HIGHWAYS AGENCY

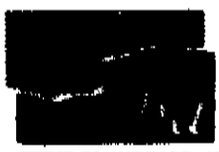
An Executive Agency of THE DEPARTMENT OF TRANSPORT

A259 Hastings Eastern Bypass

Environmental Statement
Volume 2 (Reports)

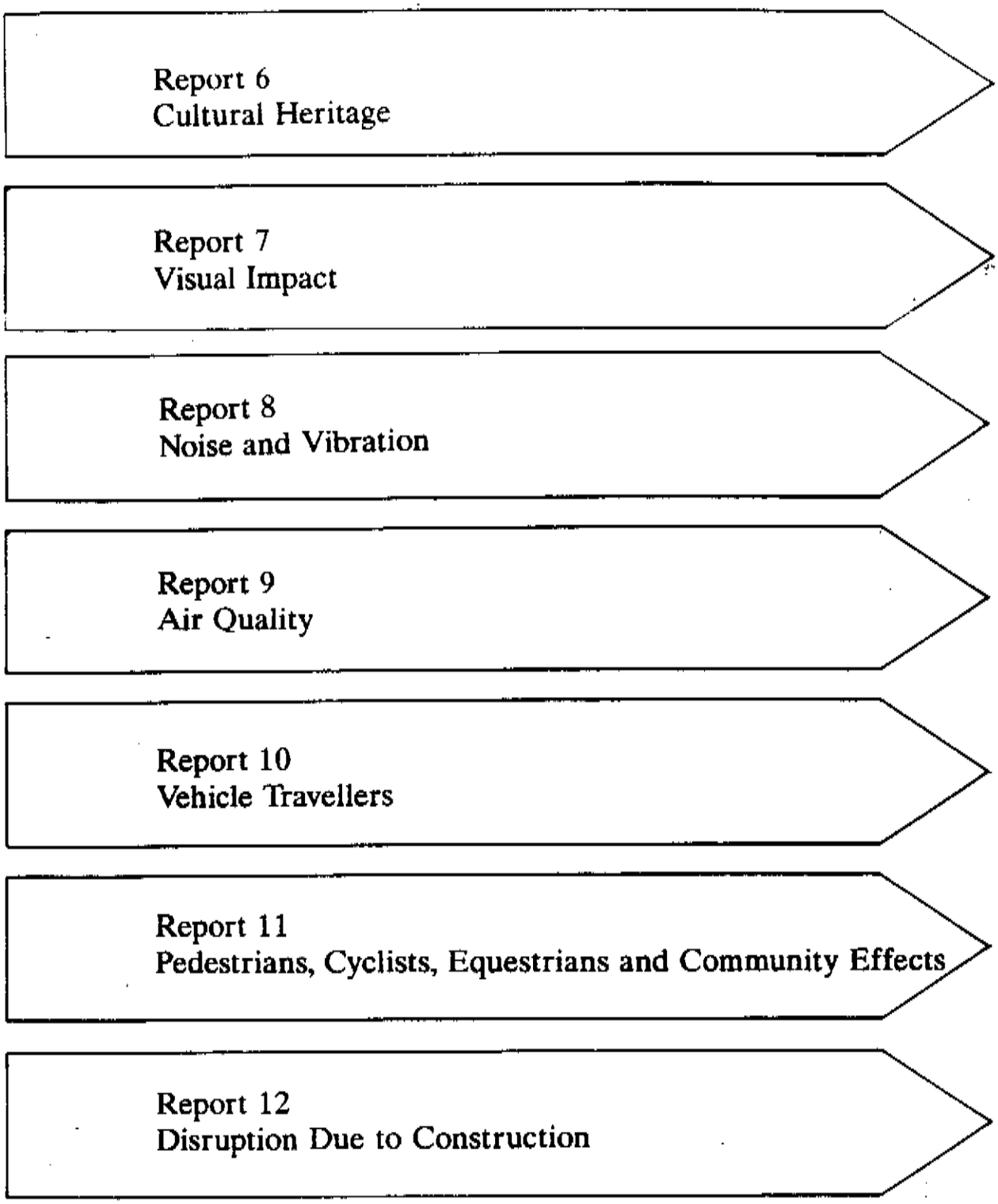
Part 2 of 2
Cultural Heritage
Visual Impact
Noise and Vibration
Air Quality
Vehicle Travellers
Pedestrians, Cyclists, Equestrians and Community Effects
Disruption Due to Construction

September 1994



CHRIS BLANDFORD ASSOCIATES

Mott MacDonald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REPORT 6

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September 1994

A259 HASTINGS EASTERN BYPASS

ENVIRONMENTAL STATEMENT

VOLUME 2

REPORT 6

CULTURAL HERITAGE

SEPTEMBER 1994

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1.0 INTRODUCTION

1.1 This report is the study of the cultural heritage features along the corridor of the proposed A259 Hastings Eastern Bypass. Work has been carried out in accordance with the Department of Transport's (DoT) Design Manual for Roads and Bridges (DMRB), *Volume 11 Environmental Assessment* (DoT 1993).

1.2 The cultural heritage is taken to mean both the physical remains of past human activity and its interaction with the landscape. This ranges from upstanding archaeological earthworks, to those which are no longer extant, for example the various ditch and pit-like features detected during the geophysical survey. Listed and other historic buildings, together with elements of the landscape such as probable Ancient Woodland, hedges and boundary ditches are also aspects of the cultural heritage.

1.3 This report updates, expands and supersedes all previous work undetaken for the Published Scheme. It incorporates for example, new archaeological discoveries and further historical evidence. A desktop study was carried out to set the Published Scheme within the historical background of the area. Section 2.0 outlines the sources used for research and contains a list of consultees. A general description of the topography and soils of the area is given in Section 3.0 with the archaeological and historical context of the route corridor discussed in Section 4.0. The method of assessment is set out in Section 5.0. The features of the cultural heritage likely to be affected by the Scheme are described in Section 6.0 where the impacts of the Scheme and the proposed mitigation are discussed. The key issues are summarised in Section 7.0. All identified heritage features within the study are have been mapped and listed in a gazetteer (Figures 2-3 and Appendix 1).

1.4 Non-intrusive archaeological field evaluation was also undertaken to detect the presence or absence of surface and subsurface features along the line of the Published Scheme. The field evaluation comprised a walkover survey, surface collection survey and geophysical survey. Each of the surveys exists as a free-standing report and these are given in Appendices 2, 3, and 4 respectively. This report, no. 6, amalgamates the results of the field evaluations with archaeological and historical knowledge from other sources. However, it should be noted that areas identified during the field evaluations have not been allocated a number in the gazetteer (Appendix 1).

1.5 It is appropriate to discuss the landscape history of an area in the context of archaeological and historic buildings. Historic landscape issues are therefore dealt with as part of this cultural heritage report which should be read in conjunction with the landscape and visual intrusion reports (Volume 2, Reports 4 and 7 respectively). However, it should be noted that the DMRB deals with historic landscapes under the heading of landscape rather than heritage.

2.0 SOURCES OF INFORMATION AND CONSULTATIONS

2.1 This report is based largely on published sources together with inforamtion from the Sites and Monuments Record (SMR) of East Sussex County Council. These data have been supplemented by the National Archaeological Record (NAR) of the Royal Commission on the Historical Monuments of England (RCHME) and the National Monuments Record (NMR) of the RCHME. The Aerial Photography Library of the RCHME and aerial photographic coverage of the route by East Sussex County Council (1987) was consulted. Historic maps, primarily first edition Ordnance Survey (OS) one and six inch maps and eighteenth and nineteenth century county maps have been examined.

2.2 The appropriate sources for Registered Parks and Gardens, Conservation Areas and battlefied sites were consulted, with no entries being found for the study area. Other material used is listed in Section 8.0.

2.3 The following groups were consulted for comments and information:

English Heritage	Ancient Monuments Inspector
East Sussex County Council	Archaeologist
Hastings Borough Council	Listed Building information
Hastings Area Archaeological Research Group	
Wealden Iron Research Group.	

3.0 TOPOGRAPHY AND SOILS (Figures 2 - 3)

3.1 The Hastings-Battle Ridge dominates the study area, situated on its southern boundary orientated north-west to south-east. The highest points of the ridge are over 150 m AOD at Batchelors Bump and the Hastings Borough Cemetery. There are a series of minor ridges enclosing narrow steep-sided valleys known as ghylls. They generally have a stream at the bottom and/ or seepage lines. These 'valleys' become less steep between Westfield and Guestling, but it remains an intricate landscape of undulating ground approximately 40 and 10 m AOD, forming the catchment of Doleham Ditch/Sailors Stream. Doleham Ditch runs northwards into a flat bottomed valley to join the River Brede outside the study area.

3.2 The route corridor is characterised by areas of woodland blocks within the predominantly agricultural land of irregular fields, often with shaws (a distinctive feature of the Weald), narrow strips of woodland containing mature trees, forming the divisions between fields.

3.3 The complex geology of the study area comprises Tunbridge Wells Sand, Wadhurst Clay and Ashdown Beds. There are tracts of Quaternary Head deposits and also alluvium in the stream valleys most notably Doleham Ditch. There is also a complex soil pattern for example there are often abrupt changes from the heavy soils of the Wadhurst Clay to free-draining areas formed on overlying sand deposits.

3.4 The geology and topography of this part of Sussex is significant for its influence on landuse and settlement patterns. The junctions between the sands and clays is where the greatest concentration of iron ore is located, more particularly in the clays. The heavy and impenetrable clay lands are associated with dense woodland cover which is also a contributory factor in the development of the iron industry.

3.5 A more detailed description of the topography etc. of the study area can be read in Section 2.0 of the landscape report (Volume 2, part 1, report 4).

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 It is likely that, prior to any human impact, the entire area of heavy clays, lighter sands and sandstones would have been covered in deciduous woodland. Clearance may have begun in the mesolithic, but was certainly occurring in the neolithic. The pace increased, particularly in the iron age, for areas such as the catchment of the Combe Haven (Smyth and Jennings, 1988) to the west of the scheme and on into the medieval period. Moreover, the accessibility of at least part of the area along the Brede Valley and the amenability of the lighter soils of the Tunbridge Wells Sand area to clearance and cultivation, indicate that much of the area may have been cleared at an early date. A similar pattern of land clearance and erosion may be assumed at Doleham Ditch. Geotechnical ground investigations carried out in 1992 revealed a depth of alluvium on the route line between Luckhurst Wood and Doleham Ditch between 2.10 m and 4.15 m. Prehistoric features may be concealed beneath it. Surface collection survey (Appendix 3) to the south-east of Westfield, retrieved four worked flints (5 flakes and 1 tool) which may be of late neolithic or early bronze age date but they do not indicate a specific site.

