North Park Farm Bridge which will be demolished and replaced with a new bridge having the piers relocated to allow for the construction of an extended westbound on-slip at Junction 6. Where necessary, an emergency access route will be constructed behind the bridge piers, under the side span, to give access for emergency services. All underbridges will be retained, some being widened to accommodate the widened motorway. Where this is not possible a reduced width or discontinuous hard shoulder will be used.

3.7 Signs and Communications

The existing verge-mounted direction signs will be replaced by overhead sign gantries which is the standard method for signing dual 4 lane motorways (see figure 3.3). The existing speed limit and information signals will be incorporated into these gantries. Electronic message signs will be added to the signal gantries. Closed circuit television is already in use on the motorway and the coverage will be extended to take into account the widening.

3.8 Drainage Works

The drainage system will be improved as part of the works to ensure that all permanent drainage is discharged via a positive system. Only earthworks and subgrade drainage will discharge via filter drains.

The majority of the existing storm water discharges via balancing ponds into existing watercourses. Some of the balancing ponds are overgrown, and these will be cleaned out and improved to provide sufficient balancing capacity to cope with the increased flows from the widened carriageway and from areas not presently connected to them.

At present only the three balancing ponds in Kent have oil interceptors, which are located at the outlet to the ponds. New oil interceptors will be provided at the inlet to all ponds together with shut-off valves to allow accidental spillages of oil etc, to be contained within the system and subsequently pumped out, preventing pollution of watercourses downstream. Flows to existing minor outfalls will be separated to ensure that only water from earthworks enters them; all flows from road areas will be diverted to systems draining to the balancing ponds.

3.9 Maintenance Work

Maintenance of existing vegetation will be carried out either in advance or at the same time as the engineering works.

Maintenance work to the existing carriageways, if required, will be carried out as part of the works. The existing safety fencing in the central reserve will be replaced and the central reserve will be provided with a hardened surface.

Maintenance to the existing bridges, including strengthening and provision of concrete barriers adjacent to the motorway to provide impact protection, will be carried out as part of the works.

3.10 Lighting Proposals

Widening to dual 4 lanes generally requires lighting, principally for safety reasons. Therefore, new lighting will be provided throughout the motorway section under consideration

and any existing lighting will be replaced (see Figure 3.3). The Volume II Specialist Report, 1. Landscape and Visual Impact discusses in greater detail the lighting proposal for the scheme.

3.11 Landscape Proposals

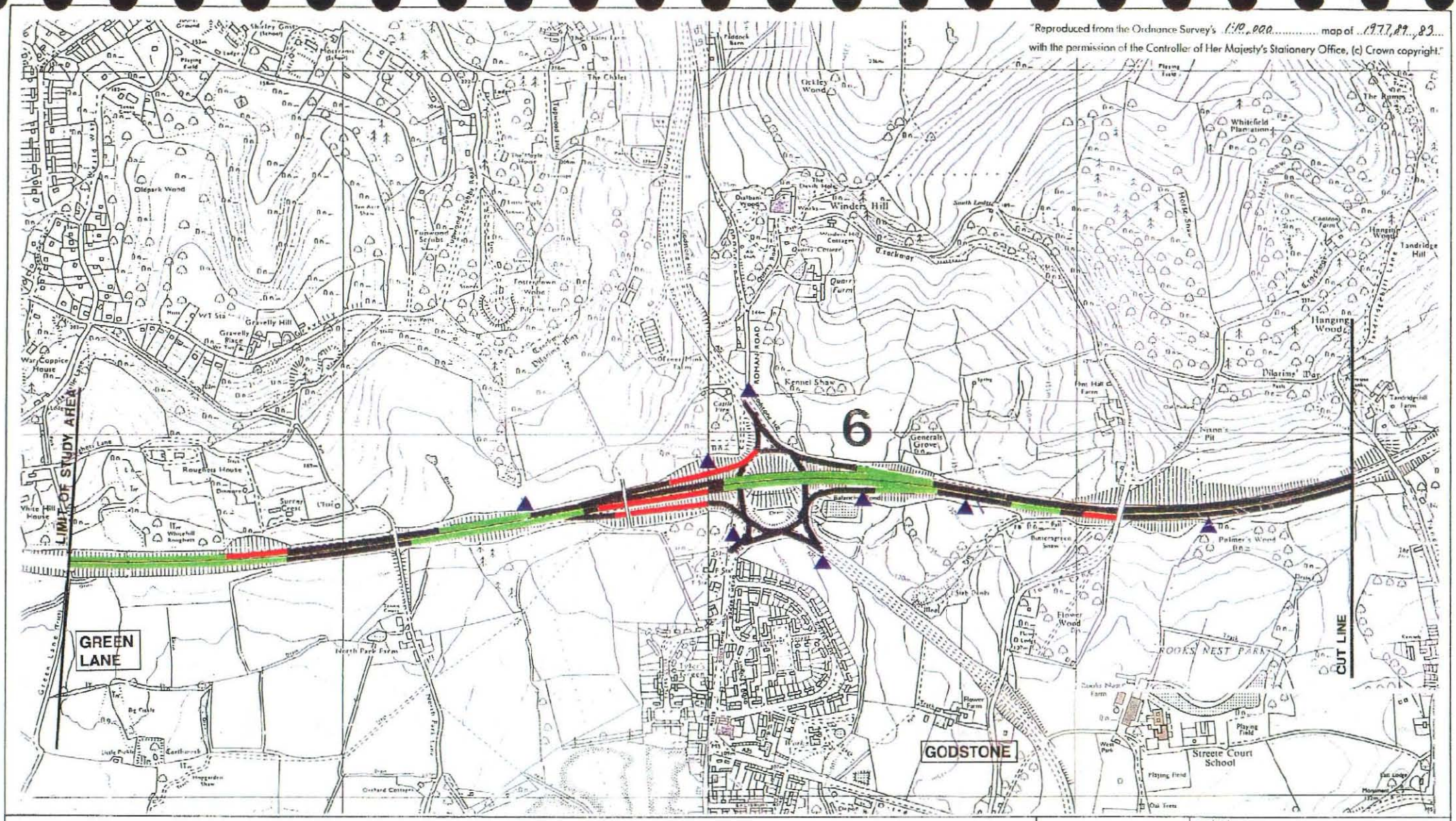
Where feasible, the existing landscape planting will be retained. New planting will be incorporated within the highway boundaries and at sensitive locations offsite planting, by agreement with landowners, is also proposed. Requests for offsite planting will be considered where appropriate.

3.12 Noise Measures

The existing noise barriers will be retained. New barriers will be included at some locations where noise levels for properties would otherwise be significantly increased.

Porous asphalt surfacing is proposed on the sections of motorway adjacent to Westerham and Brasted. This surfacing reduces noise levels by 4dB(A) which is equivalent to more than halving the traffic volume on the motorway.

It is not to be provided on the Surrey section of the motorway because this has recently undergone reconstruction, and consequently new construction will be kept to a minimum to maximise use of the previous works.



NOTES:

- Cutting (exceeding 2m depth)
- Shallow cutting / at grade
- Embankment / elevated
- Bund / false cutting
- Acoustic / screen fence

SIGNS:

- Gantry
- Roadside signs

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: EXISTING MOTORWAY FEATURES

date: April '94

drawn: Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

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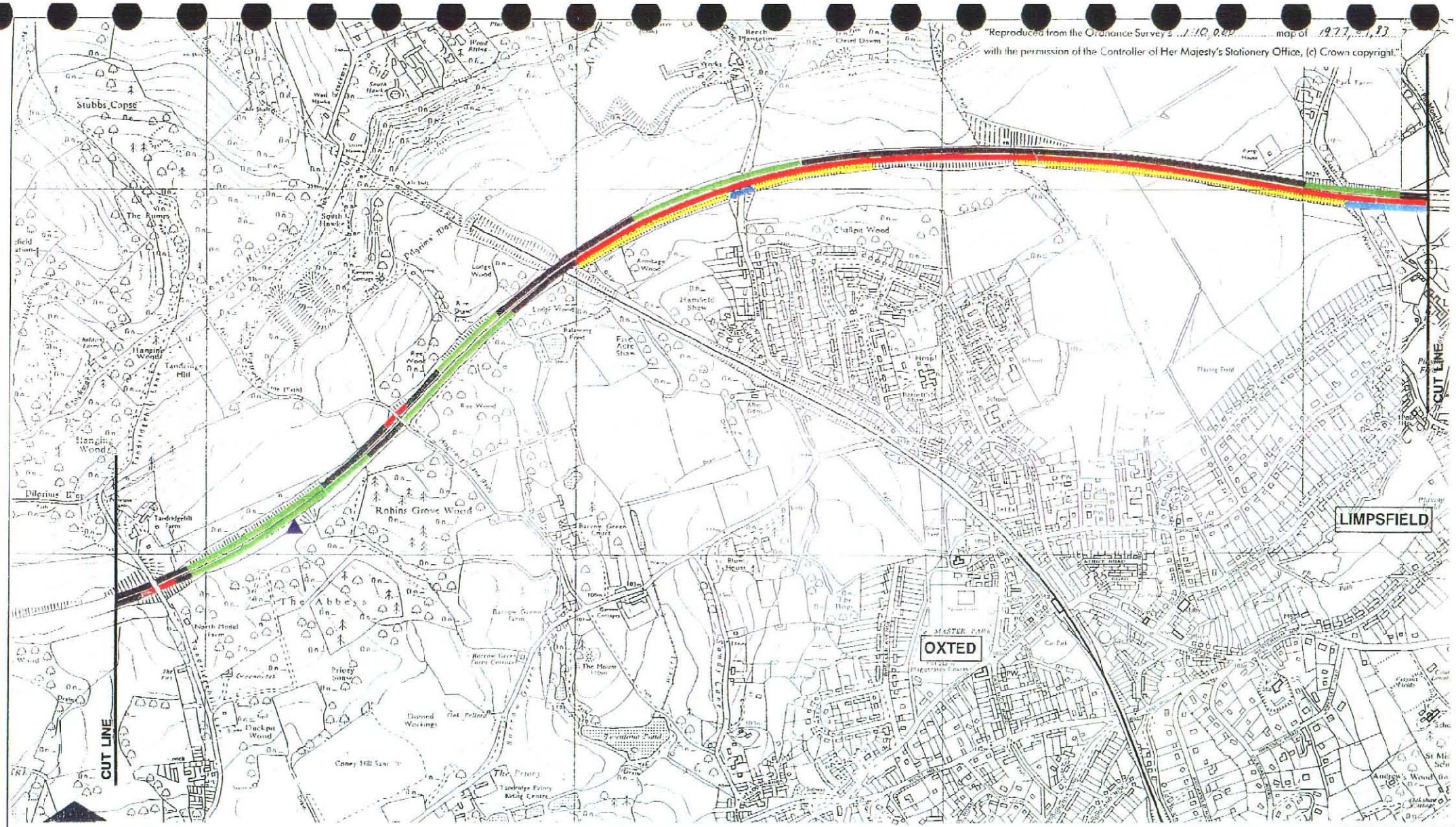

NOTES:

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- Acoustic / screen fence

SIGNS.

- Gantry
- Roadside signs

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

RPS GLOUSTON THE ENVIRONMENTAL CONSULTANCY

title: EXISTING MOTORWAY FEATURES

date	drawn
April '94	Not to scale

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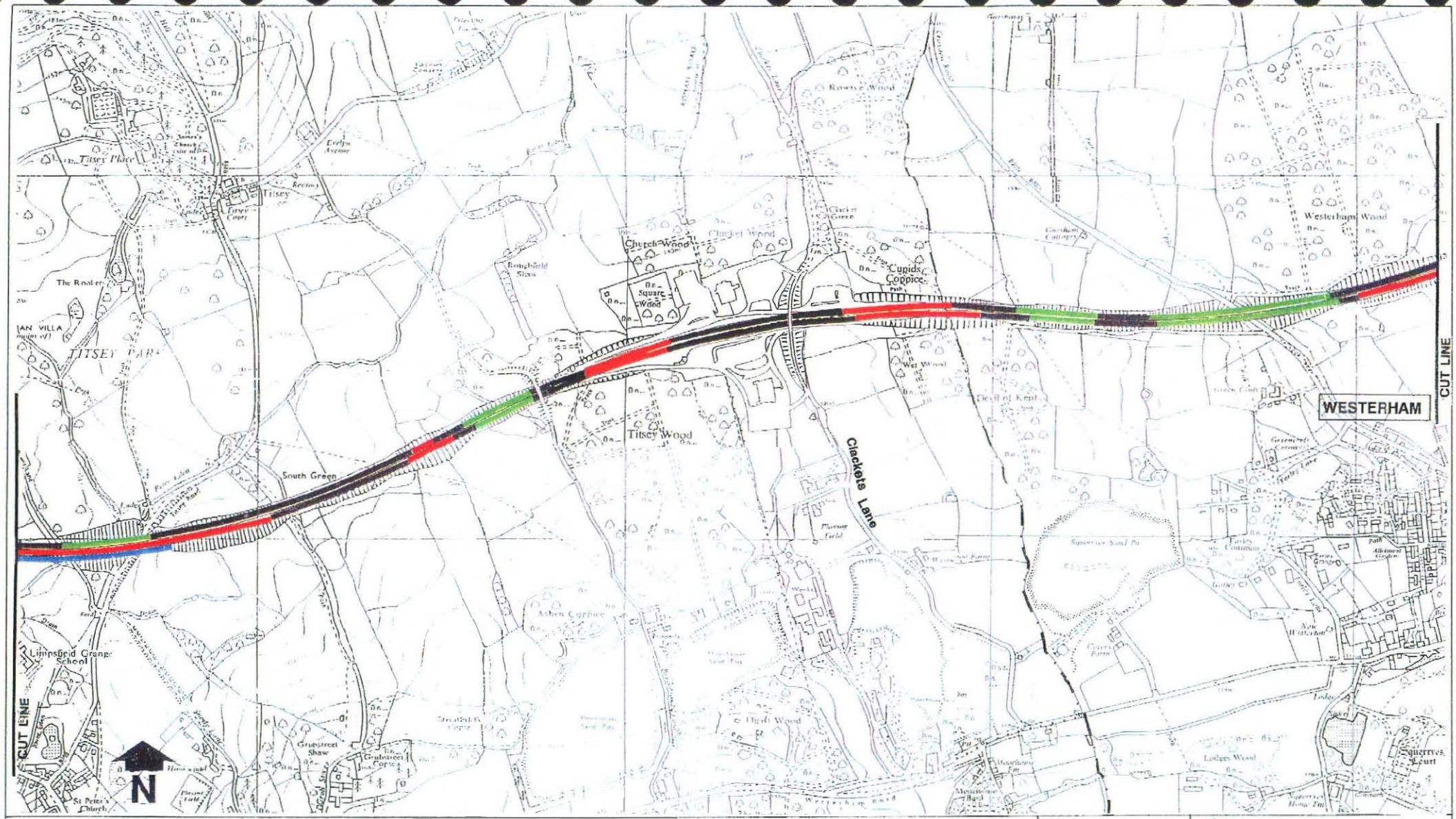

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SIGNS

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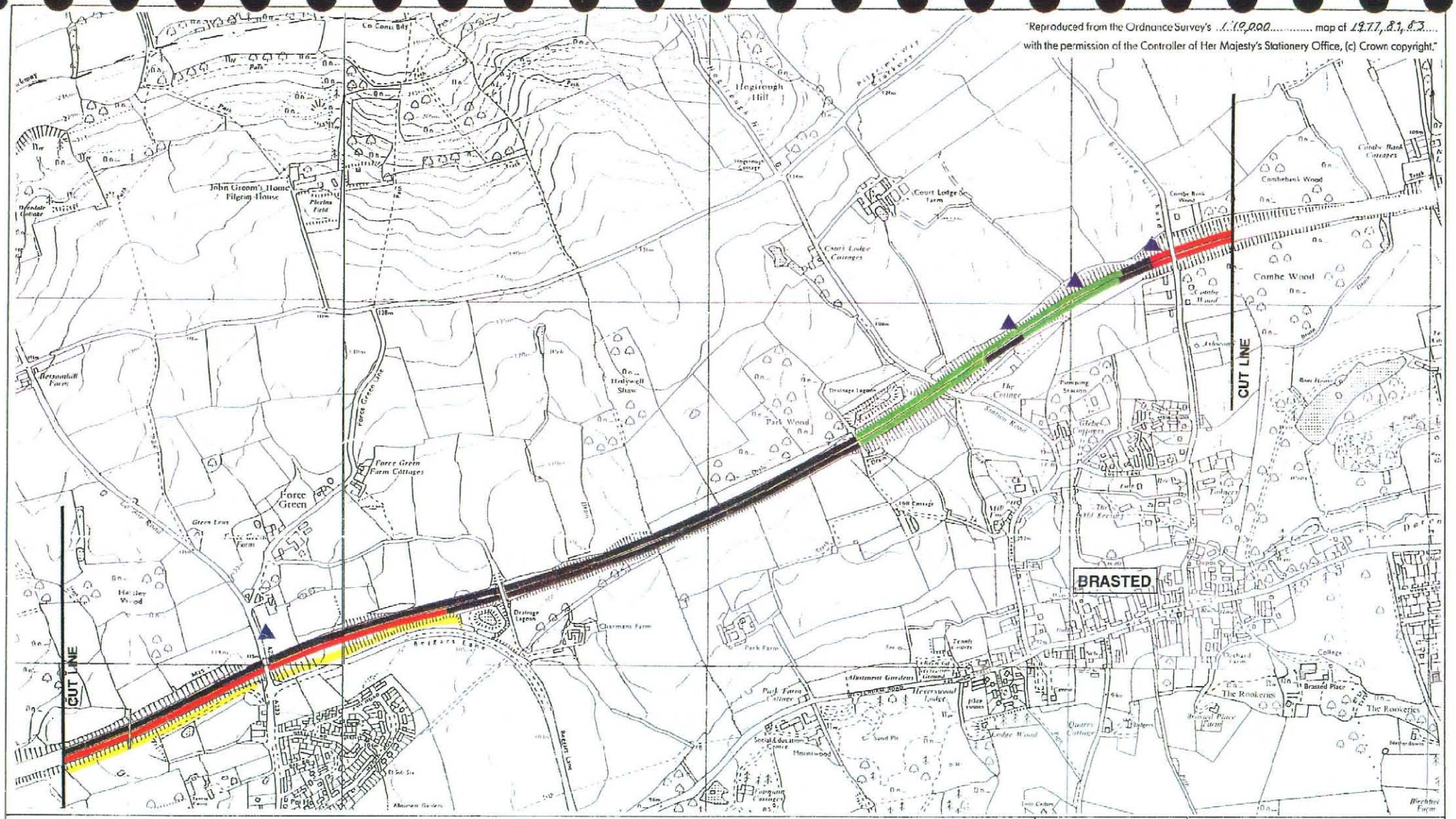

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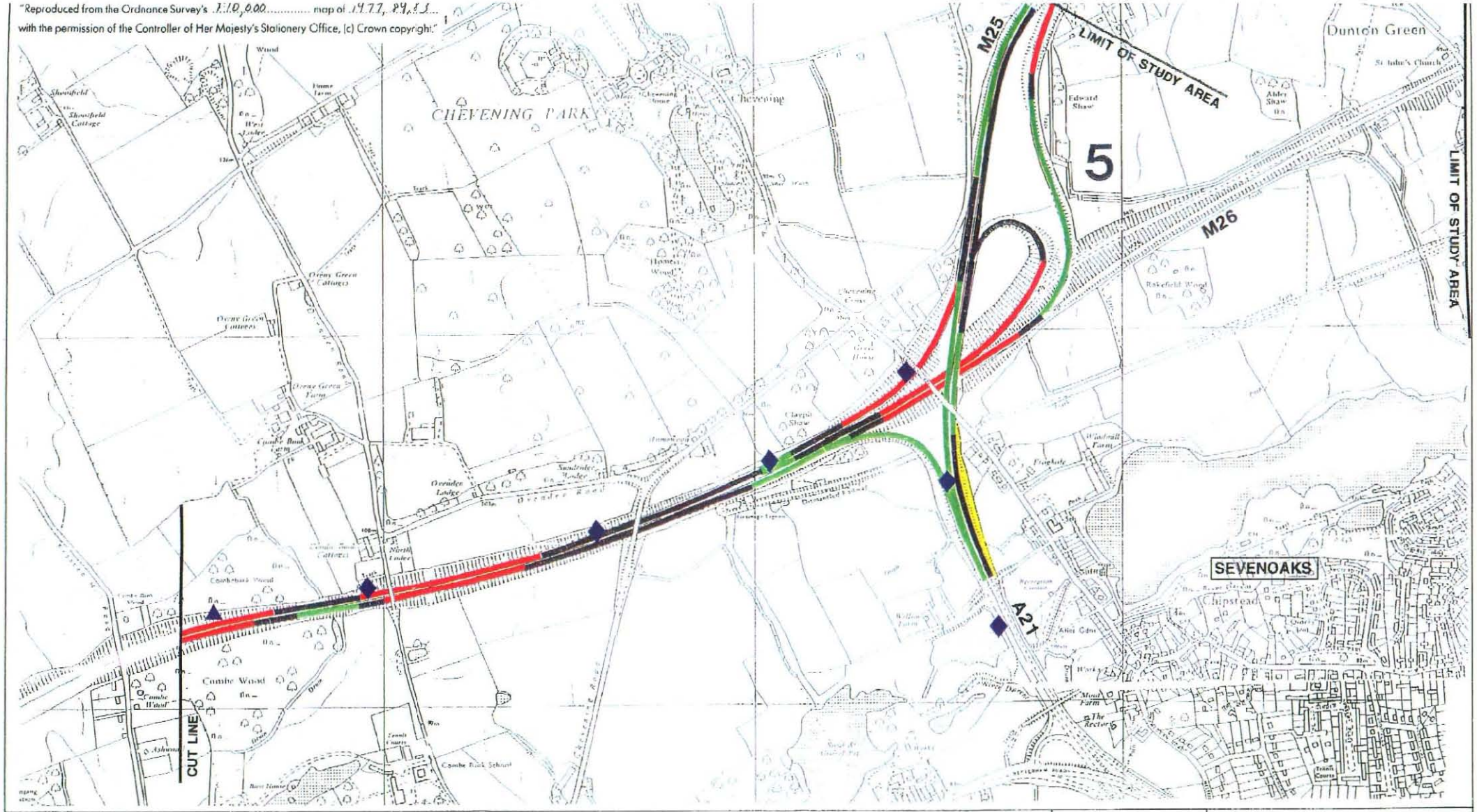

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SIGNS:

- Gantry
- Roadside signs

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HIGHWAYS AGENCY

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PURSUING EXCELLENCE - SHARING SUCCESS

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THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: EXISTING MOTORWAY FEATURES

date: April '94

drawn: Not to scale

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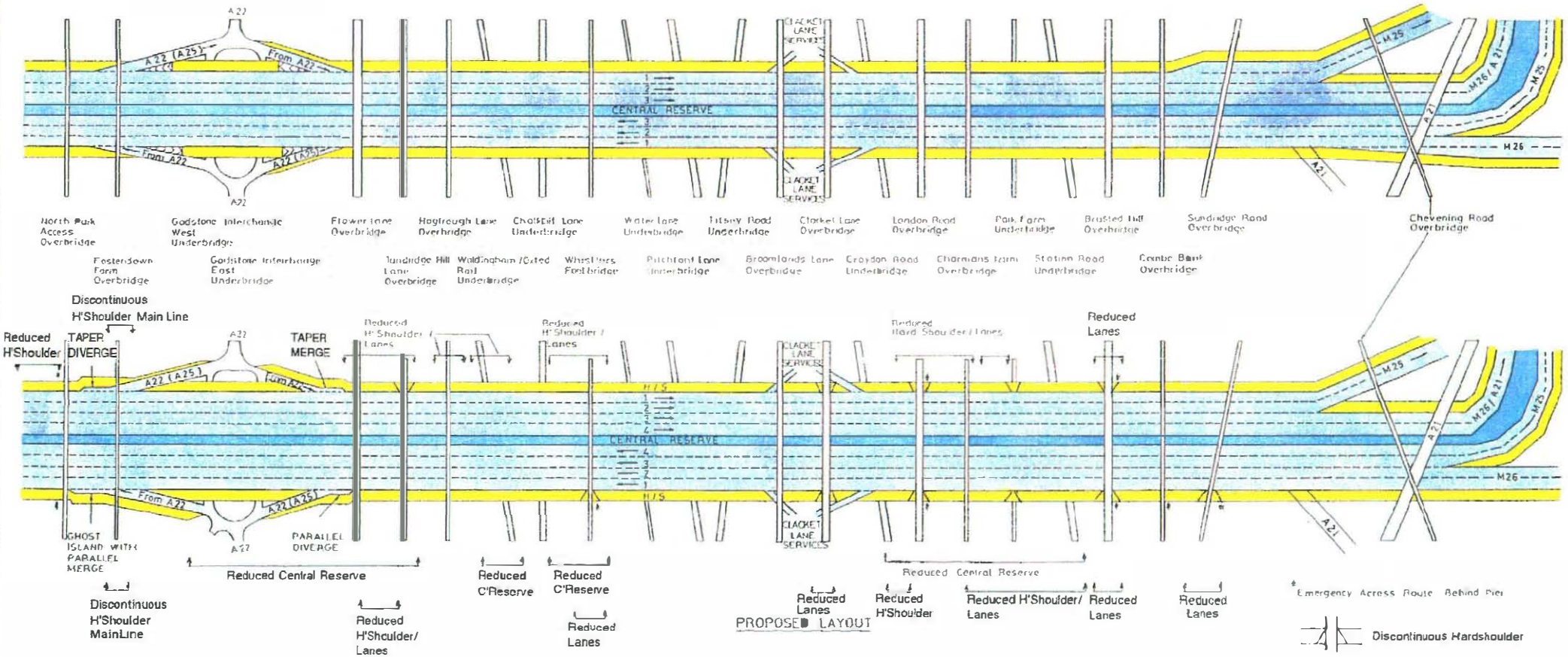
EXISTING LAYOUT



Reduced Lanes refers to Lane 4

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: SCHEMATIC LAYOUT OF PROPOSED IMPROVEMENTS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

date: April '94

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15 metre columns with double bracket arms

12 metre columns with single bracket arms

I Gantries

ORIGINAL IN COLOUR

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project
M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title
PROPOSED LIGHTING AND GANTRIES

date
April '94

drawn
Not to scale

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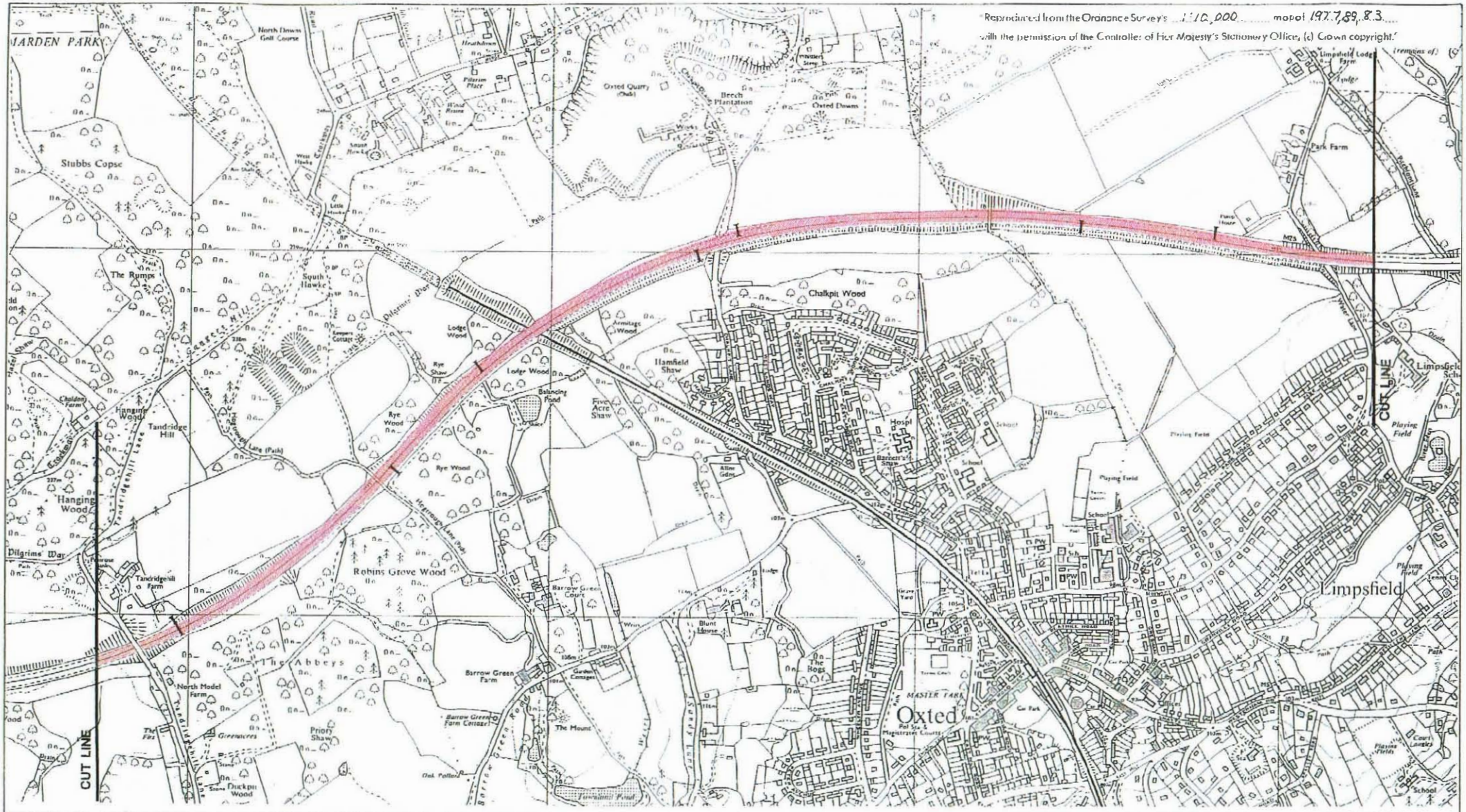

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Gantries

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title
PROPOSED LIGHTING AND GANTRIES

date
April '94

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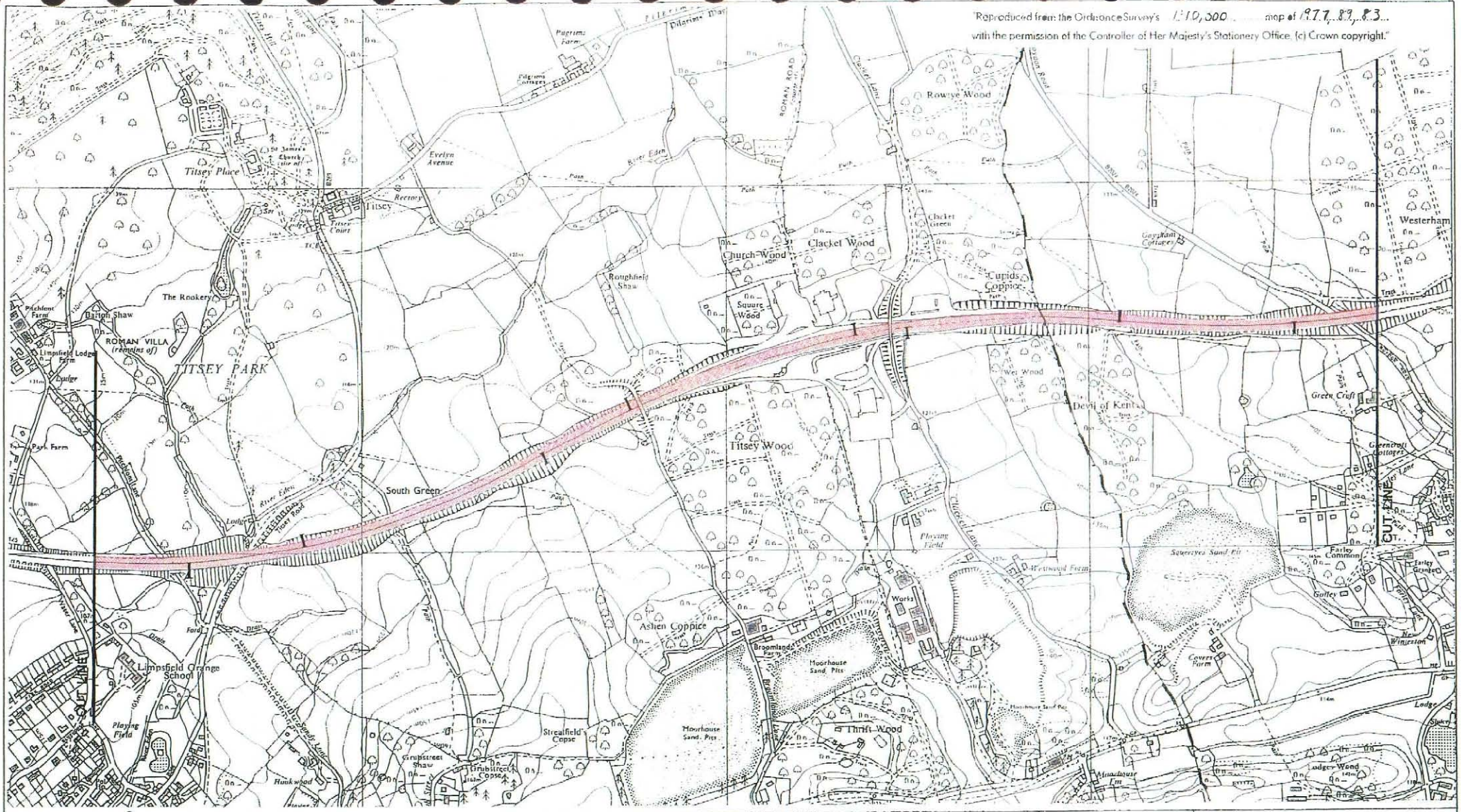

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title: PROPOSED LIGHTING AND GANTRIES

date: April '94

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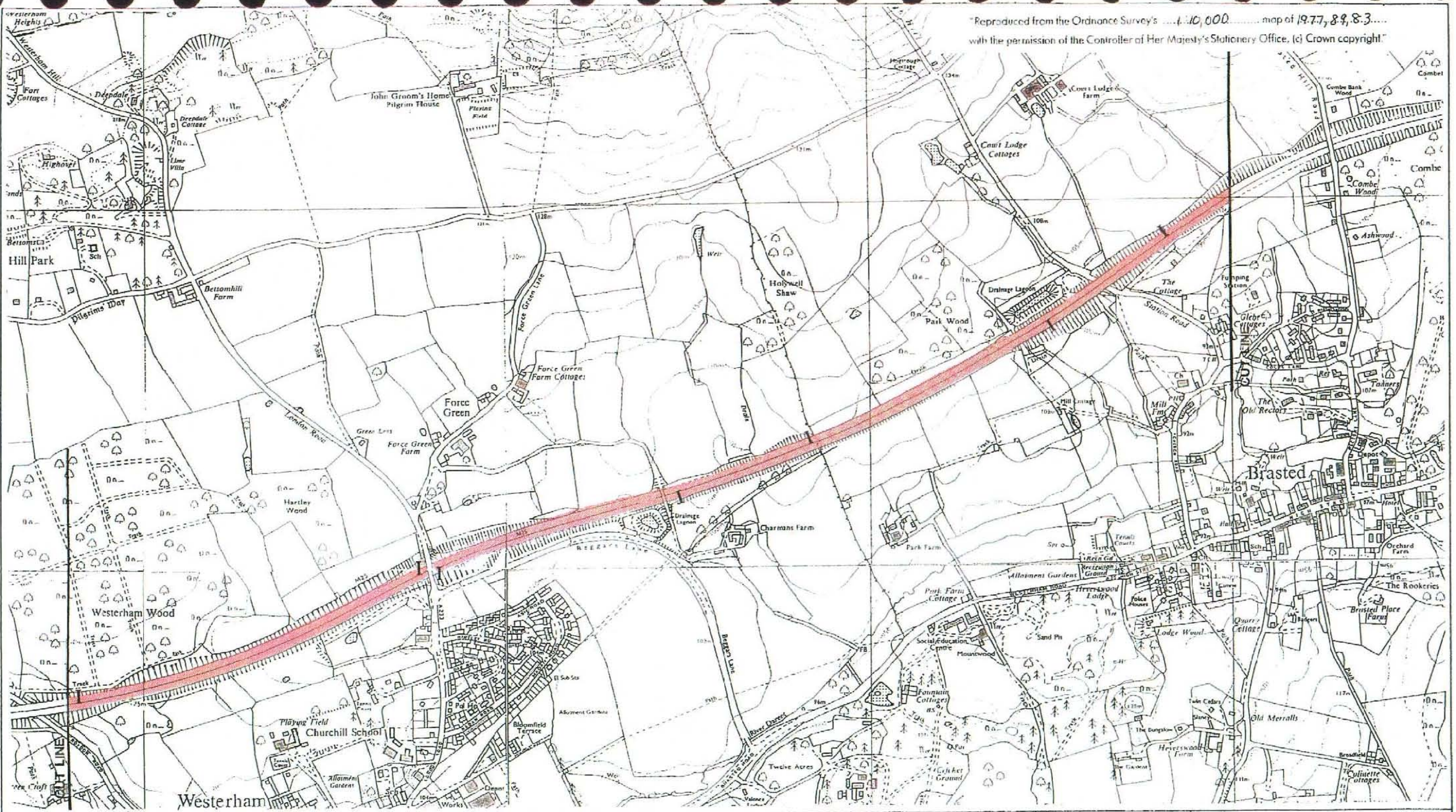

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WIDENING TO DUAL 4 LANES

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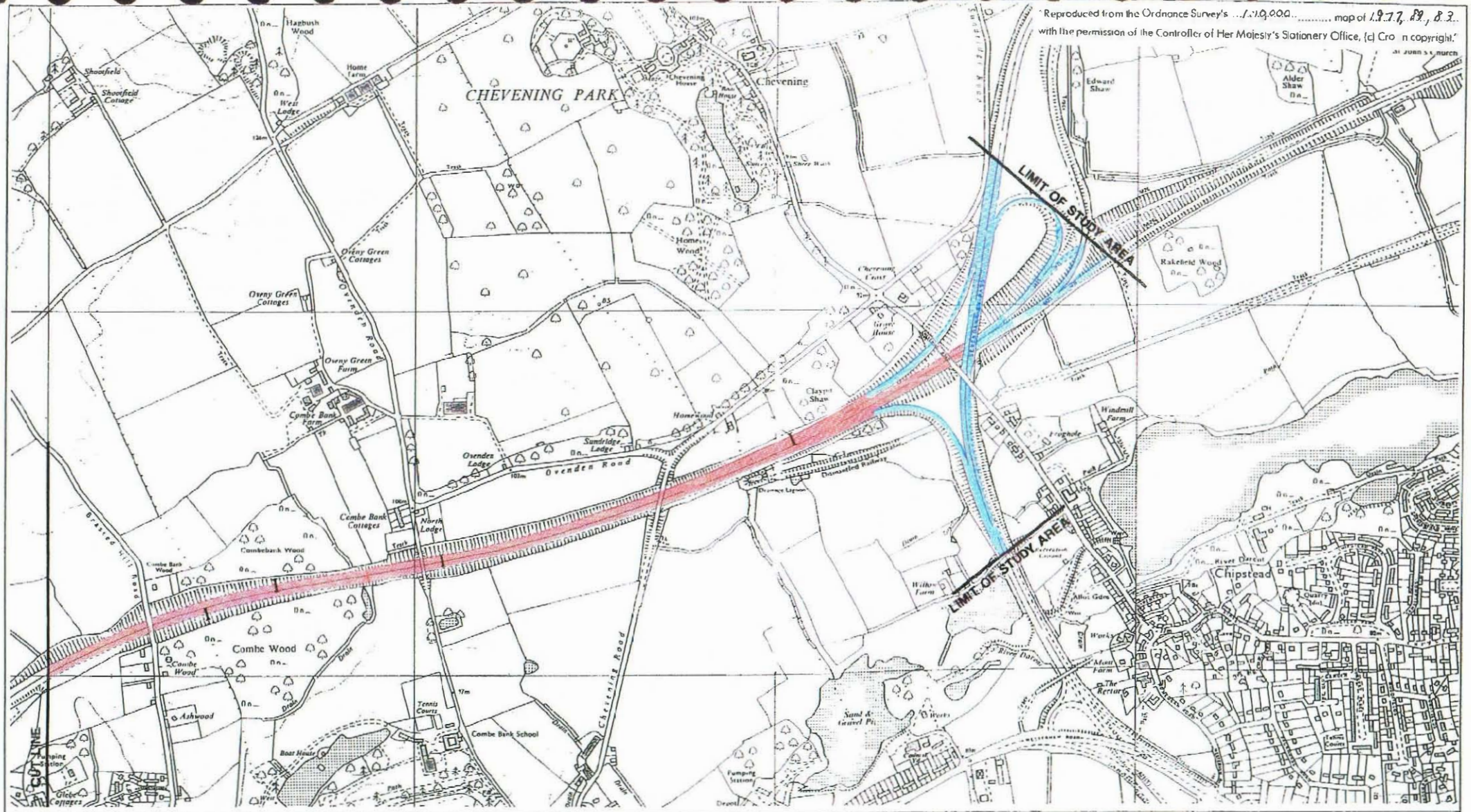

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project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: PROPOSED LIGHTING AND GANTRIES

date: April '94

drawn: Not to scale

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4.0 EXISTING ENVIRONMENTAL CONDITIONS

Summary

- *The existing motorway corridor between Junctions 5 and 7 is within an Area of Outstanding Natural Beauty and the Metropolitan Green Belt. Environmental* ***planning policies*** *at both the national and local level endeavour to protect the quality of the environment. There are a number of sites of* ***ecological*** *and* ***archaeological*** *importance within the road corridor. However, within the highway boundary there are no environmental features of particular value which cannot easily be replaced in the short term.*

- *Generally, the road is well integrated into the* ***landscape*** *with existing landscape measures effective in mitigating some of the impact of the road and traffic. However, there are limited opportunities for further measures, and these are discussed in Section 5.0.*

- *Assessment of the existing* ***noise*** *levels within the road corridor indicates that there is evidence of some noise nuisance already from the existing motorway and its high traffic volume.*

- *With respect to* ***water quality****, there is no evidence of contamination in receiving watercourses, although some of the current drainage routes are not operating as planned and the consequent effect of existing M25 run-off is difficult to determine.*

- *An initial assessment of the existing effect of the road on* ***air quality****, using data for average speed and traffic volume, indicates potential pollution problems particularly at and near to the roadside. However, there are few sensitive areas within a 200m corridor and all the receptors selected for study meet the relevant standards for air quality.*

- *The results of the* ***soil*** *analysis indicate that all the samples are well within relevant government guidelines. In particular, the existing levels of lead and cadmium do not exceed guideline levels and will not adversely affect new tree planting*

4.1 Introduction

This section provides a description of the existing environmental and planning policy issues. These provide a background against which the environmental effects of the proposals can be assessed. Further details on landscape, ecology, water quality, noise, air quality, soils and cultural heritage are contained within the specialist reports which form Volume II of this Environmental Statement.

4.2 Geology and Topography

4.2.1 Geology

Figure 4.1 illustrates the geological context of the route. The geology of the motorway corridor consists almost entirely of Gault Clay covered by thin and irregular deposits of Head. In some places along the northern side of the motorway the overlying stratum of Upper Greensand is exposed.

The Gault Clay is heavily over-consolidated, has a high liquid limit and considerable swelling/shrinkage potential. The upper zone of the Gault Clay has been affected by periglacial activity and may be remoulded and contain a network of shear surfaces. The Gault Clay is overlain in places by a thin covering of Head, a hillwash/solifluction deposit again produced by periglacial activity. The Head may also contain shear zones and exist in a semi-unstable condition.