4.2 The development of the Wealden iron industry is a key element of the archaeological context of the study area and for the development of settlement patterns and clearance. At Westfield for example, the field element in the name means a large open area and such names in the Weald are strongly associated with iron rich areas and Roman trackways (Witney 1976). Bloomery sites (furnaces that produced iron by the direct process) of the Roman period, as well as the hammer ponds associated with the post medieval iron industry, are prevalent on the higher ground of the clays. An important Scheduled Romano-British bloomery site was discovered in Beauport Park, to the north west of the study area. The site was found in 1862; its cinder heaps covered approximately 0.8 ha and the highest part of the mound was about 15 m high. In 1870 it was opened as a quarry and the cinder used to construct roads. Romano-British items retrieved included coins of Trajan and Hadrian and also Samian pottery. A date from the early second century seems likely. The substantial buildings excavated at Beauport Park suggest that it may have been the headquarters for Romano-British iron-working. Other sites likely to be found at the junction of sand and clay are likely to be smaller and have less substantial remains. A number of proven and possible bloomery sites have been identified within the locality including site no. 47 (Figure 3). A Romano-British settlement site (no. 19, Figure 3) lies south-east of Lankhurst Farm, though there is little definitive evidence. A Roman road (no. 74, Figure 2) is reported to run to the west of Lankhurst Farm, down Stonestile Lane but evidence for this is slight.

4.3 Early Anglo-Saxon settlement of the area is uncertain through to the middle ages, but Guestling is a name of seventh century origin and farm names on the edge of the study area are considered to indicate early settlement (Brandon 1974). Certainly by the later Anglo-Saxon period and into the medieval period, there was substantial progressive woodland clearance. It created a network of small fields and dispersed settlement comprising a series of isolated farmsteads and cottages with some small hamlets. A possible deserted medieval settlement (no. 27, Figure 3) has been recorded south of Eastlands Farm but there is little definite evidence. Research using manorial surveys show the local road and lane

network was certainly established by the mid sixteenth century. Some of the routeways on the ridge tops may have originated at an earlier date, perhaps in the prehistoric period.

4.4 The archaeology of the Weald is little known; this is partly due to the prevalence of woodland and the fact that the heavy soils are not condusive to cropmarks or soilmarks. A survey of the Weald such as that undertaken by Gardiner (1990) has highlighted the need for more detailed research. The iron industry in the Roman, medieval and post medieval periods has received the most atttention. Today there are few visible remains but there are many possible sites as evidenced by the number of field names from tithe maps eg Kiln Wood (no. 15, Figure 3) and Pit Field (no. 60, Figure 3). However, such fields may only be so named from their proximity to the sites of other types of kilns (which could have related to the pottery, brick or tile industry), or as in the case of Kiln Wood because the timber from the wood was used for a nearby kiln. It should be noted that the name may only be derived from distant memory of a kiln at the time that the tithe map and award were drawn up, rather than the preserve of a kiln functioning at that time.

4.5 The dispersed settlement pattern has, in the main, been responsible for the complex network of routeways in the area. Those mapped on figures 2 and 3 can be dated to at least the late eighteenth century (Yeakell and Gardner). This pattern remains essentially unchanged and retains its rural character, consisting of medieval and later farms and houses, with a considerable amount of probable ancient woodland and hedges which survive substantially as shown on Yeakell and Gardner's map of 1783 and on the early estate maps of 1619, 1668 and 1748. Examples of medieval houses within the area include the Abbey of Battle's formerly moated Great Maxfield (no. 43, Figure 3). A stone chimney and the parlour crosswing survive from the period of monastic ownership, the remainder having been rebuilt in the middle years of the seventeenth century (grade II* Listed). The moat at Great Maxfield has been filled in; that of the manor house of Westfield (now Church Place no. 8, Figure 2) next to the Norman church of Westfield, still survives in part. The study area is well represented by early agricultural buildings, dating mainly from the seventeenth century. Although the area was principally one of dispersed settlement, occasional small hamlets did exist. The Moor, formerly situated on the edge of Westfield Moor (alternatively known as Westfield Down) is an example of one such. Never large, the hamlet consisted of nine houses in 1748. Although now increasingly encroached upon by the modern village of Westfield, the settlement still retains five houses (nos. 9, 11 - 14, Figure 2) of pre-1750 date, which probably explains how it has preserved much of its ancient 'village' character.

4.6 Beauport Park at the beginniing of the Published Scheme is a late eighteenth/early nineteenth century parkland. The park was created for General James Murray who was the Governer of Quebec; Beauport was the name of the French defences at Quebec. Elements of the parkland survive today, including the monument folly, much of the enclosing wall and Beauport Lodge (Listed building grade II). Much of the park now serves as a caravan park. On the opposite side of the A21 is Claremont School (Listed building grade II) which was built in the late nineteenth century. It is set within a late Victorian

garden which now forms the school grounds. A series of fishponds survive in what remains of the 'designed' element which may be hammer ponds related to the iron industry, but these are now surrounded by extensive rhododendron cover. At the opposite end of the scheme, Broomham School (Listed building grade II) was once surrounded by a parkland but only the avenue now survives.

4.7 The expansion of Hastings from a small fishing port to a seaside resort began in the eighteenth century and accelerated with the building of estates of town houses for gentry and the development of St Leonards in the 1820s. The arrival of the railway promoted much more rapid expansion.

5.0 METHOD OF ASSESSMENT

5.1 Resources Potentially Affected

5.1.1 The cultural heritage resources considered fall into three main categories:

- archaeological remains (including palaeo-environmental deposits)
- historic buildings
- the survival of historic landscape features

5.2 Types of Impact

5.2.1 The permanent and temporary landtake for the Published Scheme, associated structures, landscape mounding and the construction of these may result in damage to, or loss of archaeological remains and deposits, physical loss to the setting of buildings and to the physical coherence of the historic landscape. These impacts can be suffered directly or indirectly. Areas of contractors' compound, construction traffic routes and borrow pits can also represent a potential impact on cultural heritage features.

5.3 Types of Mitigation Considered

5.3.1 The assessment has taken account of the mitigation proposals included in the design of the Scheme. Further mitigation measures include both general strategies and site specific measures deisgned to avoid, reduce or offset the residual effects of the Scheme. These are set out in the impact assessment in Section 6.0. They include archaeological and architectural investigations or recording and comments on where the landscape measures would be sympathetic to the survival of the landscape pattern.

5.3.2 For the archaeological record, a programme of evaluation has been implemented in consultation with English Heritage and East Sussex County County Council Archaeologist. Non-intrusive fieldwork has been undertaken, where access has been permitted, in order to give a better understanding of the potential scale of destruction. A programme of trial-trenching, test-pitting and hand-augered boreholes will be carried out in order to identify the nature, extent and quality of survival of remains identified by non-intrusive survey and to examine (access agreements permitting) areas not previously surveyed. Excavation would be carried out prior to construction allowing the appropriate level of recording. An archaeologist would also be present at key phases of construction in areas of potential interest.

5.3.3 Specific landscaping measures have been proposed where considered appropriate, to reduce the impact on the setting of historic and Listed buildings. Any historic buildings to be demolished would be surveyed at an appropriate level, in consultation with English Heritage. Mitigation measures relating to the (historic) landscape and buildings are discussed in detail in Volume 1. Measures include re-

establishment of hedgerows and false cuttings.

5.4 Detailed Assessment Method

5.4.1 A corridor considerably wider than the actual area of proposed landtake has been studied. This provides information on the context of features directly affected and allows indirect impacts to be assessed.

5.4.2 The importance of archaeological sites, historic buildings and landscape features varies considerably. The starting point for evaluating cultural heritage features has been to consider their statutory or non-statutory status (Scheduled Ancient Monuments for example). In the case of Listed buildings their grades must be the main basis of evaluation.

5.4.3 The importance of cultural heritage features can be defined by use of the non-statutory criteria for the Scheduling of Ancient Monuments (as extended for English Heritage Monuments Protection Programme), taking into account for example the rarity, condition and significance of the feature, resulting in a grading of national importance, regional/county, local or uncertain importance. There is no standard scale against which the severity of impacts on the cultural heritage may be judged. The severity of a given level of landtake or visual intrusion would vary with the type of feature. For the purposes of this study the severity of impacts is graded as high, moderate, or uncertain. High impacts are judged to be those which clearly breach national and local policy guidance or which otherwise would substantially detract from the cultural heritage interset of the area.

5.4.4 The Department of the Environment guidelines for listing and grading historic buildings were referred to where necessary. The setting of historic buildings affected by visual intrusion has been assessed with reference to the features which contribute to, or detract from, its historic character. The effects of the Scheme in terms of intruding on views of and from the building and its wider setting were also considered in line with the method set out in the Visual Impacts report (Volume 2, Report 10).

5.4.5 The assessment of the importance of features affected by the proposals has been made firstly by general reference to these guidelines and secondly on professional judgement.

6.0 DESCRIPTION, IMPACT AND MITIGATION

6.1 Cultural heritage features which would be affected by the proposed route are discussed from west to east. They have been divided into three categories: archaeology, historic buildings, historic landscape. Some features may appear in more than one grouping as there is often more than one association.

Archaeology

6.1.2 At the start of the scheme are two features (discovered during the walkover survey, Appendix 2) which may relate to the iron industry. The first is a pond and an area of mounds which are likely to be of human origin. Although these features are undated it is possible that they relate to the post medieval period (no. 38). Landtake for the road would destroy them. Above a large pond against the current embankment for the A21 is a man-made curving terrace approximately 45 m across (no. 39). Its location close to the stream makes it a possible post medieval iron-working site. The site lies on the edge of proposed earthworks and it is probable that the site would be damaged by earthmoving activity. This would be a high impact on remains of local importance. It is proposed to hand trench the terrace to verify its nature extent and quality of survival of remains in advance of road construction.

6.1.2 Within the grounds of Claremont School are a group of fishponds (no. 68) the southern edge of which would be encroached upon. It is possible that they were medieval/post medieval hammer ponds, originally used in the iron making process, but no associated features were located. The road would be a moderate impact on features of local importance which form part of the contemporary garden landscape of Claremont School. Mitigation of this impact would be as that set out in paragraph 5.3.

6.1.3 To the south of Westfield where Stonestile Lane would be diverted to Three Oaks Lane, the embankment here would overlie an area of alluvium located during geotechnical ground investigations. It is possible that archaeological features lie undetected beneath it. An area of made ground was also identified by test-pitting north of Lankhurst Farm. Both these areas would require further investigations (see 5.1.4). The Published Scheme would be an uncertain risk on possible archaeological remains. A Roman road (no. 74) is reported south of The Moor. The route may sever part of its line and represents a low risk to this linear feature.

6.1.4 West of Luckhurst Wood the road would be in a shallow cutting and would go through Pit Field (no. 31). Depressions are still visible today just 20 m south of the scheme and they may be the remnants of extraction of ore for the iron industry, or the digging of clay for kilns; a number now contain ponds. The geology here is on the boundary between the clay and sand, a common location of iron ore. The scheme would be a low risk to these features of local importance.

6.1.5 Along the line of the proposed road deposits of alluvium were identified between Luckhurst Wood and Oak Wood to Doleham Ditch. Archaeological features may be concealed within; the scheme therefore represents an unknown risk on possible archaeological remains where there is significant landtake. At Doleham Ditch the Published Scheme would be on embankment and would not disturb alluvial deposits.

6.1.6 Where the scheme severs North Wood bloomery cinder (no. 72) was found in a stream bed during a walkover survey. Further into the wood to the north are the sites of two undated bloomeries (nos. 47 and 48). It is possible that a bloomery site exists on the line of the route. The road would be a low to moderate risk on a feature of probable local importance. Mitigation proposed is as set out in paragraph 5.3.

Historic Buildings

6.1.7 The Published Scheme would have a high impact on the setting of Harrow Lodge (no. 69), an historic building of late nineteenth century date built in the style of Claremont, possibly by Shaw. The route would be an embankment about 100 m south of the Lodge. Landscaping measures are proposed to reduce the impact by the summer of the fifteenth year after opening.

6.1.8 The group of Listed and historic buildings within the historic hamlet known as The Moor (nos. 9 - 14) would be affected by the Published Scheme. Old Beams (no. 12 late sixteenth century) and Old Moor House (no. 13 seventeenth century or earlier) are both grade II Listed timber-framed buildings; the road and side road alterations would have a moderate and low impact respectively on their rural setting. The remaining grade II buildings and historic structures would suffer a low impact. Despite no ground floor views from these properties the southern approach to this hamlet would be affected by the need to cross the Published Scheme, thus altering their setting within the landscape. Landscape measures are proposed to reduce the impact of the scheme and the impact would be reduced by the summer, fifteen years after opening. It is during the construction process that these properties would be affected the most.

6.1.9 Lankhurst Farmhouse (a grade II timber-framed building no. 18) and associated structures would be over 250 m away from the scheme and the impact on its setting would be low.

6.1.10 The Published Scheme would have a moderate impact on the setting of Copshall Farmhouse and a substantial impact on its barn (nos. 62 - 63) both of which are grade II Listed buildings. The roundabout would be approximately 100 m from these properties and would be lit. Although by the summer fifteen years after opening the visual impact would be reduced, the impact on the setting would remain as moderate. These properties would now have roads on the sides.

6.1.11 Broomham School (Listed building grade II), built in the sixteenth century, enlarged in the eighteenth, but subsequently reduced in size. The impact on this property would be moderate. It would look directly onto the roundabout junction with the current A259. The landscape measures would, by the fifteenth year after opening, greatly reduce this impact.

Historic Landscape

6.1.12 The scheme would sever Baldslow Wood (no. 1) to the east of Kent Street. The wood is identified as possible ancient woodland by the Nature Conservancy Councill (NCC, now English Nature). There is no mitigation possible beyond landscape measures already proposed.

6.1.13 Luckhurst Wood and Oak Wood are also listed as probable ancient woodland and the Published Scheme would encroach upon the boundaries of these woods as it passed between them.

6.1.14 Another piece of probable ancient woodland to be affected by the route would be North Wood (no. 49), a narrow strip of woodland towards the end of the proposed road. Approximately 0.55 ha would be removed.

6.1.15 The landscape through which the route would pass has been little changed since at least the seventeenth and eighteenth centuries, with many fields shapes, hedgelines and woodlands surviving from that period. Routeways which also survive from this period would be diverted and realigned. The Published Scheme would cut across these features; constituting a high localised impact on a combination of landscape features. Where practicable field boundaries, hedgerows, woodland and roads would be reinstated along their original line.

7.0 SUMMARY OF KEY ISSUES

7.1 The Published Scheme would have an impact on archaeological sites of unknown potential, but mitigation proposals should reduce this risk. There is still the likelihood of the discovery of archaeological features which have been masked by alluvium. The area has in general a moderate potential for the existence of iron-working sites of Roman through to post medieval date.

7.2 A number of Listed and historic buildings would suffer an impact on their settings, most notably the houses within the small hamlet known as The Moor, also Harrow Lodge, Copshall Farmhouse and barn. Landscaping measures are proposed but it would be a number of years before vegetation is adequately established to obscure views. Proposed mounds would have a limited effect on these properties.

7.3 The mitigation available to lessen the impact of a new linear feature to a landscape pattern which is over 200 years old, includes re-establishing the pattern where possible by planting. However, until vegetation on the proposed earthworks has matured, the proposed route would be highly visible locally within the landscape.

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Nature Conservancy Council Provisional Ancient Woodland Inventory (1984)

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Map of the demesne lands of Westfield Moor (1619). East Sussex Record Office (ESRO) A23006

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Map of Southings Farm, Westfield (1748). ESRO A2844

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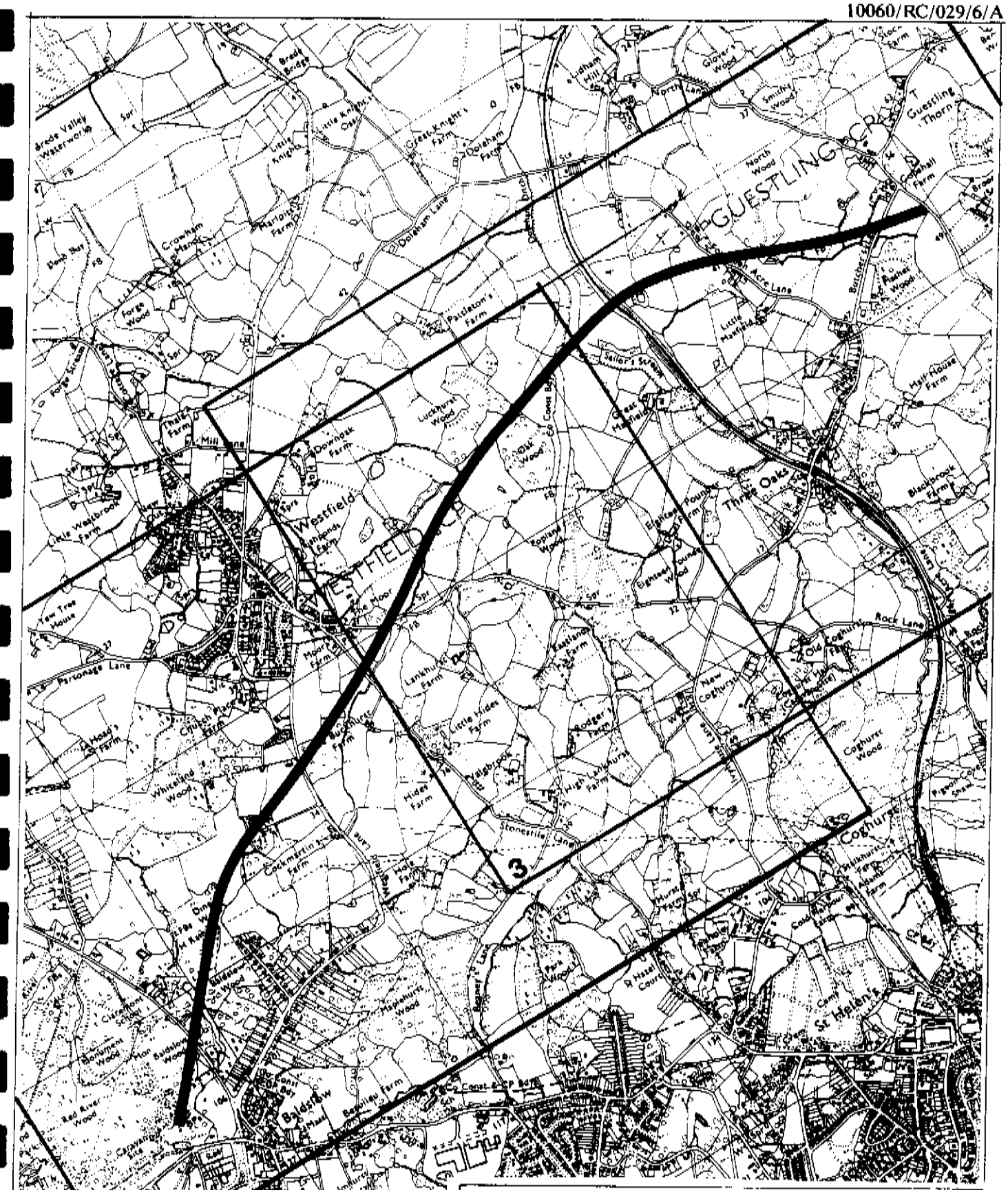


0 1 km

Cultural Heritage Features
Key Plan

Scale 1: 25,000

Report 6 Figure 1

KEY

- Published Scheme
- Study Limit
- Arch. sensitive areas
- 9 Archaeological Site
- 6 Earthworks
- 5 Field Name Evidence
- 1* Listed Building
- 7 Historic Building
- Historic Woodland
- Historic Routeways
- Parish Boundaries