4.2.2 Topography

The underlying geology determines the topography of the area (see figure 4.2). From Junction 5 to Junction 6 the motorway commences in shallow cutting in the Gault Clay. Junction 5 is located in a broad valley of Gault Clay and alluvium at the foot of the North Downs escarpment. The motorway rises gradually on to more undulating land cutting the edge of the sandstone ridge north of Westerham. It continues westwards in undulating countryside through a series of cuttings and valleys which run down from the chalk escarpment. Junction 6 is located in a basin-like hollow of Gault Clay between two spurs of Upper Greensand and between Junction 6 and 7 the motorway lies adjacent to the Upper Greensand and Chalk escarpment of the North Downs above the Gault Clay valley to the south.

4.3 Land Use

4.3.1 The following descriptions relate to areas of land immediately adjacent to the existing motorway and junctions which may be affected by the proposed changes (see figure 4.3).

4.3.2 Residential Areas

The main settlements in the corridor are Godstone, Oxted, Limpsfield, Westerham and Sevenoaks, all of which are to south of the motorway. Residential properties on the edge of these settlements are already in close proximity to the motorway.

To the north of the motorway isolated properties are found along the Pilgrims' Way, including estate buildings forming part of Titsey Park and Chevening Park.

4.3.3 Industrial and Commercial Areas

The only commercial properties within 100m of the motorway include Clacket Lane Motorway Service Area and the fire station to the south west of Junction 6.

Two major mineral extraction sites are within 500m of the motorway - Oxted Quarry to the north of the road and Squerryes sand pit to the south. The Abbeys to the south of the road is a former landfill site.

4.3.4 Recreational Facilities and Land Used by the Community

Limpsfield Grange School, Churchill School, Court Lodge School, Downsway County First School, Oxted County Secondary School, Valence School, Coombe Bank School, St Marys Church of England School and Mountwood Social Education Centre are within 500m of the motorway. One church, at Brasted, is also within the 500m corridor, as is public open space to the north of Oxted and to the east of Westerham.

4.3.5 Agriculture

Agricultural land adjacent to the motorway is classed as predominantly Grade 3 with some Grade 4 (according to the 1972 Ministry of Agriculture, Fisheries and Food 1:63,630 Agricultural Land Classification map). The Grade 3 and 4 classification means that the soils present and other factors, such as relief and climate, result in the land having moderate or

severe (respectively) limitations for agricultural use. However, the land is a mix of both arable and pasture. There are also a small number of paddocks which appear to be used solely for horse grazing.

The largely rural character of the area is reflected by the number of farms and associated buildings found throughout the corridor.

4.3.6 Woodland and Parkland

There are a number of blocks of woodland abutting the motorway, the boundaries of which were affected by the original motorway alignment. Particularly large blocks include Titsey Wood, Westerham Wood and Combe Bank Wood, which are also examples of a number of ancient woodlands found within the corridor.

As well as ancient woodland there are a number of historic parks and gardens. These can be identified today by the survival of lodges at their boundaries and often by surviving parkland, now utilized for grazing. Examples are Titsey Park and Chevening Park which are both located to the north of the motorway; land within the estate boundaries was affected by the original motorway construction.

4.4 Planning Policy

4.4.1 There are various planning policies and designations affecting the study area which are shown on Figure 4.4. The three levels of planning guidance to be taken into account are as follows:

a) National/Regional Policy

This is contained in the various Department of the Environment Policy Guidance (PPG) Notes: most notably **PPG 9** 'Regional Guidance for the South East'; **PPG 12** 'Development Plans and Regional Planning Guidance'; **PPG 7** 'Planning and the Rural Economy'; **PPG 2** 'Green Belts'; and **PPG 16** 'Planning and Archaeology'.

b) County Policy

This is contained principally in two documents:

- The Surrey County Structure Plan (Replacement Plan Deposit Version (September 1992))
- The Kent Structure Plan (Third Review Deposit Plan (May 1993))

c) Local/District Policy

The principal documents are:

- The South of Downs Local Plan 1991 and associated modifications produced by Tandridge District Council.
- The Sevenoaks Rural Areas Local Plan 1991 and associated amendments, produced by Sevenoaks District Council.

Statements of national/regional policy will also be reflected in both structure and local plans.

Some of the above plans are currently subject to review, and the following summary of policies therefore considers those versions which will be given most weight by the local authorities for the purposes of their own decisions.

4.4.2 National/Regional Policy

The study area is within both Metropolitan Green Belt and the Surrey Hills and Kent Downs Areas of Outstanding Natural Beauty; both are defined and protected by National Policy.

Current regional policy guidance for the south east is contained in **PPG9** which was approved by Government in 1989. This guidance seeks to foster economic growth within the region, focusing on its less wealthy parts in the east, and revitalising older areas, whilst conserving the countryside. It recognises and encourages the potential of the M25 for helping to redress the balance of attraction for development between the east and west of the Region. The road is therefore seen as instrumental to achieving the government's planning objectives for the South East.

In March 1993, the Government issued new draft guidance for the South East to cover the period to 2011.

This new draft guidance places more emphasis than **PPG9** on the quality of the environment. However, it continues to promote economic prosperity. It is also consistent with **PPG9** in seeking to address the geographical imbalance in economic prosperity, especially through promoting the East Thames Corridor as an 'Area of Opportunity'.

PPG 12, issued in 1992, provides guidance to local authorities on matters to be included in both structure and local plans. It is noteworthy for emphasising a policy approach which respects the relationship between planning and 'sustainable development'. It states that the sum total of planning decisions should not deny future generations the best of today's environment.

PPG 13, issued in March 1994, jointly by the Department of Environment and the Department of Transport, provides advice on how local authorities should integrate transport and land use planning. In common with **PPG 12** there is an increased emphasis on "sustainable development" and reducing the environmental impacts of transport overall.

4.4.3 County Policy

The Government's policy towards the South East is reflected in both the Surrey and Kent Structure Plans, albeit in contrasting ways.

The development pressures facing Surrey have lead to a strategy of overall 'restraint' being adopted in the County's Structure Plan.

The paramount aim is stated to be care for the environment, including the physical environment (towns and villages), countryside and open spaces, concern about noise and pollution, and energy and resource conservation.

In some contrast, the theme of the Kent Structure Plan 3rd Review is to obtain a balance between further development of the economy and conserving and enhancing rural and urban environments. It emphasises that all development should be planned and managed in an environmentally sustainable manner.

The aims of both Structure Plans are developed through two sets of 'Strategic Policies': **ST 1** to **ST 6** in the Surrey Plan, and **S 1** to **S 9** in the Kent Plan. Although both sets of policies are similar to one another in many ways, most notably in their common emphasis on environmentally-led development, they differ significantly in two respects. Firstly, the higher priority given to restraining future growth in Surrey, and secondly, a recognition of higher growth potential in Kent, specifically East Kent and along the East Thames Corridor, where development will be promoted at rates far higher than those planned for most other parts of the South East.

4.4.4 Other Structure Plan Policies

a) Restraint Policies

Although the Surrey and Kent Structure Plans have differing strategic objectives, they both place heavy emphasis on restricting development in those areas where it is considered undesirable. The principal mechanism for achieving this 'restraint' is the Metropolitan Green Belt which covers most of Surrey and much of West Kent, including the M25.

Policies **PE 1-2** and **MGB 1-3** within the Surrey and Kent Plans respectively deal with the extent of the Green Belt and the control of development within it. The criteria are particularly stringent but relate to buildings rather than roads. However, Green Belt policy does bear upon the construction and design of roads, as **PPG 2** states that the visual amenities of the Green Belt should not be harmed by development within or conspicuous from the designation.

There are other amenity and landscape designations which affect the study area. These include Areas of Outstanding Natural Beauty (AONBs), Areas of Great Landscape Value (AGLVs), and Special Landscape Areas (SLAs). These are covered by policies **PE 5** and **ENV 3** of the Surrey and Kent Plans respectively. AONBs are a statutory designation, the primary objective of which is to conserve the natural beauty of the landscape. Policies affecting AONBs are not opposed in principle to a proposed road improvement, although attention should be paid to mitigating the visual impact of the scheme.

AGLVs in Surrey and, their counterpart in Kent, SLAs, are dealt with under the same policies as those covering AONBs. These designations geographically cover a large area. However, both designations are local in origin and have little or no national importance. They cannot

therefore be afforded the same weight as AONBs or Green Belts in determining development proposals.

Other rural areas which are not themselves covered by specific landscape and amenity designations will still be subject to normal policies protecting the open countryside from inappropriate development. These include policies **ENV 1** and **PE 3** of the Kent and Surrey Plans. They tend to reflect the advice given in **PPG 7** that the countryside should be protected for its own sake. The PPG states that the guiding principle behind development in the wider countryside should be that it benefits the rural economy and maintains or enhances the environment. New development should be sensitively related to existing settlements, and should take full account of the historic, wildlife and landscape resources of the area.

b) Other Environmental Policy

Beyond the general restraint policies described above, there are others which concentrate on specific environmental themes. These will now briefly considered.

i) Nature Conservation

The tenor of Structure Plan policy dealing with nature conservation is to protect non-renewable and natural resources. However, added protection is given to areas which are subject to recognised national, county and local designations. These policies include **PE 6** in the Surrey Plan and **ENV 2, 4** and **5** in the Kent Plan. Development will be unacceptable in these areas, unless there is a proven strategic need which cannot be met elsewhere.

Other policies seek the conservation of tree cover and hedgerows (**PE 7** and **ENV 6**). Policy **ENV 11** of the Kent Structure Plan has the specific objective of enhancing the environment along primary routes, including tree planting and other landscaping schemes.

ii) The Built Environment and Heritage

The two Structure Plans contain several policies which seek to protect and improve the urban environment through resisting inappropriate development. These include **PE 8-10** in the Surrey Plan and **ENV 14, 15** and **16** in the Kent Plan.

In a similar vein, policies addressing archaeology and buildings of historic and architectural interest (**ENV 17** and **18**, and **PE 11** and **12** in the Kent and Surrey Plans respectively), seek to preserve such interest or, where this is not possible, obtain full documentation of such features prior to their destruction.

c) Development Policy

Beyond those policies that seek to restrain development in specific locations, there are others which promote development of various kinds, usually by reference to individual strategic locations and themes. The relatively higher levels of growth which are to be tolerated in Kent are reflected in the major strategic allocations in the east of the County and the East Thames Corridor. These allocations, together with those in the Surrey Structure Plan, have no direct bearing on the widening scheme for the M25. However, as stated in **PPG 9**, the development of the M25 is seen as instrumental to the planned development in the east of the Region.

Both Structure Plans acknowledge the commitment to widen the M25 through their policies which schedule major road improvement schemes; **MT 8** and **10** in the Surrey Structure Plan and **T 4** in the Kent Plan. However, the need to design new or improved roads in an environmentally sympathetic fashion is recognised in policy **T 3** of the Kent Structure Plan.

4.4.5 Local Policy

Policies and proposals contained in local plans, whilst generally more area-specific than those in Structure Plans, are nonetheless in general conformity with them. Those dealing with strategic landscape designations include **3, 4** and **39** in the South of the Downs Local Plan, **GB 1, 2** and **EN 2** in the Sevenoaks Rural Areas Local Plan, and **GB1, 2** and **EN 3** in the Sevenoaks and Area Local Plan.

There are a number of site-specific designations identified which should also be considered. **Policy 44** of the South of the Downs Local Plan states that in local nature reserves. Sites of Special Scientific Interest (SSSIs) and Areas of High Ecological Value consent will not normally be granted for development incompatible with nature conservation interests.

Similar policies apply in Sevenoaks District (Policy **EN 6** in the Rural Areas Plan and **EN 7** in the Sevenoaks Area Plan). These are relevant as the motorway passes close to SSSIs and several sites of Local Nature Conservation Interest.

It is important to note that whilst all the above policies make a strong presumption against inappropriate development in or near these designated areas, this is not absolute, allowing that there may be circumstances where the need for development may be greater.

4.5 Landscape and Visual Impact

4.5.1 The existing landscape and visual impact of the motorway has been assessed as follows:-

- Existing vegetation
- Landscape character
- Landscape Quality
- Visual impact of the motorway

The Volume II Specialist Report, 1. Landscape and Visual Impact, provides more details.

4.5.2 **Existing Vegetation**

a) Existing vegetation within 500m of the highway boundary.

This comprises woodland blocks, hedgerows, tree belts and parkland and garden trees. Substantial blocks found both north and south of the motorway provide significant visual containment, for example The Abbeys, Titsey Wood, Westerham Wood, Park Wood and Combe Wood, located at intervals between Junctions 5 and 6.

b) Existing vegetation within the highway boundary.

In general, dense planting using transplants is well established within the highway boundaries. Planting in excess of 10 years old is now making a significant visual impact and providing effective screening. Many of these areas require management in the form of selective coppicing or thinning to maintain or achieve the stated landscape objectives of the original DoT planting plan. This is programmed to be undertaken early in 1994.

Intermittent planting using feathered or standard size plants is generally poor, especially in exposed situations. Although important for long term integration of the motorway into the landscape, it will not have any significant screening effect for many years.

4.5.3 Landscape Character

The landscape context of the area is illustrated on Figure 4.5. The landscape character is determined primarily by the underlying geology. The principal landscape features are the Chalk escarpment, Greensand ridges and the low area of Gault Clay at the base of the scarp.

The geology has also influenced the vegetation type with extensive areas of ancient oak woodland on the claylands. North of the motorway large areas of Beech Hangers are found on the steep chalk slopes. The Greensand ridge is also heavily wooded.

There is a long history of human settlement and movement through the area. The settlement pattern reflects the geology with the major settlements south of the motorway on the lower Greensand ridge. Other smaller settlements and farmsteads are found along the spring line at the junction of Chalk and Clay north of the motorway. The Pilgrims' Way also follows the spring line in this area.

The overall landscape character is lowland arable and pasture land on the Gault Clay and Greensand with heavily wooded slopes on the rising ground to the north. Other features which contribute to the landscape character and quality are the historic parks within the study area. The estates of Chevening and Titsey remain intact and the large country houses are surrounded by parkland characteristic of the 18th and 19th centuries.

The study area of the motorway corridor is almost entirely within the band of Gault clay at the foot of the Chalk escarpment. Within this area the character of the route corridor is already affected by the presence of the motorway, the influence of which varies with the topography and extent of tree cover. Eight character sub-areas can be identified (See Figure 4.5) which are illustrated by aerial photographs at Figure 4.6.

- Green Lane to North Park Lane
- Godstone and Junction 6
- Flower Lane/Barrow Green
- Oxted
- Titsey
- Westerham
- Brasted
- Junction 5 and Chevening

- Green Lane to Barrow Green

In this section the North Downs rise steeply to the north of the motorway. The escarpment is generally well wooded with the occasional isolated house visible through the trees. To the south the land flattens into farmland with scattered farmsteads. A number of tree belts and hedgerows punctuate the more open landscape to the south. The Greensand ridge rises further to the south.

The motorway at Junction 6 is elevated with slip roads descending to the roundabout below the road. Existing planting on the embankments of the motorway provides some screening, but the elevated road and vehicles are visible from Tylers Green, although not from the centre of Godstone.

- Oxted

The motorway passes north of the settlement of Oxted, again at the foot of the well wooded hills of the North Downs. The Pilgrims' Way follows a route on the mid slopes along the edge of the woodland. A large chalk quarry occupies a prominent position cut into the scarp slope of the Downs.

Although close to the motorway, the settlement is visually separated by woodland and an earth bund.

- Titsey

Titsey Place and its associated parkland are situated to the north of the motorway. This attractive landscape area is set below the steep slopes of the North Downs on gradually sloping land. The settlement of Titsey and its church occupy a prominent position on the lower chalk slopes. Land of a similar character extends to the south.

- Westerham

The wooded escarpment of the North Downs is more distant from the road through this area. Gently sloping farmland with scattered farmsteads and woodland extend to the road.

The settlement of Westerham lies to the south of the motorway. The motorway is elevated with minimal embankment planting along part of its length allowing open views of the road for properties at Green Croft and Gaysham Cottages. An earth bund physically separates properties to the north west of Westerham.

- Brasted, Junction 5 and Chevening

To the north of the motorway, in general, large arable fields extend over the sloping land towards the road. Long open views are obtained from the Pilgrims' Way. Trees and hedgerows punctuate this landscape, as exemplified by the well treed parkland landscape at Chevening. The wooded Greensand ridge forms a backdrop to the south.

Junction 5 is set at a low level with planting on the embankments which enclose the carriageway.

4.5.4 Landscape Quality

An assessment of landscape quality has been based on the criteria of landscape appreciation, heritage and conservation interest. An overall value is given using the following scale from the Design Manual for Roads and Bridges, Volume 11 (DMRB) DoT 1993.

- Highest value
- Very attractive
- Good landscape
- Ordinary landscape
- Poor landscape

The study area is wholly within, or forms the southern boundary of, the Surrey Hills and Kent Downs Areas of Outstanding Natural Beauty (AONB). The North Downs section of the two AONBs is described in the Countryside Commission's Directory of Outstanding Natural Beauty (1989) as:

"an unmistakable chalk landscape of swelling hills and beech wooded combes with a steep scarp crest looking south to the Weald. The Downs are paralleled to the south by an undulating wooded greensand ridge".

The historical, ecological and recreational value of the North Downs is also emphasised in the Directory as contributing to their value, for example:

"The AONB is hugely popular with visitors.... Much of the downland crest is owned by conservation bodies, including the National Trust, and there is a dense, heavily used network of public and recreational footpaths including the new Greensand Way and the North Downs Way (national trail)"

West of Oxted the land north of the motorway is of the *highest value* and included within the Surrey Hills AONB. Areas south of the motorway between Green Lane and Barrow Green have local importance for their rural and well treed character and can be considered as *good landscape*.

East of Oxted the Surrey Hills/Kent Downs AONB extends both north and south of the motorway and the land is all of the *highest value*.

4.5.5 Visual Impact of the Existing Motorway

The Volume II Specialist Report, 1. Landscape and Visual Impact, describes in more detail the existing views to and from the road including from individual properties and settlements. The overall visual envelope is shown on figure 4.7.

a) Daytime Views

Views of the motorway and its traffic are generally contained by the Chalk escarpment to the north and the Greensand ridge to the south. This topography forms a backcloth to views of the motorway. Further screening is provided by a combination of mature woodland, tree belts and hedgerows, and existing buildings (in urban areas). Existing mitigation measures, including bunding and false cuttings, further screen traffic from view so that at most only the tops of lorries are seen in many locations.

The existing lighting columns of Junction 6 are on the junction arrangement below the motorway and are therefore rarely seen against the sky. The backdrop of the North Downs and mature woodland further assists in their integration.

b) Night-time Views

There is very little lighting within the existing landscape. Lighting at Junction 6 is lower than the motorway and is visible over a relatively small area, where it is seen as an extension to the street lighting at Godstone. Most of the motorway lighting at Junction 5 is outside the scheme but contributes to the night-time effect of the motorway in this area. Distant views of lighting at Sevenoaks are also noticeable from some view points. In general the motorway is within a dark landscape. The dark back cloth of the escarpment and the effectiveness of foreground vegetation limit the impact of vehicle headlamps on adjacent areas.

c) Distant Views

Views are possible from the Pilgrims' Way throughout much of its length in parallel to this section of motorway. Areas of woodland, hedgerows, treebelts, and existing environmental mitigation measures adjacent to the motorway provide some screening.

Distant views of the motorway at night from the north and south are of a dark landscape throughout the majority of the study area. Lighting at Junction 5 and 6 is visible over a short distance, but otherwise light sources are limited.

4.6 Noise and Vibration

4.6.1 More detailed information on the existing situation relating to noise effects associated with the M25 is contained within the Volume II Specialist Report, 4.Noise.

To the north of the motorway the land usage is mainly rural with only scattered individual houses and farms near to the motorway. On the south side a succession of small towns and villages extends along the A25, the northern edges of which reach almost to the motorway at Godstone, Oxted, Limpsfield, Westerham and Brasted. Between these, scattered houses and farms are located near to the motorway.

4.6.2 Calculation of Road Traffic Noise

The noise levels have been calculated at various locations in accordance with the procedures given in 'Calculation of Road Traffic Noise (1988)'. These procedures are necessary to enable entitlement under the Noise Insulation Regulations to be determined, ie. protection against noise levels in excess of 68 dB(A). They also provide guidance

appropriate to the calculation of traffic noise for more general applications, eg. environmental appraisal of road schemes including noise nuisance assessment, highway design and land use planning.

The basic noise level is obtained from traffic flow, traffic speed, composition of the traffic, gradient of the road and the type of road surface. This basic noise level is then corrected to take into account, as appropriate, distance from the road, nature of the ground surface, and screening by any intervening obstacles. The final stage of the calculation allows corrections to be applied for site layout. This covers aspects such as effect of reflections from buildings and other hard areas and screening effects.

4.6.3 Existing Mitigation

The noise generated by the motorway traffic has been mitigated in four locations beside the motorway (see Table 4.1):-

- An acoustic fence protects Tandridgehill Farm to the east of Tandridgehill Lane, north of the motorway.
- An earth bund protects North Model Farm to the east of Tandridgehill Lane, south of the motorway.
- A combination of earth bunds and acoustic fences stretches almost continuously around the north of Oxted and Limpsfield, providing mitigation for the area to the south.
- An earth bund has been provided either side of London Road, Westerham, giving general protection from noise to the area of the village nearest the motorway.

Table 4.1 Existing Noise Barriers

Location	Type	Height(m)	Length(m)	No of Properties Mitigated
East of Junction 6 Both Sides				
Tandridgehill Lane, South of M25 North Model Farm	FC		120	1 Farm
Tandridgehill Farm, North of M25	AF	2.5m	92m	1 Farm
Limpsfield/Oxted Area South of Motorway				
Between the Railway & Chalkpit Lane	FC		430	} Northern parts of Oxted
Across Chalkpit Lane Bridge	AF	2.5m	120	
East of Chalkpit Lane	FC		300	
West of Water Lane	FC		820	} Northern parts of Limpsfield
Water Lane to East of Titsey Road	AF	2.5m	750	
West of Junction 5 South Side				
West of London Road	FC		230	} Northern parts of Westerham
East of London Road	FC		510	

KEY:- FC = False cutting or bund AF = Acoustic Fencing

4.6.4 Vibration from Traffic

Traffic induced vibrations from low frequency sound emitted by vehicle engines and exhausts can be a source of annoyance to local people and can occur to some extent along any type of road. Such sound may result in detectable vibrations in parts of the building such as windows, doors, and in some cases, in floors. Research has shown that the nuisance from vibration from road traffic can be directly compared with the noise emanating from the traffic, and is therefore considered as part of the overall noise assessment for the motorway.

4.7 Air Quality and Climate

4.7.1 The primary pollutants produced by road vehicles that give rise to concern with regard to public health are carbon monoxide, nitrogen dioxide and hydrocarbons. Carbon dioxide is produced by vehicle engines and is thought to have serious consequences in future global warming scenarios. On a local scale it has no known effect on public health or the climate.

The Volume II Specialist Report, 5. Air Quality details the methods used for, and results of, the assessment of existing and predicted pollutant emissions in the vicinity of the M25. The assessment was undertaken in accordance with the DMRB Volume II, Section 3, Part 1 - Air Quality (DoT 1993).

4.7.2 General Atmospheric Standards

The statutory standards and guidelines for the quality of the atmosphere which apply to the major gases emitted by road vehicles are given in Table 4.2.

Table 4.2 Guidelines and Standards for Air Quality

Pollutant	Type	Period	Value
Nitrogen Dioxide	EC Limit EC Guide	98th percentile of yearly mean hourly concentrations	104 ppb 71ppb
Carbon Monoxide	US EPA Limit	Annual maximum 8 hour average	9ppm
Hydrocarbons	UK Reference	Peak hour average	N/A

4.7.3 Existing Air Quality

Thirteen locations (receptors) were selected at which air quality standards could be evaluated. Receptors were defined as inhabited dwellings or any property of special sensitivity to air pollution ie. schools or hospitals which were within 200m of the centre of the nearest carriageway. Pollution impact was assessed using details of peak hour traffic flow, peak hour traffic speed and the split between light duty and heavy duty vehicles

All of the receptors are within the carbon monoxide US EPA legislative limit of 9ppm. The highest value of 4.15ppm is at a property at Brasted which is less than half the limiting value.

Nitrogen dioxide values are predicted to lie within the EC mandatory limit value of 105 ppb, at all receptor locations.

The maximum average peak hour concentration of total hydrocarbons is predicted to be 2 ppm, reducing with distance from the road to the background methane level of 1.7 ppm.

4.8 Water Quality and Drainage

4.8.1 Water quality issues are dealt with in more detail in the Volume II Specialist Report, 3. Water Quality.

4.8.2 Drainage of Road Run-off

The major watercourses associated with the M25 survey area are the River Eden, Gibbs Brook and the River Darent. The River Eden passes beneath the M25 at Titsey Road and flows southwards. The River Darent parallels the motorway at a distance of approximately 1 km and flows into a series of lakes close to Junction 5. The River Eden and River Darent are both rivers of low flow and as such are especially susceptible to environmental impacts due to excess water arising from road run-off, offering minimum dilution of contaminants.

The storm water run-off from the motorway was designed to be carried in a combination of underground pipes, drains and unlined ditches to specific points. These were laid so that specific catchments drain to individual outfalls (See figure 4.8)

The survey area is divided into ten distinct drainage areas. Area 1 was designed to discharge road run-off into agricultural ditches which direct the water to the Redhill Brook or to Gibbs Brook. Areas 2, 3, 4, 5 and 6 were designed to discharge road run-off into balancing ponds from which the water passes into an identified network of surface ditches and streams which eventually discharge into the River Eden. Area 3A appears to have been designed to discharge water into the outfall of the balancing pond associated with Area 2. Areas 7, 8, 9 and 10 were designed to discharge water into drainage lagoons, which then discharge into surface ditches flowing to the River Darent.

The site survey revealed that the balancing ponds serving Drainage Areas 2, 3B, 5 and 6 were heavily overgrown, especially around the influent point. Some vegetation was also present within the balancing pond serving Area 4, although it did not appear to be as well developed. The drainage lagoons serving Drainage Areas 7, 8 and 9 were observed to be fully maintained and functional.

4.8.3 Water Quality

The main sources of pollution from highway surface water run-off are:

- vehicle and tyre wear;
- vehicle lubrication system losses;
- vehicles exhaust emissions;
- road surface wear;
- de-icing salts;
- accidental spillages.

If such substances are allowed to enter watercourses or the ground water regime they could constitute a hazard to both the natural environment and, where water supply systems are involved, to humans.

4.8.4 Results of the Site Survey

The site survey was undertaken in order to observe the existing run-off drainage routes and obtain water samples for laboratory analysis, the results of which would be used to establish existing water quality in the area. Water samples were collected from ditches believed to have the potential to receive motorway run-off due to their proximity to the M25. Silt

samples were taken from the dry balancing ponds and ditches to identify whether sediments contained run-off contaminants, which would indicate previous association with motorway run-off. The results were compared to data obtained from an unconnected study of run-off from one section of the stretch of the M25 under review.

The waters sampled showed little evidence of contamination by road run-off other than elevated levels of chlorides, probably arising due to the re-suspension of salts used for de-icing purposes in winter. Studies revealed elevated levels of metal contaminants in water within one balancing pond, however the levels were significantly reduced in the receiving watercourse, downstream of the balancing pond discharge point. The silt analysis indicated that the balancing ponds and drainage lagoons have at some time received road run-off.

4.8.5 Calculated Expected Levels of Contaminants

Based on the lack of dependable information arising from the sampling approach, it was decided that the impacts on water quality from existing and predicted road run-off should be calculated from reference sources. This has been performed for many motorway surveys due to the limited time for monitoring which is usually available. The calculation of run-off chemical quality ensures that a "worst case" scenario is employed, on which the potential impacts are assessed.

The levels of contaminants expected in existing run-off were calculated from data available from long term studies performed on the M1 in 1981, adjusted for the larger hardstanding area of the M25 providing run-off, as well as the greater number of vehicles which use the survey area of the M25.

The concentrations of contaminants calculated were much higher than those permitted for Class 1B (good quality) water course, which is the class of the River Darent, and the Environmental Quality Standards currently employed by the NRA for the protection of water courses. Gibbs Brook and the River Eden are both of Class 2 (fair quality). The implications are that the existing road run-off has the potential to lead to a significant environmental impact on receiving water courses. However, according to the NRA no such impacts on the main receiving watercourses in the area have been recorded to date.

4.8.6 **Groundwater Protection**

The potential exists for run-off to be migrating into the groundwater aquifers underlying the M25 between Morants Court Farm (east of Junction 5) and Green Lane (west of Junction 6), which is protected by only a thin surface layer of clay. This is particularly pertinent for Drainage Areas 1, 2, 3, 5 and 6 which are located in the regions where clay cover is the thinnest. Several abstraction points for potable water lie close to the M25, and the permeability of the strata and the duration of the migration presents the possibility that contaminants may reach the groundwater in the future. The concentration of contaminants calculated to be in the existing run-off has the potential significantly to affect the purity of the potable groundwater. As potable groundwater is in short supply in the south east of England, every effort to protect these valuable water resources is pursued by the NRA.

4.9 Soils

4.9.1 A full description of the methodology, results and the location of soil survey transects is given in the Volume II Specialist Report, 6. Soils. A total of 174 topsoil (top 10cm) and subsoil samples were taken to assess the levels of lead, cadmium and chloride. Samples were taken at various points within the motorway boundary. None of the land sampled was in agricultural use.

4.9.2 **Guideline Values on Contaminants**

There are as yet no mandatory regulations controlling the levels of pollutants in soils. However, guideline values on contaminants have been developed by the Department of the Environment Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) which apply according to the end use of the soil. Other guideline values have been produced in draft by the Ministry of Agriculture, Fisheries and Food (MAFF) for land in or likely to be returned to agriculture. These values are reported in the "Code of Good Agricultural Practice for the Protection of Soil" published for public consultation in December 1992.

The ICRCL committee published a paper in 1983, updated in 1987, introducing the concept of 'trigger concentrations'. These are a series of values for the principal contaminants of soil below which a site can be regarded as uncontaminated. For traffic derived pollutants which

may pose hazards to health the following threshold values have been determined for gardens and allotments, and parks, playing fields and open space.

Table 4.3 Threshold Values for Contaminants

Contaminants	Gardens/Allotments	Parks/playing fields/open space
Lead	500 ppm	2000 ppm
Cadmium	3 ppm	15 ppm

Typical levels of lead and cadmium commonly found in soils are as follows:

- Lead 10-150 ppm
- Cadmium <2 ppm

4.9.3 Existing Levels of Soil Contaminants

The results of the sampling exercise found concentrations of lead from 22 to 1290 ppm, cadmium from <0.5 to 1.0 ppm and chloride from <100 to 100ppm. In some areas these contaminants decreased with increasing distance from the motorway while in other areas the distribution pattern of contaminants was less well defined. Using the guidelines set by the ICRCL and MAFF to gauge the existing levels of contamination all of the soil samples analysed are well within the guidelines set by ICRCL and MAFF.

The chloride levels measured are low and do not present a problem for plant growth, nor are they likely to cause problems to soil structure. Most de-icing salt is applied between January and March. When this study was carried out, in October 1992, much would have been leached out. Surveys carried out between January and March would give different results. The threshold value for chloride from de-icing salt for trees commonly used for landscaping is 650 ppm. Any damage to plants from salt is expected to be localised to areas close to the hard shoulder.

Most of the topsoils have physical and chemical properties which favour the adsorption of contaminants such as lead and cadmium. These characteristics will prevent them being absorbed readily by plants and hence entering the food chain. Most of the soils analysed are suitable for tree growth, and where possible should be conserved for landscaping. Some of the topsoils have clay or heavy clay loam textures and care will be required during

widening of the motorway to avoid structural damage. Some of the soils are less suitable for tree growth, for example where poorly drained clay occurs. Where soils are calcareous and poorly drained, care will also be needed in selecting the appropriate tree species. During the widening of the motorway the soil materials within the motorway boundary will be tested to determine the level of other contaminants and to establish appropriate treatments, if required.

4.10 Ecology and Nature Conservation

4.10.1 Information on ecology was collected in two stages as described below, the results of which are presented in more detail in the Volume II Specialist Report, 2. Ecology and Nature Conservation

a) Desk Study

In January 1991 a desk study was undertaken to gather existing information on recognised sites of ecological value such as SSSIs, ancient woodlands and the known location of protected species. The following organisations were consulted:

- English Nature - Surrey and Kent Offices
- Kent County Council
- Sevenoaks District Council
- Kent Trust for Nature Conservation
- West Kent Badger Group
- Surrey Wildlife Trust
- Surrey County Council
- Royal Society for the Protection of Birds

These organisations were contacted again in April 1993 to confirm the accuracy of the data supplied. In addition the following were also contacted:

- English Nature - species protection (South-east Region)
- Surrey and Kent Bat Groups
- Surrey and Kent Badger Groups

b) Habitat Survey

Habitats inside and within 100 metres of the highway boundary were surveyed in summer 1993. The level of detail was intermediate between that described as a Phase 1 and a Phase 2 habitat survey by English Nature (formerly the Nature Conservancy Council NCC) (1990). A Phase 1 survey requires details of habitat types, dominant and rare species of plants, and obvious evidence of faunal activity. This survey used recognised criteria to evaluate the nature conservation importance of the habitats. It was considered necessary to survey several faunal groups in more detail and for this reason separate studies were undertaken to survey invertebrates, ornithology, badgers and dormice.

4.10.2 Results of the Desk Study

The major sites of ecological interest identified during the desk study are mapped on Figures 4.9 a-f. These sites are cross-referenced to Appendix 1 of the Volume II Specialist Report, 2. Ecology Survey. There are three SSSIs within the study area -Westerham Wood, Titsey Wood and the Woldingham and Oxted Downs. The Woldingham and Oxted Downs SSSI is a south-facing chalk escarpment to the north of the motorway and is covered with a mixture of woodland and downland vegetation. Both Westerham Wood and the Titsey Wood SSSI were severed by the motorway. Godstone Ponds SSSI and Sevenoaks Gravel Pit SSSI are outside the study area, but are downstream of watercourses which potentially receive motorway run-off.

There are a number of Sites of Nature Conservation Interest within or abutting the 100m corridor, the majority of which are ancient woodlands. Of these Claypit Shaw, Combebank Wood and Combe Wood are immediately adjacent to the motorway. There is also an Area of High Ecological Quality (AHEQ) north of the motorway - Gravelly Hill.

4.10.3 Results of the Habitat Survey

No scheduled plant species (i.e. species protected under Schedule VIII of the Wildlife and Countryside Act 1981, and subsequent amendments) were identified during the habitat survey. The following is a summary of habitats found.

a) Habitats within the 100m survey corridor

A number of ecologically valuable ancient woodlands are within the survey corridor. As ancient woodlands these are all sites of at least County importance. Some of the woodlands appear to be suffering from colonisation by invasive species such as sycamore, spreading from the adjacent highway planting.

Other woodlands, which are not provisionally identified as ancient but are notable for their good structural composition and species diversity are also within the corridor.

Other areas of local importance include the disused railway line north of Chipstead and relict patches of herb rich grassland on the downlands in particular. Several hedgerows, particularly those with a good structure and those with hedgerow trees, together with those which act as wildlife corridors, connecting areas of scrub and woodland were also identified.

Several ditches, ponds and streams add to the local value of the area, though they were not of particular importance in their own right. The motorway balancing ponds also add to the local interest.

b) Habitats within the highway boundary

The majority of the habitats within the highway boundary along this section of the M25 are of limited ecological value and are as follows:

i) Roadside planting

Large areas of the roadside verges are planted with mixed woodland and shrubs. Some areas are now so dense that the associated field layer is limited and of little value to wildlife. Other areas of planting have not established successfully and form low scrub which has not shaded the field layer.

ii) Grassland/Open Scrub

The majority of the motorway verge exists as relatively undisturbed grassland, either open and dominated by rank grass, or with scattered planted trees and encroaching scrub. There

is limited species diversity but the area is of some ecological value for the invertebrates, birds and small mammal populations it supports.

4.10.4 Fauna

Separate surveys were undertaken of particular groups of animals which were identified as being of particular significance along this section of the motorway. Groups for which specialist surveys were undertaken were dormice, badgers, invertebrates and birds.

a) Invertebrate Survey

A comprehensive survey was undertaken during June and July 1993. Sixteen sampling stations were set up, together with malaise traps at five of these stations. Areas adjacent to the motorway were also sampled.

Of the large number of invertebrates recorded ten species were of particular note. These comprised one species Nephrocerus scutellatus listed in Category 1 (Endangered) of the British Red Data Book, one species (*Cheilosia nigripes*) in Category 3 (Nationally Rare), five species regarded as Nationally Notable (*Merioptera roeselii, Nephrocerus flavicornis, Pipizella virens, Solva marginata and Brachyopa insensilis*) and three species considered to be Nationally Notable (*Xylophagus ater, Didea fasciata and Criorhina floccosa*). From the known habitat data for these species it was concluded that none were strictly dependant on the motorway for their survival, as in most cases it did not represent their main habitat.

b) Ornithological Survey

This study used methods devised by the British Trust for Ornithology and aimed to provide a general account of the breeding bird community rather than a full inventory. Recording was undertaken during the morning when bird activity is greatest. All species seen or heard were noted, together with the habitat in which they were recorded. No internationally or nationally significant species were recorded, and none which are listed in Schedule 1 of the Wildlife and Countryside Act (1981) or in Annex 1 of the EC Directive on the Conservation of Wild Birds (EEC/409/79). None of the species is listed as a Red Data Book Species, although seven candidate Red Data Book species were noted.

c) Badger Survey

The motorway corridor was surveyed during November 1993. Ten groups of badgers' setts were recorded, with a concentration of badger activity in the west of the study area. The locations and status of these setts were mapped and recommendations for mitigation are included in a separate report. Due to the sensitive nature of details concerning badger setts, the distribution of this report is limited to approved readers only.

d) Dormouse Survey

A comprehensive survey of 41 woodlands adjacent or close to the motorway was undertaken during November 1993 to establish whether dormice were present in the motorway corridor.

Dormice are fully protected under Schedule 5 of the Wildlife and Countryside Act (1981) and its amendments.

The survey was undertaken using standard techniques developed by the Mammal Society and confirmed the presence of dormice in ten woodlands. The presence of dormice was not apparent on the motorway verges.

4.11 Cultural Heritage

4.11.1 More detailed information on the known sites and features within 500m of each side of this stretch of the M25 is contained within the Volume II Specialist Report, 7. Cultural Heritage. This includes the following:

a) material obtained as part of a full desk study undertaken in November 1993
b) results of a site investigation undertaken in December 1993

Material was obtained in November 1993 from:

- Surrey County Council Sites and Monuments Record (SMR)
- Listed Building registers
- Aerial photograph libraries
- Brief literature review
- Visual site inspection
- Local authority policy documents
- Kent County Council Sites and Monument Record (SMR)

Preliminary consultations were also held with:

- Kent County Council Sites and Monuments Records Officer
- Surrey County Council County Archaeologist
- English Heritage Scheduling Section

4.11.2 **Archaeological Sites**

Archaeological sites within the surveyed area have been divided into four general categories of importance: major (Scheduled Ancient Monuments and Grade I Listed Buildings), average (sites of county or regional importance), minor (sites of district and local importance), and unimportant sites.

In addition there are sites where the archaeological potential is unknown.

The locations of areas of known archaeological interest, summaries of the records, together with their period and type are given in more detail in the Specialist Report on Cultural Heritage and are indicated on Figure 4.10.

a) Sites of Major Importance (Scheduled Ancient Monuments)

There are six nationally important Scheduled Ancient Monuments (SAMs) within the study area, two of which are within the route corridor. The latter are the Medieval moated site with associated fishponds (SAM 12755) and the Camp at War Coppice (Surrey SAM 27).

The other SAMs in the study area include the remains of the Roman Villa in Titsey Park (Surrey 64), Fosterdown Fort (Surrey 156), The Mount, Barrow Green (NMR no 12780) and The Bowl Barrow at the north end of Hilly Field (NMR no 20167).

b) Sites of Average Importance

Sites of average importance within the study area include sites of prehistoric date, several sites of Roman activity and medieval remains.

c) Sites of Minor Importance

Lower tier sites are also identified based upon currently available information.

4.11.3 Listed Buildings and Historic Parks

Buildings of particular historic or architectural interest may be listed under the provisions of the Town and Country Planning Act 1990 and the Planning (Listed Buildings and Conservation Areas) Act 1990. Local Authorities are charged with the registration and protection of listed buildings and their settings. The locations of the listed buildings in the corridor are indicated on Figures 4.10.

One listed building (grade II), the South Lodge at Titsey (290), lies within 50m of the motorway embankment.

Two historic parks, at Titsey and Chevening, are located to the north of the motorway.

4.12 Community Effects and Recreation

4.12.1 Community Severance

When this section of the motorway was constructed, provision was made for maintaining the existing side road network, with some minor realignment of the side roads, where necessary, to facilitate bridge design and construction. In addition, a number of bridges and subways was provided to accommodate public rights of way.

Consequently, the communities located either side of the M25 between Junctions 5 and 7 are served by a network of side roads and public rights of way which mitigate any severance effects.

4.12.2 **Public Rights of Way**

There is an extensive network of public footpaths and bridleways on either side of the motorway, including the North Downs Way and Pilgrims' Way (see Figure 4.11). The area as a whole is well used, and is popular with local residents and visitors.

Comments received from the Principal Rights of Way Officer at Surrey indicates that noise from the existing motorway affects the amenity of adjacent rights of way. Furthermore, a number of bridges used as bridleways, do not have parapets to bridleway standard, which acts as a deterrent to horseriders and reduces the level of use of these rights of way.

4.13 Vehicle Travellers

4.13.1 The view from the road can be beneficial to travellers. It can allow them to appreciate the beauty of different landscapes providing visual interest and helping to reduce driver stress. The view from the road can also help drivers locate themselves along the route. The definitions of the view are as follows:

4.13.2 **View from the Road**

a. No view - road in deep cutting or contained by earth bunds, environmental barriers or adjacent structures.

b. Restricted view - frequent cuttings or structures blocking the view.

c. Intermittent view - road generally at ground level but with shallow cuttings or barriers at intervals.

d. Open view - view extending over many miles, or only restricted by existing landscape features.