WESTFIELD CP

REFER INSET

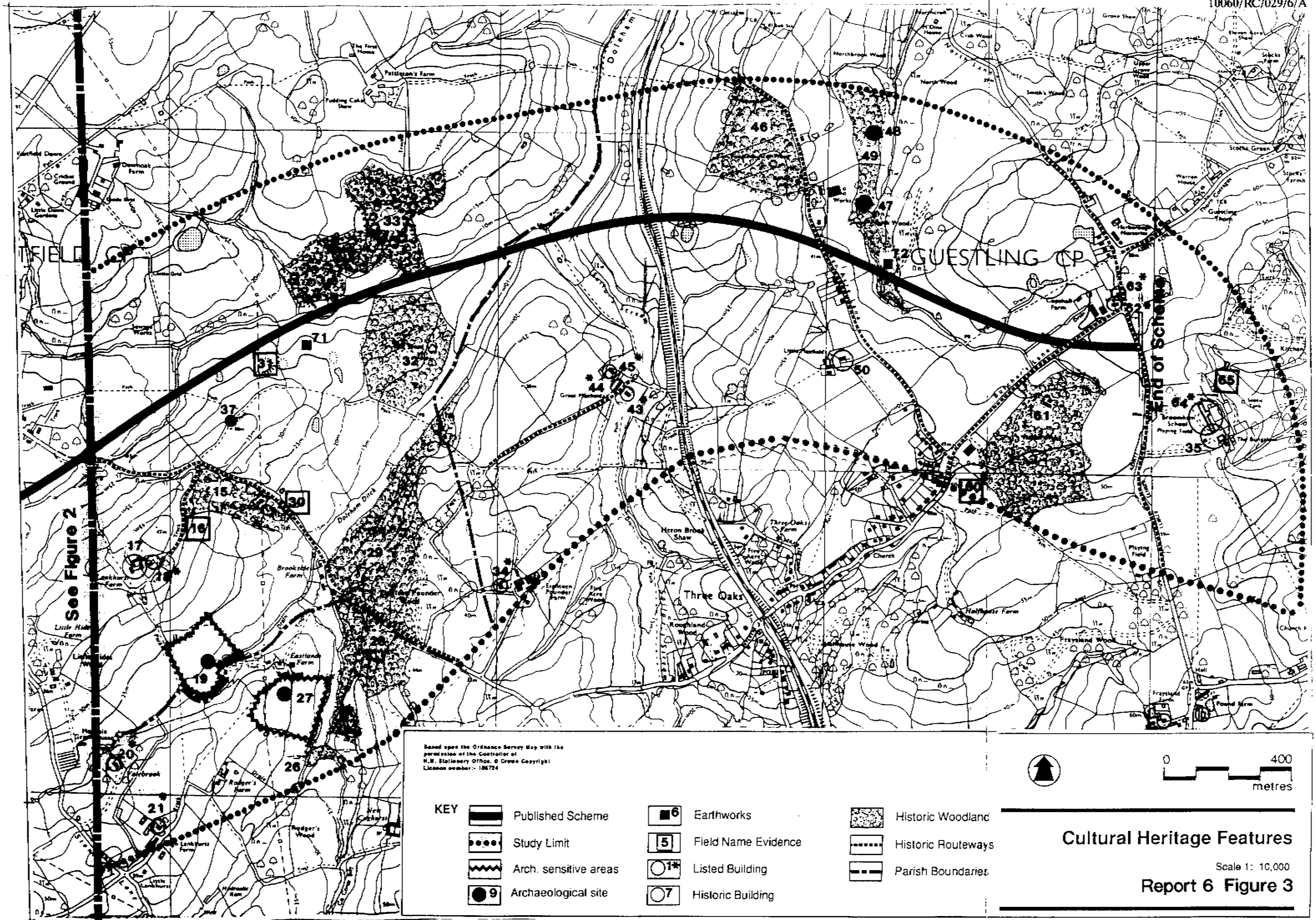
Figure 3

0 400 metres

Cultural Heritage Features

Scale 1 : 10,000

Report 6 Figure 2



Cultural Heritage Features

Scale 1: 10,000

Report 6 Figure 3

APPENDIX 1

GAZETTEER OF CULTURAL HERITAGE FEATURES

APPENDIX 1

GAZETTEER OF CULTURAL HERITAGE FEATURES

KEY:

A	**Archaeological Item**
HB	**Historic Building**
L	**Historic Landscape Feature**
ASA	**Archaeologically Sensitive Area**
DMV	**Deserted Medieval Village**
II & II*	**Listed Building Grades**
C17	**Seventeenth century**
1st ed 6"	**First edition six inch map: Ordnance Survey 1870**
NCC	**Nature Conservancy Council: East Sussex Inventory of Ancient Woodland (Provisional) 1988**
ROHAS	**Rape of Hastings Architectural Survey**

No	NGR (all TQ)	Type	Parish	Description	Grade
001	80151400	L	Westfield	Baldslow Wood: prob ancient wood.	NCC
002	79791413	HB	Westfield	Former stables at Claremont School; built 1878-9 of red brick.	II
003	79801409	HB	Westfield	Former Lodge at Claremont School; as above.	II
004	79881411	HB	Westfield	Claremont School, Ebden's Hill; red brick, tudor style built 1878-9.	II
005	79671438	HB	Westfield	Moat Cottage, Kent Street; C17, brick, tile hung, thatched roof. A cottage shown on site on 1619 estate map.	II
006	80351480	L	Westfield	Whitelands Wood:prob ancient wood.	NCC
007	80601435	L	Westfield	Roughlands Wood; prob ancient woodland.	-
008	80921505	HB	Westfield	Church Place Farm, Vicarage Lane; early C18 red brick house built on site of former manor house (ROHAS) remains of medieval moat.	II & ASA
009	81441510	HB	Westfield	Moor Farmhouse, The Moor; prob. C17 or earlier, updated in C18. A house shown on site in 1619.	II
010	81551506	HB	Westfield	Site of now rebuilt historic dwelling, shown on estate plan of 1748.	-

011	81541508	HB	Westfield	Corner Cottage and The Cottage, The Moor; surviving end bay of late C16 house, with added 2-bay front range of c 1700 (ROHAS).	I I
012	81571506	HB	Westfield	Old Beams, The Moor; 3-bay house of c 1600 with additions c 1700. Timber framing still exposed externally (ROHAS).	I I
013	81581509	HB	Westfield	Old Moor House, The Moor; 4-bay "L" plan house of early C17 with timber framing still exposed externally (ROHAS).	I I
014	81551513	HB	Westfield	House adjoining Old Moor House; C18 redbrick and weather boarded. A house shown on this site on estate map of 1748.	I I
015	82201490	L/A	Westfield	Kiln Wood - prob ancient woodland; name also implies kiln site.	NCC
016	82071484	A	Westfield	Kiln Field - name on Westfield tithe.	-
017	81881470	HB	Westfield	Group of three farm buildings of Lankhurst Farmhouse shown on 1st ed 6": none of surviving buildings are of any great antiquity.	-
018	81941471	HB	Westfield	Lankhurst Farmhouse; Crosswinged house of C18, incorporating one C17 wall (ROHAS).	I I
019	82101441	A	Westfield	Romano British settlement within county designated ASA no. 322.	ASA
020	81831409	HB	Westfield	Valebrook, Stonetile Lane; late C18.	I I
021	81971390	HB	Westfield	High Lankhurst Farmhouse; C18 red brick.	I I
022	811135	L	Westfield	Tip of Maplehurst Wood, prob ancient woodland.	NCC
023	8096 1508	HB	Westfield	Barn at Church Place Farm; 5-bay timber framed barn of c 1600 (ROHAS)	ASA
024	8149 1514	A	Westfield	At The Moor, site of destroyed historic dwelling shown on estate plan of 1748.	-
025	8152 1513	A	Westfield	At The Moor, site of now rebuilt historic dwelling shown on plan of 1748.	-
026	825140	L	Westfield & Guestling	Roger's Wood possibly historic horseshoe shaped woodland.	-
027	824143	A	Westfield	Probable DMV within ASA no. 323.	ASA
028	826144	L	Westfield & Guestling	Eight Acre Wood - prob ancient woodland.	NCC
029	826148	L	Westfield & Guestling	Eighteen Pounder and Popland Woods, prob ancient woodland.	NCC

030	82381488	A	Westfield	Kiln Field - name on Westfield Tithe.	-
031	82261529	A	Westfield	Pit Field - name on Westfield Tithe.	-
032	827154	L	Westfield	Oak Wood - prob ancient woodland.	NCC
033	826157	L	Westfield	Luckhurst Wood - prob ancient woodland.	NCC
034	83011465	HB	Guestling	Eighteen Pounder Farmhouse; L-shaped early C19, brick and weather boarded.	II
035	8518 1513	HB	Guestling	Barn at Broomham School, early C18 rebuilt using frame of C15 barn. Now in use as part of school (ROHAS)	-
036	7968 1444	A	Westfield	Cottage shown on now vacant site on 1619 estate plan.	-
037	8218 1515	A	Westfield	Westfield barn shown on site on estate plan of 1619.	-
038	7976 1352	A	Westfield	Small ponds and uneven mounds of ? workings	-
039	7982 1366	A	Westfield	Terrace c 45 m across cut into slope possible post medieval iron working site.	-
043	83391521	HB	Guestling	Great Maxfield, Rock Lane. Former moated mansion owned by Battle Abbey. 4-bay crosswing of c 1500 survives with earlier stone chimney (ROHAS).	II*
044	83371523	HB	Guestling	1,2 & 3 Oast Cottages, Great Maxfield; C19, converted from two oasthouses and granary.	II
045	83351528	HB	Guestling	Barn at Great Maxfield. Large 5-bay, aisled timber framed barn of c 1700. Now converted to a dwelling (ROHAS).	II
046	838160	L	Guestling	Fourteen Acre Wood prob ancient wood.	NCC
047	84121580	A	Guestling	Site of bloomery(s), undated, in North Wood, possibly same as No. 48.	-
048	84201600	A	Guestling	Site of bloomery(s), undated, in North Wood, possibly same as No. 47.	-
049	841159	L	Guestling	North Wood - prob ancient woodland.	NCC
050	84051533	HB	Guestling	Little Maxfield Farmhouse; C17 or earlier. Timber framed, now brick underbuilt and weatherclad above.	II
060	84461490	L	Guestling	Pit Field - name on Guestling Tithe.	-
061	847151	L	Guestling	Plashet Wood - prob ancient woodland.	NCC
062	84881551	HB	Guestling	Barn at Copshall Fm; single aisled, 6-bay barn, rebuilt in c 1600 (ROHAS). Now converted into a house.	II

063	84901554	HB	Guestling	Copshall Farmhouse; mid to late C17, 3-bay farmhouse retaining its thatched roof.	I I
064	85151515	HB	Guestling	Broomham School. Large stone and brick gentry house of C16 and later. Seat of Ashburnhams of Guestling (ROHAS).	I I
065	852150	L	Guestling	Field name evidence for Park, presumably at Broomham.	-
066	80981430	HB	Westfield	Cockmartin's Farm; house, barn and building shown on estate map of 1748. Present buildings give no indication of great antiquity.	-
067	81201389	HB	Westfield	Hole Farm; house, 2 barns and buildings shown on 1619 estate map. Present buildings appear to be of no great antiquity.	-
068	79911399	A	Westfield	Fishponds in grounds of Claremont.	-
069	79871389	HB	Westfield	Harrow Lodge; built in style of Claremont, possibly by Shaw.	-
070	80321420	A	Westfield	Boundary ditch by E edge of Dines Wood.	-
071	82401525	A	Westfield	Depressions ? Clay or ore diggings. See also Site 31.	-
072	84201565	A	Guestling	Bloomery cinder in stream bed.	-
073	80791444 80991447	A	Westfield	Two possible lynchets.	-
074	81451508 81651400	A	Westfield	Conjectured line of Roman Road	-

APPENDIX 2

WALKOVER SURVEY

APPENDIX 2

WALKOVER SURVEY

1.0 INTRODUCTION

1.1 A walkover survey of the proposed route of the A259 Hastings Eastern Bypass was made between the 8th and 9th of October 1992. The route started at Claremont School, near Baldslow, and ended at Copshall Farm, Guestling Thorn.

1.2 Access to inspect the land was granted by all landowners/tenants who were approached except for the owner of Moor Farm, Westfield and the owners of Harrow Lodge and Pinehurst on the A229 south of Claremont School. In such cases, though the line of the proposed route could not be physically traversed, the land in question was observed from neighbouring fields and public rights of way.

1.3 All fields under pasture were viewed and the majority physically traversed. In some cases difficulty or prohibition of access made actual traverse impossible or very inconvenient, but these cases were rare. Ploughed fields were inspected, though areas of standing crops were not traversed. Woods were inspected as access allowed though progress was often severely impeded by dense undergrowth.

2.0 RESULTS

2.1 Six areas of possible archaeological interest were detected:

a) Baldslow Wood: the smaller of the two fishponds (no. 68) recorded from the 1:2500 engineers map (TQ 79901379) measures approximately 13x8 m. Access to the pond was denied by the landowner, though observation from the grounds of Claremont School would suggest that it remains largely clear of vegetational cover.

b) Dines Wood: about 75 m length of north-east/south-west aligned field boundary was recorded close to the eastern edge of Dines Wood (TQ 80321420). Traces of a low bank (no. 70) were detected to the north-west. This linear earthwork presumably represents the former eastern most extent of Baldslow Wood.

c) West of Oak Wood: a series of irregular depressions, measuring between 3 m and 7 m in width, were noted to the immediate west and north-west of the two recorded ponds. Unfortunately, as complete access to the field was denied by the landowner, the full nature and extent of these depressions remain unknown, though they may represent clay/ore diggings.

APPENDIX 3

ARCHAEOLOGICAL EVALUATION

SURFACE COLLECTION SURVEY

September 1994

CONTENTS

FIGURES

1.0 INTRODUCTION

1.1 The surface collection survey was conducted by the Oxford Archaeological Unit during November 1992, and was commissioned by Chris Blandford Associates (CBA) on behalf of the Department of Transport. This formed part of the study being carried out to assess the impact on the cultural heritage of the proposed A259 Hastings Eastern Bypass on the archaeological landscape.

1.2 Surface collection survey, recording the presence or absence of archaeological material within areas of arable, is an established technique used to identify unknown archaeological sites, to define areas of archaeological potential and to interpret past patterns of human settlement activity.

2.0 METHOD

2.1 The method used for the surface collection survey followed the basic premise that all arable areas of landtake should be subject to survey using a systematic linear transect sampling method to a standard specification.

2.2 Transects were set out from 1:2500 scale drawings (EN 10060-PN 162) of the Published Scheme by measuring from fixed points on field boundaries.

2.3 The survey was based on a corridor approximately 80 m wide, 40 m either side of the centre line of the proposed road. Artefacts were collected by walking 20 m units along transects set 20 m apart.

2.4 A field log book and a series of field record sheets were kept to record variations within and between each land parcel. These recorded the following:

a) Land parcel number.
b) Soil/crop conditions.
c) Ground surface visibility conditions.
d) Slope/topography.
e) Lighting /weather conditions.
f) Length of transects and number of units walked.
g) Time of day and date.
h) Initial interpretation/summary of finds.

2.5 Collection Strategy

2.5.1 The collection strategy was designed to be inclusive rather than exclusive, ie for most object categories total recovery was aimed at, irrespective of the date of the material in question. This was intended to avoid problems caused by fieldworkers exercising objective bias against certain types of object or against objects thought to be of recent date. For example, subjective assessment of date and consequent 'on the spot' discard in the field could have resulted in imbalances in the recovered quantities of categories such as tile and pottery.

2.5.2 The major artefact categories collected and recorded were pottery (post medieval), baked clay/daub, fire-cracked flint, worked flint, glass, metal objects, slag and other smelting waste related material, marine shell and coal/charcoal.

2.5.3 The only items which were not recovered, or which if recovered were not subsequently recorded, were twentieth century plastic, bakerlite and asbestos, large metal objects derived from modern agricultural machinery, and post medieval brick and tile where this material occurred in large quantities. In the latter case, representative samples were kept and a note made in the field of the presence and location of dense scatters of such material.

2.6 Conditions

2.6.1 The majority of land available for study was pasture or set aside and therefore unsuitable for this method of survey. In some arable fields the advanced state of the crop also meant that surface artefact collection could not be undertaken.

2.6.2 Three property owners were approached for access for the surface collection survey. Access was denied to all but one of the properties. A total of 91, 20 m collection units were surveyed.

2.6.3 Surface visibility was good with at least 80% of soil being visible. Land parcels with a visibility of less than 25% (ie areas of leaf crop or set aside) were not surveyed.

3.0 RESULTS

3.1 Artefacts Retrieved

3.1.1 All the finds recovered (with the exception of those classes of post medieval/modern material mentioned above), were recorded on a computerised database in broad object categories. The finds were dated where possible, but many items, such as tile and some pottery, were found in such small fragments that they were not closely datable and consequently have been recorded as being of 'uncertain' age. The computerised data was used to provide lists of artefact types by period and formed the basis for a series of finds distribution plots for each of the land parcels surveyed during the project.

3.1.2 The principal finds categories in terms of quantity were brick/tile, slag and other smelting waste related materials and fire-cracked flint. Full analysis, however, tended to concentrate on those groups, such as pottery and worked flint, which were likely to provide chronological information. Certain other classes of object which might have contained a range of closely datable objects consisted mainly post medieval material.

3.2 Worked Flint

3.2.1 Of the 28 pieces of worked flint that were recovered only six were intentionally worked, and consisted of five flakes and one tool. The raw material consisted of good quality flint exhibiting some degree of incipient cortication varying from heavy to a light milky clouding of the flint.

3.2.2 The dating of the collection is problematical as there were few diagnostic pieces and dating based on knapping technology is difficult for unstratified, abraded material. A late Neolithic or early Bronze Age is considered a reasonable date for the assemblage.

3.3 Fire-cracked Flint

3.3.1 Fifty four pieces of fire-cracked flint were recovered from the field survey. Such material, being the by-product of direct and prolonged heat, such as that produced by a kiln, furnace or bonfire and not from more general activities such as stubble burning, is a good indicator of past settlement or industrial activities, especially, in the latter case, when it is associated with slag or other metallurgical waste products.

3.4 Pottery

3.4.1 Forty six sherds of pottery were recovered from the survey. All recorded fragments were of post medieval date and may represent dispersed manuring scatters.

3.5 Tile and Brick

3.5.1 One hundred and forty three fragments of tile were recorded, most of which could not be dated with precision. A few pieces could be assigned a Roman date from their fabric, although this assumption was not supported by the evidence of characteristic forms (such as tegulae and box flue tiles) or by surface artefact associations.

3.5.2 The majority of the assemblage is presumably of post medieval date. A detailed analysis of fabric type would probably have permitted a more accurate estimate of numbers by period, but this was not possible within the time constraints of the project.

3.6 Other Finds

3.6.1 Organics and other intrinsically undatable artefacts included, slag and other metallurgically related waste material (107 lumps), coal (four lumps) and marine shell (13 pieces). All recorded glass fragments were of post medieval date. Metal objects were either post medieval or undatable, consisting, in the main, of corroded iron and bolt fragments.

3.7 Artefact Scatters

3.7.1 The distribution of artefacts was studied for evidence of concentrations which may indicate the presence of archaeological sites. The principal categories of material used were those which occurred in large quantities and were susceptible to sub-division by period. These materials were worked flint, pottery and, to a lesser extent, brick/tile and slag.

3.7.2 The criteria which distinguish a significant concentration of artefacts, implying a site, and a random scatter, implying material spread through later agricultural activities, such as manuring, are difficult to define and vary depending on the material and period of the scatter in question. In the case of pottery, such factors as the relative density of material surrounding a 'scatter', the extent and compactness of the spread and (where applicable) the association of the material with other artefact categories of the same period, or with material of other periods (eg a close association between Iron Age and early Roman sites) were considered.

3.7.3 The results, nevertheless involve an element of subjectivity dependent upon the type of material in question. Worked flint, for example, survives relatively well in ploughsoil, though it can become heavily abraded. Prehistoric pottery, however, being less fired than Roman or medieval examples, will not survive well in disturbed ploughsoils and will therefore appear, if at all, in very small quantities. In contrast fire-cracked flint and slag related materials will survive and remain identifiable even when broken down by ploughing.

3.8 Sites Located

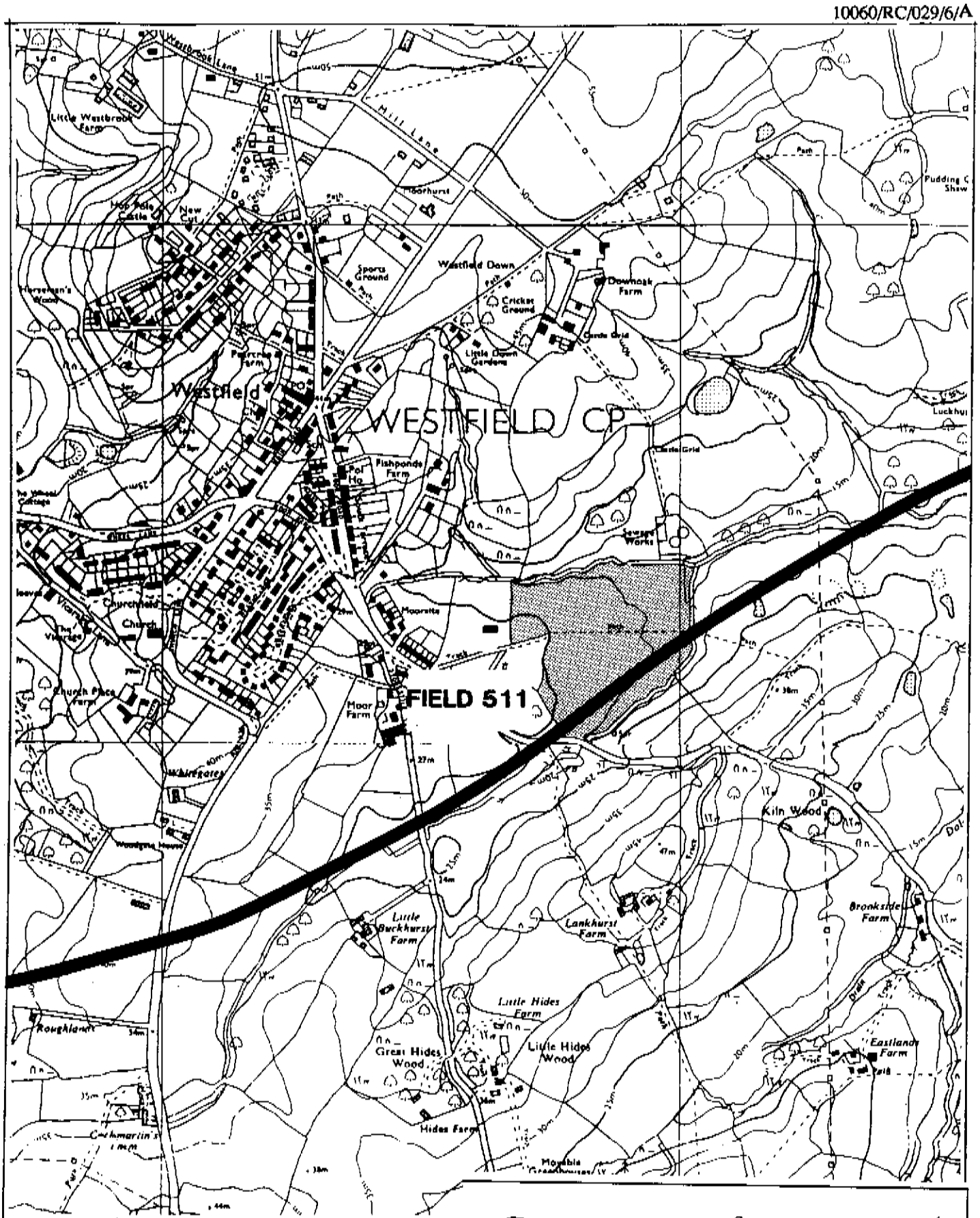
3.8.1 The area covered by the field survey and the extent of recorded artefactual clustering are shown on figures A3/1 - A3/2. The 'confidence' rating indicates a judgement of the confidence that clusters represent distinct concentrations of potential archaeological significance ranging from 1 (high) to 3 (low).