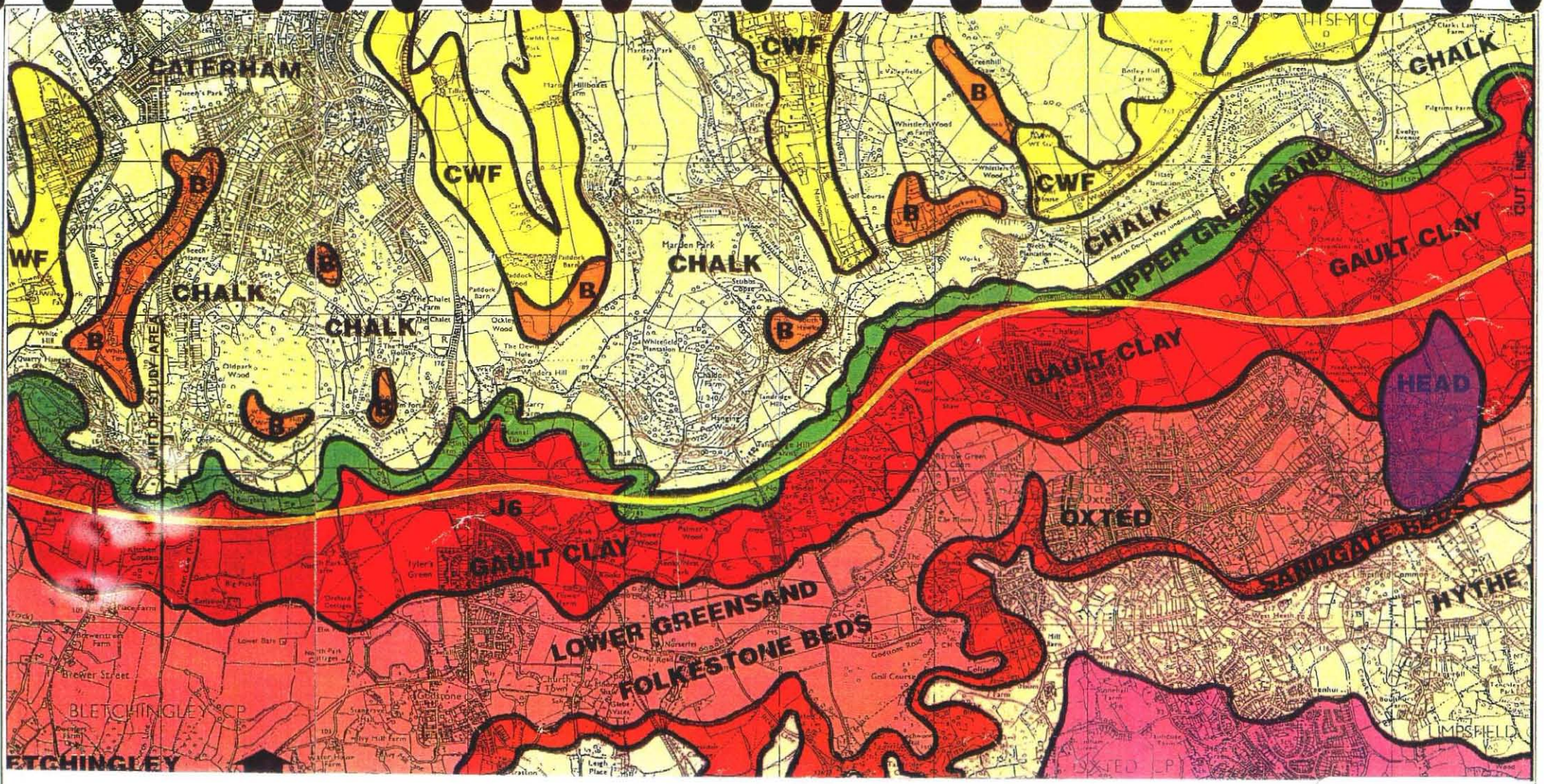
In general terms views to the north of the motorway are over open country towards the escarpment of the North Downs, which is close to the motorway at the western end and progressively further away, with open farmland in between, at the eastern end. Only short lengths of cutting intercept this view. The only buildings close to the motorway and forming a feature of the view are at the motorway service area at Clacket Lane.

To the south of the motorway the views are also generally fairly open across farmland and villages. However, long lengths of noise fence and bund cut off the view towards the villages of Westerham, Limpsfield and Oxted. There are also wooded areas limiting the view to the south as well as the service area mentioned above.

4.13.3 Driver Stress

Increases in hourly traffic flow without a corresponding increase of road width can lead to greater congestion, accidents, and delay. Traffic congestion, increases in accidents, decreases in traffic speeds, and consequentially longer journey times can all result in driver stress. The DMRB Volume 11 - Section 3 Part 9 sets out a methodology for determination of driver stress in relation to vehicle flow per lane and vehicle speeds.

Based on the above methodology it has been calculated that drivers using the M25 between Junction 5 and Green Lane (east of Junction 7) experience high levels of stress.



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ORIGINAL IN COLOUR

NOTES: GEOLOGICAL SEQUENCE IN STUDY AREA
NUMBERS REFER TO SECTION

RECENT SUPERFICIAL DEPOSITS
- CLAY WITH FLINTS
- ALLUVIUM
- BOYN HILL TERRACE GRAVELS
- HEAD

QUATERNARY

EOCENE
9 BLACKHEATH BEDS, WOOLWICH BEDS, THANET BEDS

TERTIARY

UPPER CRETACEOUS
8 CHALK

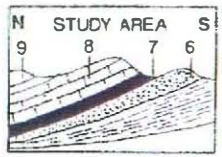
LOWER CRETACEOUS
- UPPER GREENSAND
7 GAULT CLAY

SECONDARY OR MESOZOIC

LOWER GREENSAND
6 FOLKSTONE BEDS
6 SANDGATE BEDS
6 HYTHE BEDS

WEALDEN SERIES
5 WEALD CLAY
B– BLACKHEATH BEDS

SECONDARY OR MESOZOIC



GEOLOGY

9. Lower London Tertiaries (Landenian)
8. Chalk
   Upper Greensand
7. Gault
6. Lower Greensand

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

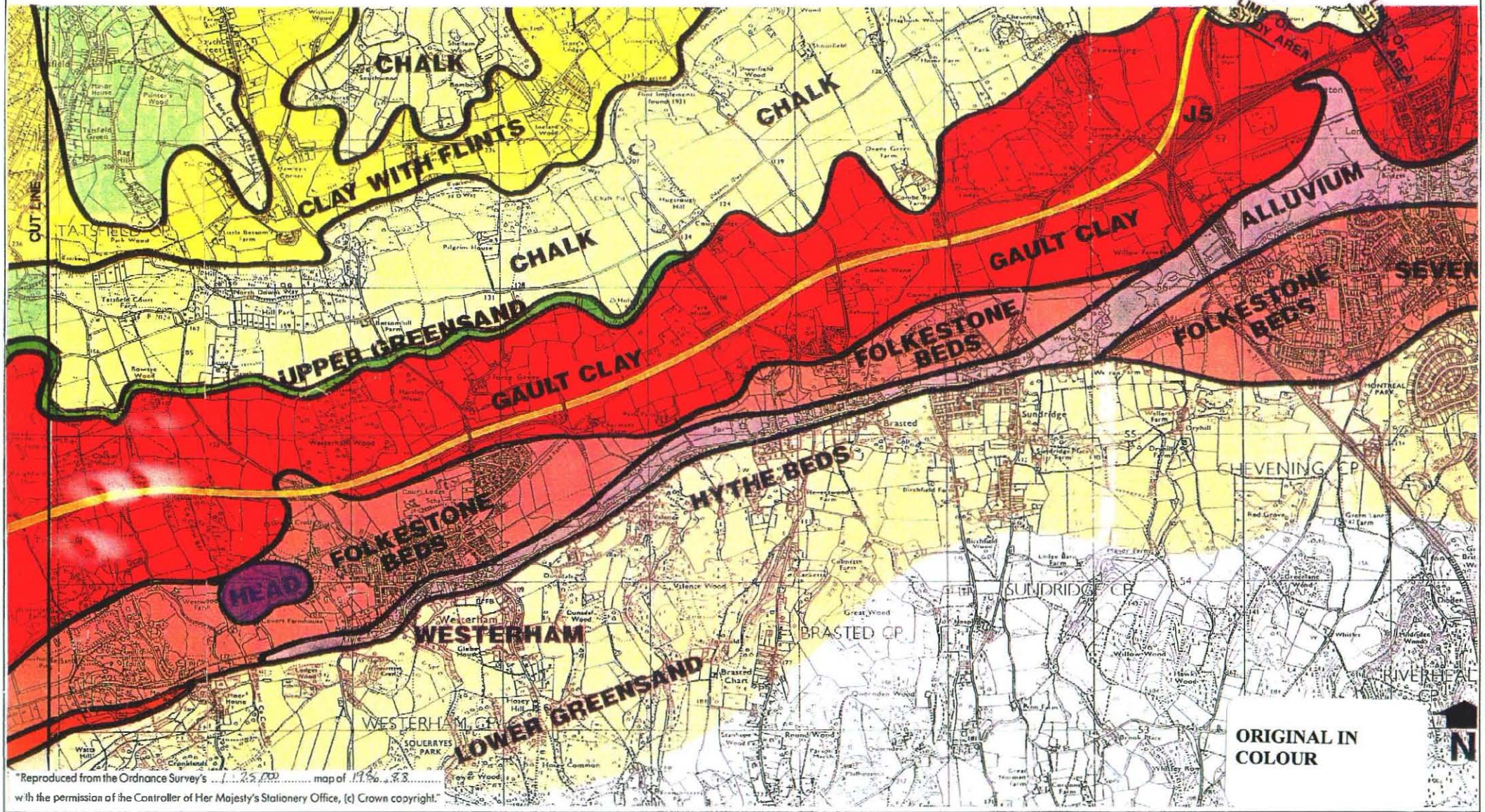
title: GENERALISED GEOLOGY

date: April '94

drawn: Not to scale

N

fig.no. 4.1a



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NOTES: GEOLOGICAL SEQUENCE IN STUDY AREA

NUMBERS REFER TO SECTION

RECENT SUPERFICIAL DEPOSITS

QUATERNARY

- CLAY WITH FLINTS
- ALLUVIUM
- BOYN HILL TERRACE GRAVELS
- HEAD

SECONDARY OR MESOZOIC

EOCENE

TERTIARY

9 BLACKHEATH BEDS
WOOLWICH BEDS
THANET BEDS

UPPER CRETACEOUS.

8 CHALK

LOWER CRETACEOUS.

- UPPER GREENSAND
- 7 GAULT CLAY

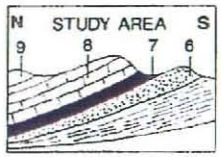
LOWER GREENSAND

- 6 FOLKSTONE BEDS
- 6 SANDGATE BEDS
- 6 HYTHE BEDS

WEALDEN SERIES

- 5 WEALD CLAY
- B= BLACKHEATH BEDS

London Syncline — North Downs



GEOLOGY

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8. Chalk
   Upper Greensand
7. Gault
6. Lower Greensand

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: GENERALISED GEOLOGY

date: April '94

drawn: Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

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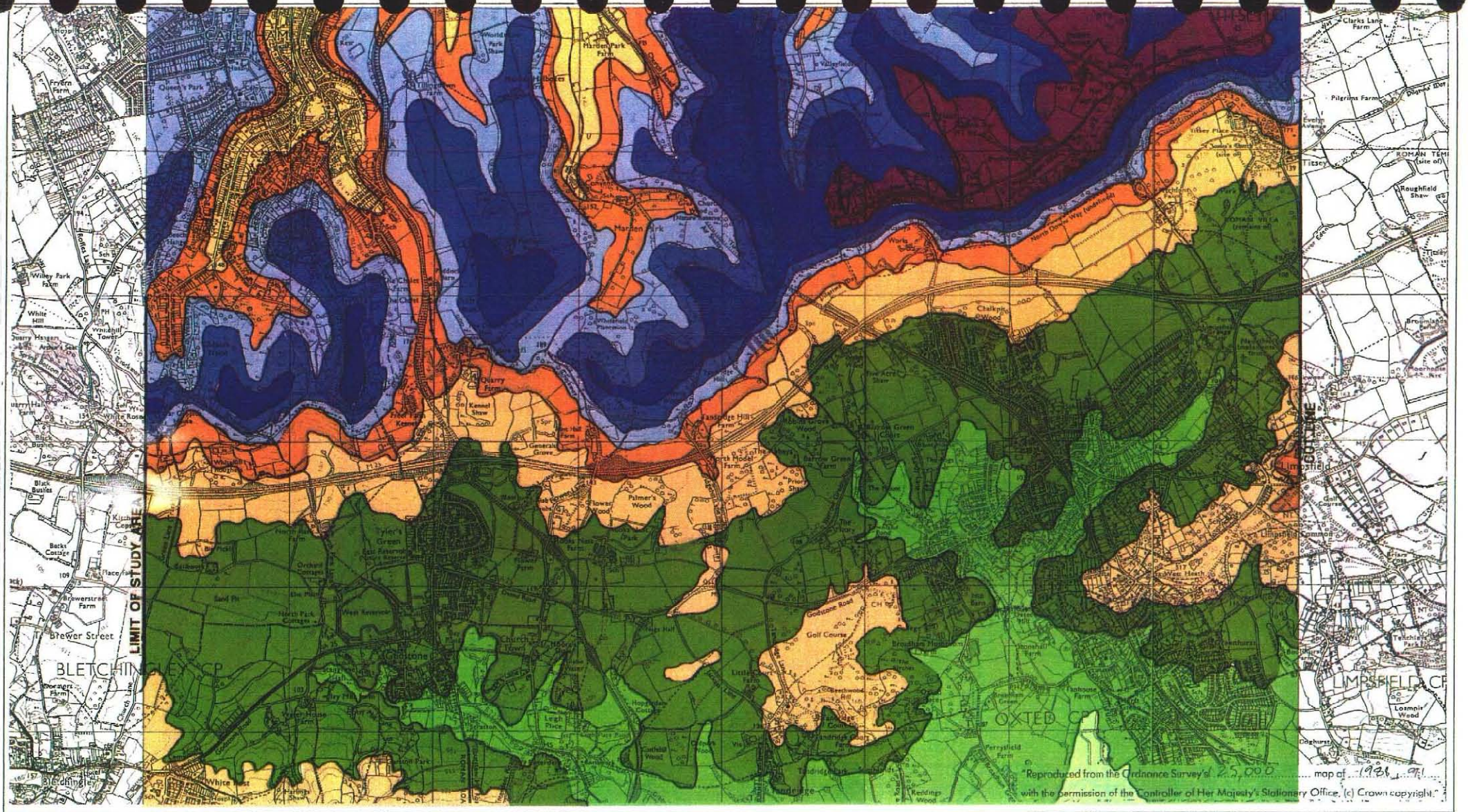


NOTES:

	0 - 75 metres
	75 - 100
	100 - 125
	125 - 150
	150 -175
	175 - 200
	200 - 225
	225 - 250
	250 - 275

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

PARKMAN — PURSUING EXCELLENCE · SHARING SUCCESS

title: **TOPOGRAPHY**

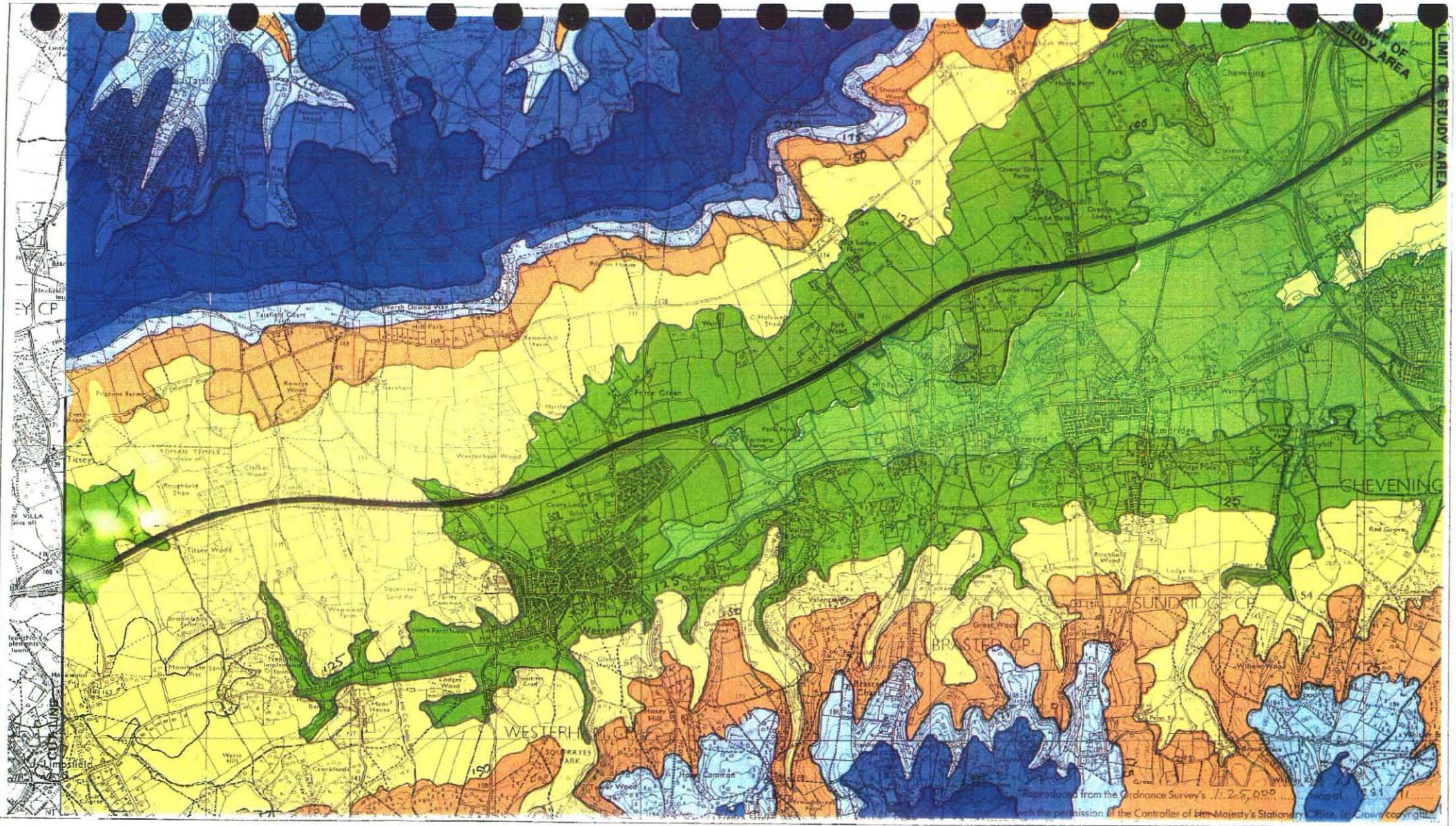
date: April '94

drawn: Not to scale

RPS CLOUSTON — THE ENVIRONMENTAL CONSULTANCY

N

fig.no. **4.2a**



NOTES:

	0 - 75 metres
	75 - 100
	100 - 125
	125 - 150
	150 -175
	175 -200
	200 - 225
	225 - 250
	250 - 275

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

RPS CLOUSTON

title: TOPOGRAPHY

date: April '94

drawn: Not to scale

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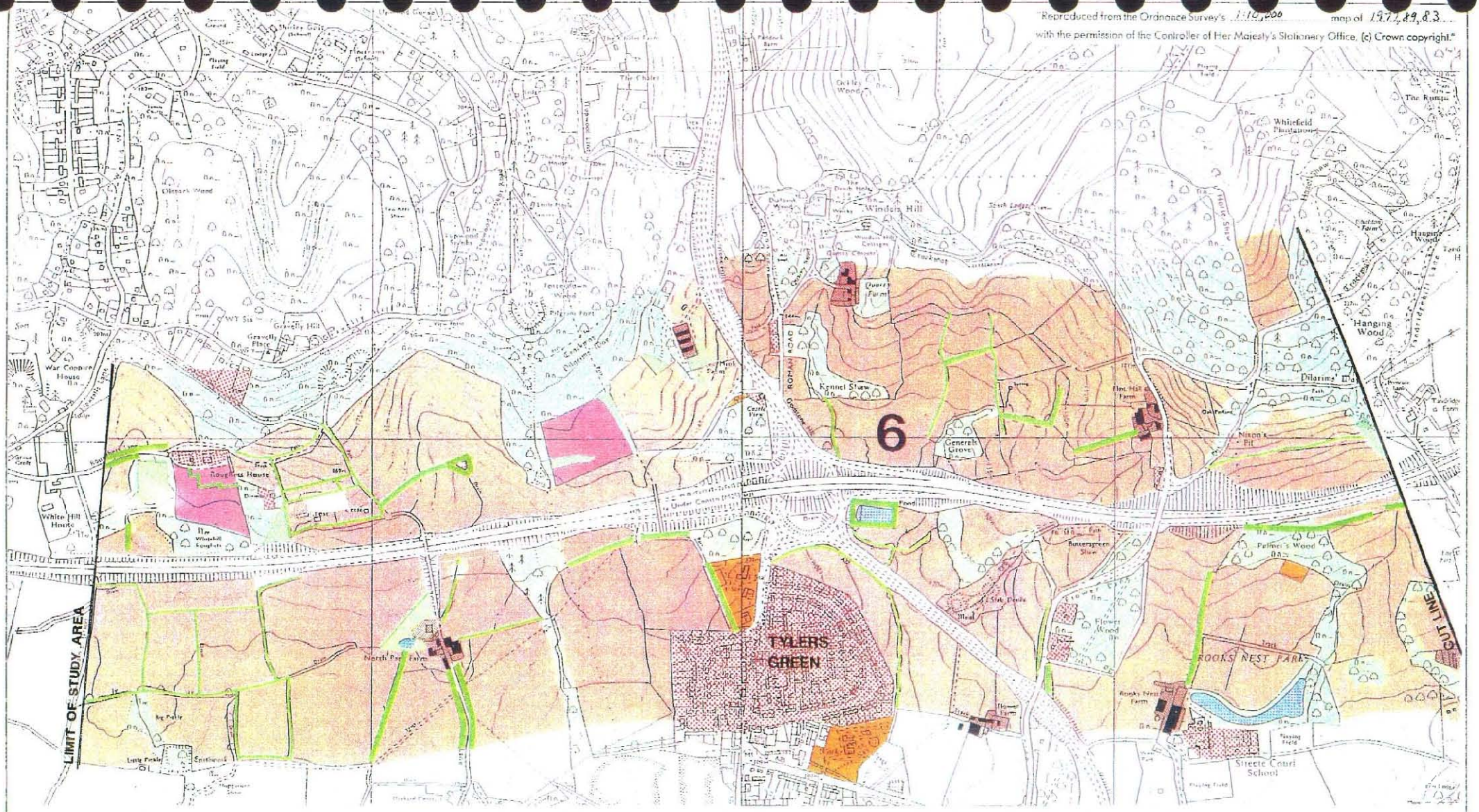
fig no. **4.2b**



NOTES:

- Agriculture
- Woodland
- Industrial/Commercial
- Recreational facilities and land used by the community
- Water
- Horse paddocks
- Residential
- Farm buildings and yards
- Significant hedgerows

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: EXISTING LAND USE

date: April '94

Not to scale

RPS CLOUSTON

N

fig.no. 4.3a

NOTES:

- Agriculture
- Woodland
- Industrial/Commercial
- Recreational facilities and land used by the community
- Water
- Horse paddocks
- Residential
- Farm buildings and yards
- Significant hedgerows

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

PARKMAN

title: **EXISTING LAND USE**

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

date:

drawn: Not to scale

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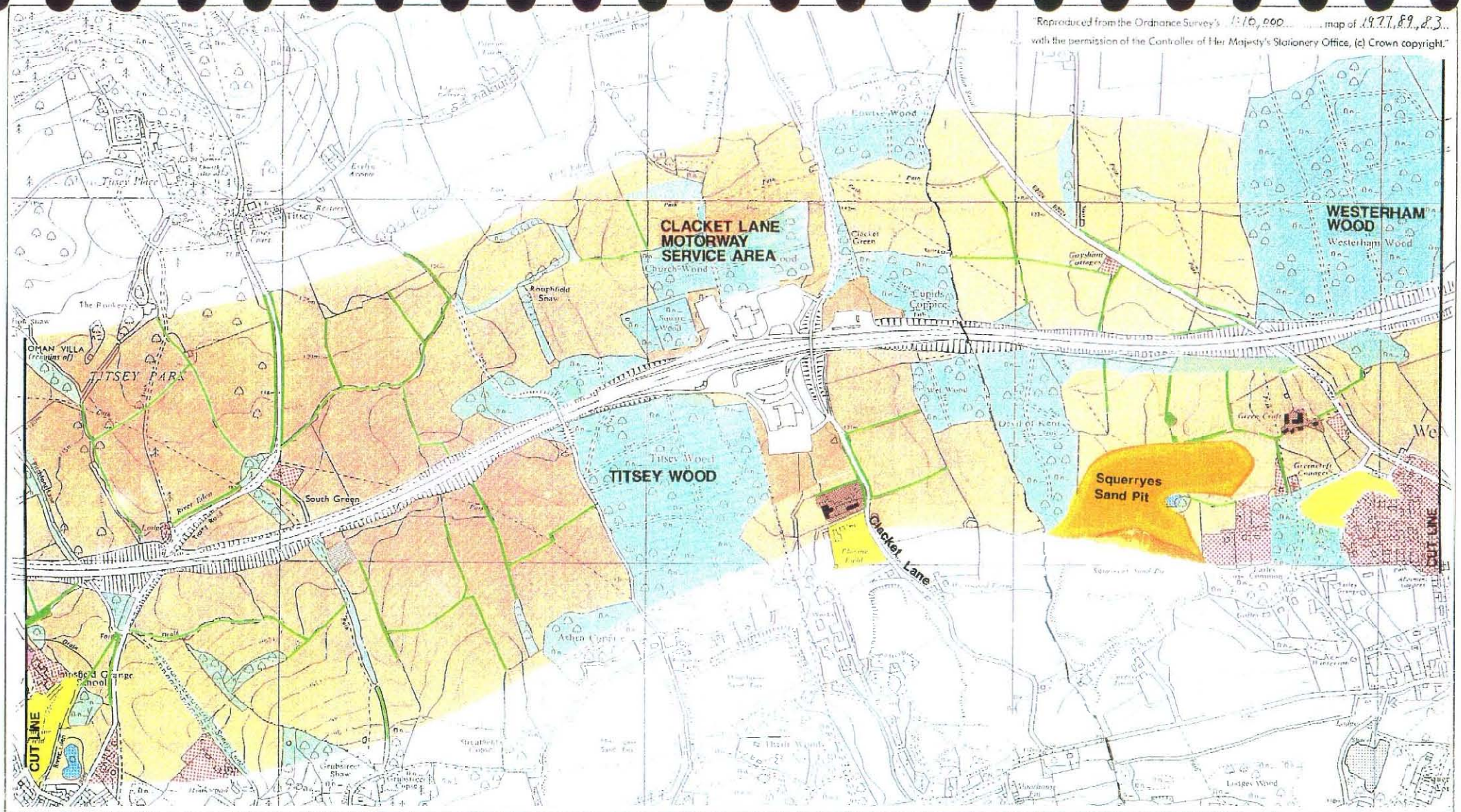

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- Water
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ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: EXISTING LAND USE

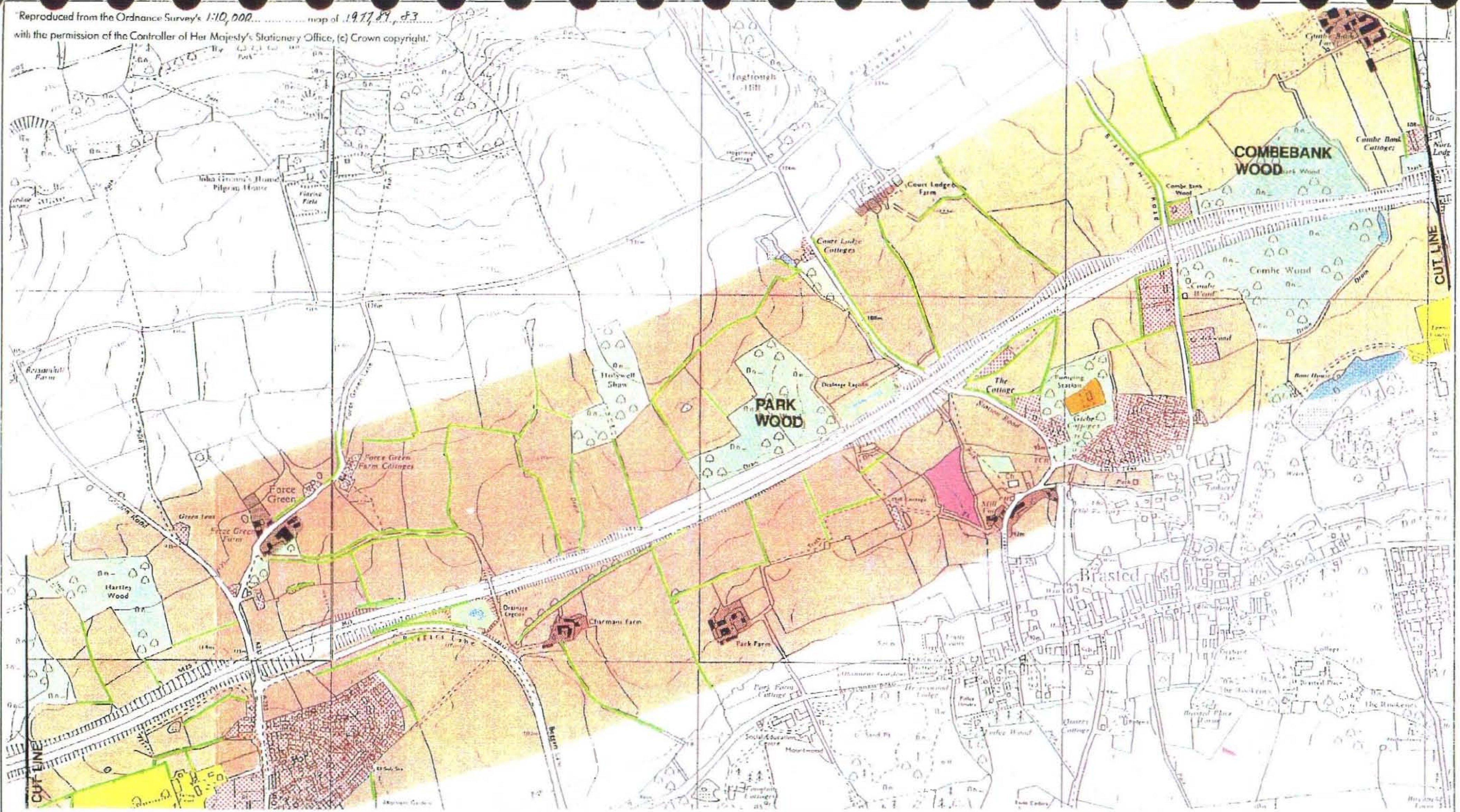
date: April '94

Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

N

fig.no. 4.3c



NOTES:

Agriculture	Recreational facilities and land used by the community
Woodland	Water
Industrial/Commercial	Horse paddocks
Residential	
Farm buildings and yards	
Significant hedgerows	

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

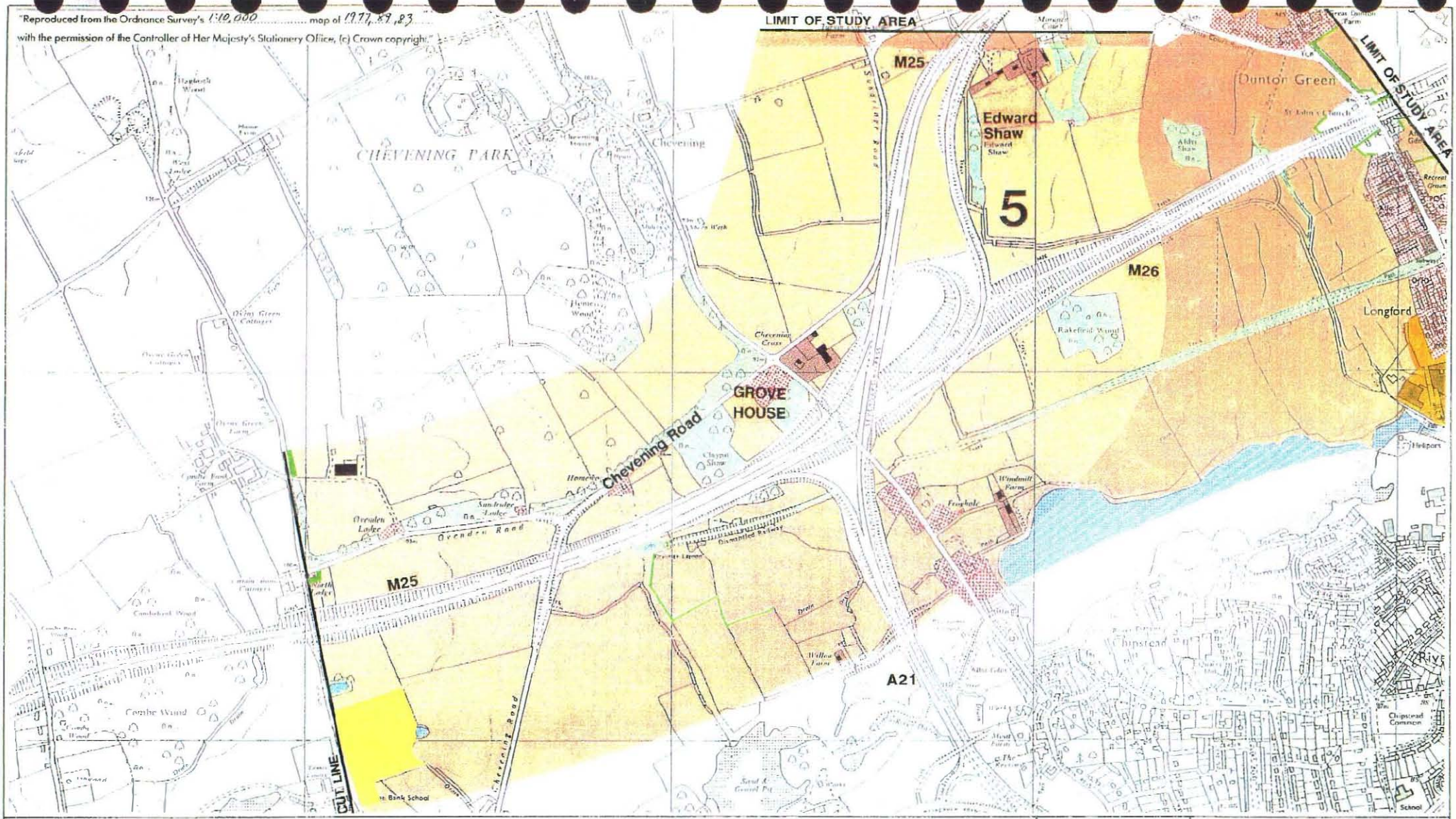
title: EXISTING LAND USE

date: April '94

Not to scale

N

fig.no. 4.3d



NOTES:

- Agriculture
- Woodland
- Industrial/Commercial
- Recreational facilities and land used by the community
- Water
- Horse paddocks
- Residential
- Farm buildings and yards
- Significant hedgerows

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: EXISTING LAND USE

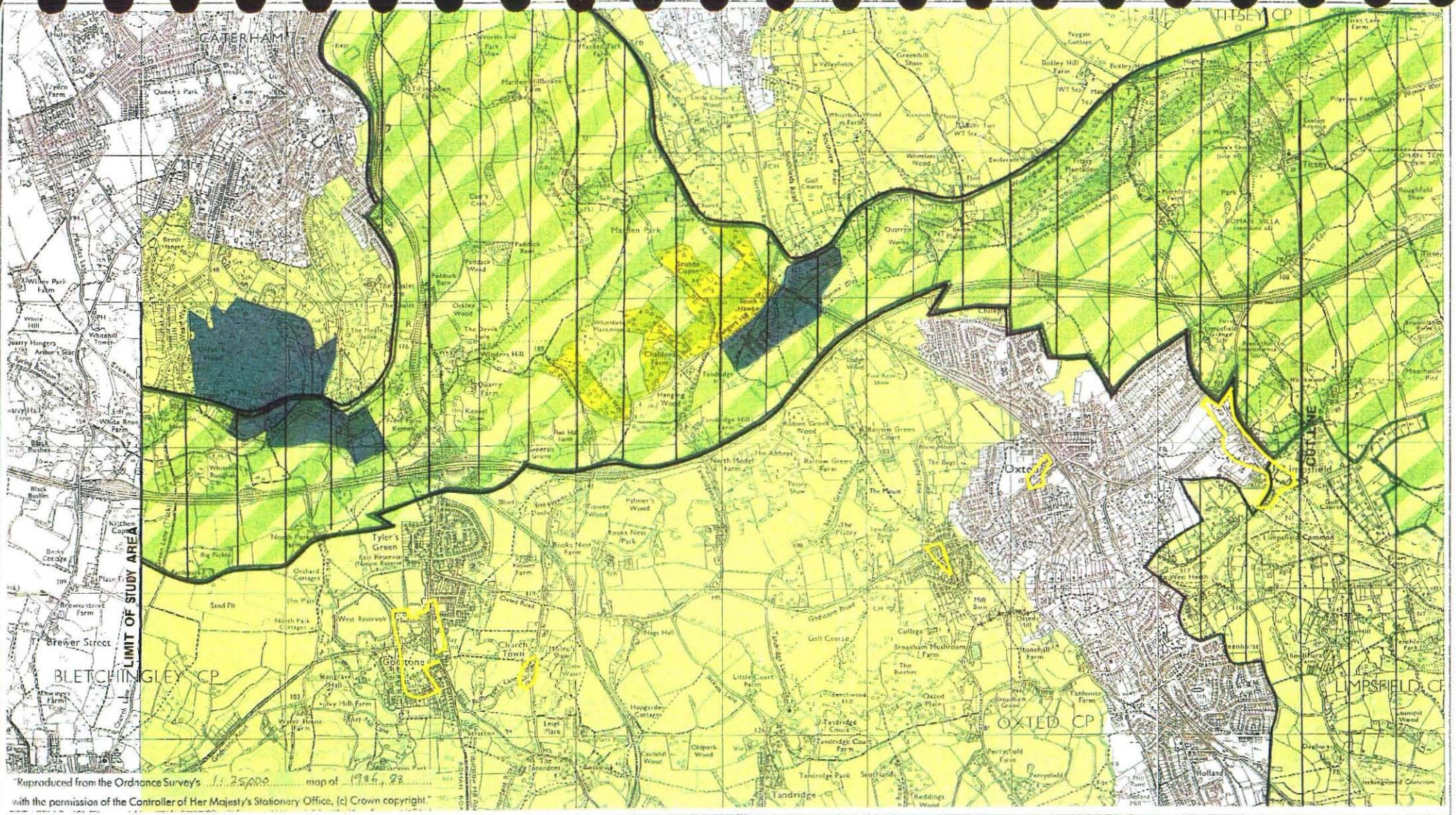
date: April '94

Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

N

fig.no: 4.3e



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NOTES:

- Area of Great Landscape Value or Special Landscape Area
- Green Belt
- Sites allocated or recently developed
- Conservation Area
- Site of Special Scientific Interest
- Other sites of Nature Conservation Interest
- Area of Outstanding Natural Beauty

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: PLANNING AND LAND USE

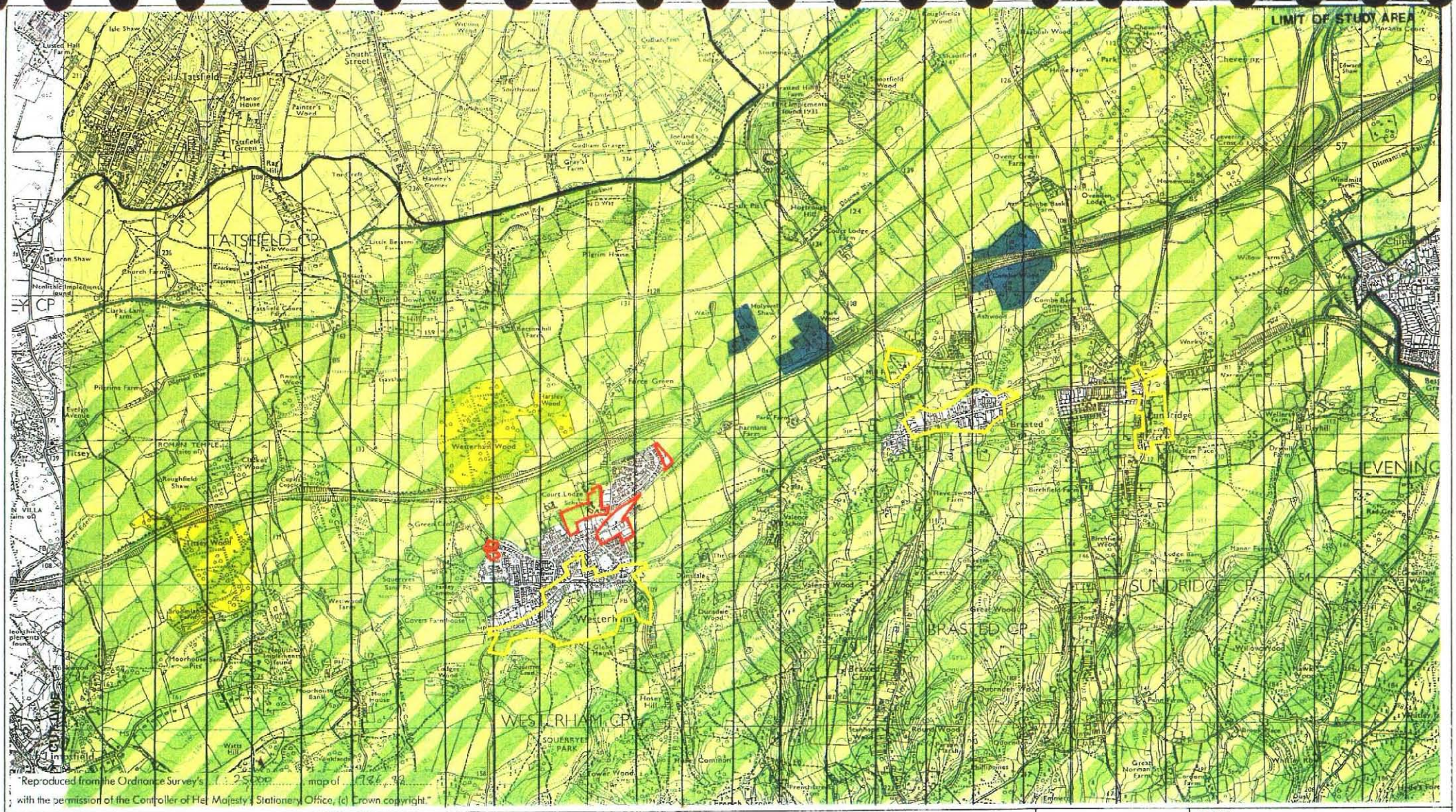
date: April '94

drawn: Not to scale

RPS CLOUSTON

N

fig.no. 4.4a



NOTES:

- Area of Great Landscape Value or Special Landscape Area
- Green Belt
- Sites allocated or recently developed
- Conservation Area
- Site of Special Scientific Interest
- Other sites of Nature Conservation Interest
- Area of Outstanding Natural Beauty

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: PLANNING AND LAND USE

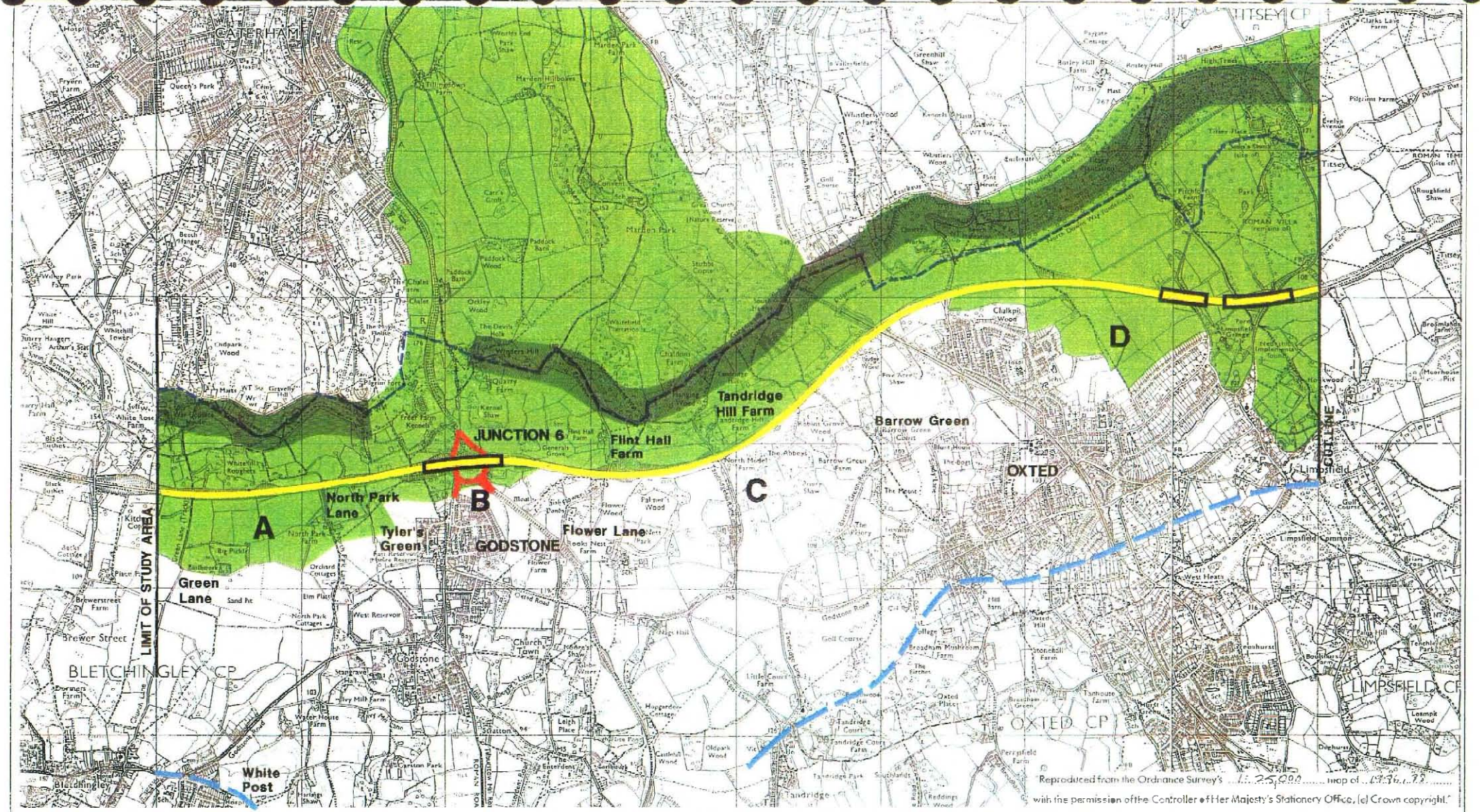
date: April '94

drawn: Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

N

fig.no. 4.4b



NOTES

- M25
- Area of Outstanding Natural Beauty
- Chalk Escarpment
- Embankment with potential for skyline views
- Lower Greensand Ridge
- Pilgrims' Way
- Existing lighting at junction