3.8.2 **Field 511:** High density scattering of slag (107 lumps) apparently clustering at the south eastern margins of the surveyed area and medium density scattering of fire-cracked flint (54 pieces) apparently clustering at the south western margins of the surveyed area. A diffuse scattering of post medieval pottery (46 sherds) was also recorded. Together these may indicate the former presence of a post medieval iron working site within the vicinity of the proposed road. A confidence rating of 2 is considered appropriate for the potential significance of these scatters.

4.0 SUMMARY

4.1 This site is not likely to represent a major constraint on the proposed bypass, but further evaluation of the nature, extent and quality of survival of remains should be carried out prior to construction. Areas of negative evidence may also require trenching to verify the absence of archaeological features.

4.2 Other areas of cultivated land were intended to be surveyed, but due to denial of access and the advance state of the crop in some cases, this was not possible. These areas should be evaluated when either access is negotiated or after the next harvest.



Based upon the Ordnance Survey Map with the permission of the Controller of H.M. Stationery Office. © Crown Copyright Licence number:- 186724

KEY

Field surveyed

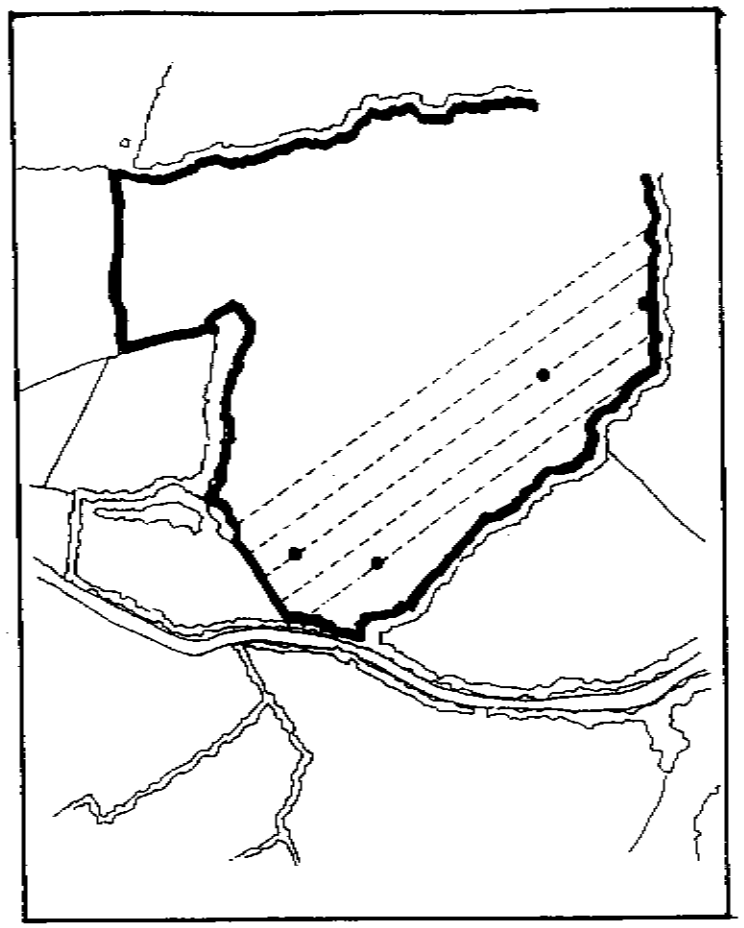
Line of Published Scheme

0 1 Km

Artefact Scatters: Location of Field Surveyed

Scale 1: 25,000

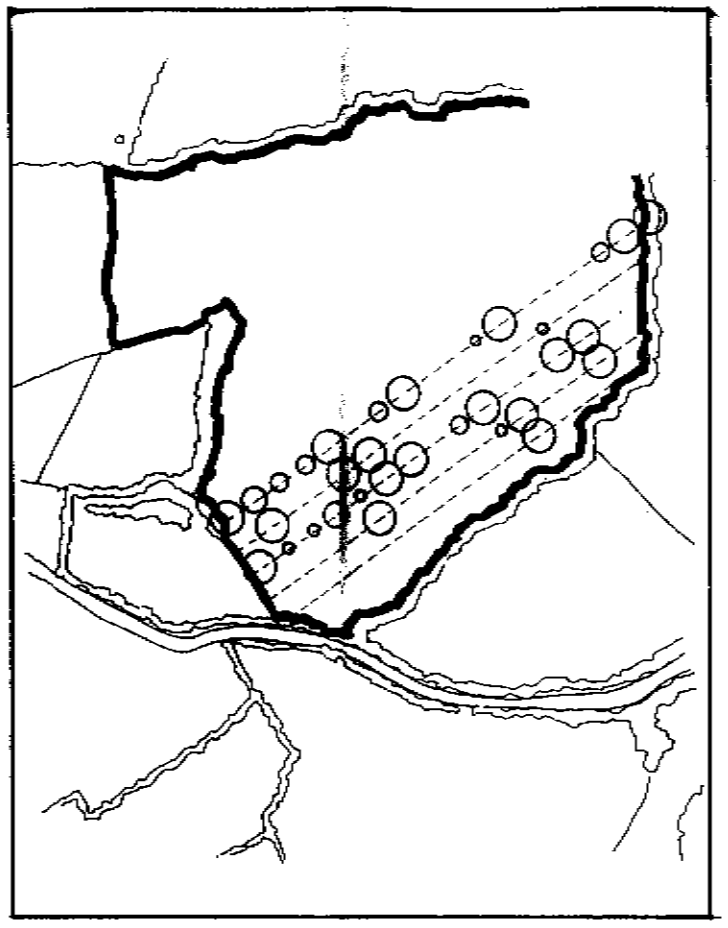
Report 6. Figure A3/1.



KEY

WORKED FLINT

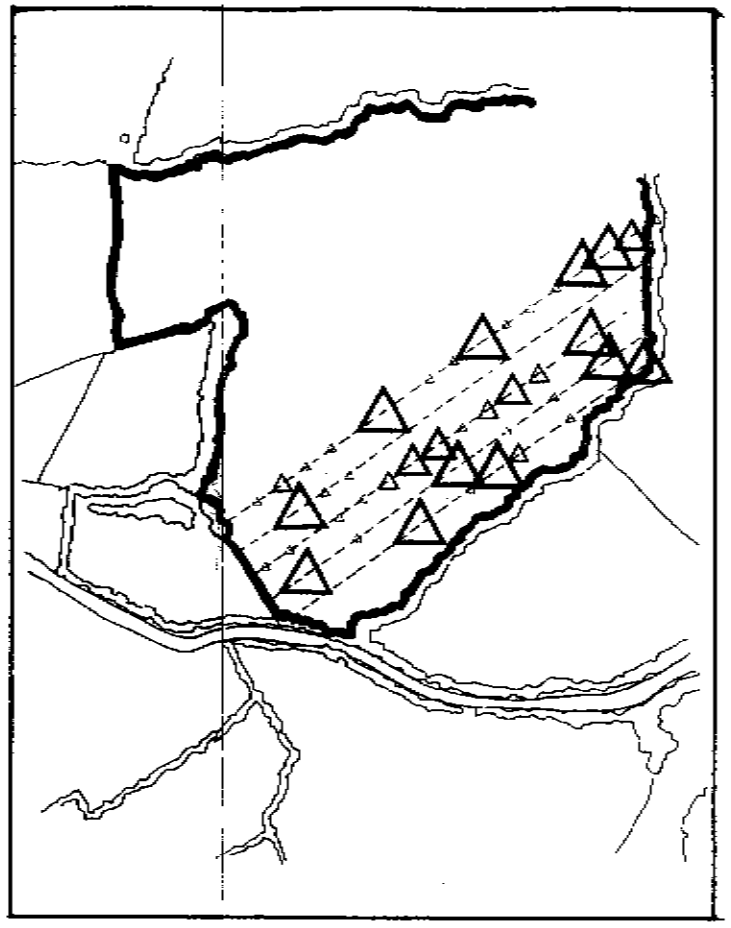
1 Piece	•
2 Pieces	●
3 Pieces	●
4 Pieces	●



KEY

BURNT FLINT

1 Piece	○
2 Pieces	○
3 Pieces	○
4 Pieces	○



KEY

SLAG

1 Piece	△
2 Pieces	△
3 Pieces	△
4 Pieces	△

0 200 metres

Field 511:
Artefact Scatters

Scale 1: 5,000

Report 6. Figure A3/2

APPENDIX 4

ARCHAEOLOGICAL EVALUATION

GEOPHYSICAL SURVEY

September 1994

CONTENTS

1.0 INTRODUCTION

1.1 A geophysical evaluation survey was undertaken by Geophysical Surveys of Bradford in November 1992, commissioned by Chris Blandford Associates (CBA) on behalf of the Department of Transport. This formed part of the study to assess the likely impact of the proposed A259 Hastings Eastern Bypass on the cultural heritage. The desktop report indicated activity of a varied archaeological nature and date.