LANDSCAPE CHARACTER AREAS

- A Green Lane to North Park
- B Godstone/Junction 6
- C Flower Lane to Barrow Green
- D Oxted

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS/DLN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

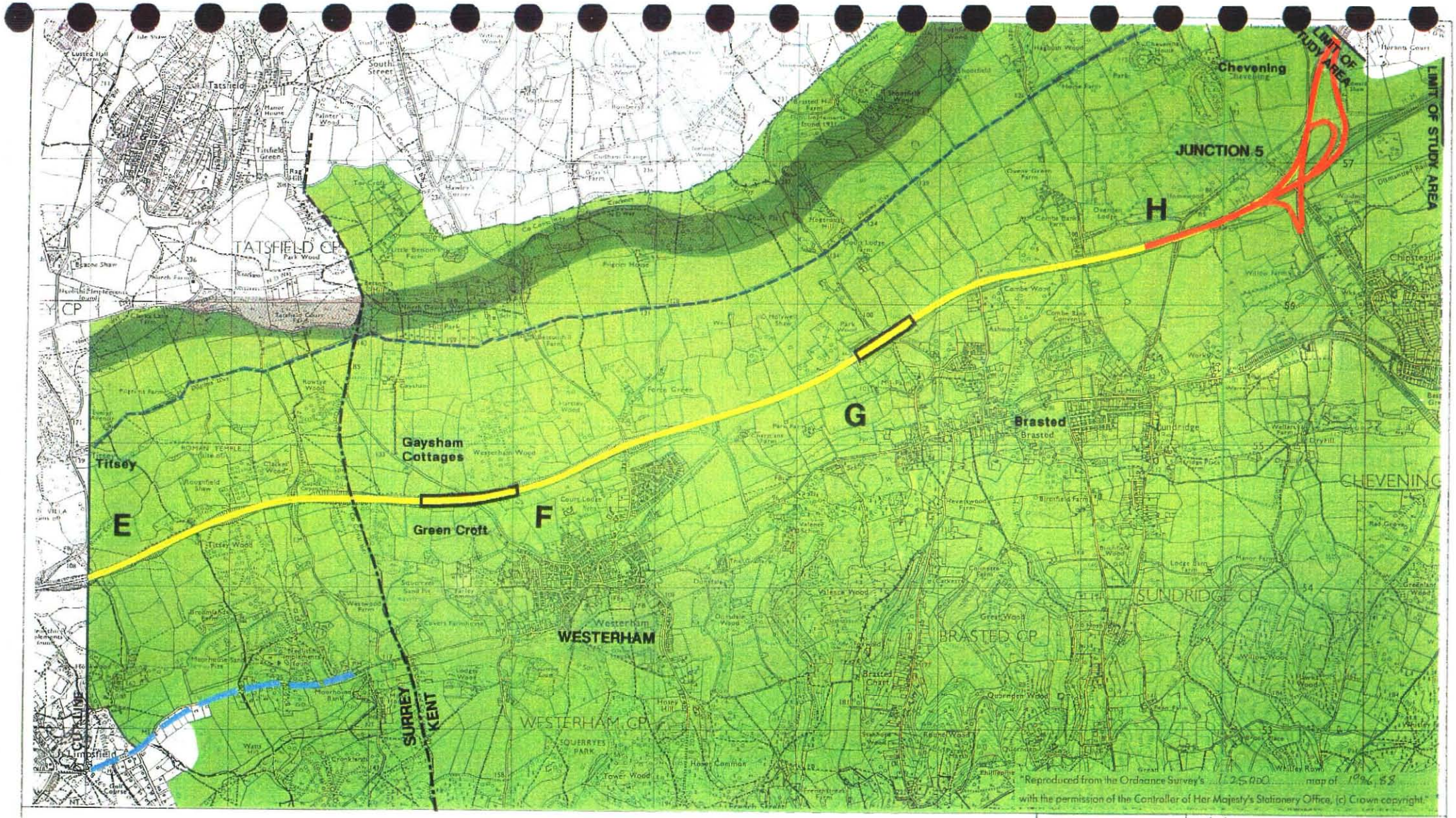
title: LANDSCAPE CONTEXT

date: April '94

Not to scale

N

fig.no. 4.5a



NOTES

- M25
- Area of Outstanding Natural Beauty
- Chalk Escarpment
- Embankment with potential for skyline views
- Lower Greensand Ridge
- Pilgrims' Way
- Surrey/Kent Boundary
- Existing lighting at junction

LANDSCAPE CHARACTER AREAS

- E Tilsey
- F Westerham
- G Brasted/Junction 5
- H Junction 5 and Chevening

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

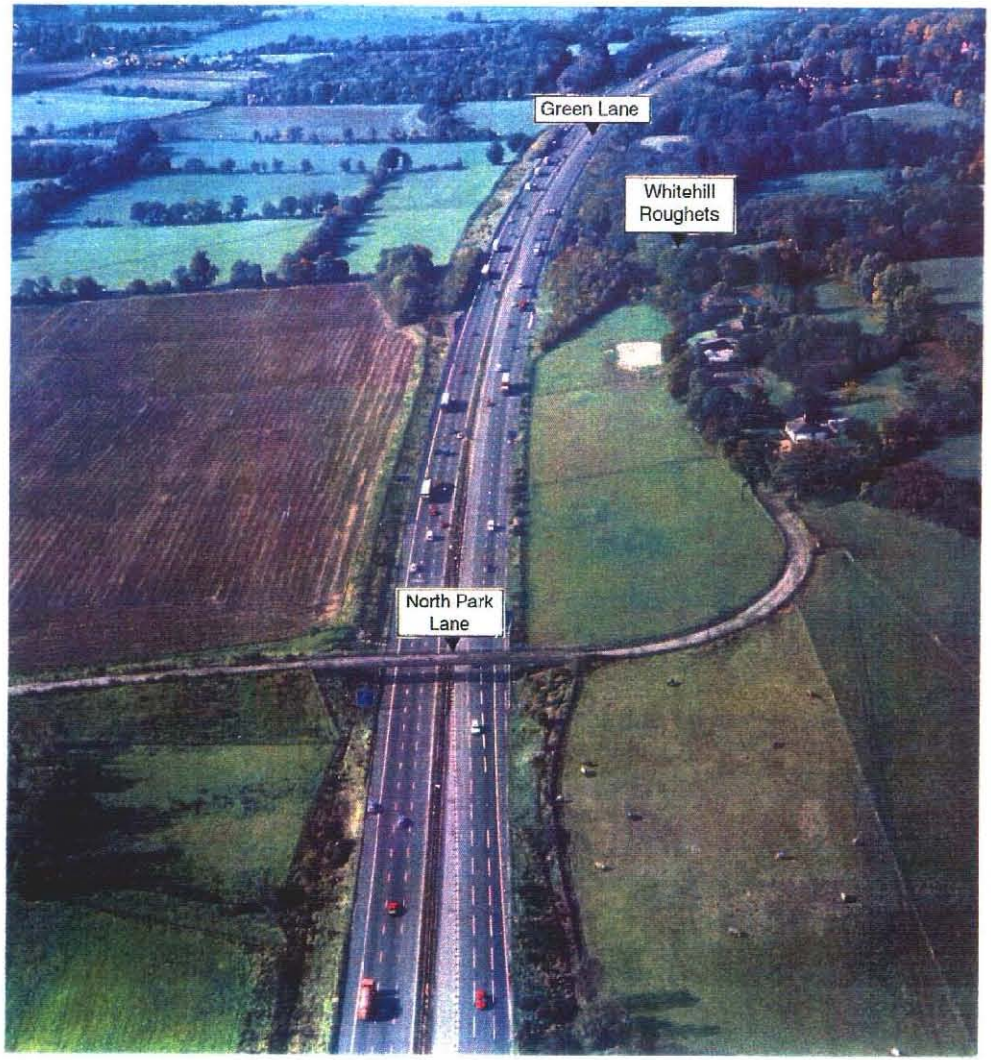
title: LANDSCAPE CONTEXT

date: April '94

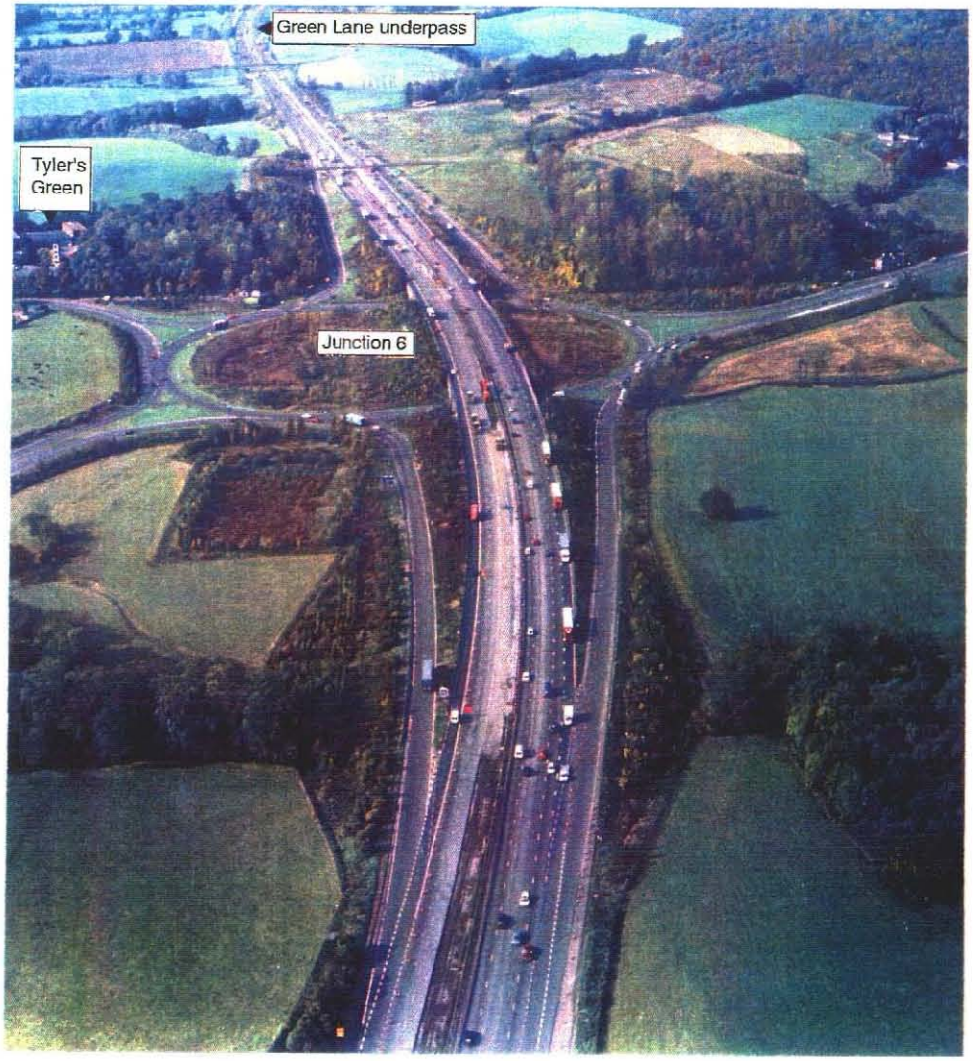
Not to scale

N

fig no: 4.5b



GREEN LANE TO NORTH PARK LANE



GODSTONE AND JUNCTION 6

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title
CHARACTER AREAS A & B

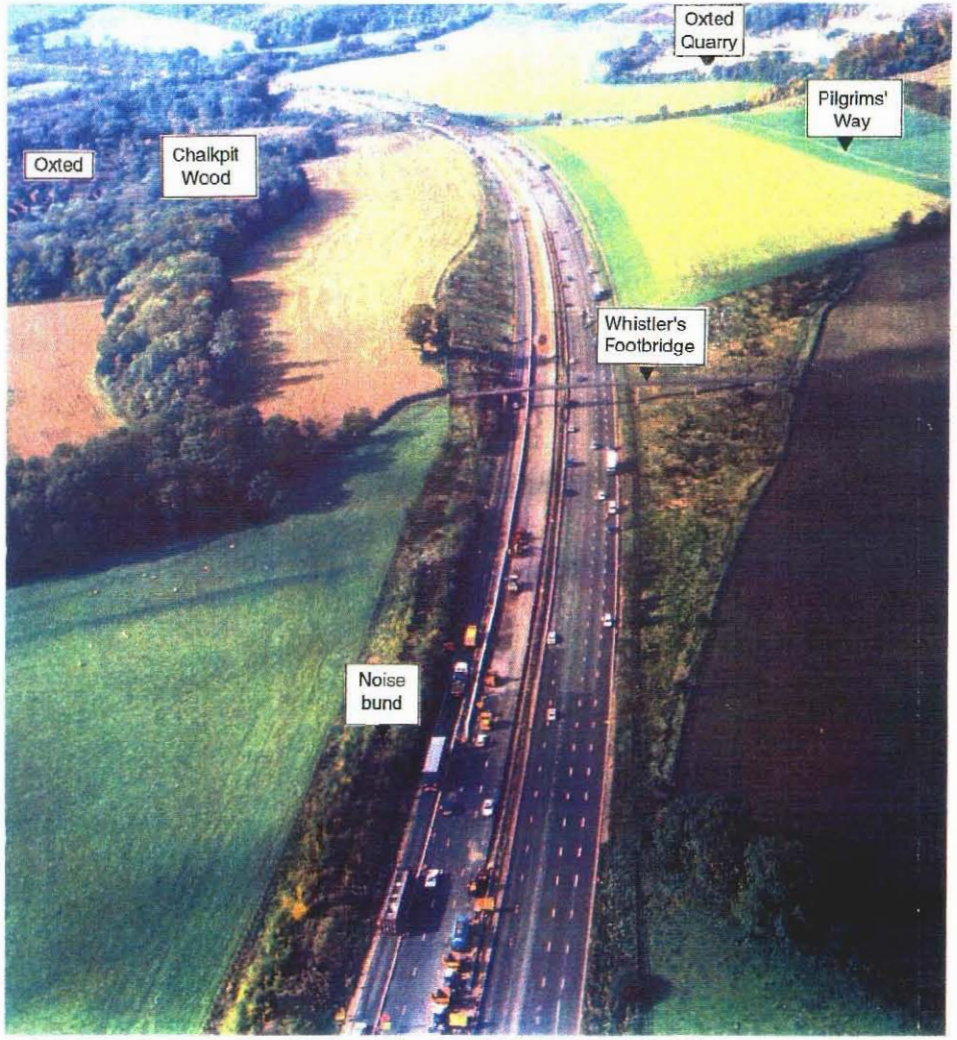
date
April '94

Not to scale

N

fig.no.
4.6a

FLOWER LANE/BARROW GREEN



OXTED

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

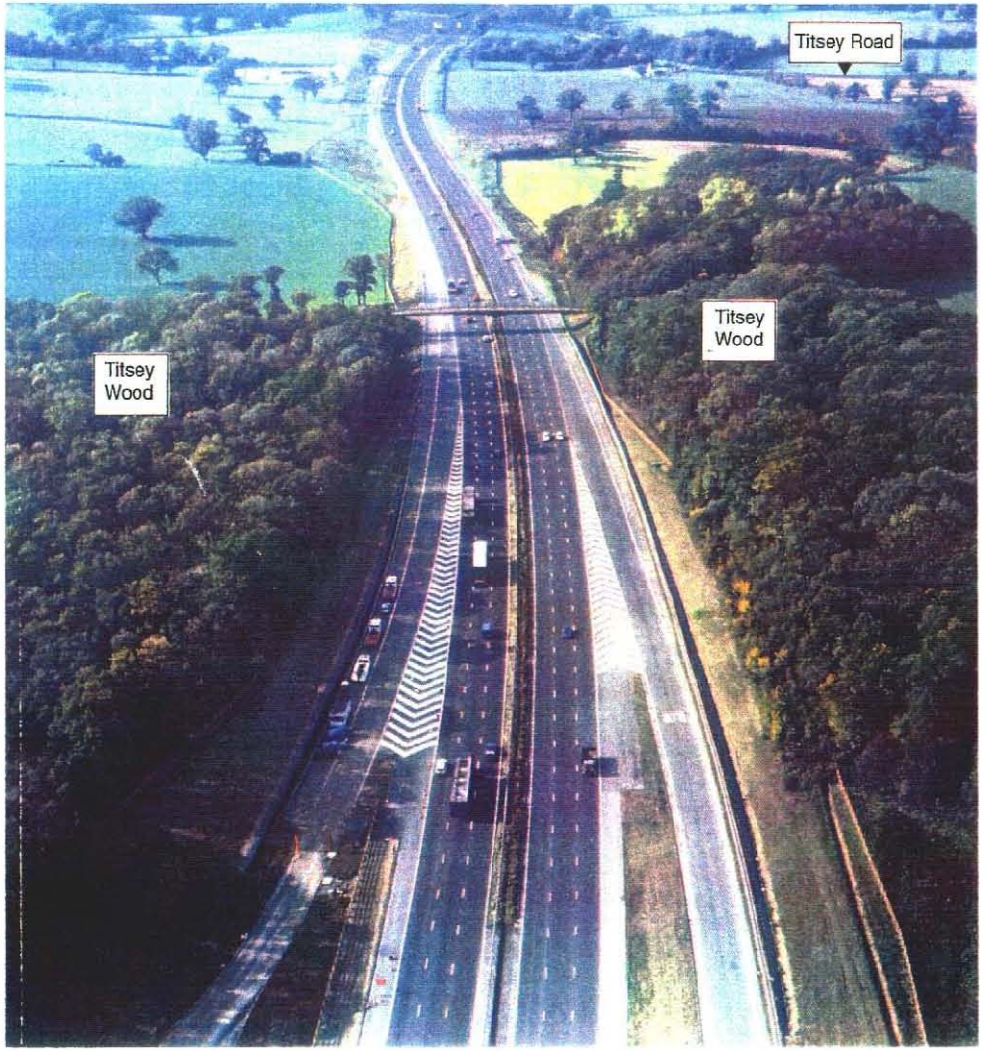
title
CHARACTER AREAS C & D

date
April '94

Not to scale

N

fig.no.
4.6b



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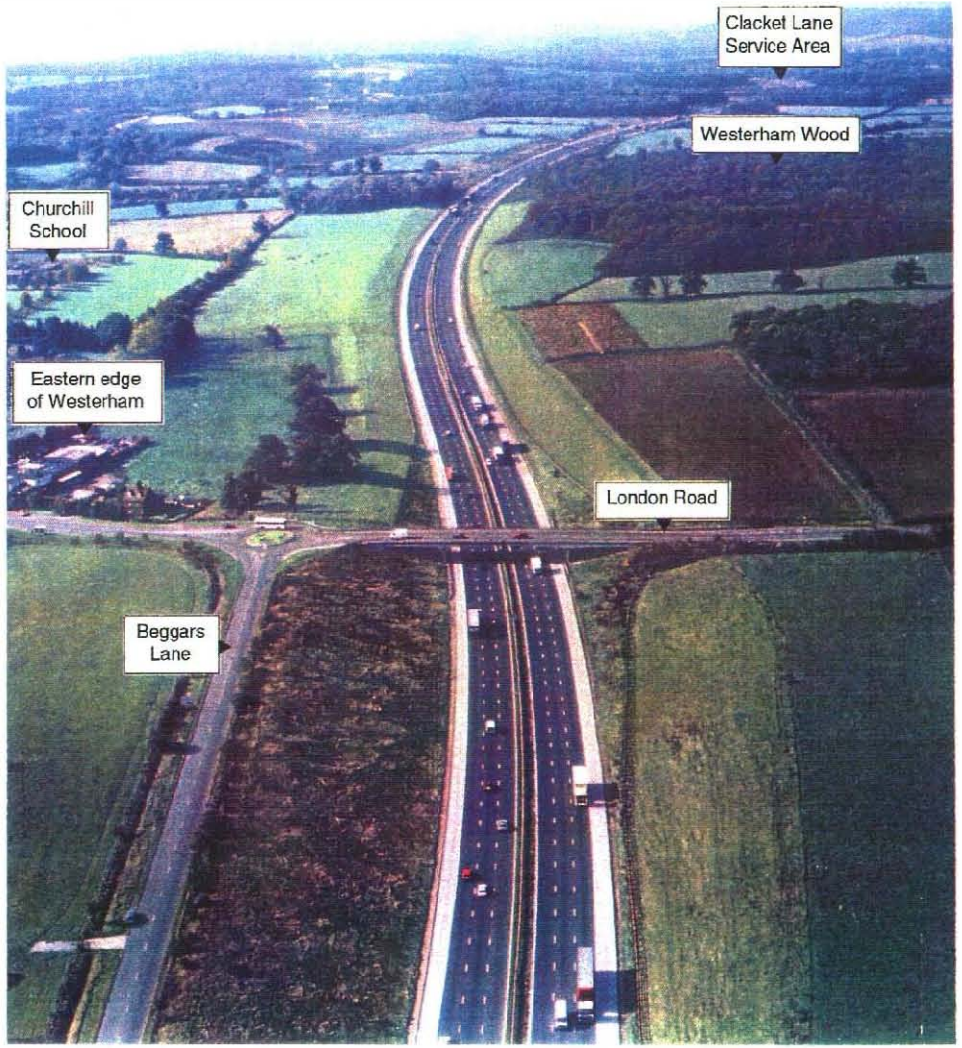


WESTERHAM

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

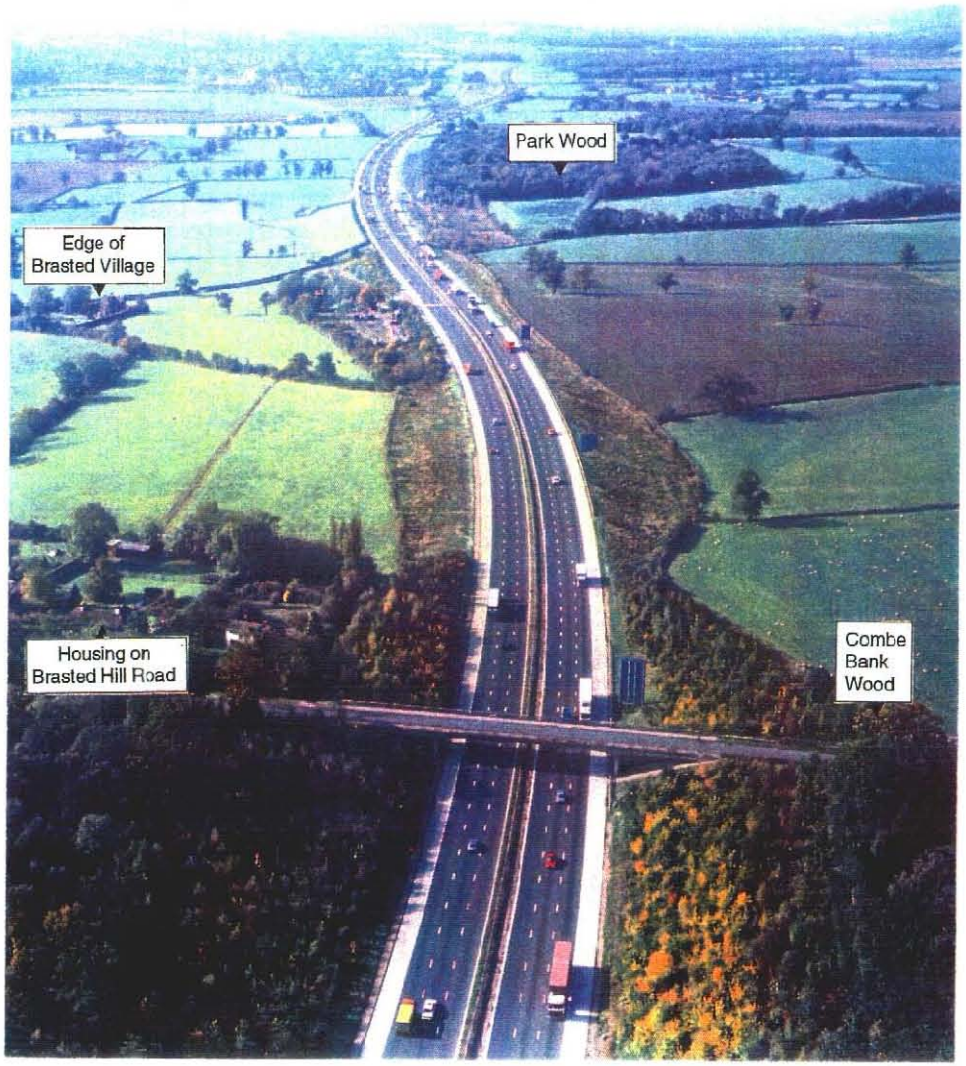
title
CHARACTER AREAS E & F

date
April '94

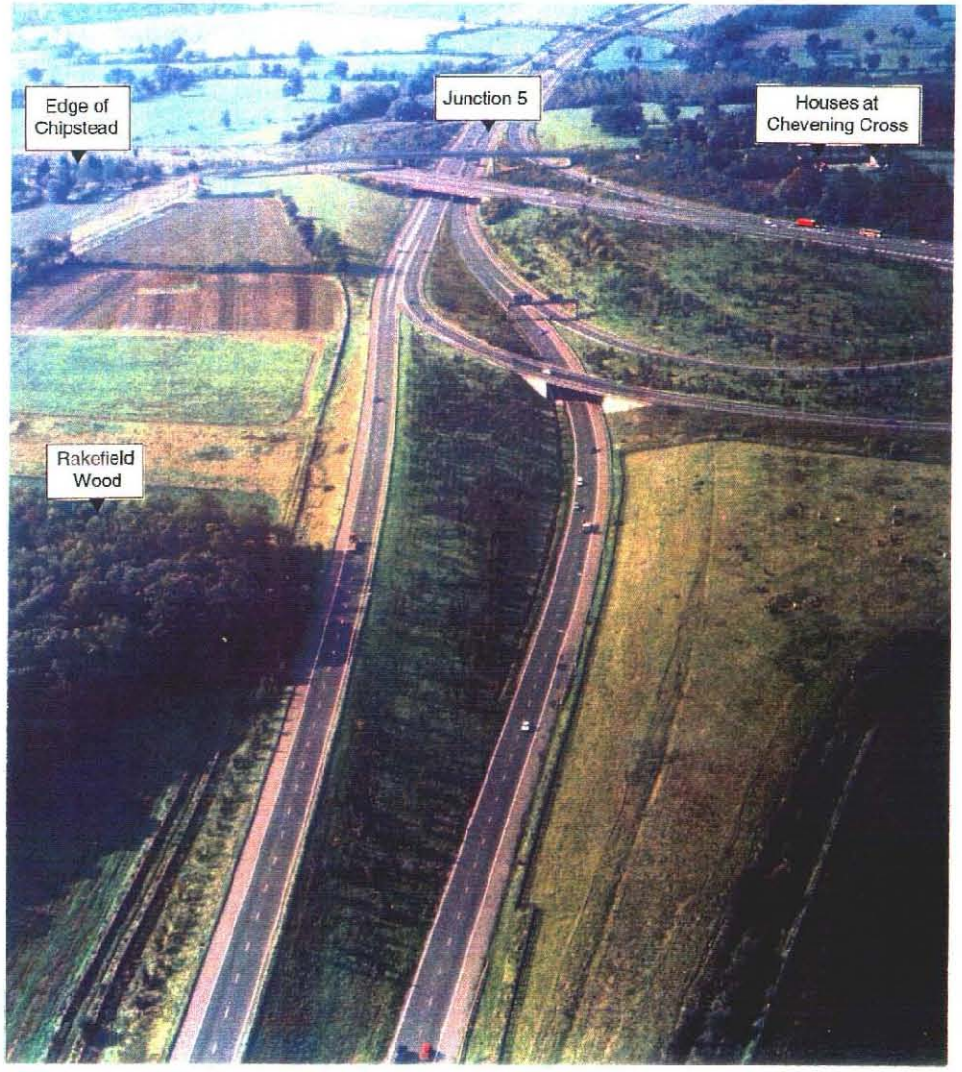
Not to scale

N

fig.no.
4.6c



BRASTED



JUNCTION 5 AND CHEVENING

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

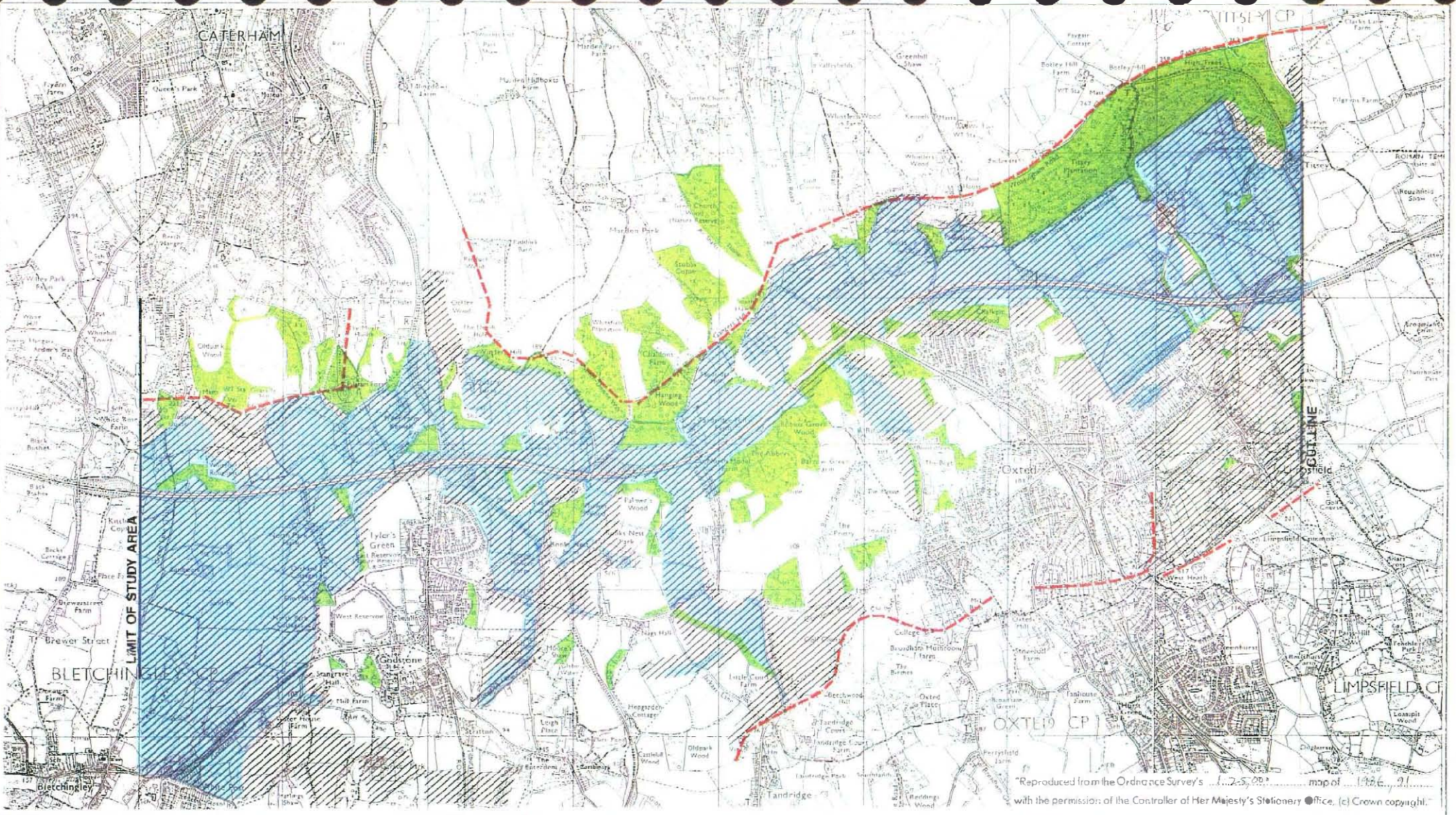
title
CHARACTER AREAS G & H

date
April '94

Not to scale

N

fig.no.
4.6d



M25

Visually significant ridgeline

Significant woodland

Area of land from which there are views of the existing motorway, structures, traffic and lighting

Area of land from which there might be a view of the proposed lighting.

Note 1:

- Visual envelope of the existing motorway is established by site survey.
- Visual envelope of proposed lighting is established by computer analysis of contours cross checked by cross sections and site survey. It is important to note that this is an approximation only. Localised topography and planting screen many potential views within the area and views tend to be glimpsed or framed by existing vegetation.

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

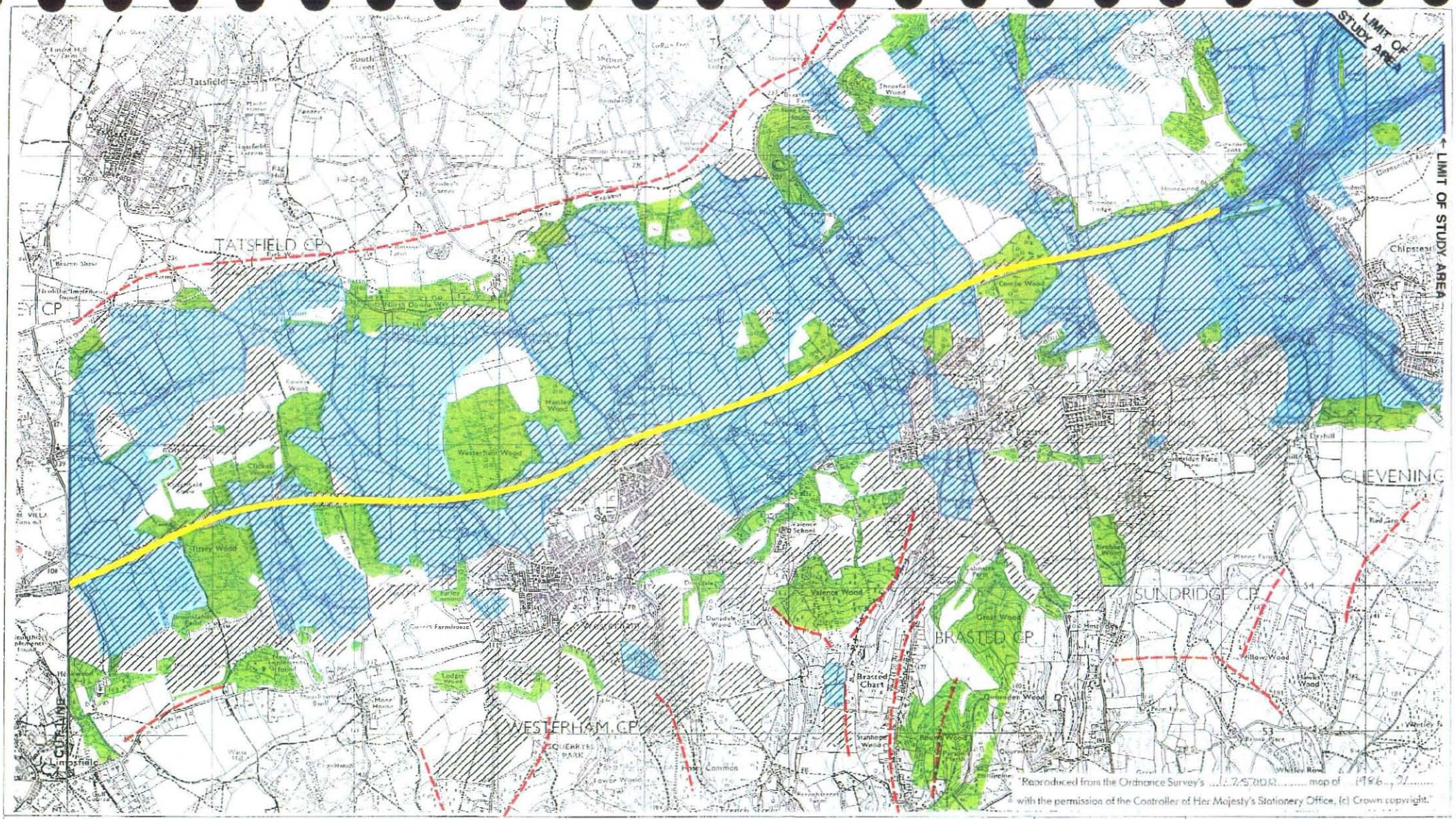
title: VISUAL ENVELOPE

date: April 94

Not to scale

N

fig.no: **4.7a**



M25

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Significant woodland

Area of land from which there are views of the existing motorway, structures, traffic and lighting

Area of land from which there might be a view of the proposed lighting.

Note 1:

- Visual envelope of the existing motorway is established by site survey.
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ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

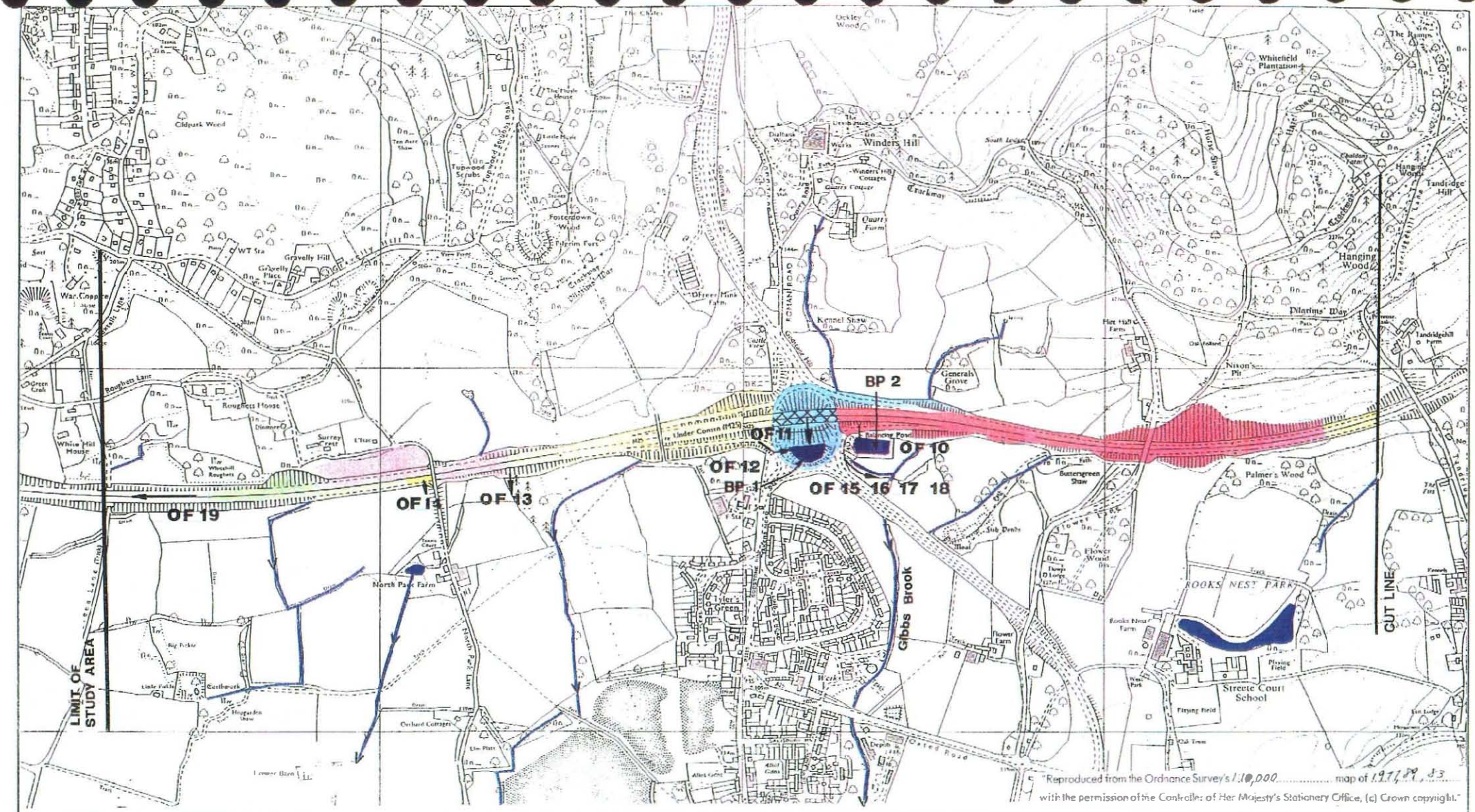
title: VISUAL ENVELOPE

date: April '94

Not to scale

N

fig. no: 4.7b



NOTES:

- Drainage area 1A
- Drainage area 1B
- Drainage area 1C
- Drainage area 2
- Drainage area 3A
- Drainage area 3B

OF : EXISTING OUTFALL

BP : BALANCING POND

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

RPS CLOUSTON

title: DRAINAGE

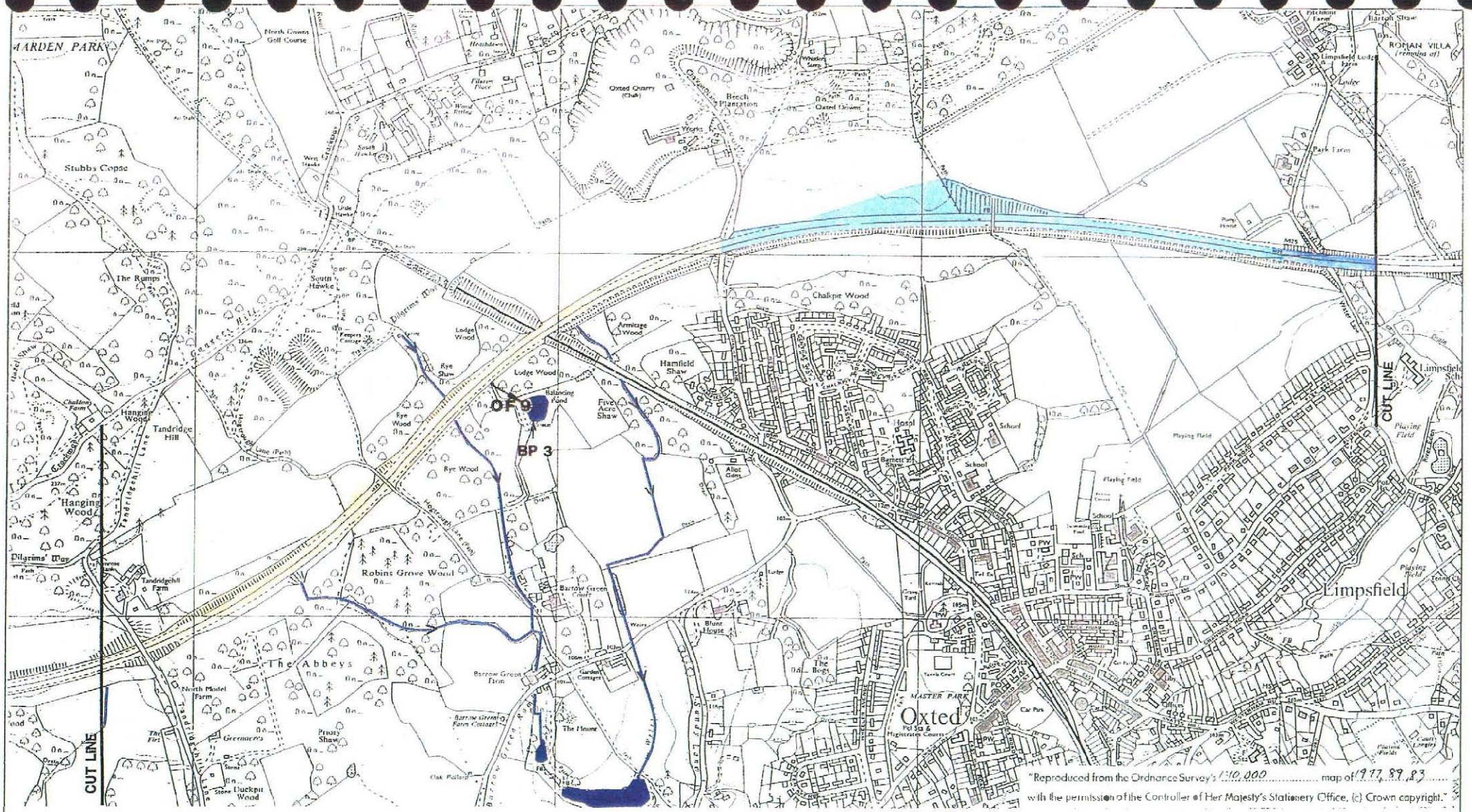
Sheet 1 of 5

date: April '94

drawn: Not to scale

N

fig.no. 4.8a



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NOTES:

Drainage area 4

Drainage area 5

OF : EXISTING OUTFALL

BP : BALANCING POND

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: DRAINAGE

Sheet 2 of 5

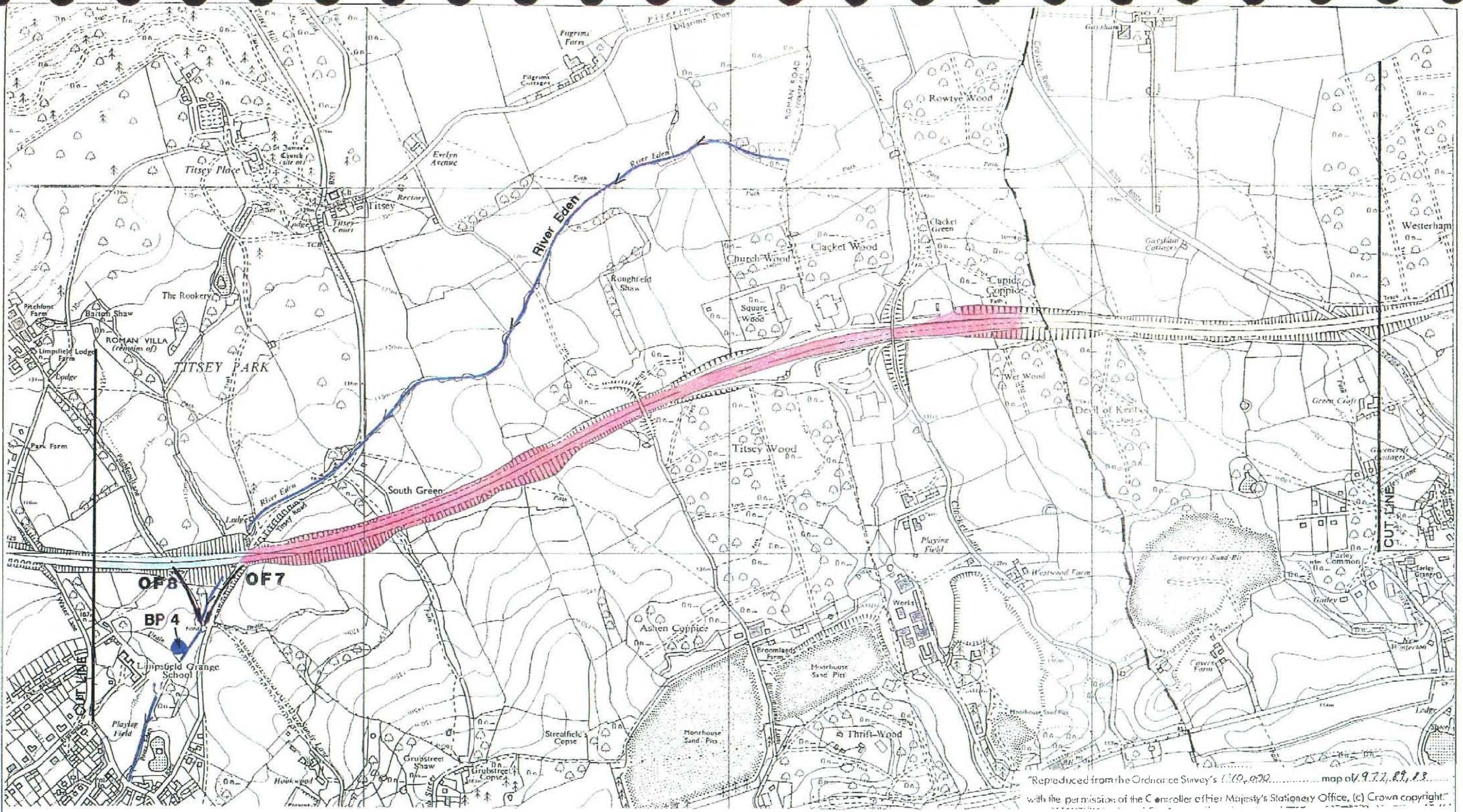
date: April '94

drawn: Not to scale

RPS CLOUSTON

N

fig.no. 4.8b



NOTES:

🟦 Drainage area 5

🟥 Drainage area 6

🟨 Drainage area 7

OF : EXISTING OUTFALL

BP : BALANCING POND

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

project
M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title
DRAINAGE

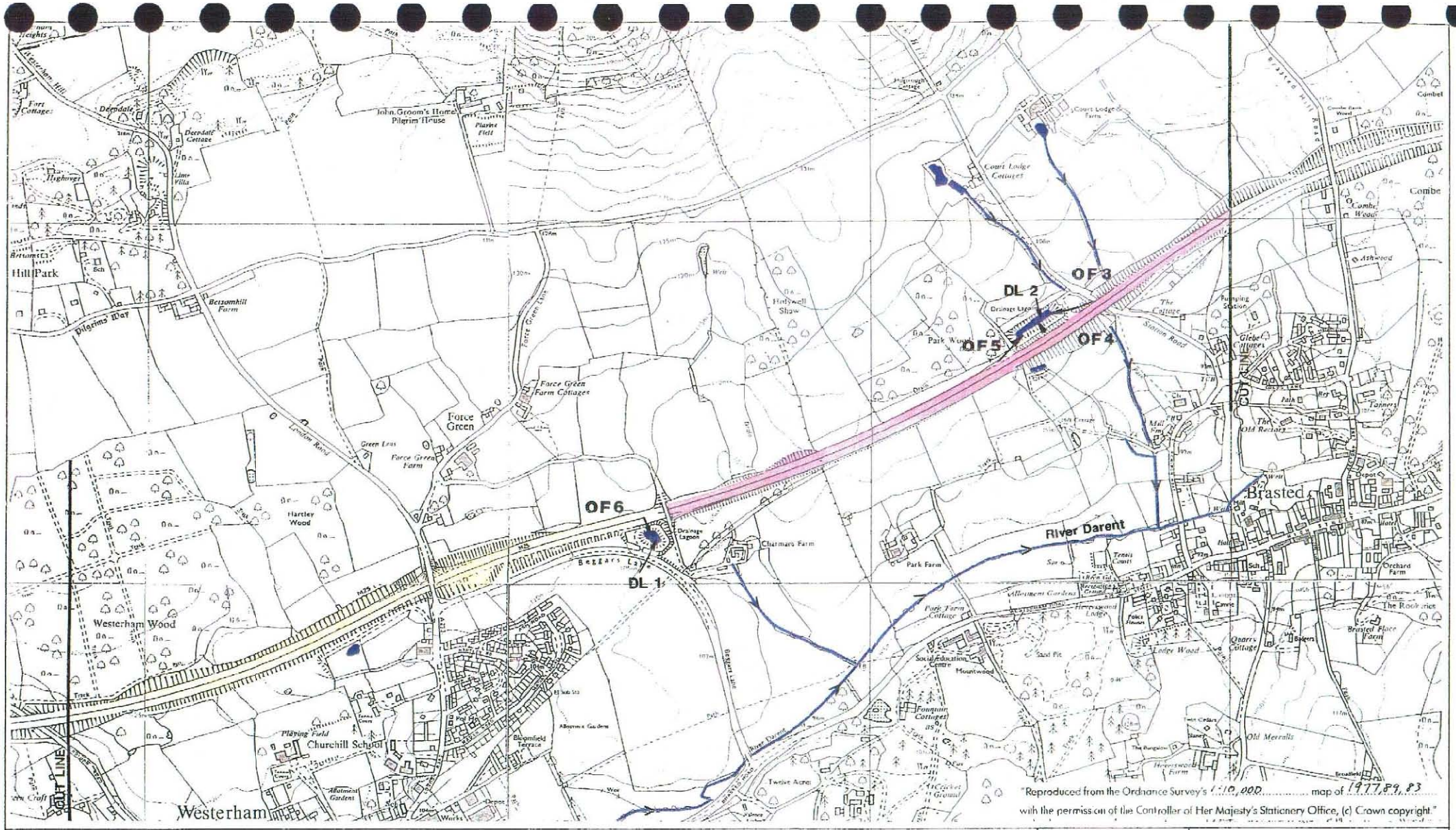
Sheet 3 of 5

date
April '94

drawn
Not to scale

N

fig. no.
4.8c



NOTES:

Drainage area 7

Drainage area 8

OF : EXISTING OUTFALL

DL : DRAINAGE LAGOON

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project

M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title

DRAINAGE

Sheet 4 of 5

date

April '94

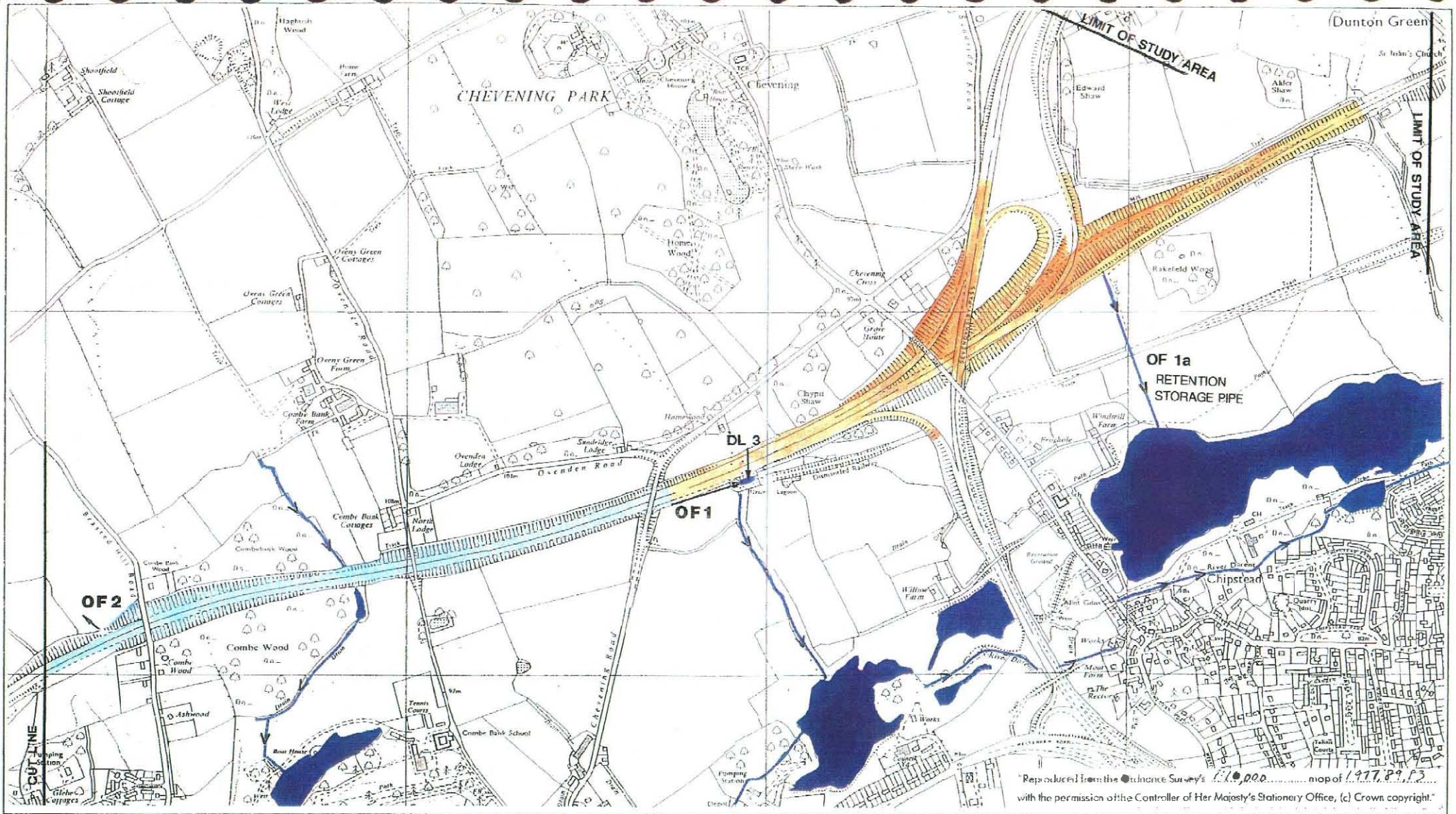
drawn

Not to scale

N

fig.no.

4.8d



NOTES:

Drainage area 9

Drainage area 10

OF : EXISTING OUTFALL

DL : DRAINAGE LAGOON

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project

M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title

DRAINAGE

Sheet 5 of 5

date

April '94

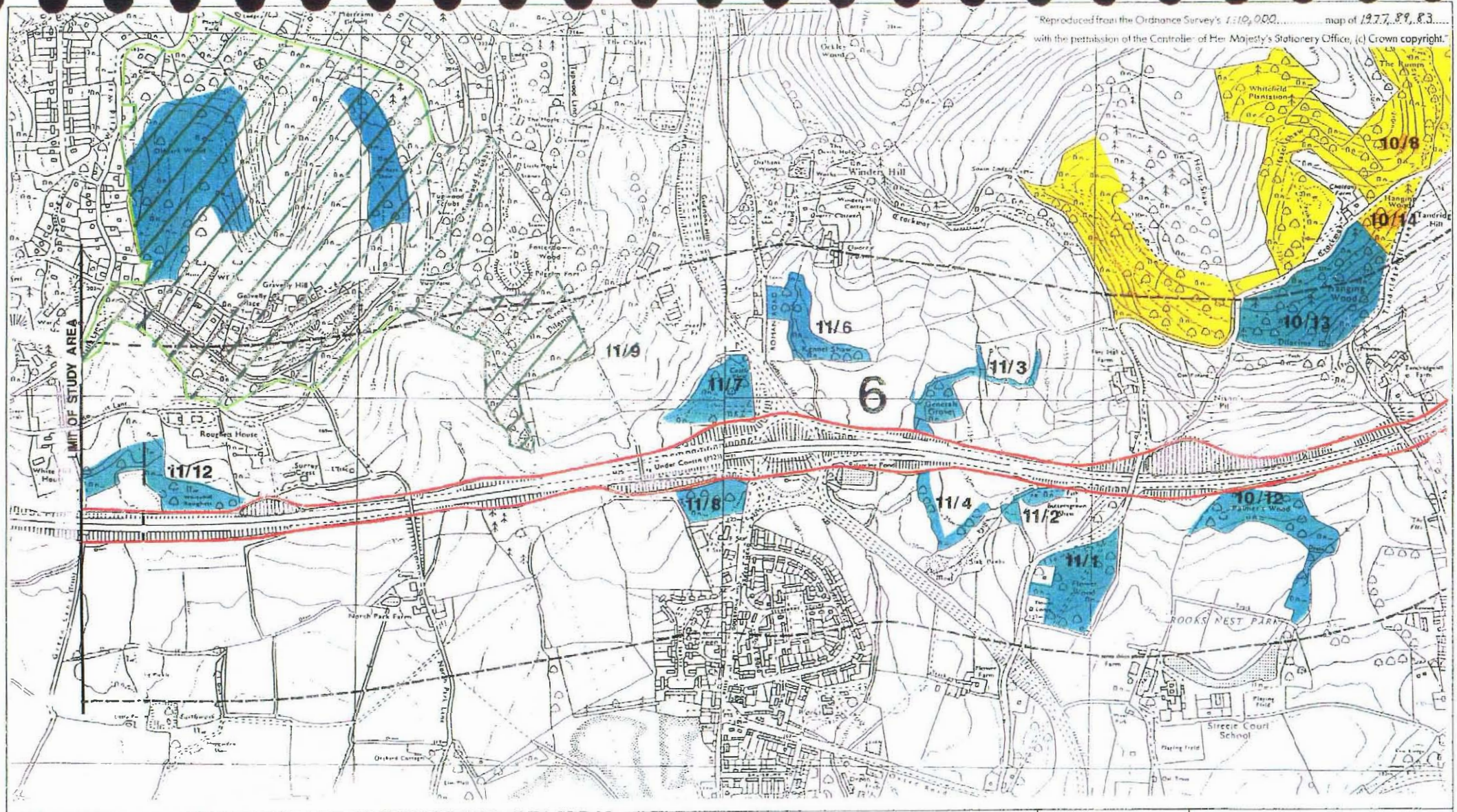
drawn

Not to scale

N

fig.no.

4.8e



NOTES

- Sites of Special Scientific Interest
- Sites of Nature Conservation Interest
- Areas of High Ecological Value (AHNCV, AHEQ)
- Other areas of Nature Conservation Interest

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project
M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

title
SITES OF NATURE CONSERVATION INTEREST

date
April '94

drawn
Not to scale

N

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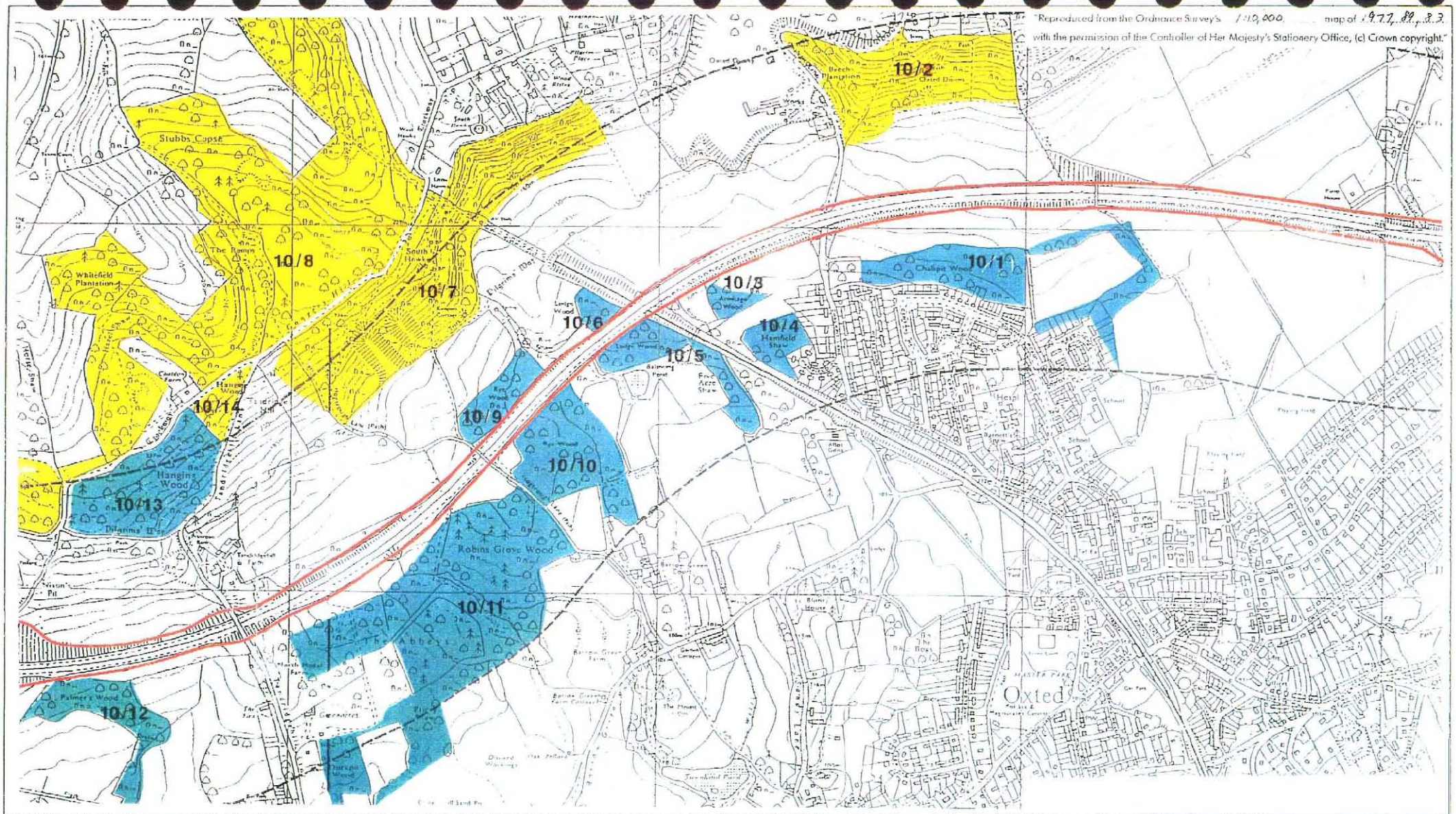
4.9a



NOTES

- Sites of Special Scientific Interest
- Sites of Nature Conservation Interest
- Areas of High Ecological Value (AHNCV, AHEQ)
- Other areas of Nature Conservation Interest

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: SITES OF NATURE CONSERVATION INTEREST

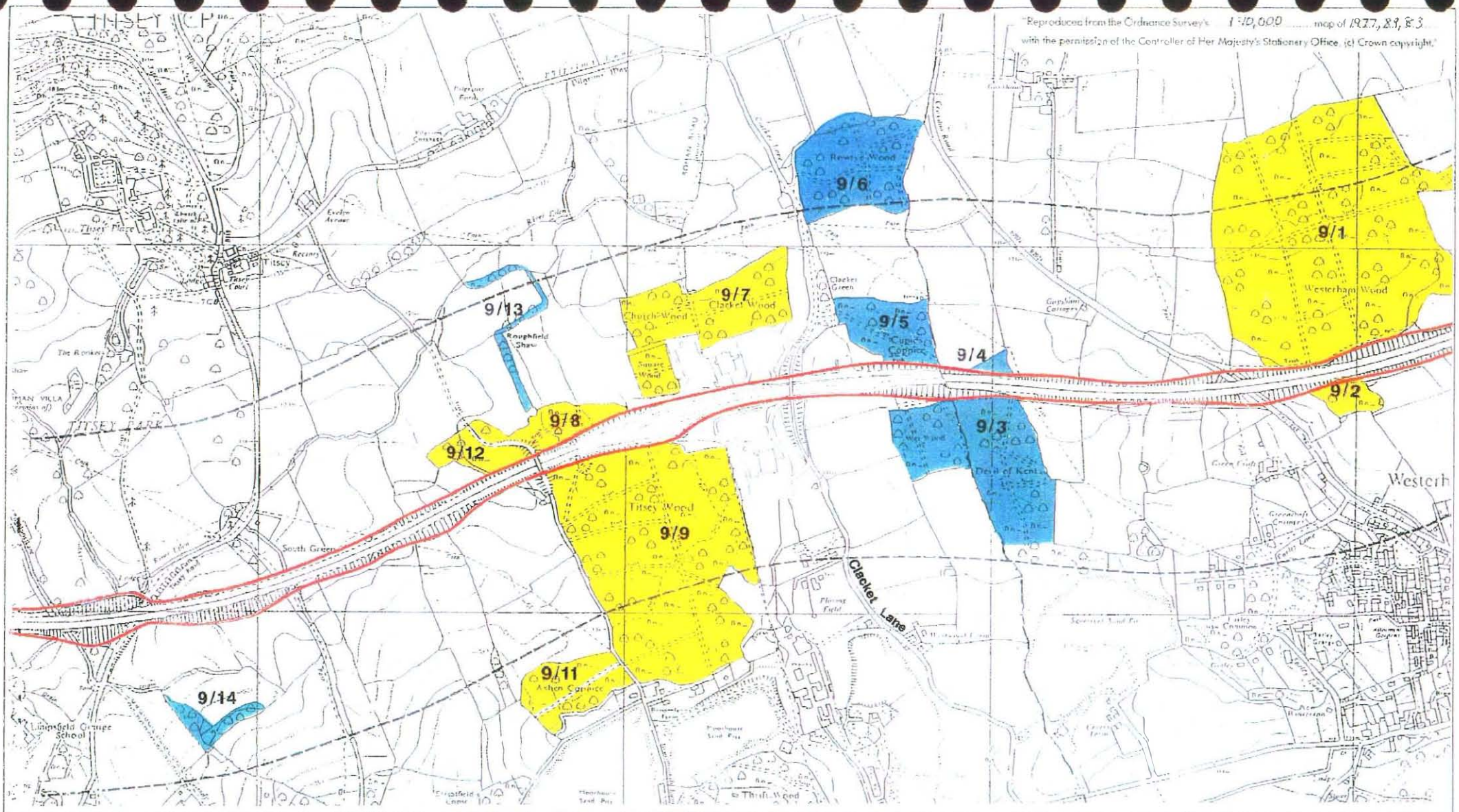
date: April '94

drawn: Not to scale

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

N

fig.no. 4.9b



NOTES

- Sites of Special Scientific Interest
- Sites of Nature Conservation Interest
- Areas of High Ecological Value (AHNCV, AHEQ)
- Other areas of Nature Conservation Interest

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

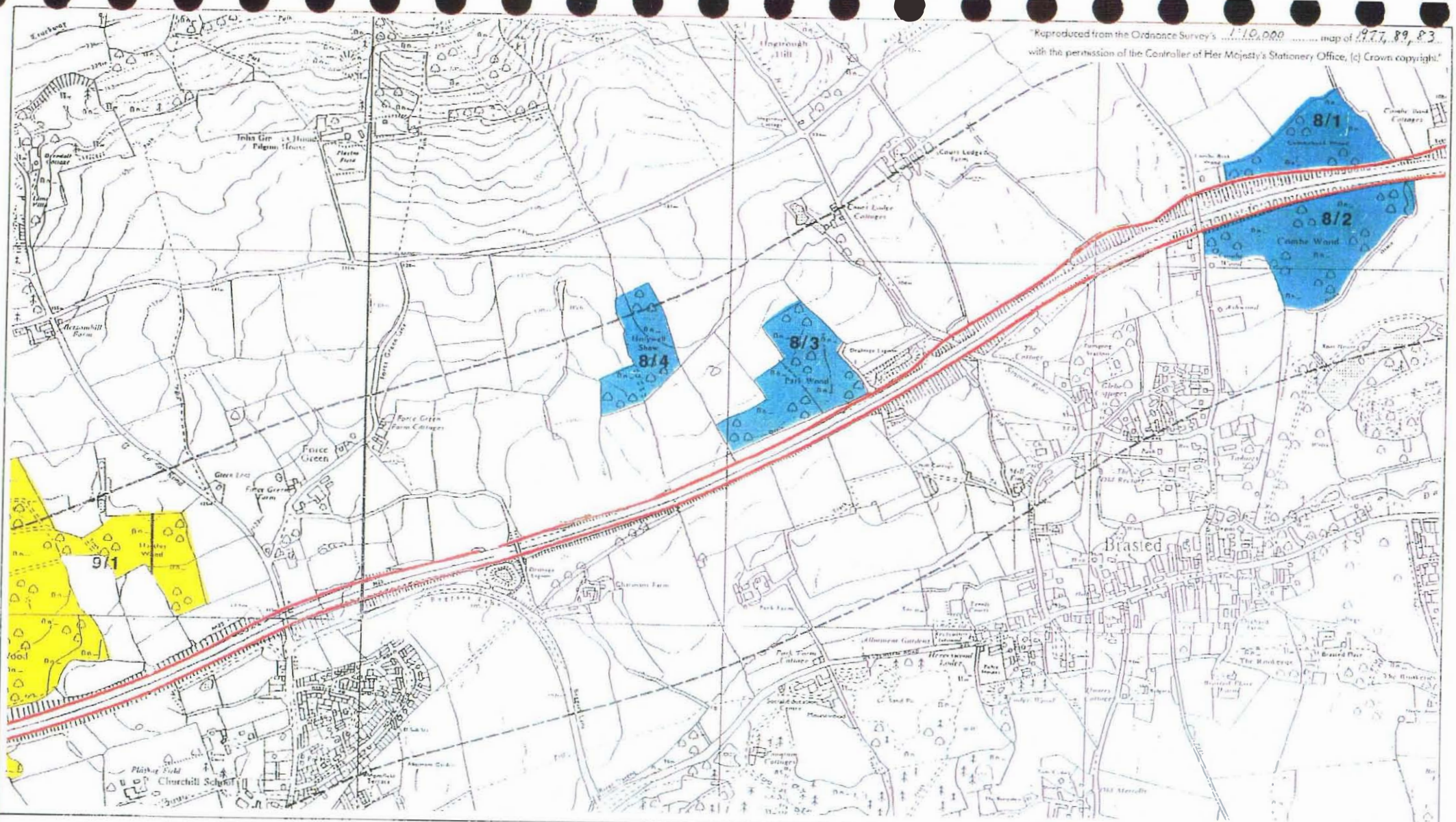
title: SITES OF NATURE CONSERVATION INTEREST

date: April '94

drawn: Not to scale

N

fig.no. 4.9c



NOTES

- Sites of Special Scientific Interest
- Sites of Nature Conservation Interest
- Areas of High Ecological Value (AHNCV, AHEQ)
- Other areas of Nature Conservation Interest

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

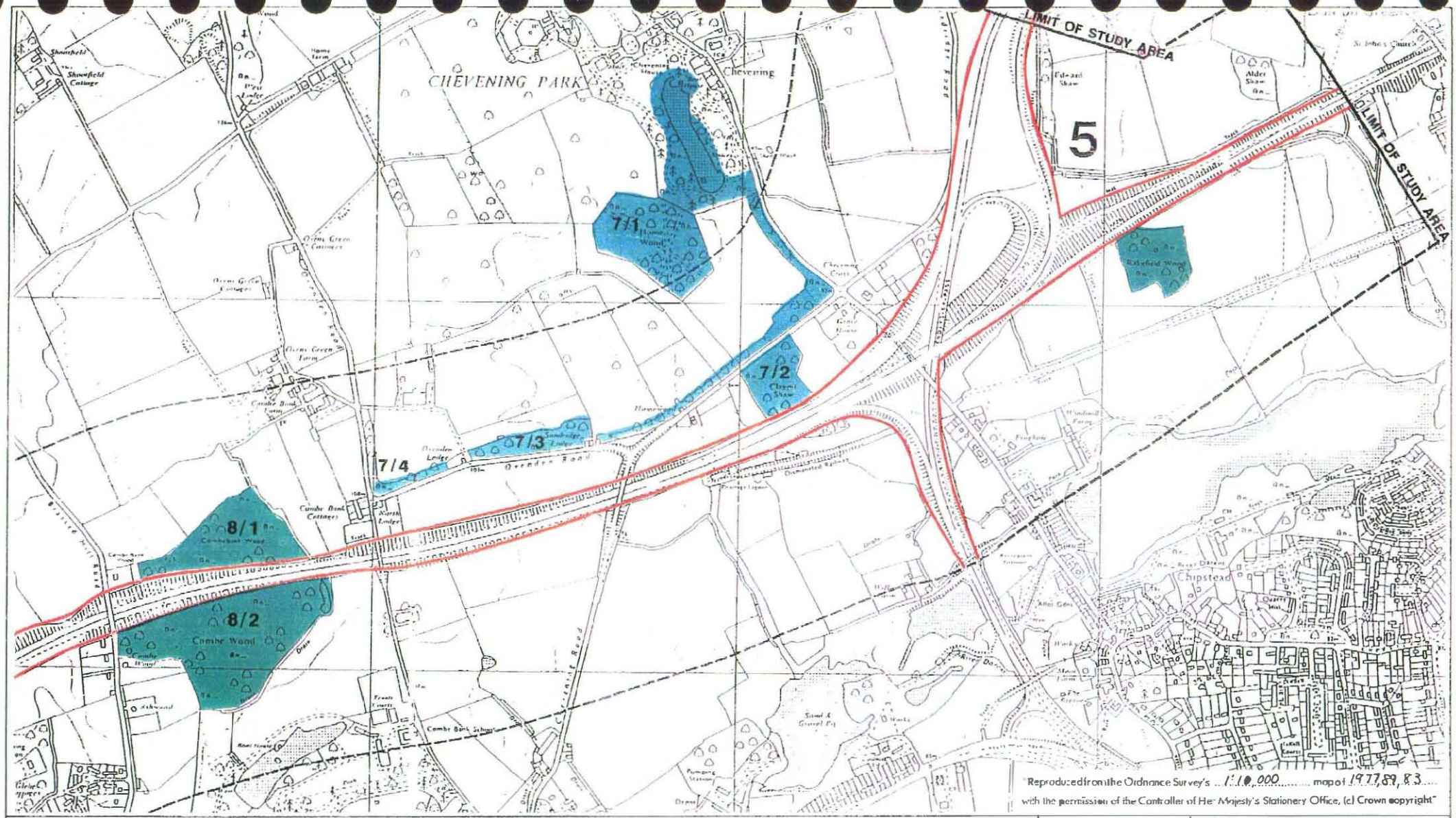
title: SITES OF NATURE CONSERVATION INTEREST

date: April '94

drawn: Not to scale

N

fig.no.: 4.9d



NOTES

- Sites of Special Scientific Interest
- Sites of Nature Conservation Interest
- Areas of High Ecological Value (AHNCV, AHEQ)
- Other areas of Nature Conservation Interest

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

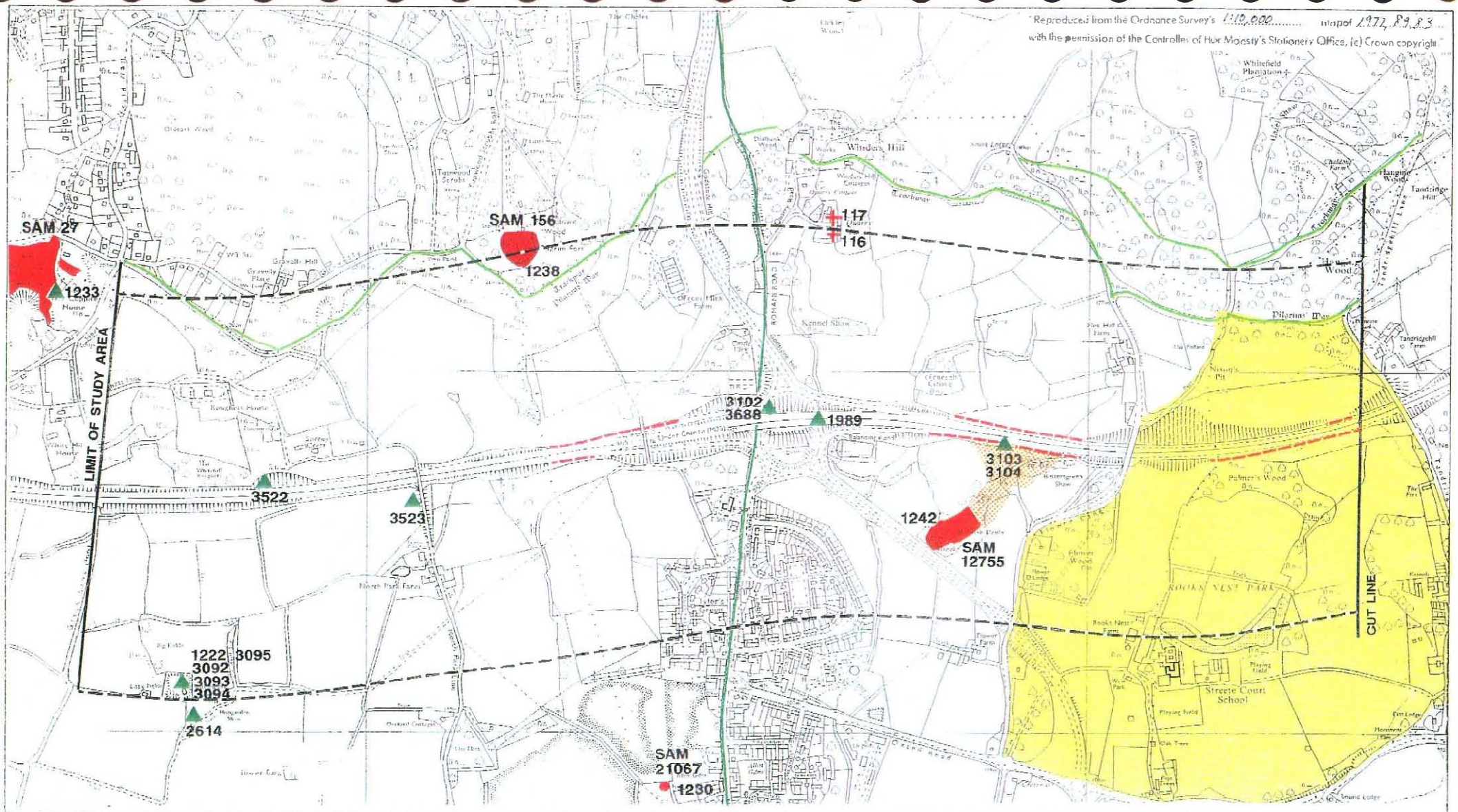
title: SITES OF NATURE CONSERVATION INTEREST

date: April '94

drawn: Not to scale

N

fig.no. 4.9e



NOTES:

- Scheduled Ancient Monuments (SAMs)
- Sites and Monuments Records (SMRs)
- Statutory Listed Building
- Trackway
- Historic park or garden (not designated)
- Building on local list
- Areas where further assessment is recommended
- Walkover survey areas
- Conservation area within route corridor
- English Heritage designated extent of garden of historic interest

ORIGINAL IN COLOUR

THE DEPARTMENT OF TRANSPORT

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: HERITAGE SITES

date	drawn
Dec. '93	Not to scale

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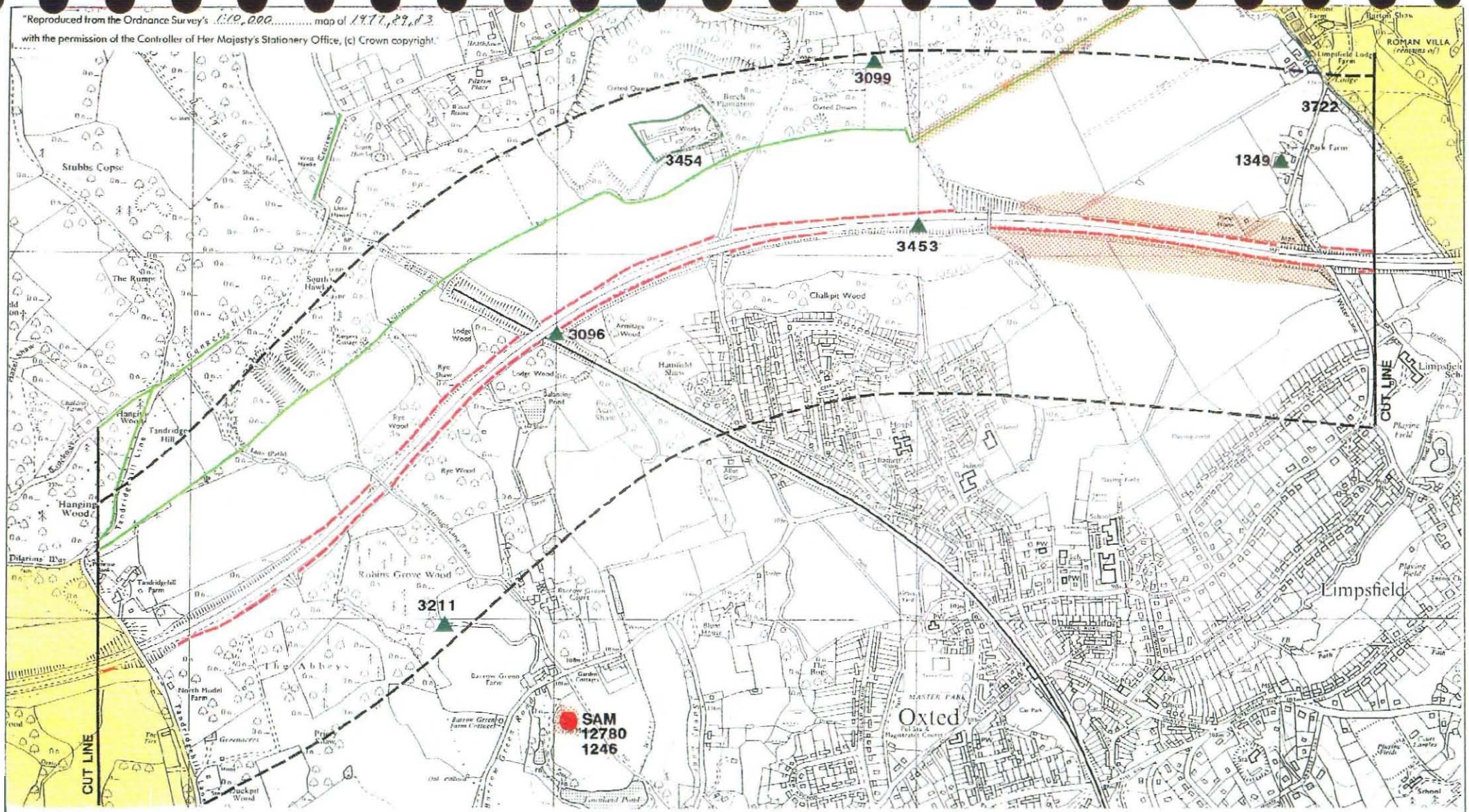
fig.no: 4.10a



NOTES:

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- Statutory Listed Building
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- Walkover survey areas
- Conservation area within route corridor
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ORIGINAL IN COLOUR