1.2 Geophysical survey is a recognised non intrusive archaeological evaluation technique, and geophysical methods such as gradiometry are particularly suited to pasture where traditional archaeological prospection techniques are inappropriate. It was anticipated that the magnetic data would help identify individual features of archaeological interest along the proposed route.

2.0 METHOD

2.1 Magnetic readings were logged at 0.5 m intervals along one axis in 1 m traverses giving 800 readings per 20 m x 20 m grid, unless otherwise stated.

2.2 The location of individual transects surveyed can be seen in figures A4/2-4. The results of each transect are discussed from west to east within each figure. It should be noted that the numbering of transects are not consecutive from west to east. Numbers were allocated to individual landowners and where more than one transect was undertaken within a landowner area, a letter was added to the number; eg 89A and 89B.

2.3 The figures only illustrate anomalies of possible archaeological significance. The more detailed result plots from which these are derived are not included here but a copy of the archive has been deposited with the County Archaeologist.

2.4 Some areas were visited but were found to be unsuitable for gradiometer survey. Where appropriate the details of these areas are given in the text.

3.0 RESULTS

3.1 The results from each area have been displayed in dot density and X-Y formats within the archive. The display formats are discussed in Annex A. Both the data displays and the relevant interpretation diagrams for each transect were produced at a scale of 1:500 to allow exact measurements to be obtained and are lodged in the archive.

3.2 General Considerations

3.2.1 Ground conditions varied considerably along the route of the road and, where appropriate, are mentioned in the discussion of results. In some areas the magnetic response was dominated by modern ferrous material. This disrupted any archaeological response, although archaeological features may still be found intact, even though they cannot be detected using a gradiometer.

3.2.2 The gradiometer survey corridor was 20 m wide. Interpreting the data from such a narrow survey area is difficult, as it is often hard to identify a true background upon which anomalous readings can be identified. Therefore, the interpretation of many anomalies has to be tentative. In this report, unless noted otherwise, the linear anomalies are thought to be the result of ditch type features.

3.3 Analysis of Results

Results are discussed by transect from west to east and are divided by figure number. Individual transect numbers are not sequential. Transect numbers appear in bold.

3.3.1 *Figure A4/2*

56: The data from this small survey, in a field that was overgrown with grass and weeds, was dominated by ferrous responses. This was the product of a buried pipe and other ferrous debris. Although some possible archaeological anomalies have been identified, it is likely that they are also associated with ferrous material, conceivably buried at some depth.

3.3.2 *Figure A4/3*

89A: No anomalies of archaeological interest were noted in this transect.

89B: The data set in this transect was very quiet. However, a couple of weak anomalies of some archaeological potential were identified.

89C: This data set contained some anomalies of possible archaeological interest. However, the most obvious anomalies were associated with former agricultural practices. Occasional ferrous anomalies were also present.

3.3.3 *Figure A4/4*

105: A few weak anomalies of possible archaeological interest have been noted in this data set. The data was generally quiet with the occasional ferrous type response.

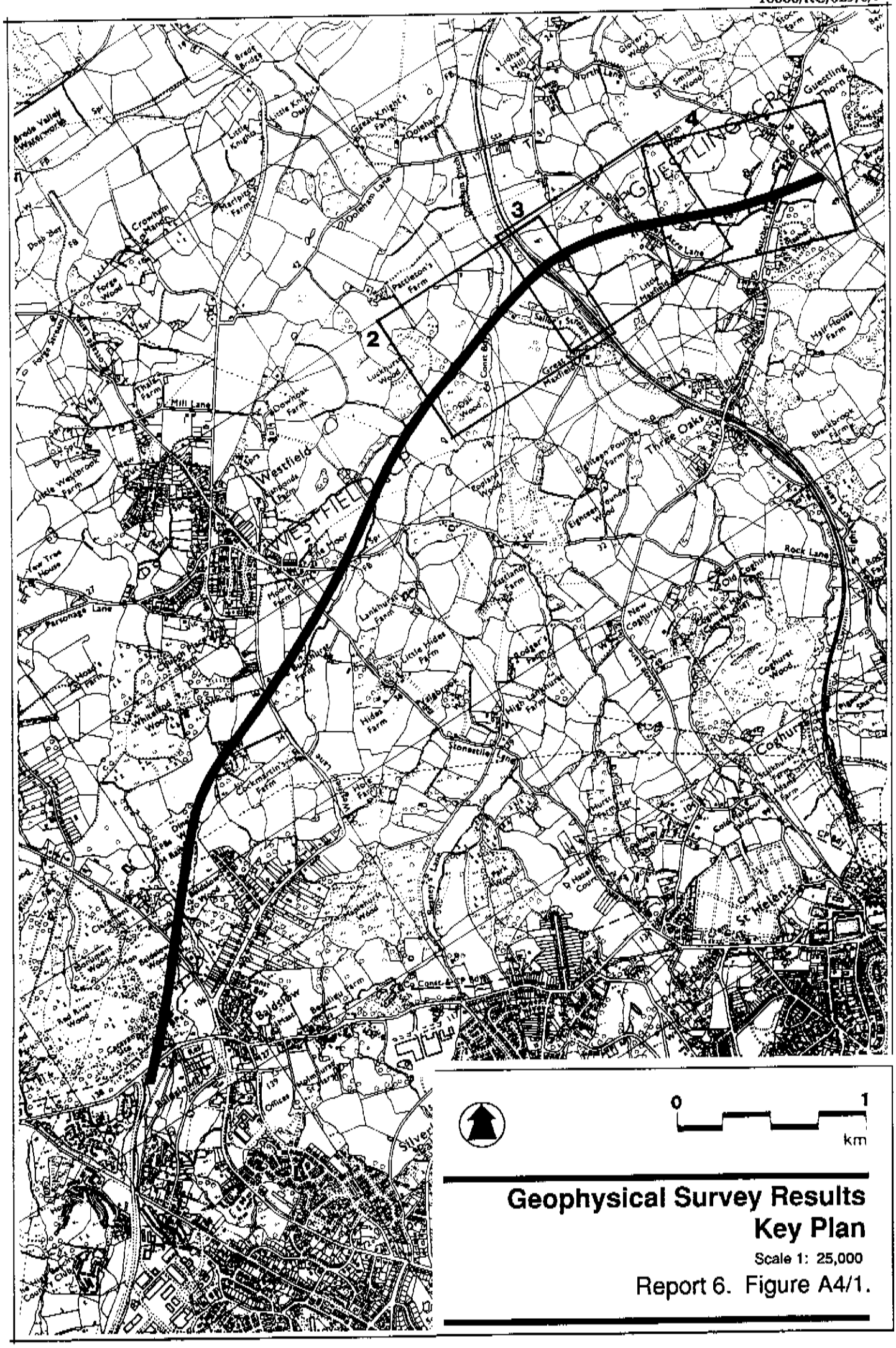
87A: This area was magnetically quiet. A minor area of disturbance can be seen in the eastern part of the survey. It is thought that this is likely to be due to dumping of magnetic material.

87B: This small survey area, 40 m in length, provided evidence for a number of archaeological anomalies. It is suggested that a series of ditches are present in this area.

4.0 SUMMARY

4.1 Although no areas containing dense concentrations of archaeological type anomalies have been surveyed, a few anomalies of archaeological potential have been noted. In particular transects 89B, 89C and 87B demonstrate anomalies which could be interpreted as ditches and pits.

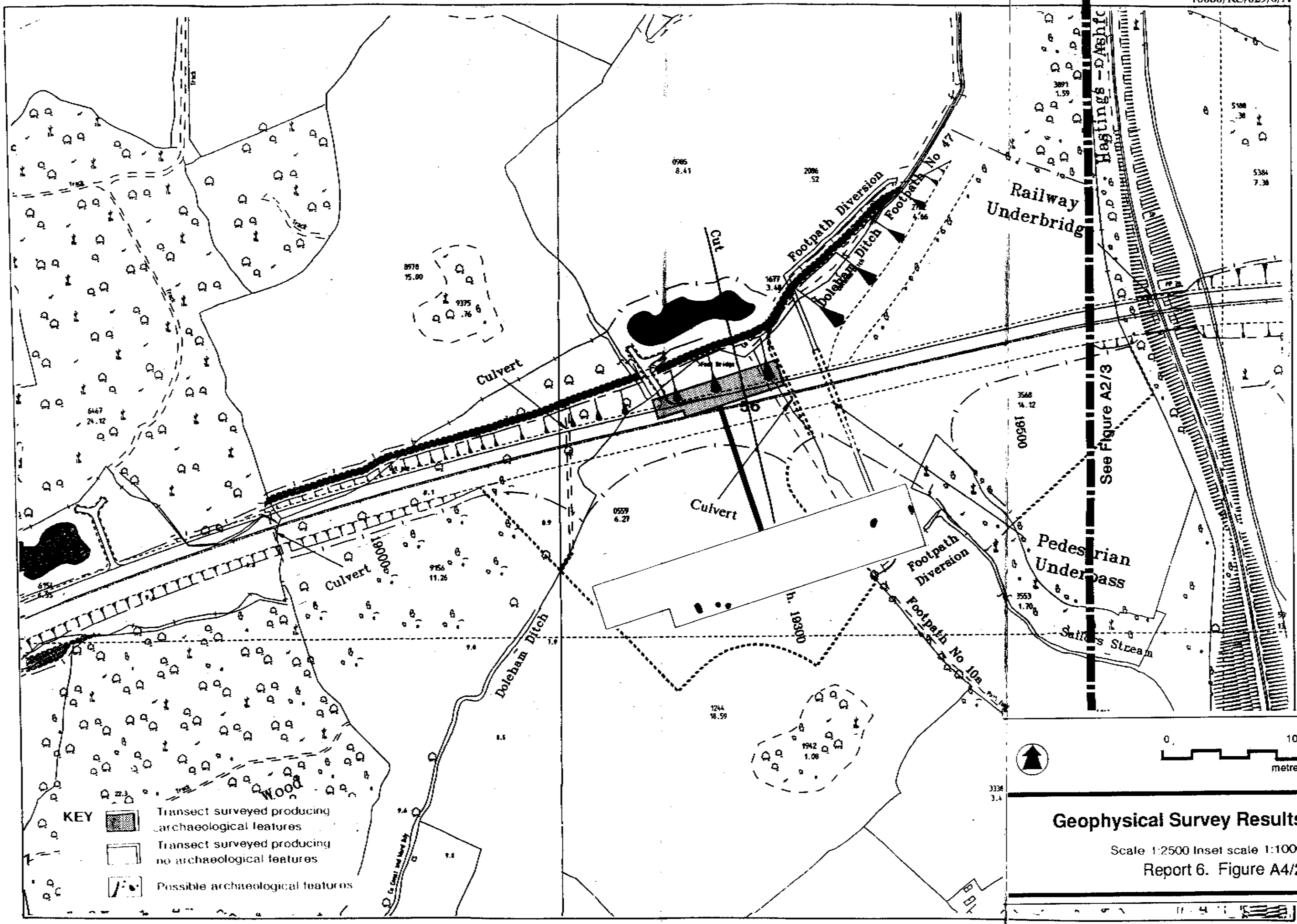
4.2 These features are not likely to represent a major constraint on the proposed bypass, but further evaluation of the nature, extent and quality of survival of remains should be carried out prior to construction, particularly when this information is added to that revealed in the desktop study and other field evaluation techniques.