THE DEPARTMENT OF TRANSPORT

PARKMAN

RPS CLOUSTON

project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

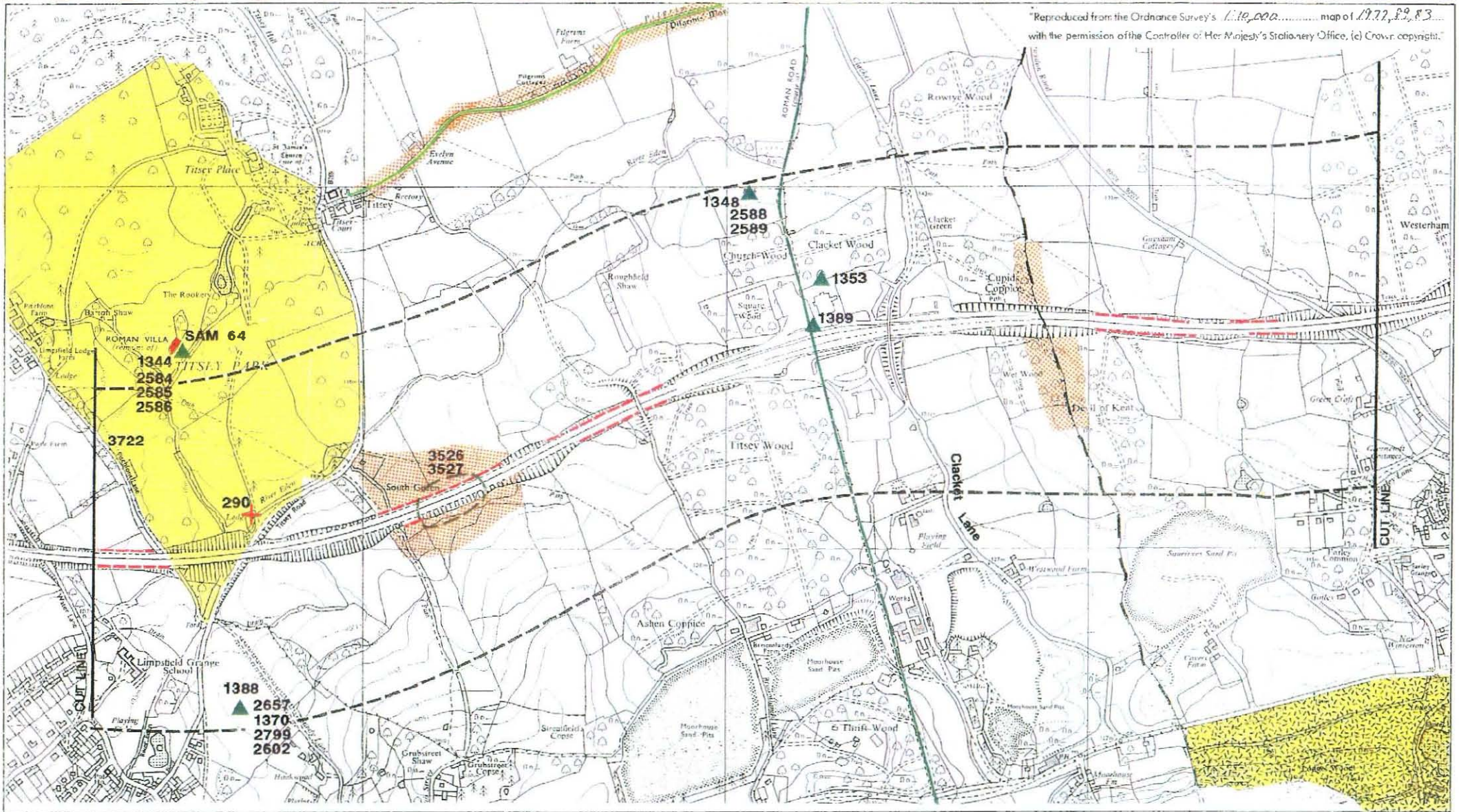
title: **HERITAGE SITES**

date: Dec. '93

drawn: Not to scale

N

fig.no. **4.10b**



NOTES:

- Scheduled Ancient Monuments (SAMs)
- Sites and Monuments Records (SMRs)
- Statutory Listed Building
- Trackway
- Historic park or garden (not designated)
- Building on local list
- Areas where further assessment is recommended
- Walkover survey areas
- Conservation area within route corridor
- English Heritage designated extent of garden of historic interest

ORIGINAL IN COLOUR

THE DEPARTMENT OF TRANSPORT

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: HERITAGE SITES

date: Dec. '93

drawn: Not to scale

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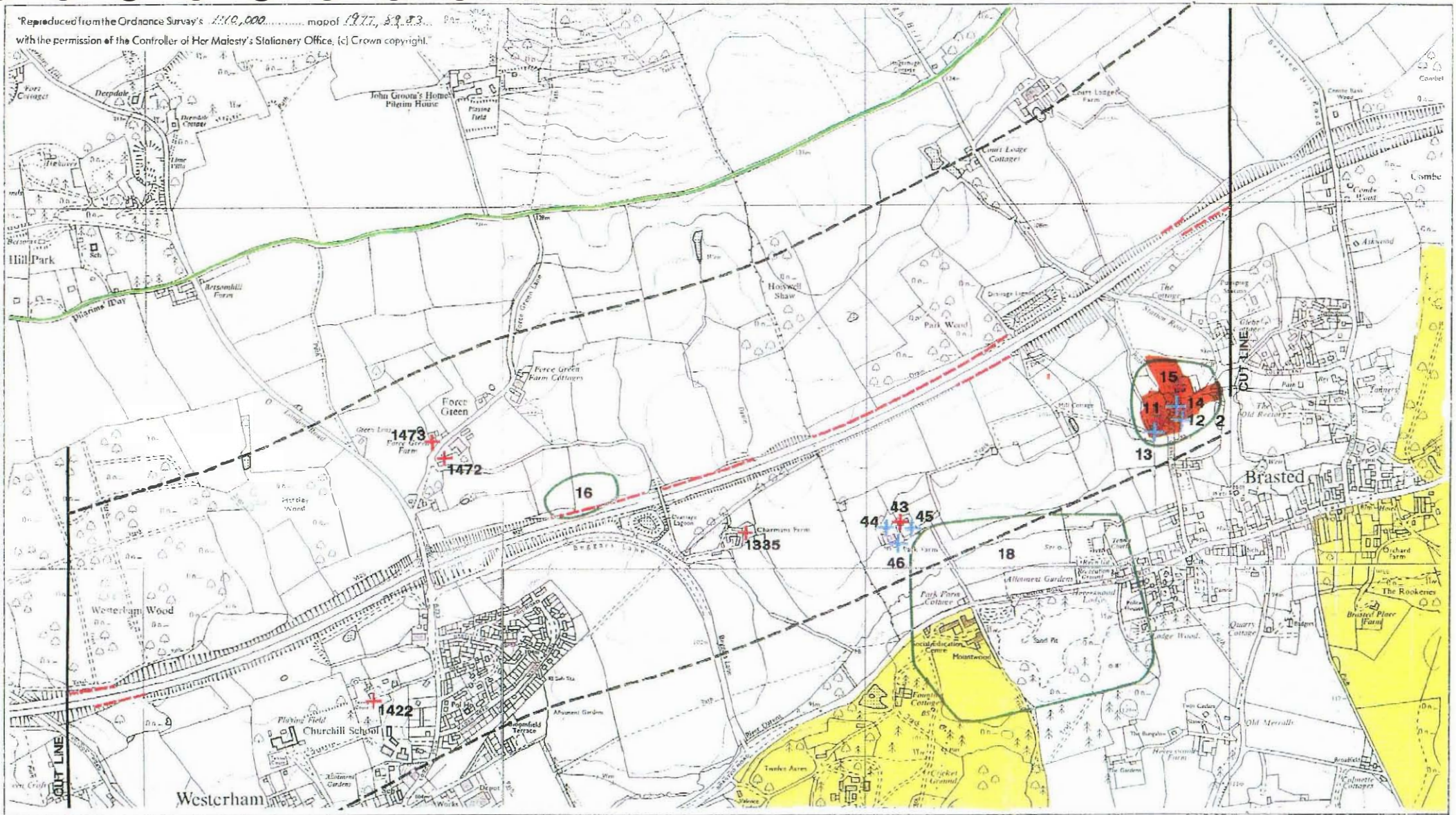
fig.no.: 4.10c



NOTES:

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- Sites and Monuments Records (SMRs)
- Statutory Listed Building
- Trackway
- Historic park or garden (not designated)
- Building on local list
- Areas where further assessment is recommended
- Walkover survey areas
- Conservation area within route corridor
- English Heritage designated extent of garden of historic interest

ORIGINAL IN COLOUR

THE DEPARTMENT OF TRANSPORT

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

PARKMAN

title: HERITAGE SITES

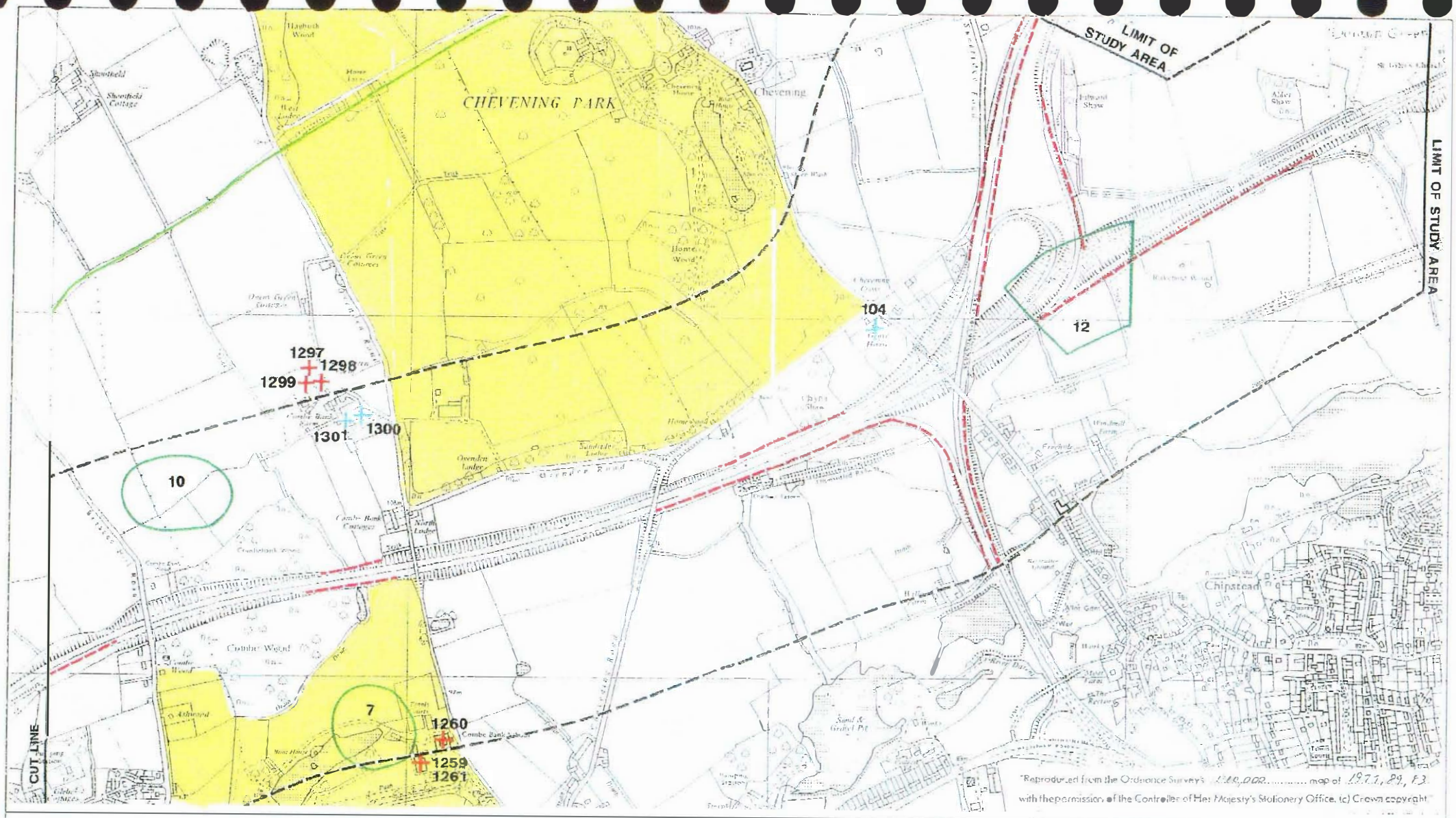
RPS CLOUSTON

date: Dec. '93

drawn: Not to scale

N

fig.no. 4.10d



NOTES:

- Scheduled Ancient Monuments (SAMs)
- Sites and Monuments Records (SMRs)
- Statutory Listed Building
- Trackway
- Historic park or garden (not designated)
- Building on local list
- Areas where further assessment is recommended
- Walkover survey areas
- Conservation area within route corridor
- English Heritage designated extent of garden of historic interest

ORIGINAL IN COLOUR

THE DEPARTMENT OF TRANSPORT

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

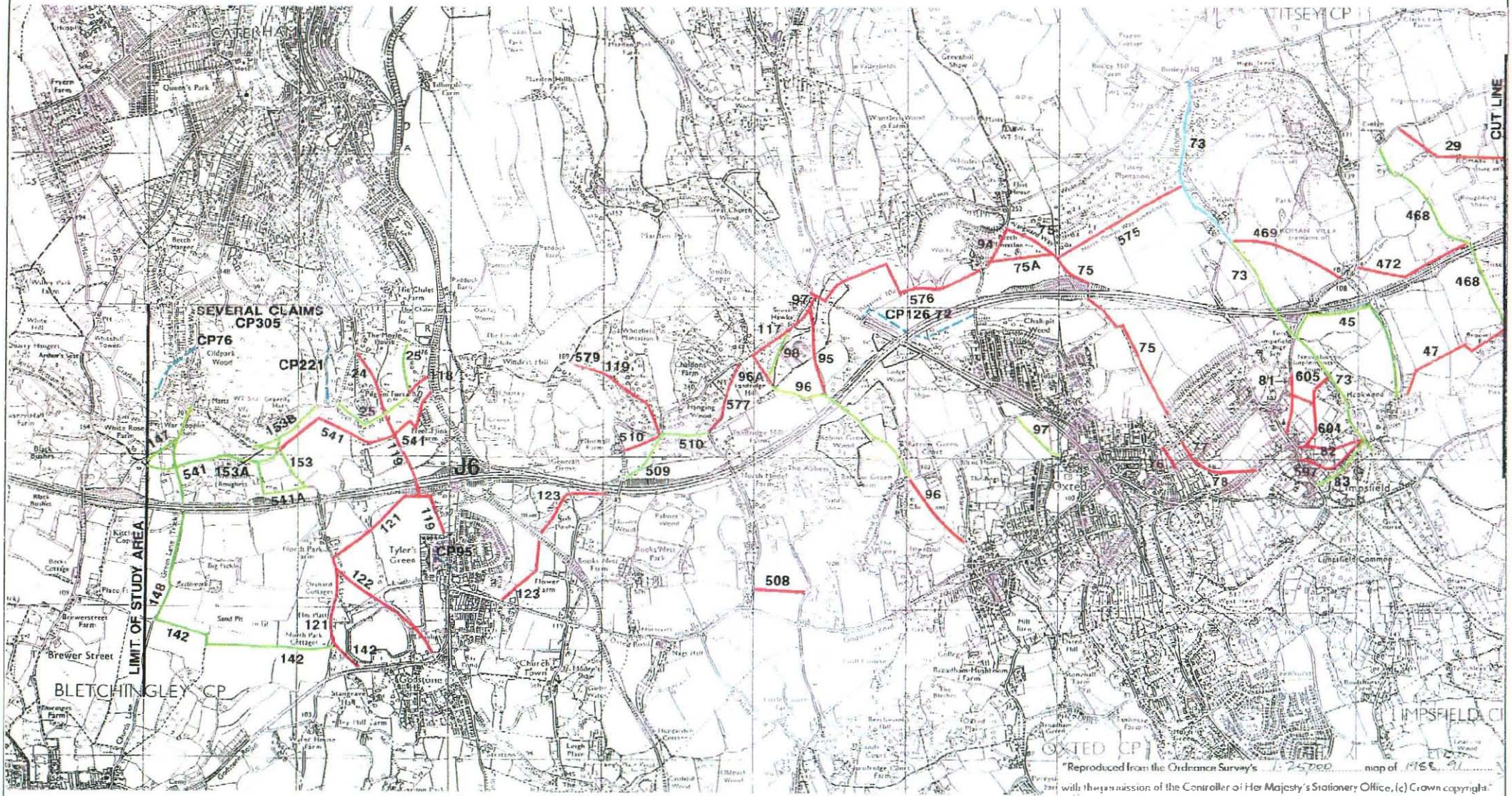
title: HERITAGE SITES

date: Dec. '93

drawn: Not to scale

N

fig no: 4.10e



NOTES

- Footpath
- Bridleway
- Byway open to all traffic (boat)
- Road used as a public path
- Claimed paths

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

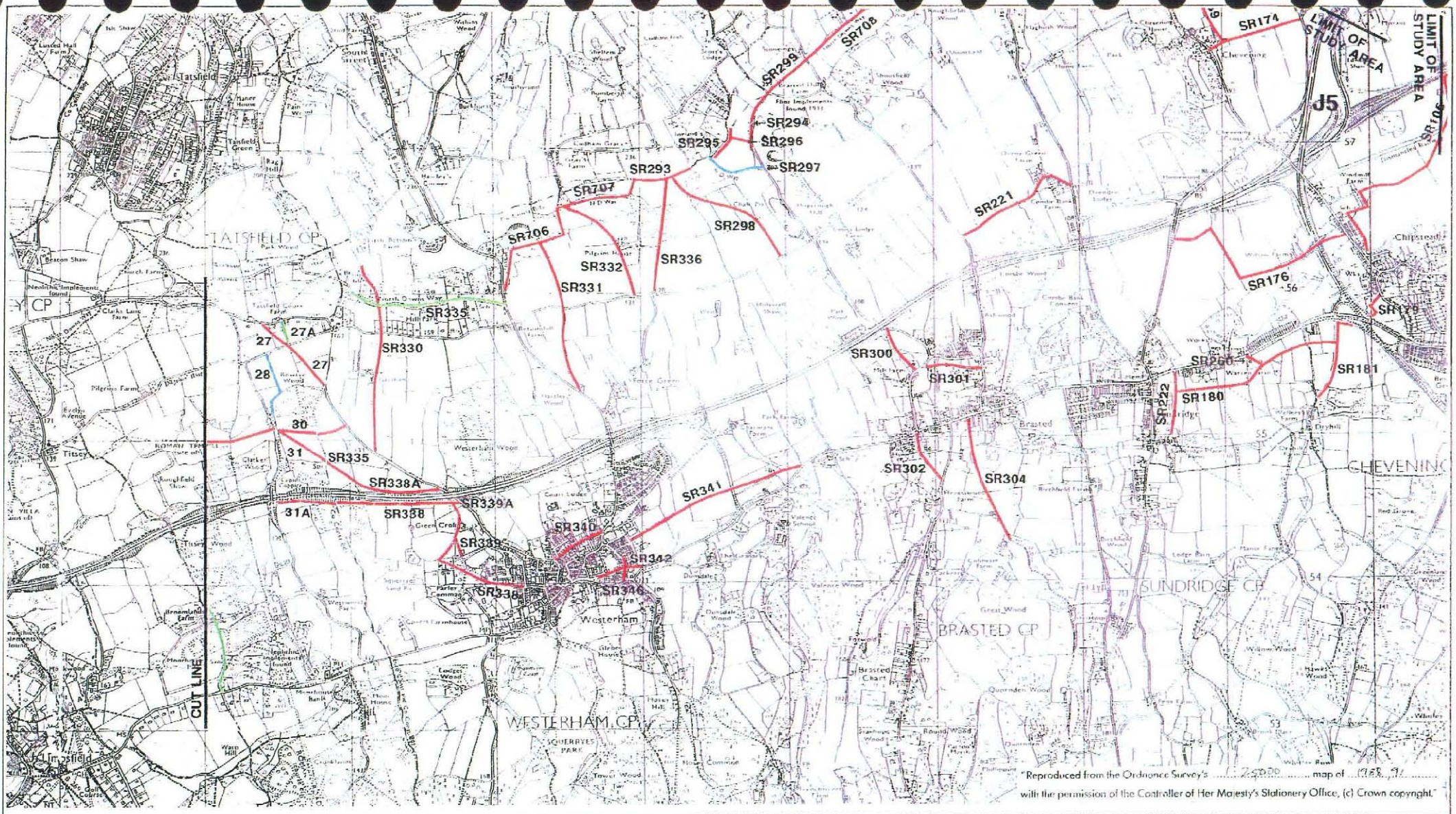
title: PUBLIC RIGHTS OF WAY

date: April '94

drawn: Not to scale

N

fig.no. 4.11a



NOTES

- Footpath
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ORIGINAL IN COLOUR

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: PUBLIC RIGHTS OF WAY

date: April '94

drawn: Not to scale

N

fig.no. 4.11b

5.0 MITIGATION MEASURES INCORPORATED IN THE PROPOSALS

Summary

The main mitigation measures are as follows:

- ***Landscape and Visual Impact***

  As much as possible of the existing planting will be retained. Lost planting will be replaced where possible, and areas of additional planting are proposed. Indigenous species will be planted blending the scheme visually and ecologically into its surroundings. Offsite planting is proposed, but this will be subject to agreement with landowners.

- ***Noise***

  Existing acoustic barriers will be retained and new barriers provided where effective. Porous asphalt surfacing is proposed, on sections of motorway adjacent to Westerham and Brasted. This will directly mitigate the effect on the northern ends of the villages of Brasted and Westerham. On a wider scale it will reduce noise levels within an area which is enjoyed for recreation.

- ***Water Quality***

  Improved drainage and pollution interceptor tanks will reduce the risk of pollution of adjacent watercourses.

- ***Ecology***

  The proposed planting will provide equivalent habitats for wildlife, compensating for any habitats that are lost. Badger protection measures will be incorporated at locations where a concentration of badger activity has been identified.

- ***Cultural Heritage***

  Prior to construction, studies of selected trial pits will be undertaken to ascertain whether undisturbed areas remain. Trial trenching will be carried out if there is good reason to expect archaeological remains to be present.

5.1 Introduction

This section sets out the measures which will be taken to prevent, reduce, or where possible, offset potential environmental impacts which may occur during construction of the scheme and its subsequent use.

Appendix C: Mitigation Tables lists the proposed mitigation measures and identifies their capital and yearly maintenance costs.

5.2 Objectives

The engineering and environmental improvement works associated with the provision of an additional lane to each carriageway of the M25 between Junction 5 and Green Lane (east of Junction 7) can be accommodated within the highway boundary. However, the areas available for implementing environmental mitigation measures are limited.

The existing environmental measures provide noise and visual screening, a degree of integration into the surrounding landscape and some wildlife habitat. Measures to limit potential flooding and protect water quality in the road corridor were also implemented, although not originally designed to the standards now considered good practice.

The objective of the proposed mitigation measures is to ensure that the existing level of environmental protection where effective is retained and where practicable is improved. The proposed measures are illustrated on figures 5.1 a-e.

5.3 Mitigation of Operational Impacts

5.3.1 Geology and Soils

No mitigation measures are proposed in respect of geology as no SSSIs notified for reasons of geological importance nor any Regionally Important Geological Sites (RIGS) are affected by the proposals.

Wherever possible existing topsoil from within the motorway will be used to resoil the embankment and cutting slopes for landscape planting. The topsoil will be handled and stored so as to minimise structural damage and compaction.

5.3.2 Land Use

No mitigation measures are proposed with respect to land uses in the corridor since there will be no landtake beyond the highway boundaries.

5.3.3 Policies and Plans

There are no specific mitigation measures proposed in respect of planning issues . However, the general amenity of the area will benefit from measures such as the provision of porous asphalt and the improvement of noise barriers and mounds; improved or replacement planting and improvements in air quality. There will also be improvements in water quality due to the pollution control measures proposed.

5.3.4 Landscape proposals

a) Objectives

The environmental effects of the proposals include a number of potentially adverse impacts on the landscape.

- increased visual impact, particularly from lighting;
- deterioration of landscape character in an AONB as a result of the introduction of lighting and gantries;
- loss, in the short term, of existing vegetation.

The objectives of the landscape proposals are:

- to provide an element of screening in order to mitigate the effects of visual intrusion and wherever possible to retain existing trees, woodlands and hedgerows. Where new planting is proposed this will reflect the predominantly rural nature of the area and use indigenous species found locally;

- to assist in integrating a widened motorway in the local setting with regard to existing landscape character and component features; and

- to provide visual interest to road users.

Schematic sections at selected locations are at figures 5.3 a-e.

b) Proposed planting within the highway boundary

Planting arrangements within the highway boundary will reflect the existing character of the areas as follows:

- Green Lane to North Park Lane
  This is generally an open section of motorway where the majority of existing planting will be retained. The scope for new planting within the highway boundaries is very limited, although some will be possible on wider embankments.

- Godstone and Junction 6
  The existing planting is already effective in screening the motorway. The proposals retain most of the planting, apart from a strip north and south along the motorway carriageways. In gaps, or where planting has failed, new planting will be included.

- Flower Lane/Barrow Green
  This is a very open section of motorway and existing planting will be retained where possible. There is virtually no opportunity for new planting within the highway boundary along this section. Some limited planting is proposed to infill gaps.

- Oxted
  It will not be possible to mitigate the limited amount of existing planting lost to the west of the area. To the east some will be lost, which will be replaced by new woodland type planting to reinforce and infill gaps between existing planting on the bund.

- Titsey

  Some planting will be lost due to regrading of the embankment. East of Titsey Road new woodland planting is proposed on the embankments to assist in screening and to provide a backdrop to the proposed lighting. At Clacket Lane Service Area new planting is proposed on the regraded embankments.

- Westerham

  To the east of Croydon Road some planting will be lost which will be replaced by new woodland type planting as a buffer to Westerham Wood. North of Beggars Lane additional planting is proposed on the land adjacent to the motorway, which at present is sparsely vegetated.

- Brasted

  Some planting will be lost to the proposals. To compensate for this, additional woodland planting is proposed west of Brasted Hill Road to assist in screening at this location.

- Chevening

  New planting is proposed to reinforce the existing hedgerow at the top of the northern bank adjacent to the motorway. Other planting at Chevening Road will be retained as far as possible.

In all cases species chosen will reflect the soils of the area and the species in the existing successfully established planting.

c) Offsite Planting

To further achieve the objectives above, offsite planting is proposed at certain locations outside the highway boundary, but will be subject to landowners' agreement. The main areas under consideration are as follows:

- North Park Lane

  Offsite planting is proposed to reinforce an existing hedgerow adjacent to properties north of the motorway which are close to the road.

- Flint Hall Farm
  South of Flint Hall Farm offsite planting is proposed adjacent to the northern highway boundary.

- Green Park Lodge, Titsey
  Offsite planting is proposed to reinforce existing planting along Titsey road in order to protect Green Park Lodge

- Churchill School
  Offsite planting is proposed on the bund along the southern boundary of the motorway

- Mill Farm
  Offsite planting is proposed north of Mill Farm on the embankment slopes along the southern carriageway.

- Combe Wood
  Offsite planting is proposed adjacent to the highway boundary north and south of the motorway

d) Treatment of Structures

All existing road, rail, accommodation and pedestrian access bridges will be retained, or reconstructed, within the widened motorway scheme. Underbridges carrying the motorway over existing crossing points will be widened using the same material of construction as in the existing structures. Widened superstructures will comprise of either in-situ concrete, precast concrete or weathering steel construction. Widened substructures will comprise of in-situ concrete incorporating ribbed or grooved finishes to match the existing.

Overbridges will generally remain unaltered, except for strengthening to some of the piers by the addition of in-situ concrete or barrier protection. Retaining wall structures required at widened cutting or embankment locations will generally be of relatively low height and will be formed using strengthened soil solutions incorporating provision for topsoiling and grassing. Where there are

requirements for larger retaining structures, these will be formed using either gabion walls, reinforced concrete or concrete faced piled walls, with the concrete facing incorporating a vertical ribbed finish.
A typical structure is illustrated at 5.4 b.

5.3.5 Noise and Vibration

The Volume II Specialist Report, 4. Noise, identifies locations where noise barriers have been considered. The calculations indicate that with noise barriers in place a reduction of up to 6.0 dB(A) can be achieved. The properties concerned generally lie close to, and are exposed to the motorway.

Existing noise barriers will be retained and table 5.1 shows the proposed new barriers. Porous asphalt surfacing is proposed on sections of motorway adjacent to Westerham and Brasted. It is not to be provided on the Surrey section of the motorway because this has recently undergone reconstruction and consequently new construction will be kept to a minimum to maximise use of the previous works.

The porous asphalt will directly mitigate for the northern ends of the village of Brasted and the town of Westerham. On a wider scale it will reduce noise levels in the motorway corridor which is designated as Metropolitan Green Belt and an Area of Outstanding Natural Beauty.

The noise fencing and bunds provided to mitigate noise nuisance will have similar mitigating effects on the airborne vibration which disturbs occupiers. No separate vibration mitigation is required.

Table 5.1 - Proposed Noise Barriers

Location	Type	Height	Length	Comments
South Motorway verge on raised section through Junction 6	Acoustic Fence	2m	500m	Will mitigate for the northern properties of Godstone, providing a 1.5dB(A) decrease over the design life period
North motorway verge immediately west of North Park Farm Bridge	Acoustic fence	3m	300m	Will mitigate properties to north of motorway providing a decrease over the design life period

5.3.6 Air Quality and Climate

There are no specific mitigation measures proposed in respect of air quality, although noise and vegetative screens, where implemented, will improve dispersal of primary pollutants. However, there will be improvements in air quality resulting from reductions in congestion, legislation in respect of fuel and catalytic converters, and improvements in engine technology.

5.3.7 Water Quality

The majority of existing drains alongside or under the hardshoulders of the motorway will be removed or grouted up, and replaced by a new piped system under, or behind, the new hardshoulder to which the paved areas will drain via paved channels and gullies. Any remaining drains will be carefully assessed for their integrity and performance using CCTV surveys. This will ensure that the road run-off is directed to the correct outfall, and will prevent accumulation in localised spots. If not prevented, this can result in migration of contamination into the underlying strata and to sensitive watercourses, or result in local flooding. All pipes showing breaches of integrity will be relaid. Any pipes showing diversion of water away from the expected drainage route will also be relaid to the correct route.

Subsoil drainage from the road foundations and bridges, and run-off from cutting slopes, will be directed through a separate drainage system which will ultimately connect into the new system. All run-off from the motorway will therefore be ultimately directed to drainage retention ponds. Only small areas of embankment slopes falling away from the motorway and considered highly unlikely to be contaminated will continue to drain to existing ditches. No motorway hardstanding areas will be permitted to drain to these ditches.

All road run-off will be directed through enclosed drainage pipes to prevent the migration of contamination into underlying ground, especially the chalk and lower greensand, and their associated potable groundwaters.

Balancing ponds will be incorporated for all of the Drainage Areas, prior to their discharge into receiving water courses or drainage systems. Oil/grit interceptors will be installed upstream of these ponds to prevent oil and sediment entering the receiving watercourses.

The capacity of these balancing ponds will be assessed to ensure that both the additional volumes of routine road run-off and those arising during a 1 in 5 year storm event can be contained. The balancing ponds will be designed to permit maximum mitigation of the concentrations of contaminants through settlements and dilution. The bases of the ponds will be lined to prevent migration of contaminants into the underlying strata and associated ground water.

The flow rates from the ponds will be regulated to prevent flooding of receiving water courses and ensure additional dilution of any residual contaminants. A cut-off facility will be installed at the oil/grit interceptors. This will enable the migration of contaminants out of the system to be halted in the event of an emergency and will protect watercourses against spillages of chemicals or oils arising from accidents involving bulk tankers.

Modifications may include the de-silting of the ponds and removal of vegetation. The excavated silt will be required to be disposed of to a landfill site capable of taking Class C contaminated wastes, due to the level of metals identified from the surveys undertaken.

It is proposed that run-off from Drainage Area 1 is directed into the new Warwick Wold balancing pond which is proposed for the treatment of run-off from Junction 7. Provision for the volumes arising from Drainage Area 1 have been made in the design of that new balancing pond. The drainage system associated with Drainage Area 3A will be re-routed to discharge to one of the balancing ponds currently serving Junction 6.

5.3.8 Cultural Heritage

A study of geotechnical trial pits around Junction 6 was undertaken in December 1993. It is proposed that, prior to construction, further studies are undertaken of selected trial pits to ascertain whether the area of land likely to be affected by the widening proposals was disturbed during the original motorway construction. Trial trenching may then be undertaken in those areas where there is a good reason to expect archaeological remains to be present.

5.3.9 Community effects and recreation

As the widening scheme will not cause any new severance, no additional mitigation measures are proposed. The two bridges at Hogtrough Lane and Broomlands Lane both have 1.6m high equestrian parapets, these will not be altered.

In general, users of rights of way will benefit from mitigation measures such as the provision of porous asphalt, noise barriers and mounds, and improved or replacement planting.

5.3.10 Vehicle Travellers

The proposed mitigation measures for travellers using the motorway are aimed at improving driving conditions and reducing driver stress. These will include reduced congestion as a result of an additional lane, the provision of improved signing, and the introduction of road lighting.

5.3.11 Ecology and Nature Conservation

The proposed highway planting will replace some of that which is lost within the widening and provide equivalent habitats for wildlife. Specific habitat creation measures will include the following:

a) Woodland and scrub

Woodland will be created using a variety of locally native tree and shrub species and woodland herbs and grasses.
The inclusion of scrub within the landscape proposals will be an effective way of giving a natural edge to woodland, increasing its wildlife interest by providing additional structural diversity, varied microclimate and species diversity.

Woodland belts will be planted to link existing hedgerows and woodlands and provide continuity of habitats.

A review of the highway planting will include selective removal of alien species such as Sycamore.

b) Grassland

Where appropriate, sections of regraded verge and embankment will not be planted so that a wide diversity of different habitats is provided within the motorway corridor. This will permit natural colonisation by locally indigenous species in these areas.

c) Balancing Ponds

Works proposed for balancing ponds in the area will be undertaken, where feasible, using the following design principles:

- the margins shaped and contoured to provide a varied profile;
- the embankment gradients varied and including shallow edges to encourage marginal vegetation;
- security fencing and access points integrated with the design;
- over-deepened areas included to ensure that at least part of the pond will provide wetland habitat throughout the year;
- measures incorporated to ensure that good water quality is maintained.

These measures will partially mitigate the net loss of available wildlife habitat and will provide additional habitat diversity.

d) Badger Fencing

A review of mitigation measures with respect to badger-proof fencing will also be undertaken.

5.4 Mitigation of Construction Impacts

5.4.1 The following measures will be taken during the construction phase to limit potential physical impact, visual impact, noise and water pollution.

5.4.2 Control of Offsite Working Areas

Temporary working and storage areas which may be required for construction of the scheme cannot be accommodated within the highway boundary. The sensitive nature of the area, as the motorway is within Green Belt and AONB and is in close proximity to numerous sites of nature conservation interest, means that suitable sites are unlikely to be found adjacent to the motorway. Potentially suitable sites will be identified in consultation with the local authorities, prior to tender, and these will be notified to the Contractors.

5.4.3 Landscape and Visual Impact

The Contractor will be required to protect all trees, shrubs and ground flora which are to be retained, by the erection of a temporary fence, before commencing any construction activities in the area. A working margin of about 1 metre will be established between any engineering works and the vegetation to be retained. Where tree root severance is unavoidable, remedial measures will be undertaken by specialists to maintain the health and balance of the tree. The temporary fencing will be removed on completion of the engineering works.

5.4.4 Noise

A noise control system for the construction period will be agreed with local authorities as to the way in which work can be carried out, and in particular which plant or machinery can or cannot be used, the hours during which work can be carried out, and the level of noise which may be emitted.

The level of construction noise will vary along the works and throughout the duration of the works as they progress. Noise mitigation features will be in place at the beginning of the works where possible, and they will reduce construction noise effects as well as giving immediate relief from traffic noise.

5.4.5 Water Quality

Construction works can result in short term impacts on local receiving watercourses primarily from excavation activities and spillages of stored fuels. The installation of adequate mitigation measures will alleviate any potential for short term impacts, and these will include bunding of all oil, diesel or chemical storage tanks and drums, no storage of chemicals on excavated chalk areas, and the creation of a temporary drainage system involving ditches and balancing ponds for the entrapment of storm water run-off from the construction sites, in accordance with the requirements of the National Rivers Authority.

5.4.6 Ecology and Nature Conservation

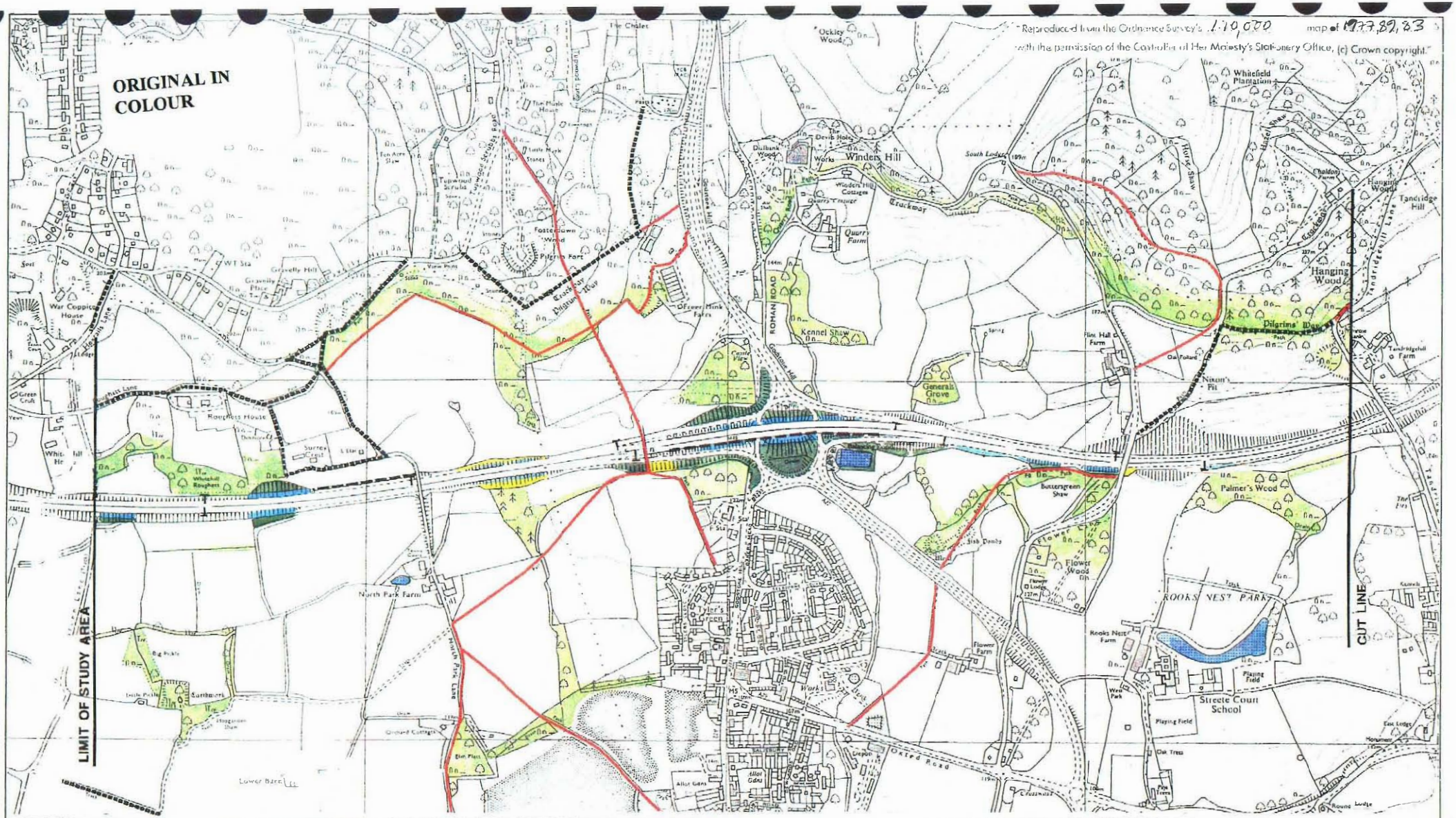
In order to ensure that the objective of minimising the impact of the widening proposals on ecology and nature conservation is achieved, the Contract documents will clearly place restrictions on the Contractor's activities and define measures to be taken to protect habitats and wildlife. These will include:-

- the timing of certain operations, such as clearing the works area of existing vegetation and trees;
- establishing "no go" areas for habitats to be retained and protected;
- measures to prevent pollution of watercourses;
- suppression of dust;
- prohibiting burning on site.

Strict supervision of the Contract by the Resident Engineer's staff, which will include a Landscape Clerk of Works experienced in ecological and nature conservation works, will ensure that the required degree of protection is achieved.

5.4.7 Traffic Management

It is intended that traffic management measures during construction will enable 3 traffic lanes to remain open in both directions apart from limited night-time closure. Where lane closures are necessary, these will be confined to off-peak periods thus avoiding the diversion of motorway traffic onto unsuitable local roads.

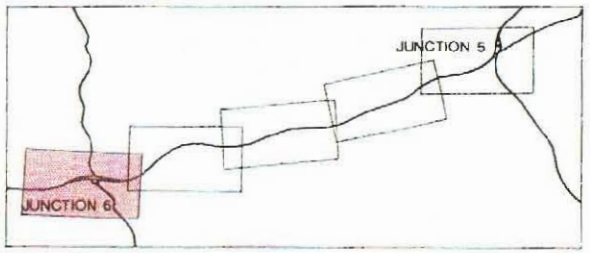


NOTES:

- Planting lost
- Well established planting retained within highway boundary
- Planting proposed within highway boundary
- Existing significant woodland outside highway boundary

STRUCTURES:

- Proposed noise barrier
- Gantries
- Existing public footpaths
- Existing public bridleways
- Claimed path
- Waterbodies



HIGHWAYS AGENCY

ATKINSONLIN AND PARTNERS

PARKMAN

RPS CLOUSTON

project
M25 JUNCTIONS 5 TO 7
WIDENING TO DUAL 4 LANES

title
LANDSCAPE PROPOSALS

date
April '94

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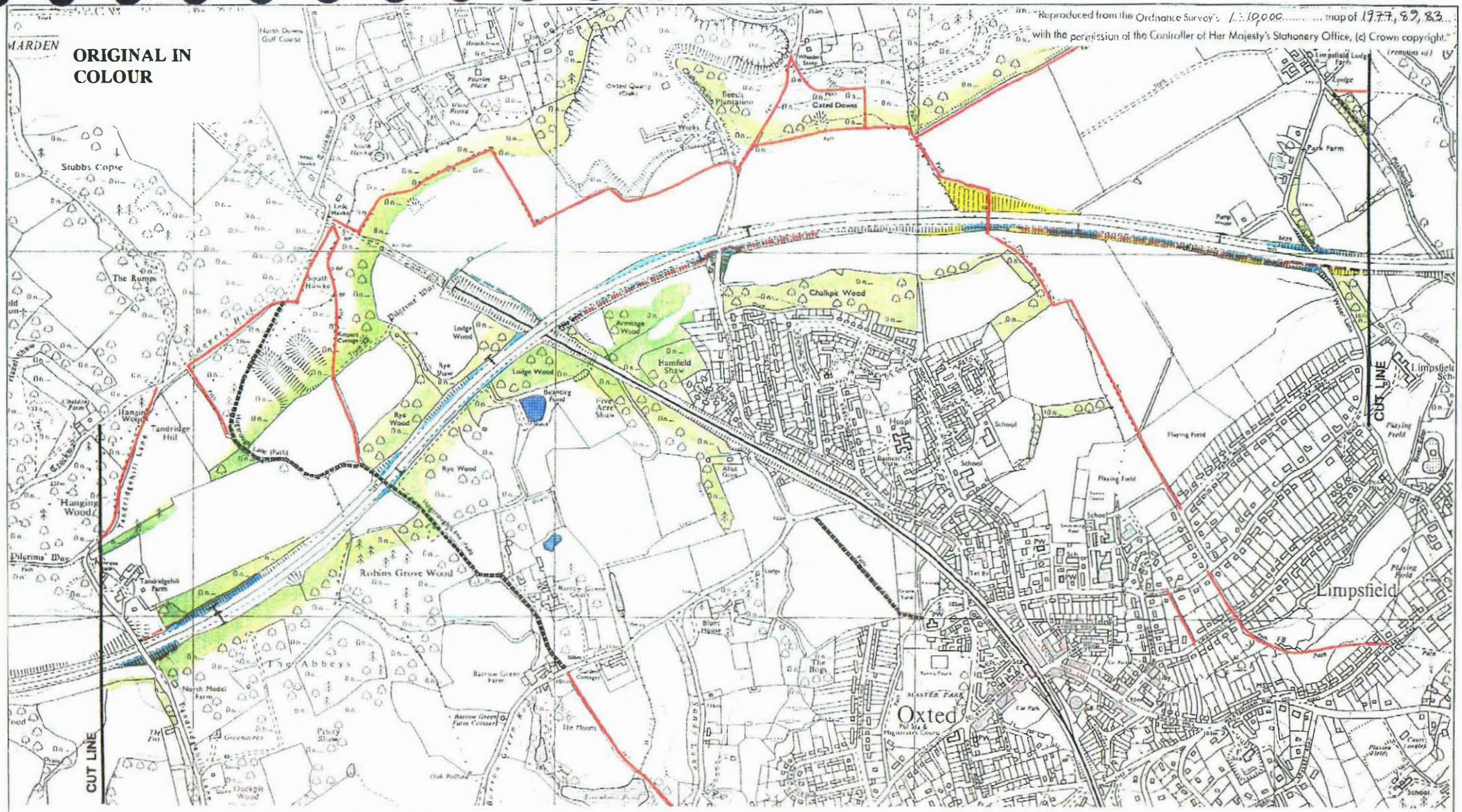

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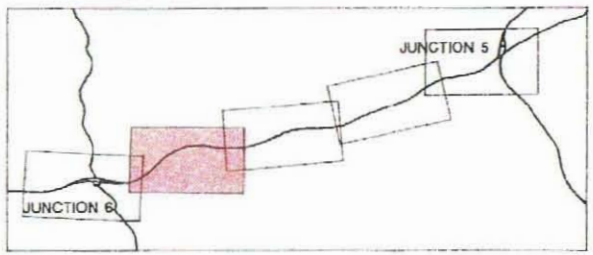

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

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LANDSCAPE PROPOSALS

date
April '94

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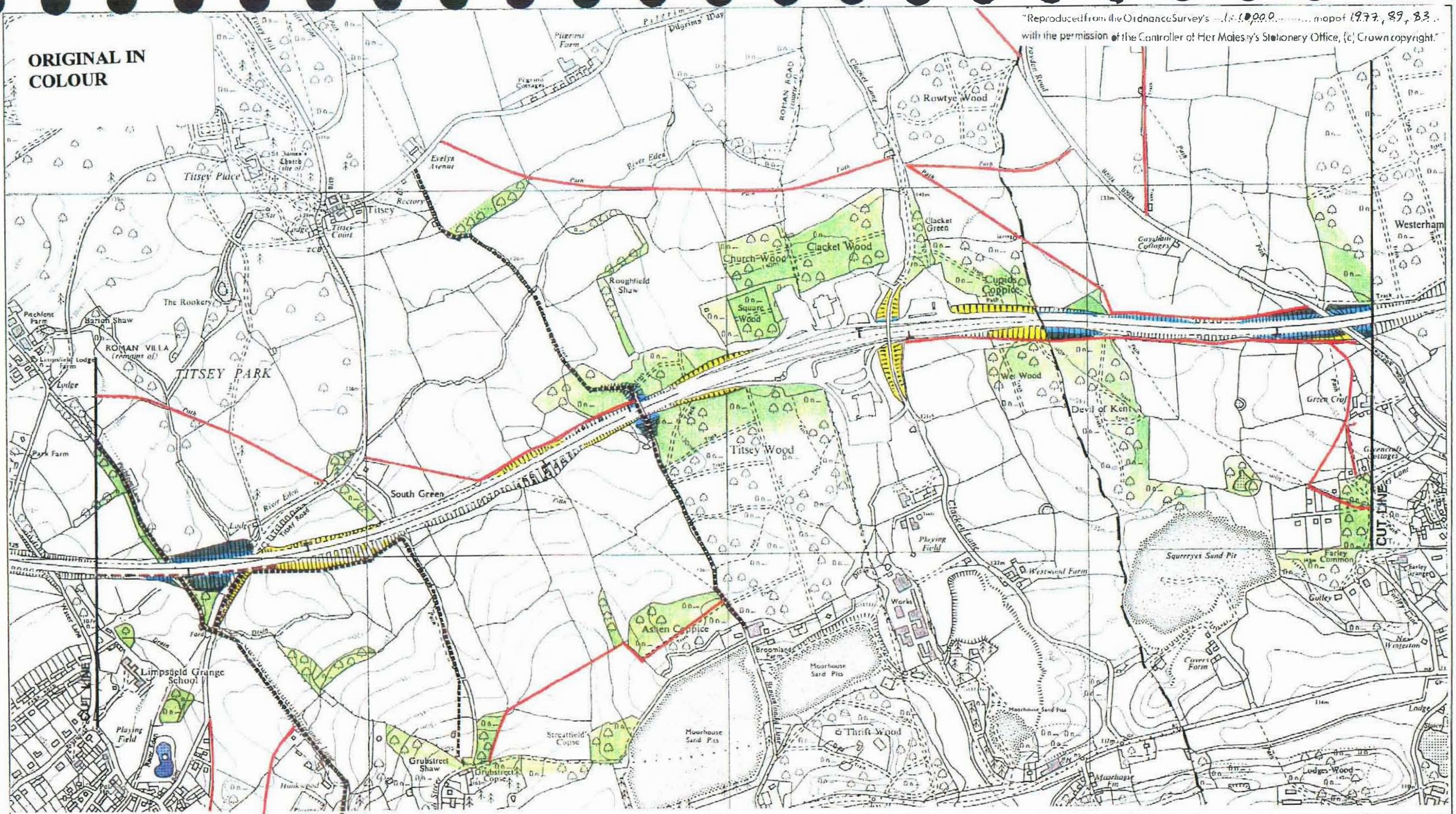
ORIGINAL IN COLOUR

"Reproduced from the Ordnance Survey's 1:10000 map of 1977, 89, 83 with the permission of the Controller of Her Majesty's Stationery Office, (c) Crown copyright."



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HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

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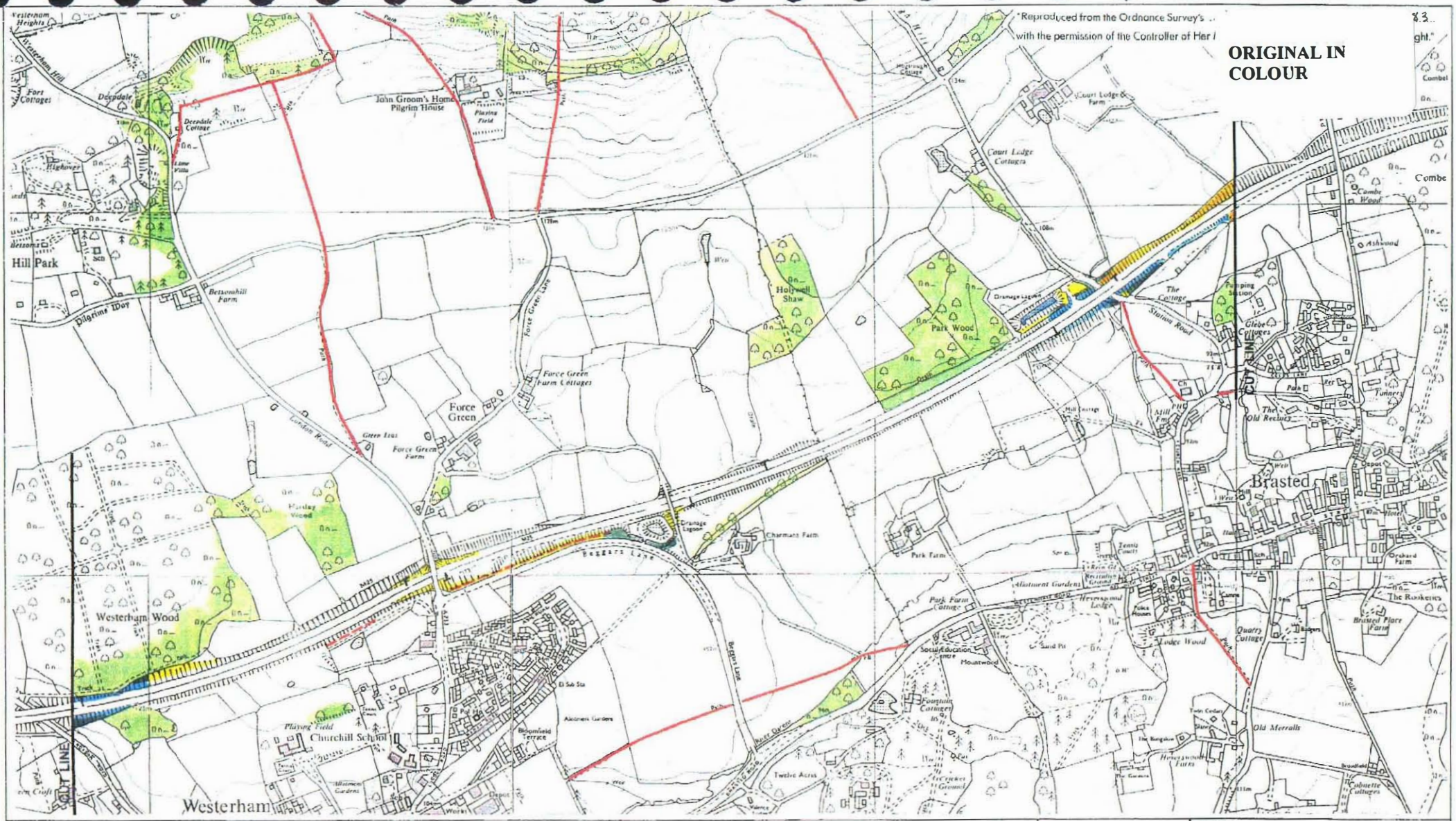

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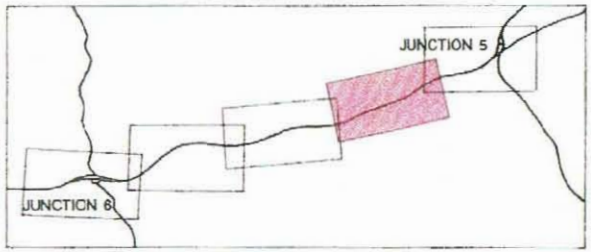

HIGHWAYS AGENCY

ATKINSODLIN AND PARTNERS

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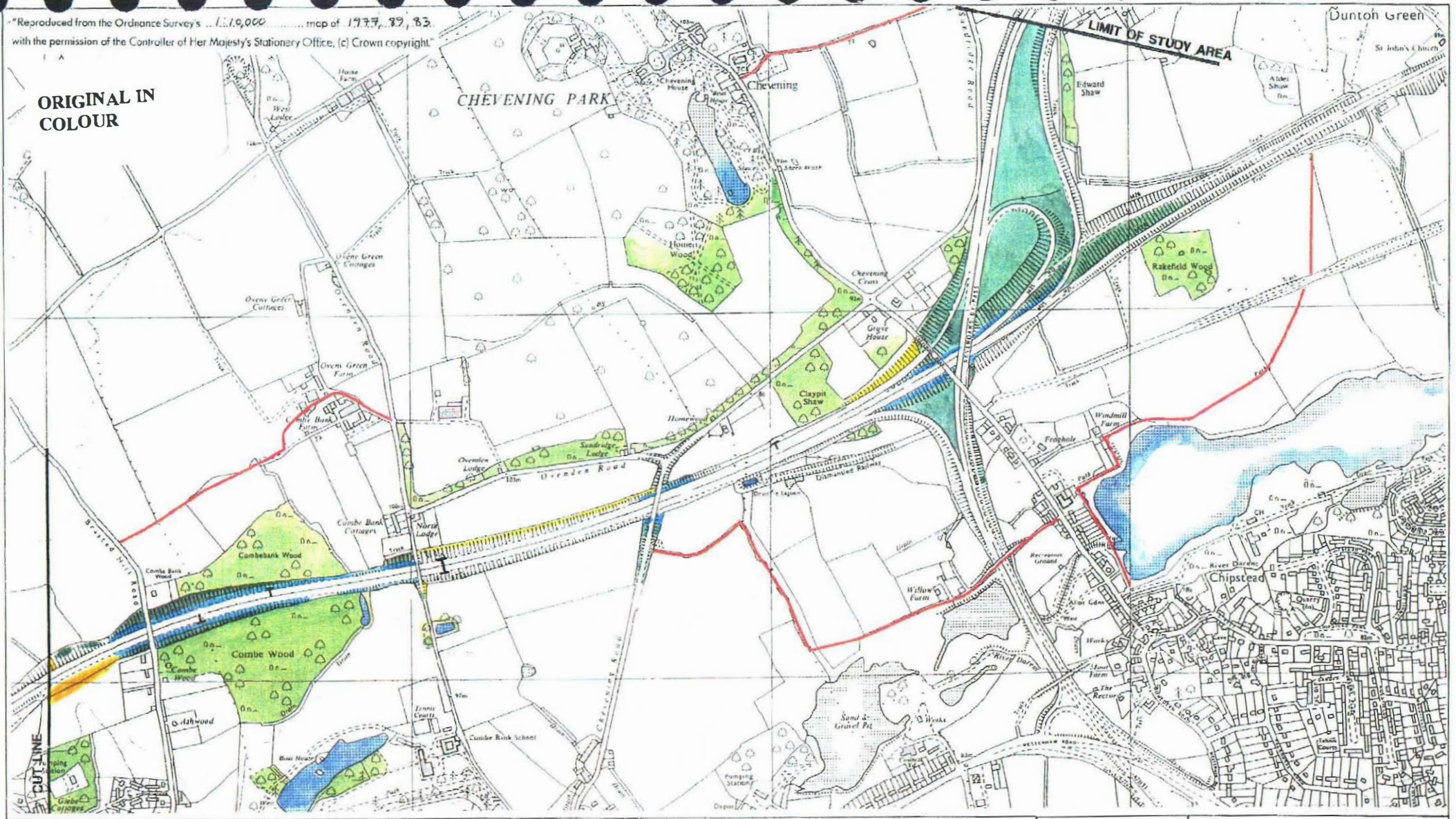

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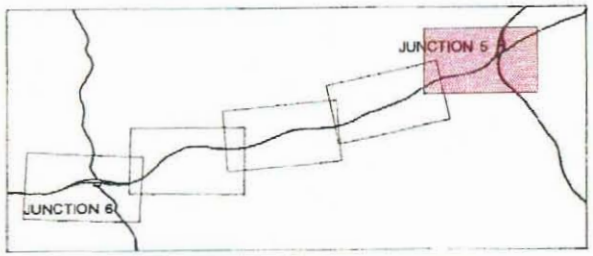

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project
M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

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April '94

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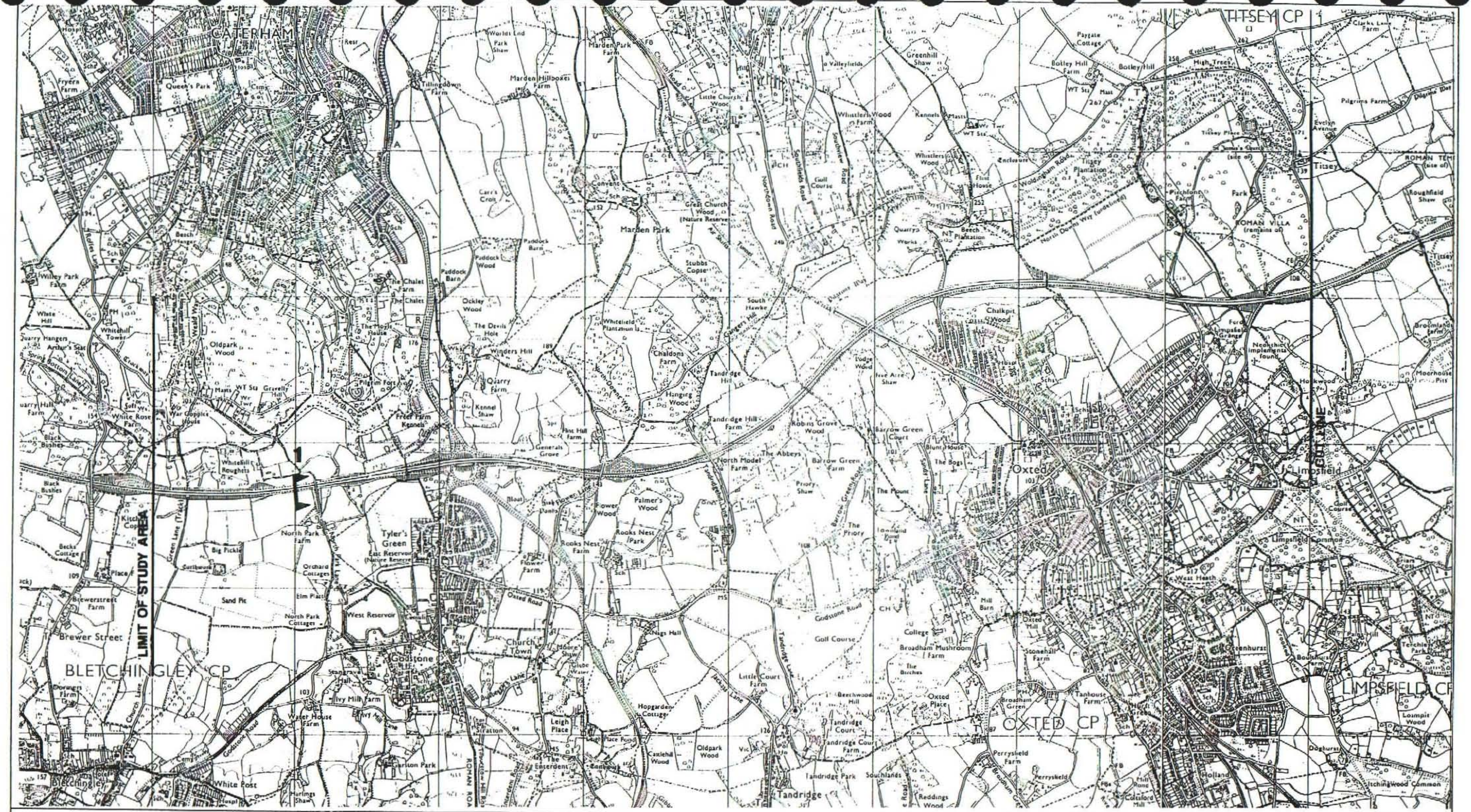
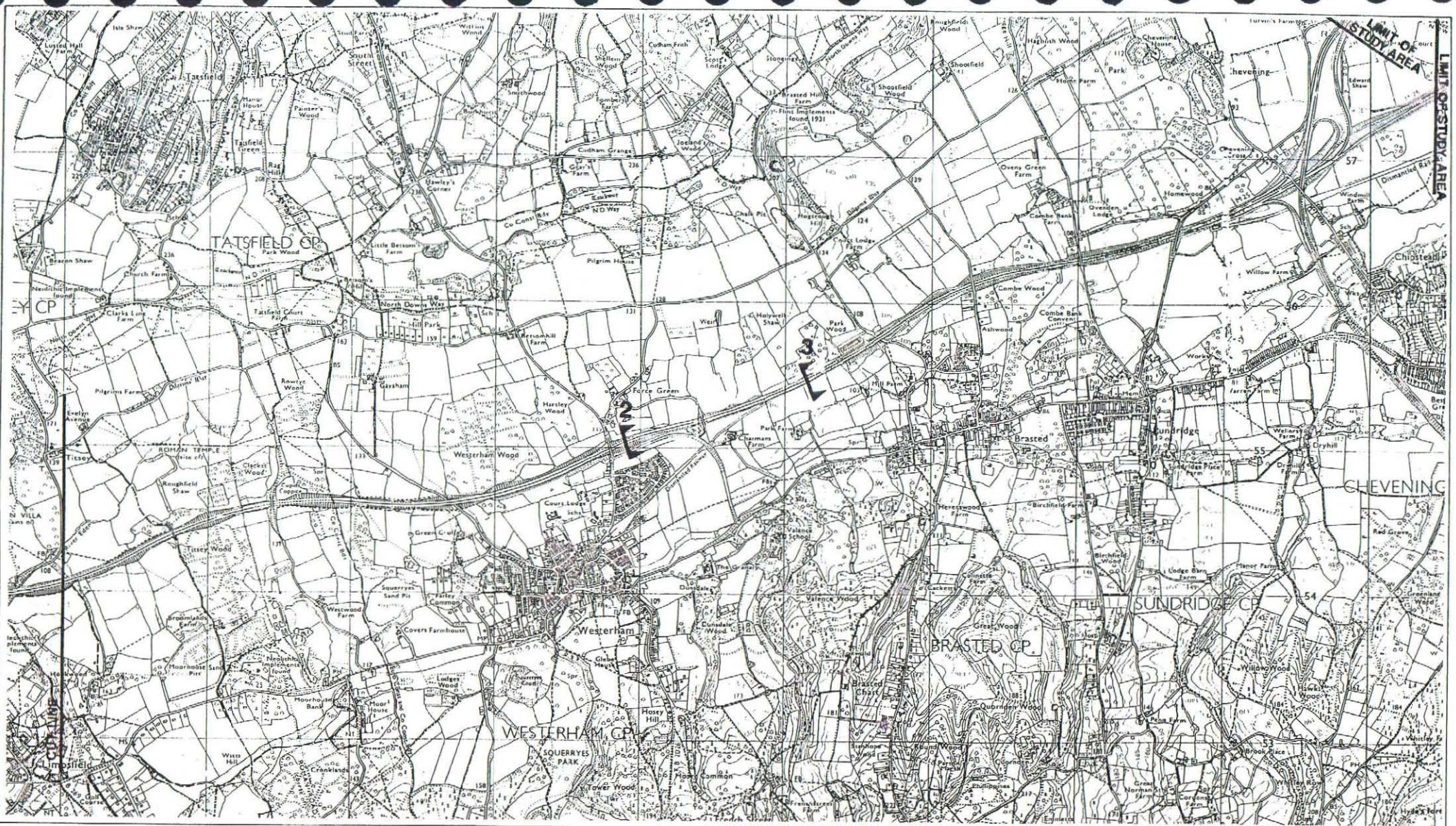


HIGHWAYS AGENCY	project M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES
ATKINS ODLIN AND PARTNERS	title SCHEMATIC SECTION LOCATION PLAN (Sheet 1 of 2)
PARKMAN	date: April '94 / drawn: Not to scale
RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY	N / fig.no. 5.2a



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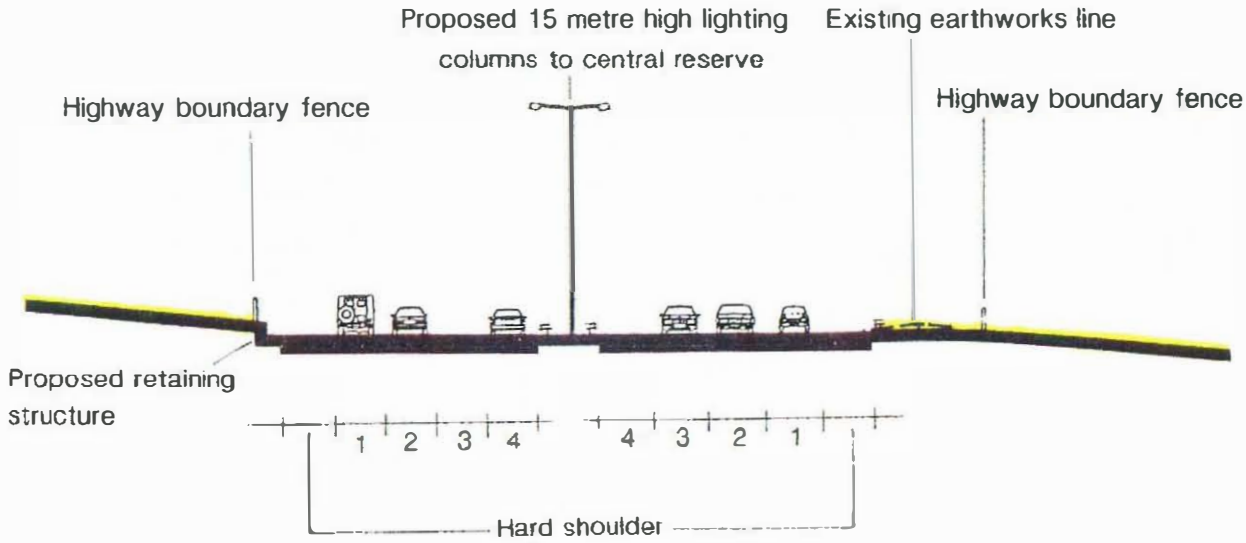
ATKINS ODLIN AND PARTNERS	title: SCHEMATIC SECTION LOCATION PLAN (Sheet 2 of 2)	
PARKMAN	date: April '94	drawn: Not to scale
RPS THE ENVIRONMENTAL CONSULTANCY	N	fig.no. 5.2b



Central Reserve = 4m

Lane 1 = 3.60m
Lane 2 = 3.65m } **14.6m**
Lane 3 = 3.60m
Lane 4 = 3.75m

Hard shoulder = 3.0m

Lane 1 = 3.60m
Lane 2 = 3.65m } **14.6m**
Lane 3 = 3.60m
Lane 4 = 3.75m

Hard shoulder = 3.3m

NOTES:

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

Project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

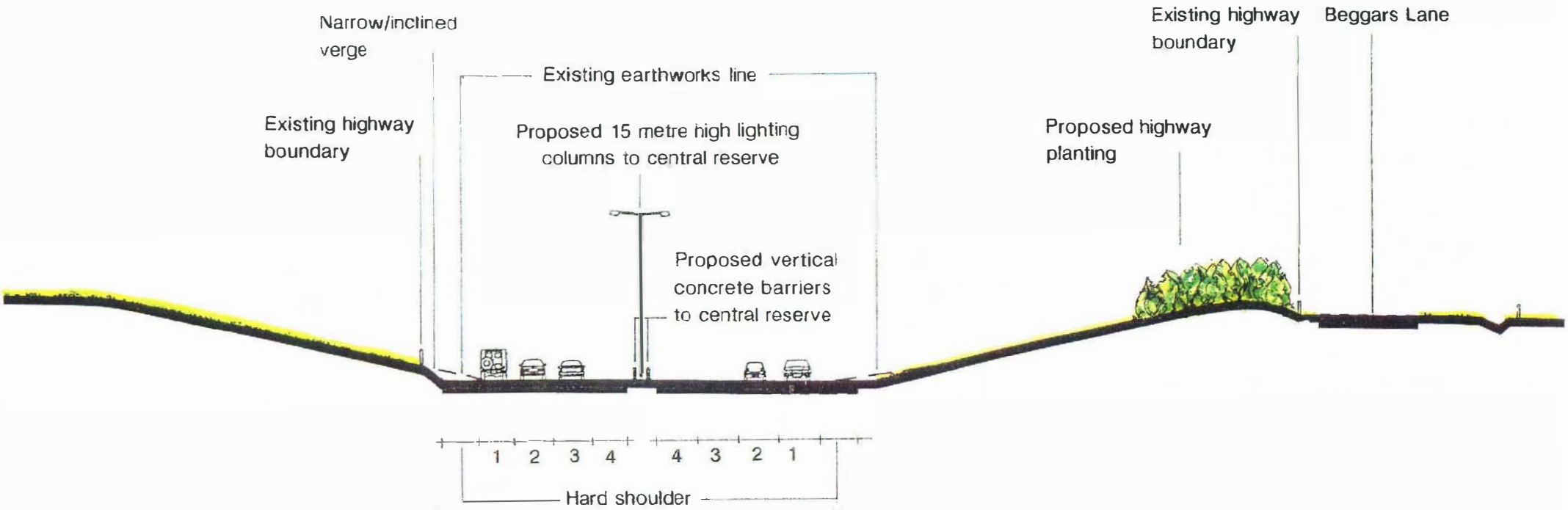
Title: **SCHEMATIC SECTION 1 CH 20700**

Date: **April '94**

Not to scale

N

Fig. No: **5.3a**



Central Reserve = 3m

Lane 1 = 3.60m
Lane 2 = 3.65m } **14.3m**
Lane 3 = 3.60m
Lane 4 = 3.45m

Hard shoulder = 3.0m

Lane 1 = 3.60m
Lane 2 = 3.65m } **14.6m**
Lane 3 = 3.60m
Lane 4 = 3.75m

Hard shoulder = 3.3m

NOTES:

N.B. Proposed retaining structure to be confirmed

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

Project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

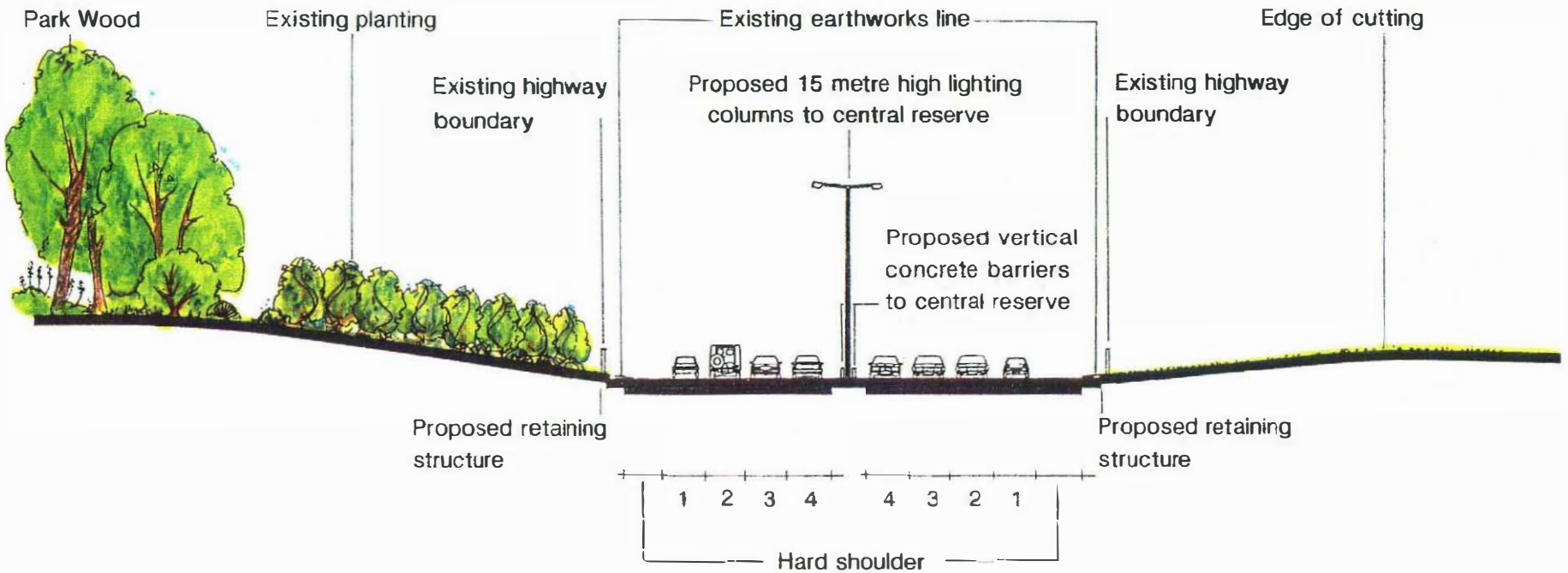
Title: **SCHEMATIC SECTION 2 CH 32350**

Date: **April '94**

Not to scale

N

Fig. No: **5.3b**



Central Reserve = 3.0m

Lane 1 = 3.60m	**Lane 1 = 3.60m**
Lane 2 = 3.65m } **14.3m**	**Lane 2 = 3.65m** } **14.3m**
Lane 3 = 3.60m	**Lane 3 = 3.60m**
Lane 4 = 3.45m	**Lane 4 = 3.45m**
Hard shoulder = 3.0m	**Hard shoulder = 3.0m**

NOTES:

HIGHWAYS AGENCY

ATKINS ODLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

Project: **M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES**

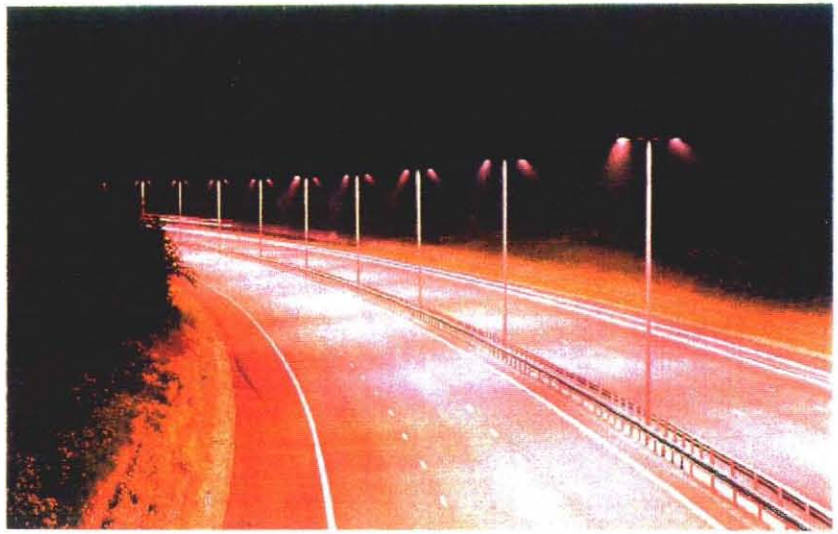
Title: **SCHEMATIC SECTION 3 CH 33430**

Date: **April '94**

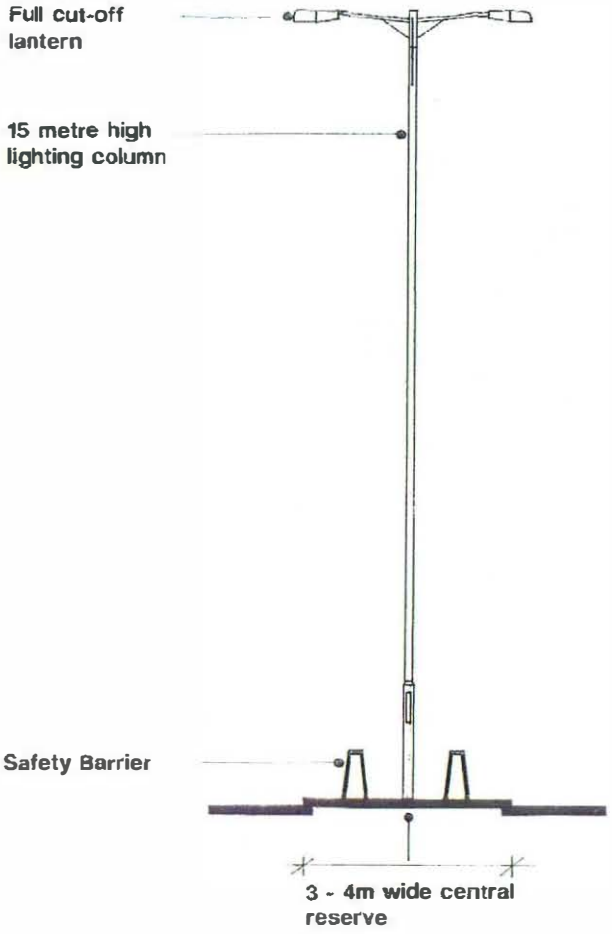
Not to scale

N

Fig. No: **5.3c**



TYPICAL GLARE REDUCING LIGHTING



TYPICAL CENTRAL RESERVE DETAIL WITH LIGHTING COLUMN

ORIGINAL IN COLOUR

HIGHWAYS AGENCY

ATKINS OOLIN AND PARTNERS

PARKMAN

RPS CLOUSTON THE ENVIRONMENTAL CONSULTANCY

project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

title: TYPICAL DETAIL - CENTRAL RESERVE WITH LIGHTING COLUMNS

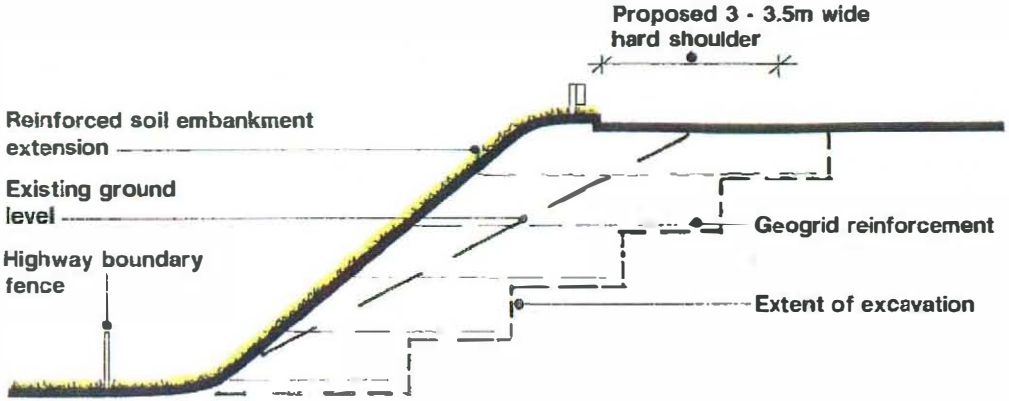
date: April '94

drawn:

Not to scale

fig.no. 5.4a

EXAMPLE OF EARTH GEOTEXTILE RETAINING WALL SYSTEM

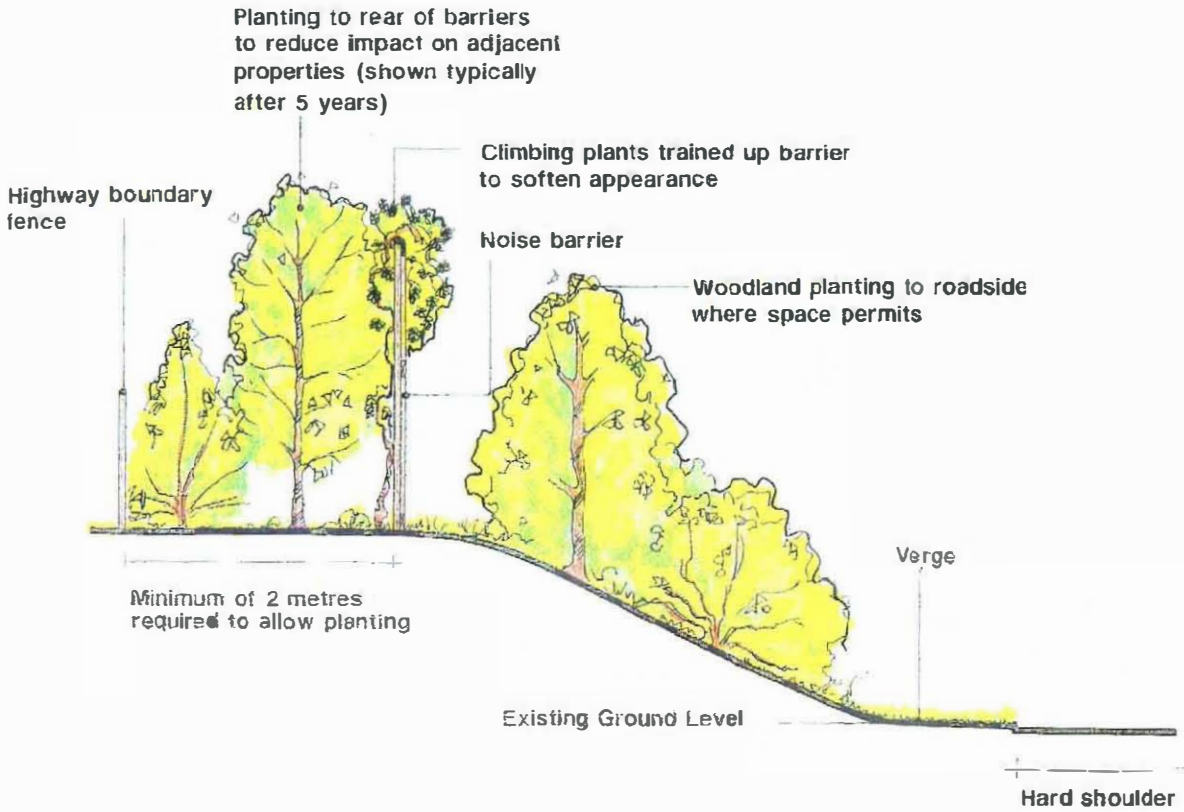


DETAIL SHOWING TYPICAL REINFORCEMENT FOR STEEPENED SLOPE

ORIGINAL IN COLOUR

HIGHWAYS AGENCY	project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES	
ATKINS ODLIN AND PARTNERS	title: TYPICAL DETAIL - REINFORCED SLOPE	
PARKMAN	date: April.'94	drawn:
RPS CLOUSTON THE ENVIRONMENTAL CONSULTANTS	Not to scale	fig.no. 5.4b

EXAMPLE OF ACOUSTIC BARRIER



DETAIL SHOWING ACOUSTIC BARRIER AND PLANTING

ORIGINAL IN COLOUR

HIGHWAYS AGENCY	project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES
ATKINS ODLIN AND PARTNERS	title: TYPICAL DETAIL - TIMBER ACOUSTIC BARRIER PROPOSED TREATMENT
PARKMAN	date: April.'94 / drawn:
RPS CLOUSTON	Not to scale / fig.no. 5.4c

6.0 THE ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Summary

The main environmental effects after installation of mitigation measures are:

- ***Geology, Topography, Land Use and Policies***
  There will be no change over and above the existing conditions.

- ***Landscape and Visual Impact***
  The impact of the addition of a fourth lane will be a minor effect, but the introduction of lighting and gantries will introduce a degree of urbanisation to a rural landscape of high quality. The daytime impact will in general be a minor long term effect minimised by the topography, vegetation and existing mitigation measures. The impact on views from the Pilgrims' Way will be a moderate long term effect, as will the night-time impact of introducing lighting into an unlit corridor.

- ***Noise and Vibration***
  The provision of noise mitigation measures will result in a moderate beneficial effect in the long term

- ***Air Quality***
  The emissions of all pollutants from vehicles are expected to be reduced in the opening year (1996) compared to those in 1993 due to the increased use of unleaded fuel, legislation related to emission controls, and improvements in engine technology. In the year 2011 the predicted concentrations of pollutant will also be below the relevant EC Mandatory limit values for either the existing or widened motorway. There will be no adverse effect on air quality as a result of widening.

- ***Water Quality and Drainage***
  The inclusion of new drainage measures within the proposals will improve the existing situation and result in a moderate beneficial effect in the short to medium term

- ***Soils***

  Any change in the levels and dispersal of pollutants resulting from widening will be a minor effect in the long term.

- ***Ecology and Nature Conservation***

  The loss of verge habitat is a minor long term effect. The introduction of lighting in an unlit corridor may have a moderate long term effect but no research has been carried out to verify such effects.

- ***Cultural Heritage***

  The proposal will have a minor effect on known archaeology. There may be some disturbance of archaeological remains contained in previously undisturbed deposits.

- ***Community Effect and Recreation***

  There will be no direct effects over and above the existing situation. There will be an increased visual impact on users of the rights of way network due to the introduction of lighting, but noise mitigation measures will be a moderate beneficial effect for users of those facilities.

- ***Vehicle Travellers***

  Widening of the motorway will not significantly affect the existing views from the road and should reduce levels of driver stress.

- ***Interaction of Effects***

  The combined effect upon the environment will be localised to areas within the highway boundary and will be insignificant in the long term.

- ***Construction Disturbance***

  There may be significant short term effects resulting from the location of the contractors depot and the increased congestion on the M25 during the construction period.

6.1 Introduction

6.1.1 In this section the environmental effects or impacts of the scheme are assessed using the following procedures:

a) examination of the receiving environment;
b) examination of the engineering proposals, including mitigation measures;
c) assessment of the potential impacts of the scheme, with the purpose of identifying the relative significance of each impact.

Impacts are defined in Article 3 of the EC Directive on the Assessment of Effects of Certain Public and Private Projects on the Environment (185/337/EEC) as:

"the direct and indirect effects of a project on the following factors:

- *human beings, fauna and flora;*
- *soil, water, air climate and landscape;*
- *the interaction between the factors mentioned in the first and seconds indents;*
- *material assets and the cultural heritage".*

With respect to the proposals for this scheme, the significance of the potential impacts have also been assessed in the context that if there are no improvements, there will be environmental degradation as a result of increased traffic flows on the motorway itself, and displacement of traffic on to the local road network.

6.1.2 Significance Criteria

On this basis, the impacts are taken as those that will occur as a result of widening over and above a "do nothing" of no widening but with increased traffic flows. The impacts are then divided into "beneficial" and "adverse" impacts with the degree of impact assessed as the predicted deviation from the baseline situation during construction and normal operating condition, and in the event of an accident which could be harmful to the environment.

Where possible, estimates of impacts are in measurable quantities against generally accepted standards, EC standards on water pollution and accepted World Health Organisation standards on air pollution, whereas other issues such as visual impact, have to be assessed more subjectively.

- **None** No significant effect

- **Minor** The effects are of low magnitude and frequency

- **Moderate** The effects may result in the relevant standards being exceeded. Moderate effects are likely to be of concern to local interests.

- **Significant** The effects are likely to be of a high magnitude and where standards apply they may be exceeded considerably. Concern over these effects would be of local and/or regional importance.

- **Severe** The effects would be of a very high magnitude and, where standards apply, they would be exceeded considerably with concern being of regional and/or national importance.

6.1.3 **Time Scale**

The impacts of the proposed widening on the environment may be non-existent or only last for a short duration after the construction period. At the other extreme, they could be of a permanent nature. Unless otherwise stated, the following definitions of time scale have been used:-

- **short term** effects will be of short duration and mitigated soon after the completion of the widening, say 2 to 4 years from the commencement of work.

- **medium term** effects will take longer to mitigate, for example until the planting has successfully matured, say 10 to 15 years after planting.

- **long term** permanent effect which will not be fully mitigated by the proposed planting and other measures.

6.1.4 The environmental impacts of the widening proposal are summarised in Appendix A, Environmental Impact Tables, and compared both with the existing conditions and the situation in the future if the motorway is not widened.

6.2 Geology, Topography and Land Use

6.2.1 Geology and Topography

There will be no change to the existing topography and geological features outside the highway boundary, but there may be some indirect effects from local extraction of minerals for construction purposes, and disposal of wastes. The location of these activities will be determined by the contractor in discussion with the local planning authority.

6.2.2 Land Use

a) Rural Land Uses

As the engineering works are to be carried out within the highway boundaries, there will be no landtake or physical impact on agricultural holdings, woodlands, parkland or significant tree belts. The potential impacts of construction works are discussed in 6.14.

b) Urban Areas

Landtake and property severance will not occur. There will be an increased visual impact on urban areas as a result of the introduction of lighting columns. The effect of lighting is considered in more detail in section 6.4.

There will be a moderate adverse visual impact in the short to medium term where widening requires the removal of existing planting. The overall effect on adjacent land uses in the corridor will be *minor*.

6.3 Policies and Plans

6.3.1 Transport

The proposal to widen the M25 between Junctions 5 and 7 accords with the following:

- Central Government policy to reduce congestion on the strategic trunk road network and to protect and improve the environment as defined in "Trunk Roads in England 1994 Review" (DoT, March 1994) and **PPG 13** on Transport.

- The Structure Plans of Surrey County Council and Kent County Council, in which there are objectives to retain and improve the existing road network which includes the M25.

6.3.2 **Environmental Planning Policies**

The proposed widening does not conflict with policies relating to the blanket designation of the Metropolitan Green Belt and Area of Outstanding Natural Beauty. There is some conflict with specific policies relating to loss of existing planting and the effect of lighting in a high quality landscape. The relevant district councils do not comment specifically on the proposed widening within published planning policy documents.

There will be no loss of properties, land or physical effect on any site where a planning application has either been submitted or approved.

6.4 Landscape and Visual Impact

6.4.1 Widening to Dual 4 lanes will have four potentially adverse impacts on the surrounding landscape:

a) the removal of existing vegetation within the highway boundaries;

b) the extension of the lighting provision and increased numbers of signs and gantries;

c) the deterioration of landscape character in an AONB;

d) visual impact on settlements and the Pilgrims' Way.

6.4.2 **Vegetation**

Of a total area of approximately 10.7 ha of established vegetation, approximately 3.4 ha will require removal at specific locations within the highway boundaries, although 7.3 ha will still be retained. This will result in an increase in visual intrusion, in particular where existing planting is providing significant screening. This is a *moderate effect in the short to medium term* until new planting has become established.

It is proposed to plant approximately 10.7 ha of new and replacement planting which in the long term will be beneficial and is a net gain of 7.3 ha. Elsewhere in the corridor offsite vegetation provides significant screening for the motorway and will not be affected by the widening proposals. There are opportunities to increase the extent of offsite planting by agreement where this would be of benefit.

6.4.3 Landscape Character/Quality

As described at section 4.4, the motorway is within an area of high landscape quality which, by virtue of its topography, ecological and historic associations, is designated as an Area of Outstanding Natural Beauty.

The landscape character and quality of the area has already been altered by the presence of the motorway. The topography and pattern of landcover is generally medium to large in scale. The addition of a fourth lane and loss of vegetation within the highway will not significantly alter the character of the surrounding countryside.

Of greater potential impact is the introduction of lighting and additional gantries. In the daytime these features will introduce increased urbanisation in a predominantly rural area and at night-time will introduce a lit corridor into a "dark" landscape. The cumulative impact of these changes will have a *moderate long term adverse effect* on the landscape.

6.4.4 Visual Impact

An assessment of the impact of widening and the introduction of lighting and gantries is considered in greater detail in the Volume II Specialist Report, 1. Landscape and Visual Impact, and is summarised below.

a) Visual Envelope

Figure 4.7 illustrates the increase in the visual envelope of the motorway principally arising from the introduction of lighting.

The increase in the extent of the visual envelope is related to:

- the height of the lighting columns and signs;

- the visual containment provided by the North Downs escarpment and, to a lesser extent, the Greensand ridge;
- the shielding effect of properties on the edge of Godstone, Oxted and Westerham;
- the effectiveness of existing bunding and planting around Junction 6;
- the low density of housing outside the main settlements;
- the screening effect of existing woods and hedgerows.

In general, the impact of the addition of a fourth lane will be at most a *minor effect in the short to medium term.* The motorway is already present in the landscape and any increase in visual intrusion will be due to the short term loss of existing mitigation measures, i.e. landscape planting. This will be replaced in the medium term. Of greater potential impact is the introduction of lighting and additional gantries. These are discussed in greater detail below.

b) Near Views

Daytime

The effect on landscape and views varies throughout the length of the scheme. There are localised areas where the effect will be *substantial* such as along the Pilgrims' Way north of Oxted. However, the existing topography and vegetation will reduce the daytime effect to a significant degree and there will be relatively few skyline views of the proposed lighting and signs. The principal settlements are predominantly to the south of the motorway and the effect on daytime views of the columns is reduced by the backdrop of the Chalk escarpment.

Localised views will be possible at the following locations:

- the edge of Godstone
- isolated farms at Flower Lane
- Northern part of Oxted
- Titsey
- The edges of Westerham

Overall this will be a *moderate long term effect.*

Night-time Views

The study area is through a "dark" landscape. Therefore, the addition of lighting will result in a significant change to night-time views.

The areas of greatest impact are likely to be at Westerham and Oxted where false cuttings and bunds screen the headlamps of existing traffic. There will also be significant localised effects from elevated sections of the motorway at:

- Junction 6
- Westerham
- Brasted
- Green Park Lodge, Titsey

Overall this will be a *moderate long term effect.*

c) Distant Views

Daytime

In most instances the effect of the lighting columns on long views is mitigated by the backcloth effect of topography and vegetation. In distant views, the daytime impact will differ very little from the existing situation. Properties along the Greensand ridge which have a view of the road at present may also have views of the lighting columns, but the additional impact will be minor, seen against the back drop of the Chalk escarpment in the north. Overall this will be a *minor long term effect.*

The Pilgrims' Way, and properties along it, may have views of lighting columns but these will be seen against vegetation or higher land of the Greensand ridge to the south. The Pilgrims' Way is also at a higher level than the motorway, thus reducing the potential for skyline views of the columns. However, the Pilgrims' Way is an historic and well used right of way, and the visual intrusion of the lighting columns will significantly change the character of views to the south and result in a *moderate long term effect.*

Night-time

Distant views of the M25 from the south and north are of a dark landscape throughout the majority of the study area. Lighting at Junction 5 and 6 is visible over a limited distance. The addition of highway lighting will not significantly increase the level of existing visual impact in these areas. Elsewhere motorway lighting will be a new and intrusive feature in the landscape. However views from elevated land, especially to the north, will be above the

lanterns, and the use of full cut-off will shield views of the luminaires from those locations. Overall the distant night-time impact is a *minor long term effect.*

6.5 Noise and Vibration

6.5.1 The assessment undertaken in the Volume II Specialist Report, 4. Noise, has shown that implementation of the scheme will have beneficial effects for traffic noise and vibration in some parts of the Kent section of the scheme. This is due to the provision of porous asphalt which will decrease noise levels over the 15 year design life at 4dB(A) which is equivalent to more than halving the traffic volume on the motorway.

6.5.2 Elsewhere on the Kent section and on the Surrey section of the scheme, traffic noise levels are expected to increase by 1-2 dB(A) over the design life period. This will be mitigated by maintaining the existing barriers and by the provision of noise fences over the raised section of motorway through Junction 6 and also immediately to the west of North Park Farm access bridge. However, several properties will still qualify for noise insulation under the Noise Insulation Regulations 1975 (amended 1988). This is due to their scattered nature and the associated impracticalities in providing large scale mitigation for individual isolated properties. An estimated 18 residential properties will qualify for insulation. Overall these effects will be of *moderate benefit in the long term.*

6.6 Air Quality and Climate

6.6.1 The emissions of pollutants from vehicles on this section of the M25 in the opening year (1996) are expected to be reduced compared to those in 1993 due to the increased use of unleaded fuel, legislation related to emission controls, and improvements in engine technology. The pollutants evaluated include carbon monoxide (CO), total hydrocarbons (THC) and nitrogen dioxide (NO_2). The predicted levels of pollution for the base year (1993), and 1996 and 2011 for the existing and widened motorway are assessed in detail in the Volume II Specialist Report, 5. Air Quality.

6.6.2 The results show that the health effect of both carbon monoxide and THC is minimal for this stretch of motorway. The predicted levels for both pollutants are less for the dual 4 lane widening than the dual 3 lane existing motorway. No mandatory limits or guideline values are exceeded.

6.6.3 All receptors are predicted to meet the EC limit value for nitrogen dioxide in 1993 and for both the dual 3 lane motorway and the dual 4 lane widening in 1996. The predicted concentrations of pollutants in 2011 are below the EC mandatory limit of 105 ppb for both scenarios. Consequently there is no adverse effect on the air quality as a result of widening the motorway.

6.6.4 With respect to climatic effects, the main pollutant of concern is carbon dioxide due to its link with global warming. The difference between the concentration of carbon dioxide from the dual 3 lane motorway and the dual 4 lane widening is not an issue because traffic volumes will remain unaffected.

6.7 Water Quality and Drainage

6.7.1 It is estimated that by the year 2011, there will be up to a 57% increase in traffic on the M25, regardless of whether widening occurs. Calculations based on the "worst case" scenario where no widening is carried out reveal a significant increase in the concentration of contaminants in the road run-off. This would result in a *potentially significant effect* on the receiving water courses far greater than currently exists.

6.7.2 The widening of the M25 will result in the laying of a proportion of new enclosed drainage pipes for road run-off from the motorway. This will eliminate any existing problems associated with migration of contaminants into the underlying aquifer and provide greater control over the motorway run-off drainage routes, and of discharge, and therefore mitigate the impacts on receiving watercourses by ensuring that only a given volume of water is discharged at any one location. This will be a *moderate beneficial effect in the short to medium term.*

6.7.3 The "worst case" scenario assessed for widening of the M25, reveals that contaminant concentrations will increase by approximately 30% above the "calculated" predicted levels. A 'plug' of contaminants could, if unmitigated, therefore enter receiving watercourses during the initial period of a storm event. The "worst case" situation will arise when maximum flows from the hardstanding area are discharged into a watercourse at low flow, i.e. a short term storm event following a prolonged dry period.

In addition, the increase in volumes of water arising from the increased area of hardstanding will lead to a significant rise in the volumes of road run-off. If unmitigated, this could result

in the increased possibility of downstream flooding which is significant given the existing sensitivity of the area to flooding.

The potential adverse effects associated with the widening of the road will, therefore, be associated with the possibility of flooding in adjacent areas during storm events, in particular during the 1 in 50 year storm event, and the duration of contaminated water entering the receiving water courses. The increased volumes of motorway run-off arising from heavy rainfall following a dry period would result in a longer exposure time of aquatic biota to contaminants. Many of the contaminants are toxic to aquatic biota at the concentrations calculated, and the longer exposure time will result in a *potentially moderate effect*.

These effects will be mitigated by the incorporation of balancing ponds, with oil/grit interceptors, in all drainage areas. This is a *moderate beneficial effect in the short to medium term.*

6.8 Soils

6.8.1 The widening of the motorway will mean traffic will come approximately 3.5 metres closer to the motorway boundary. Increasing vehicle speed, as a result of reduced congestion, will raise the height and increase the distance to which spray during wet weather and particulates during dry conditions will travel. These factors will mean that less pollutants will be deposited on the carriageways and hard shoulder, and more on the motorway verge and possibly outside the motorway boundary.

6.8.2 Lead and Cadmium

The chemical and physical characteristics of the topsoils within and adjacent to the motorway boundary favour the absorption of lead and cadmium. This will mean that most of the lead and cadmium entering the soil profile will be retained, rather than leached out in drainage water (although certainly some will be leached and/or redistributed by the soil flora and fauna). Absorption of contaminants within the soil will mean that lead and cadmium will not be readily absorbed by plants and be less likely to enter the food chain.

Widening of the motorway is likely to have minimal effect on the amount of lead entering the soil. This is because lead emissions are largely unaffected by vehicle speeds. Although the proposals will bring vehicles approximately 3.5 metres closer to the motorway boundary,

which may mean that lead could contaminate new areas, this will have a *minor short term effect* on flora and fauna since legislation recently introduced dictates that from 1993 all new cars will have to use unleaded fuel.

Increased speed will lead to changes in the wear and tear of vehicle components and may lead to an increase in cadmium entering the soil. Again because the vehicles are closer to the motorway boundary new areas may become contaminated.

Since there are no definitive figures on the amount of cadmium entering soils from vehicle pollution (or indeed from other sources of pollution), no firm conclusions can be made on the quantity of cadmium which may enter the soil annually once the motorway is widened. Any rise in cadmium levels will be mainly on land within the highway boundaries, and levels are sufficiently low that Government guideline values will not be exceeded. Any rise in cadmium levels is likely *to be a minor effect in the long term.*

6.8.3 Chloride

Measured chloride levels were low and not a problem to plant growth. The future amount of salt applied will not change significantly and any damage to plants is likely to be localised to areas close to the hard shoulder. For chloride it is likely that the proposals will have *no significant effects* on the soils outside the motorway boundary and will only have a *minor effects* on plants and soils within the motorway boundary.

6.9 Ecology and Nature Conservation

6.9.1 The main ecological impact will be the removal of the motorway verge vegetation. As identified in the Volume II Specialist Report, 2 Ecology Survey, the majority of this is anthropogenic and of low species diversity. As a habitat, it has some value as a corridor for wildlife by linking the semi-natural habitats adjoining the road, but this value is limited by existing severance caused by Clacket Lane Motorway Service Area and by roads passing under and over the motorway. Widening will result in the loss of 13.6 ha of verge (including planting) north and south of the road. This will be a *minor long term effect.*

6.9.2 There is also the potential impact of disturbance of nesting birds in vegetation on the motorway verge. As stated at 5.4.6, provisions in the Contract will be included to ensure that

any vegetation likely to provide habitat for nesting birds, which is to be removed in the scheme, is cut outside the nesting season ie. from August to February.

6.9.3 Potential indirect impacts, which may result even if widening is undertaken within existing landtake, include:

a) impacts on watertables which may affect existing valuable woodlands and waterbodies adjacent to the motorway. There is no evidence that there is any impact at present and this situation is unlikely to change as a result of road widening;

b) noise disturbance and air pollution (dealt with in other sections) may affect the ecology of the broader countryside. In general, there will already be impacts as a result of the existing highway and these will not appreciably be increased by the road widening proposals;

c) colonisation of ecologically valuable sites by alien species introduced within the highway planting. This has already occurred in the case of Sycamore which has colonised ancient woodlands. Using locally indigenous species in future highway planting proposals will minimise the extent of this occurring after widening;

d) disturbance from the introduction of lighting may adversely affect faunal activity in the motorway corridor. There is some evidence that bird populations (e.g. waders) alter their feeding behaviour in lit situations, but there is limited available documentation about other known impacts. Possible impacts include:

- birds may be discouraged from roosting in vegetation adjacent to the road;
- the exposure of birds and small mammals (such as dormice) to predators may be increased;
- the physical obstruction caused by lighting columns may reduce feeding success of birds in fields adjacent to the motorway as it is known that birds do not like feeding in areas where they are less able to view approaching predators;

- the mortality of night flying invertebrates may increase as a result of attraction to the lighting.

It is thought likely that lighting will have a *moderate long term effect* over and above the existing disturbance caused by car lights, though it should be remembered that this area has low night-time levels at present. However, lighting in the central reserve with full cut off luminaires will minimise light spillage over adjacent land.

6.9.4 Badger activity in the motorway corridor has been identified but no existing badger tunnels or fencing have been discovered. It is not known whether there is a high incidence of road casualties in the corridor, but due to the extent of badger activity in the area it is proposed to establish badger fencing along some sectors of the study area.

6.10 Cultural Heritage

6.10.1 The desk study undertaken in 1991 and updated in 1993 has highlighted the fact that the archaeology of the area through which the road passes is not fully understood, although the impact can be reasonably assessed for most of the scheme.

6.10.2 The proposal will have a *minor effect* on the known archaeology, since all of the work will be confined to the existing road corridor. A preliminary site inspection has identified areas where undisturbed ground surfaces may remain intact and widening proposals may have a greater effect. These areas are as follows:

- widening of the carriageway at approximately the same level as the surrounding land;
- widening the carriageway onto embankments under which archaeological deposits could be disturbed by additional construction;
- introduction of retaining walls, the footings of which may affect previously undisturbed sediments.

6.10.3 Monitoring of trial pits in those areas where the impact is unclear should provide sufficient information to assess any potential impacts more fully, and provide opportunities to investigate significant finds.

6.10.4 There will be no direct physical impacts on listed buildings in the corridor and with agreed mitigation measures in place there will be *no significant effects* over and above the existing situation on the settings of these buildings.

6.11 Community Effects and Recreation

6.11.1 Community Severance

There will be no additional severance of roads, public rights of way, facilities or open spaces after the widening. Consequently there will be no community severance.

6.11.2 Users of Facilities

There will be an increased visual impact on users of the rights of way network due to the introduction of lighting and gantries, although this will be minimised by the existing mitigating measures as discussed in section 6.4

There will be benefits resulting in a reduction of noise for Fawley Common Churchill School, Combe Bank School and Park, Valence School and Mountwood Social Education Centre.

6.12 Vehicle Travellers

6.12.1 View from the Road

The definitions used for the view from the widened motorway are the same as used in sub-section 4.13.1 for the existing situation, namely:

- **No View:** Road in deep cutting or contained by earth mounds, environmental barriers or adjacent structures.
- **Restricted View:** Frequent cuttings or structures blocking the view.
- **Intermittent View:** Road generally at ground level with shallow cuttings or barriers at intervals.

- **Open Views:** View extending over many miles, or only restricted by existing landscape features.

In any assessment of the change of view from the road it has to be noted that any perceived impacts on the driver have to be balanced with the effect on amenity of local residents and users of the rights of way network.

Widening of the motorway will not significantly alter the view from the road apart from the length of the road at Junction 6, between the eastbound and westbound slip road, over the roundabout, where the view to the south will be obstructed by the proposed noise barrier.

6.12.2 Driver Stress

Driver stress is made up of three main components:-

- Frustration - caused by being unable to drive at the desired speed due to congestion.
- Fear of Accidents - related mainly to high speeds in dense traffic with a high proportion of heavy vehicles. Poor weather conditions make this situation worse.
- Uncertainty of the route to follow caused mainly by inadequate signing. This should not normally be a problem on motorways.

Table 6.1 shows predicted average peak hour speeds at opening year 1995 and design year 2011. The assessments of driver stress are based on these figures.

Table 6.1 - Driver Stress

Year	Motorway Layout	Average Peak Hour Speed	Stress Level
1995	2 x 3 lanes (as existing)	80 kph	High
2011	2 x 3 lanes (as existing)	45-50 kph	High
2011	2 x 4 lanes (as proposed)	100 kph	High

Frustration should be reduced to an extent due to the higher average speeds predicted, although this will lead to a greater fear of accidents.

The improved signing which should result from replacing the existing side mounted direction signs by gantry signs and adding enhanced message sign gantries at intervals to give more detailed information on sources of delays, etc. should reduce route uncertainty.

The combined effect of these three components is likely to result in high stress levels as shown in Table 6.1. As can be seen, the combined change in the levels of the three stress components are only relative, as the high traffic flows present in all peak hour situations mean that driver stress levels are likely to remain high. There will be no change over the existing situation.

6.13 Interaction of Effects

6.13.1 As defined by Article 3 of the EC Directive, the direct and indirect effects of a project have also to be assessed with respect to the interaction of factors under consideration. It should be noted that for this study, although the effect on flora and fauna of individual pollutants in air, water and soil can be predicted with some confidence, the combined effects of pollutants in the environment (air, water and soil) is less obvious.

6.13.2 The predicted interaction of pollutants in air, water and soils, and their effect on flora and fauna as a result of the proposed scheme, are indicated in figure 6.1. In summary an increase in traffic volumes and vehicle speed will mean an increase in the take up of pollutants by flora and fauna. Although the motorway will come closer to areas outside the motorway boundaries, the main effects on the environment will remain localised to areas within the highway boundaries. This is a *minor long term effect.*

6.14 Construction Disturbance

6.14.1 Construction could start in Summer 1995 and last for about eighteen months. Throughout the construction period the motorway will be open to traffic. It is intended to keep three traffic lanes open in each direction during peak hours and, where lane closures are necessary, these will be confined to off-peak periods. Advance warning of construction works will be provided. Diversion routes, agreed in advance with the police and local highway authorities, are intended only to be used in the event of incidents.

6.14.2 Congestion

The short term adverse impacts resulting from construction will include increased congestion on the M25 and potential displacement of traffic to the local roads. Work on adjacent sections may have an incremental effect on the severity of the impact. This will be a *significant effect in the short term.*

6.14.3 Cut and Fill Material

Approximately 682,000 cubic metres of earthworks fill material will be required for the construction of the widened embankments. It is envisaged that this will all be imported granular material or chalk. The construction works will generate a total of approximately 655,000 cubic metres of material, the excess of which will be exported from the site for disposal. It is intended to use as much of the surplus material as possible to create and/or improve landscape/noise bunds either within the highway boundaries, or outside the highway boundaries by agreement with landowners.

Prior to the tender period, discussions on the location of disposal sites will be held with the local authorities and the results will be given to tenderers where appropriate. However, the decision on the source of imported material and the destination of material for disposal will be the responsibility of the appointed contractor for the works. In both instances, the Contractor will be subject to the statutory planning controls enforced by the Local Authorities which will include consideration of environmental factors. There are strict controls to prevent illegal dumping of surplus fill and unlicensed mineral extraction, and there is a "duty of care" on the contractor to ensure his compliance with legislation. All material not suitable for use as fill will be disposed of at licensed tips by the contractor.

Transportation of materials to and from the site will be via the existing motorway.

6.14.4 Location of Construction Depot

The works will be constructed within the existing motorway boundaries between Green Lane east of Junction 7 and Junction 5, but there is insufficient space within the site to provide a construction depot to locate temporary office accommodation, storage and working areas. Potential sites will be discussed with the local authority and notified within the contract documents. The appointed contractor for the works will identify a site for a construction

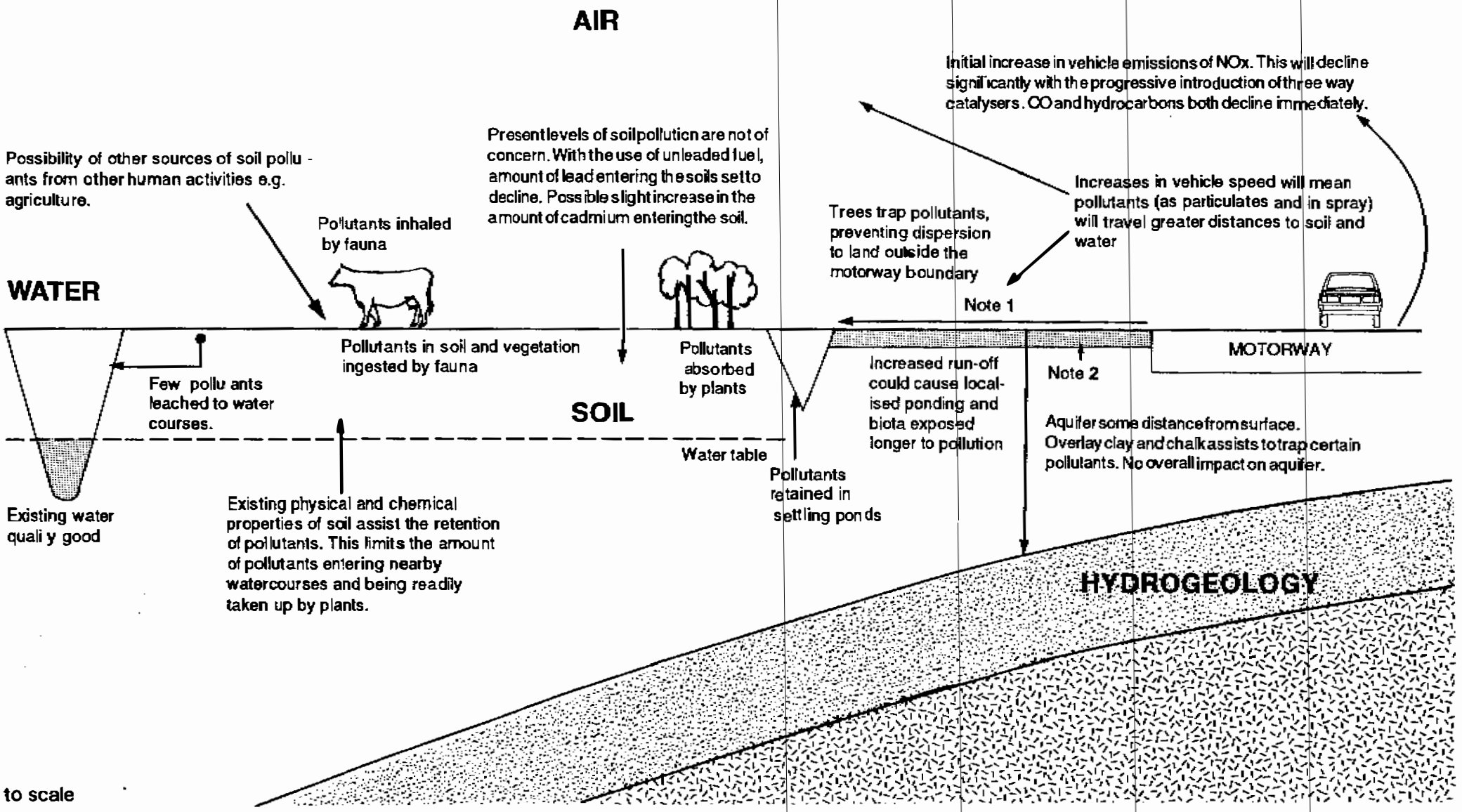
depot, subject to local planning constraints. This will cause a potentially *significant short term adverse effect.*

6.14.5 Construction Noise

A noise control system for the construction period will be agreed with the local authorities' environmental health officers prior to work commencing. This will include a limit on the levels of construction noise and the hours of working for which these are to be operated. The level of construction noise will vary along the works and throughout the duration of the works as they progress.

6.14.6 Water Quality

The installation of mitigation measures as defined at 5.4.5 will ensure that the potential adverse effects of construction on adjacent watercourses will be mitigated.



Not to scale

NOTES:

1 Potential for suspended solids in construction run-off entering surrounding watercourses. Careful management of on-site operations will avoid this.

2 New run-off ditches to be laid. This will lead to a greater improvement in the control of discharge.

HIGHWAYS AGENCY

PARKMAN

RPS CLOUSTON

Project: M25 JUNCTIONS 5 TO 7 WIDENING TO DUAL 4 LANES

Title: INTERACTION OF POLLUTANTS: PREDICTED IMPACT

Date: April '94

Drawn:

N

Fig. No: 6.1

7.0 SUMMARY OF SIGNIFICANT ISSUES

7.1 Introduction

The beneficial and adverse effects which can be predicted after the implementation of mitigation measures are summarised below.

7.2 Beneficial Effects

- Long term (more than 10 years) delay in increased environmental degradation eg. air quality resulting from congestion on the M25.
- Long term (more than 10 years) reduction in likelihood of displacement of traffic onto the local roads network as a result of congestion.
- Potential long term improvement to drainage and water quality protection measures.
- Potential short to medium term (10-15 years) improvement in noise environment as a result of provision of porous asphalt and noise barriers and mounds.
- Potential long term benefit from establishment of approximately 10.7 ha of additional planting, a net gain of 7.3 ha (68%).

7.3 Adverse Effects

- The loss of approximately 3.4 ha (32%) of existing planting and visual screening.
- Potential environmental impacts of construction including offsite disposal and storage areas (short term impact).
- The construction of new gantries and the extension of lighting throughout the road corridor. The proposed screening measures will only partially mitigate the increase in day and night-time visual intrusion. This is, therefore, a long term impact.

7.4 Maintenance

On completion of the works, a maintenance programme in line with standard DoT procedure will be carried out to ensure that the mitigation measures are effectively implemented. This will include:

- Establishment of smaller stock planting and 3 years maintenance.
- Establishment of larger stock planting and up to 5 years maintenance.
- Continued management after the maintenance and establishment period has finished to ensure vigorous and dense growth to provide screening.
- Continued management and monitoring of the drainage system to ensure it is effective in its mitigation objectives.

APPENDIX A

ENVIRONMENTAL IMPACTS TABLE

TRAVELLERS					
Sub Group	**Effect**	**Units/Interest**	**Do Something**	**Do Minimum**	**Comments**
Traveller Amenity	Driver Stress		High	High	Reduced driver stress for do something by comparison to do minimum
Vehicle Users Amenity	View from the road		See comments	See comments	Overall the view from the road will not change except where offsite measures will affect open views to the north
Pedestrians and Equestrians Amenity	Severance (New)	Number			No designated footpaths or bridleways will be severed
	Change in Amenity			Existing amenity unchanged	
Traveller Safety Pedestrians and Equestrians			No change	No change	
All vehicle travellers safety			See comments	See comments	Increase in hourly traffic flow without a corresponding increase in road width can lead to an increase in accidents

LOCAL PEOPLE AND THEIR COMMUNITIES					
Sub-Group	**Effects**	**Units**	**Do Something**	**Do Minimum**	**Comments**
Residential Properties	Properties demolished	Number	0	0	
	Noise $dBL_{A10, 18HR}$ (properties within 300m of motorway)	Number of properties experiencing an increase of:- 1 to 3dB(A)	123	336	The changes in noise are the difference between design year (2011) and do minimum at opening year
		Number of properties experiencing a decrease of:- 1 to 3dB(A)	213	0	
	Visual Impact	Number of properties subject to: Substantial Moderate Slight No change Visual impact	 0 30 165		
	Severance		None	None	
	Disruption during construction		Short term (see comments)	None	A noise control system for the construction period to be agreed with the local authorities

LOCAL PEOPLE AND THEIR COMMUNITIES					
Sub Group	**Effects**	**Units**	**Do Something**	**Do Minimum**	**Comments**
Community Facilities	Locations Demolished	Number	0	0	
	Noise $dB_{LA10, 18HR}$	Locations experiencing an increase of 1 to 3 dB(A)	N Oxted public open space Hospital (Barnets Shaw) Downsway County First School St Marys C of E School Oxted County Secondary School Limpsfield Grange School Fosterdown Wood Combe Bank School and Park Chevening Park Valence School Mountwood Social Education Centre	N Oxted public open space Hospital (Barnets Shaw) Downsway County First School St Marys C of E School Oxted County Secondary School Limpsfield Grange School Fosterdown Wood Fire Station (Godstone Hill) Public open space (East Westerham) Farley Common Churchill School Brasted Church Conservation Area Combe Bank School and Park Chevening Park Valence School Mountwood Social Education Centre	

LOCAL PEOPLE AND THEIR COMMUNITIES					
Sub Group	**Effects**	**Units**	**Do Something**	**Do Minimum**	**Comments**
Community Facilities (Cont'd)	Noise (cont'd) Noise $dB_{LA10,\ 18HR}$	Locations experiencing a decrease of:-			
		1 to 3 dB(A)	Public open space (East Westerham) Farley Common Churchill School Brasted Church Conservation Area Fire Station (Godstone Hill)	0	
	Visual Impact		Court Lodge School	0	Lighting columns will be visible
	Severance		None	None	
	Disruption during construction		Short term (see comments)	None	A noise control system for the construction period to be agreed with the local authority

THE CULTURAL AND NATURAL ENVIRONMENT					
Sub Group	**Effect**	**Units/Value**	**Do Something**	**Do Minimum**	**Comments**
Heritage	Noise $dBL_{A10,\ 18R}$	Locations experiencing a decrease of 1 to 3 dB(A)	Brasted Church Conservation area	No change	
	Destruction	ha	12 potential sites	No change	Confirmation of effect awaited from test-pit observations
	Visual Impact		0	No change	
Nature Conservation and Landscape a) Surrey Hills and Kent Downs AONB	Land take	ha	0	No change	
	Landscape effect		Introduction of lighting into an unlit corridor	No change	Increased urbanisation in a predominantly rural area

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POLICY AND PLANS					
Policy	**Authority**	**Interest(s)**	**Scheme**	**Do Minimum**	**Comments**
Strategic and General Environmental	Surrey CC ST.1, ST.3, EN.1, EN.2, Kent CC S.1, S.2, S.3, S.4, S.5, S.7	Resistance to urbanisation. Maintenance of Green Belt. Development to comply with high environmental standards. Requirement for environmental statements. Strategic growth a priority in East and North Kent	Is not contrary to policies	No change	The scheme is not contrary to Green Belt policy (see later comments). The scheme has been subject to the Environmental Assessment procedure and an Environmental Statement has been prepared. The scheme will assist in promoting strategic growth in the East and North of Kent
The Natural Environment	Surrey CC PE.8, PE.9 Kent CC ENV.2, ENV.4, ENV.5, ENV.6, Tandridge DC 42, 43, 44 Sevenoaks DC EV10, EN5, EN6, EV12, EN6, EN7, EN8	General presumption against development in acknowledged nature reserves and wildlife habitats. Maintenance and enhancement of hedgerow cover. Conservation of trees and important woodland. Requirement for replacement tree planting	No policy conflict	No change	There are a number of recognised conservation sites including SSSIs and other lesser designations which are adjacent to the scheme, but these will remain unaffected.

POLICY AND PLANS					
Policy	**Authority**	**Interest(s)**	**Scheme**	**Do Minimum**	**Comments**
Heritage and the Built Environment	Surrey CC PE.12, PE.13, Kent CC ENV.12, ENV.16, ENV.17, ENV.18 Tandridge DC 47, 48, 49, 51, 52 Sevenoaks DC EVIA, EV7, EV8, EV9, EV10, EV11	General presumption against development affecting features of architectural, historical or archaeological importance. General protection and enhancement of the character of conservation areas and built-up areas in general	Some possible conflict with policies	No change	No acknowledged or designated features are likely to be affected. Whether or not presently unrecognised interests which will be affected requires further investigation
Transport	Surrey CC MT.9, MT.11, Kent CC T.2, T.3, T.4, ENV.11	Support for the strategic road network. Prioritises new or improved transport facilities. Promotes optimum scheme design in environmental terms. Schemes to be designed to accommodate 15 years predicted traffic growth. Enhancement of the environment along primary routes	Supported by policy	The existing road will not be able to accommodate 15 years predicted traffic growth	The M25 is identified as part of the strategic road network. Widening of the M25 is identified as a priority scheme. The optimum scheme has been achieved through the design process
Recreation	Surrey CC RU.7, RU.10 Kent CC SR.4 Sevenoaks DC R.11	Protection and promotion of the Public Rights of Way network. General protection for outdoor recreation facilities in the countryside	Some possible conflict with policy	No change	There will be some loss of amenity on adjacent rights of way

POLICY AND PLANS					
Policy	**Authority**	**Interest(s)**	**Scheme**	**Do Minimum**	**Comments**
Agricultural Resources	Surrey CC RU.6 Kent CC ED.6 Tandridge DC 37	Protection of the best and most versatile farmland	No change	No change	
Safeguarding Mineral Resources	Surrey CC DP.28 Kent CC NR.7	Protection of Mineral Reserves	Some possible conflict with policies	No change	The scheme may affect some existing minerals reserve adjacent or near to the M25 subject to liaison with LPA
Pollution	Kent CC ENV.19, NR3, NR4	Presumption against development resulting in unacceptable levels of pollution. Protection of surface and ground water quality	No conflict with policies	No change	Improvement in vehicle technology will result in improved air quality irrespective of the scheme

APPENDIX B

LAND USE TABLE

EXISTING LAND USE	AREA REQUIRED PERMANENTLY		AREA REQUIRED TEMPORARILY DURING CONSTRUCTION	COMMENTS
	Area for carriageway, footways and other hard surfaces	Area for verges, embankments, cuttings and other landscaping		
Motorway (within highway boundary)	The widened motorway will remain inside the existing highway boundary. Any land required will be existing motorway verge, embankment or cutting	As left		
Additional land (outside highway boundary)		Any additional land take for environmental interests (landscaping/bunding) would be by agreement with landowner	Areas temporarily required during construction would be by agreement with landowner and local authority	

APPENDIX C

MITIGATION MEASURES TABLE

MITIGATION MEASURES	LOCATION, PURPOSE AND FORECAST BENEFIT	CAPITAL COST	FORECAST, MAINTENANCE REQUIREMENT, METHOD AND COST	COMMENTS
Noise Barrier (Acoustic Fence)	South motorway verge on raised section through Junction 6 (500m). Provides a noise reduction of 1-2dB(A) (accompanying opening year to design year) for properties at northern end of Godstone	£50,000	'Maintenance free' fencing	Without noise barrier ≈ 28 property facades would, over the design life, experience noise levels such that they would qualify for insulation, under 1975 Noise Insulation Regulations
Noise Barrier (Acoustic Fence)	North motorway verge immediately west of North Park Access Bridge for 300 metres. Provides noise reduction of 1 to 2 dB(A) for properties at Roughnets	£37,500	"Maintenance free" fencing	Without noise barrier, seven facades would over the design life experience noise levels such that they would qualify for insulation under 1975 Noise Insulation Regulations
Porous Asphalt	Provided on the motorway adjacent to Westerham and Brasted	£660,000		Porous asphalt as well as reducing traffic noise levels will also reduce spray from the road during wet conditions. This will reduce the passage of contaminants from the road onto verges and adjacent embankments/cuttings.
Balancing pond	Balancing ponds designed to NRA requirements	6 No. at £48,700	Bi-annual routine maintenance and cleaning required, 6 No. x £1000 per year.	

MITIGATION MEASURES	LOCATION, PURPOSE AND FORECAST BENEFIT	CAPITAL COST	FORECAST, MAINTENANCE REQUIREMENT, METHOD AND COST	COMMENTS
Provision of Oil/Grit Interceptors	Oil/grit interceptors provided at all outfalls to meet requirements of NRA. Interceptors located upstream of balancing ponds prevent their contamination	6 No at £10,000 each	Biannual routine maintenance and cleaning required 6 No. x £1000 per year	Drainage system also designed for the containment of any accidental spillage of contaminant on the motorway. This can subsequently be pumped out to prevent pollution of downstream watercourses
Provision of Badger fencing	Badger fencing provided at locations of known badger activity	Length (to be determined) at £7.90/m		Full details are contained within a separate confidential report.
Provision of onsite and offsite planting	To provide mitigation for visual impacts, planting will be located within the highway boundary and where requested by landowners outside the boundary	Costs to be determined when scheme finalised		

APPENDIX D DEPOSIT LOCATIONS

Copies of the Environmental Statement may be inspected free of charge during normal office hours at the following deposit locations:

The Highways Agency
St Christopher House
Southwark Street
London SE 1 0TE

The Highways Agency
South East Construction
Programme Division
Federated House
London Road
Dorking
Surrey RH4 1SZ

Kent County Council
Springfield
Maidstone
Kent ME14 2LX

Surrey County Council
County Hall
Penryhn Road
Kingston-upon-Thames
Surrey KT1 2DN

Sevenoaks District Council
Council Offices
Argyle Road
Sevenoaks
Kent
TN13 1HG

Tandridge District Council
Council Offices
Station Road East
Oxted
Surrey RH8 0BT

Godstone Village Stores and Post Office
98 High Street
Godstone
Surrey

APPENDIX E REFERENCES

The following documents have been referenced within the Environmental Statement.

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APPENDIX F GLOSSARY OF TERMS

Above Ordnance Datum (AOD)

The distance above the mean high tides at Newlyn, Cornwall

Agricultural Land Classification

A classification of land by the Minister of Agriculture into one of five grades; Grade 1 representing land with very minor or few limitations and consistently high yields and Grade 5 which has severe limitations.

Area of Outstanding Natural Beauty

A statutory designation of national importance which indicates areas of countryside of particular landscape value.

Balancing Pond

An artificial pond (may exist dry for much of the year), designed to control the outflow of water from the drainage system to the water courses and prevent flooding.

Conservation Areas

Areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance, designated by virtue of the Town and Country Planning Act 1971.

dB(A)

The unit of noise measurement (measured on a logarithmic scale) which expresses the loudness in terms of decibel (dB) scale and the frequency factor (A).

Design Life

This is the period on which forecasts are based and for which the design is expected to be valid. (15 years post opening).

Desk Study

A study based on document information.

Do-Minimum

For this scheme, refers to the 3 lane unimproved motorway and assumes high traffic growth in accordance with national forecasts.

Do-Something

Forthis scheme, refers to 4 lane widened motorway and assumes high traffic growth in accordance with national forecasts. Also includes proposed methods of mitigation.

Environmental Assessment

Can be defined as a technique for ensuring that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead. It provides a focus for public scrutiny of the project and enables the importance of the predicted effects, and the scope for modifying or mitigating them, to be properly evaluated by the decision making authority.

Environmental Statement

The outcome of the Environmental Assessment presented in a formal document or documents in accordance with EC Directive 85/337.

Green Belts

Areas of land, largely rural in character, adjacent to main urban centres which are protected by restrictions on building, the emphasis being on restricting urban sprawl, preventing the coalescence of neighbouring towns and preserving their individual character.

Groundwater

Water contained in the soil or rocks below the water table.

Listed Building

A building which has been identified by the Secretary State for the Environment as being of special architectural or historic interest and is entered on the list of such buildings. (Town and Country Planning Act 1971).

Local Plan

A detailed plan for an area which defines land use and policies by the Local Authority subject to approval by the Secretary of State for the Environment.

Luminaire

The lantern component of the lighting system.

Mitigation

The measure envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

Noise Barrier

Reduces the effect at reception points of sound energy generated by traffic. May be in the form of a fence or an earth mound.

Oil Interceptor

Separates out and retains oil based contaminants from road run off water prior to its release to watercourses.

Porous Asphalt

Porous macadam road surfacing. It reduces spray during wet conditions and has different acoustic properties from the standard impervious bituminous and concrete surfaces (reduces traffic noise).

Scheduled Species

Species with special protection under the terms of the Wildlife and Countryside Act 1981 and the Wildlife and Countryside (Amendments) Acts 1985.

Scrub

A plant community dominated by shrubs.

Sites and Monuments Record (SMR)

Inventory of archaeological and historical features, usually by County Councils and mapped at 1:10,000.

Sites of Special Scientific Interest (SSSI)

An area designated under the National Parks and Access to the Countryside Act 1949 and re-notified under the Wildlife and Countryside Act 1981 as being of special importance and worthy of preservation. A statutory designation.

Structure Plan

A statement of a County Council's general proposals for the development of land in the County.

Tree Preservation Order (TPO)

An order placed by a Local Authority on trees or woodland considered of high amenity value.

Trunk Road

Major through roads for whose construction and maintenance Central Government is responsible.