Geophysical Survey Results
Key Plan

Scale 1: 25,000

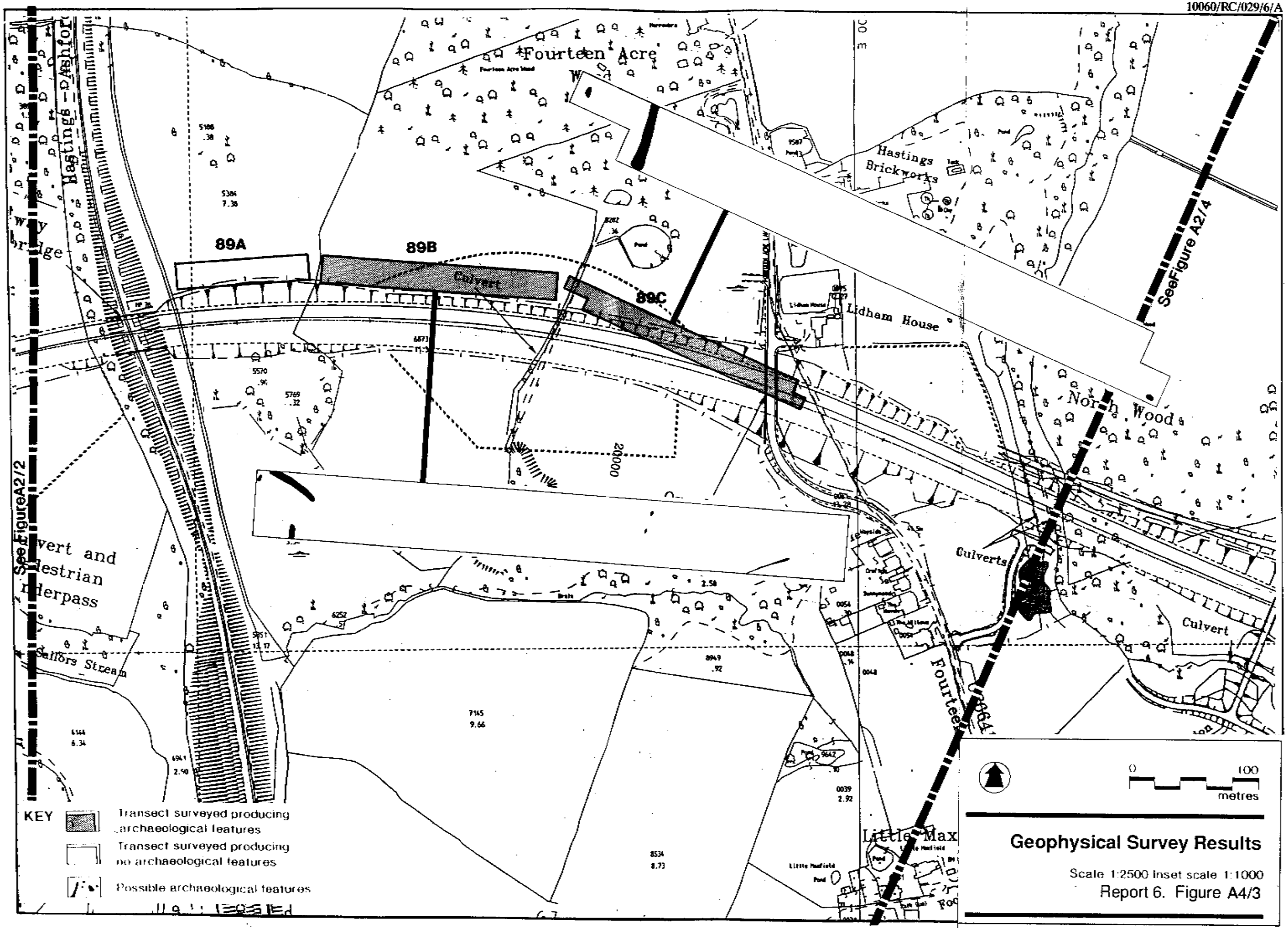
Report 6. Figure A4/1.



Geophysical Survey Results

Scale 1:2500 Inset scale 1:1000

Report 6. Figure A4/2



Geophysical Survey Results

Scale 1:2500 Inset scale 1:1000

Report 6. Figure A4/3

See Figure A2/3

Copshall Farm

115500 N

585000 E

Access Overbridge and Footpa

Footpath Diversion

105

87A

87B

Culvert

Culvert

Culvert

Footpath Diversion

Footpath No 16

Plashet Wood

Butcher's Lane

21000

0 100 metres

KEY

Transect surveyed producing archaeological features

Transect surveyed producing no archaeological features

Possible archaeological features

Geophysical Survey Results

Scale 1:2500 Inset scale 1:1000

Report 6. Figure A4/4

ANNEX A

1.0 TECHNICAL INFORMATION

1.1 The following is a description of the equipment and display formats used in Geophysical Surveys of Bradford reports. It should be emphasised that whilst all of the display options are regularly used, the diagrams produced in the final reports are the most suitable to illustrate the data from each site. The choice of diagrams results from the experience and knowledge of the staff of Geophysical Surveys of Bradford.

1.2 Instrumentation

Fluxgate Gradiometer - Geoscan FM36

1.2.1 This instrument comprises of two fluxgates mounted vertically apart, at a distance of 500mm. The gradiometer is carried by hand, with the bottom sensor approximately 100-300mm from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is conventionally measured in nanoTesla (nT) or gamma. The fluxgate gradiometer suppresses any diurnal or regional effects. Generally features up to one metre deep may be detected by this method.

Resistance Meter - Geoscan RM4 or RM15

1.2.2 This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. The "Twin Probe" arrangement involves the paring of electrodes (one current and one potential) with one pair remaining in a fixed position, whilst the other measures the resistance variations across a fixed grid. The resistance is measured in Ohms and the calculated resistivity is in Ohm-metres. The resistance method as used for area survey has a depth resolution of approximately 0.75m, although the nature of the overburden and underlying geology will cause variations in this generality. The technique can be adapted to sample greater depths of earth and can therefore be used to produce vertical "pseudo sections".

Magnetic Susceptibility

1.2.3 Variations in the magnetic susceptibility of subsoils and topsoils occur naturally, but greater enhanced susceptibility can also be a product of increased human/anthropogenic activity. This phenomenon of susceptibility enhancement can therefore be used to provide information about the "level of archaeological activity" associated with a site. It can also be used in a predictive manner to ascertain

the suitability of a site for a magnetic survey. The instrument employed for measuring this phenomenon is either a field coil or a laboratory based susceptibility bridge. For the latter 50g soil samples are collected in the field.

1.3 Display Options

1.3.1 The following is a description of the display options used. Unless specifically mentioned in the text, it may be assumed that no filtering or smoothing has been used to enhance the data. For any particular report a limited number of display modes may be used.

X-Y Plot

1.3.2 This involves a line representation of the data. Each successive row of data is equally incremented in the Y axis, to produce a stacked profile effect. This display may incorporate a hidden-line removal algorithm, which blocks out lines behind the major peaks and can aid interpretation. Advantages of this type of display are that it allows the full range of the data to be viewed and shows the shape of the individual anomalies. Results are produced on a flatbed plotter.

Dot-Density

1.3.3 In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending on the relative position between the two levels. The focus of the display may be changed using different levels and a contrast factor (C.F.). Usually the C.F. = 1, producing a linear scale between the cut-off levels. Assessing a lower than normal reading involves the use of an inverse plot, This plot simply reverses the minimum and maximum values, resulting in the lower values being presented by more dots. In either representation, each reading is allocated a unique area dependent on its position on the survey grid, within which numbers of dots are randomly placed. The main limitation of this display method is that multiple plots have to be produced in order to view the whole range of the data. It is also difficult to gauge the true strength of any anomaly without looking at the raw data values. This display is much favoured for producing plans of sites, where positioning of the anomalies and features is important.

Contour

1.3.4 This display joins data points of an equal value by a contour line. Displays are generated on the computer screen or plotted directly on a flatbed plotter / inkjet printer.

3-D Mesh

1.3.5 This display joins the data values in both the X and Y axis. The display may be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white. A hidden line option is occasionally used (see 1.4.2 above).

Grey-Scale

1.3.6 This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey scale.

1.3.7 Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. While colour plots can look impressive and can be used to highlight certain anomalies, grey-scales tend to be more informative.

Report 6
Cultural Heritage

Report 7
Visual Impact

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September 1994

A259 HASTINGS EASTERN BYPASS

ENVIRONMENTAL STATEMENT

VOLUME 2

REPORT 7

VISUAL IMPACT

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1.0 INTRODUCTION

1.1 This report describes the visual impacts caused by the proposed A259 Hastings Eastern Bypass on residents/occupiers of property and users of areas with public access. It does not cover the impact on landscape character and landscape quality which is described in Volume 2, Report 4 of the Environmental Statement.

1.2 Assessment of the visual impact was first carried out when alternative route options were being considered. As the Preferred Route has been developed, additional assessment in line with the procedures of the Manual of Environmental Appraisal (MEA) were carried out as necessary.

1.3 Following publication of the revised methods, surveys to assess the visual impact and to devise appropriate mitigation for the developing proposals were carried out in March and June 1994.

2.0 METHODS

2.1 The Visual Impact Appraisal has been carried out in accordance with The Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 5 *Landscape Effects*.

2.2 The DMRB guidance states that the extent to which visual impact would result from the construction of the road is dependent upon the quality and type of landscape through which the road passes. The visual impact appraisal is a qualitative comparison between the existing scene (including any developments which have received planning permission) and the projected scene. It is the difference between the two, that is, the change in visual impact, whether beneficial or adverse, which is important in determining the visual impact of the scheme.

2.3 The process of assessing visual impacts is essentially site based and has been carried out by an experienced landscape architect. Where possible the assessment was made by surveying the view from the centreline of the published scheme to the sites or properties visible within the visual envelope. This approach avoided the difficulties associated with access to private property. In addition, a thorough on-site survey was undertaken by walking all the local footpaths, viewpoints and roads.

2.4 Where there was difficulty in obtaining a clear impression of the extent to which the scheme and its traffic would be visible, cross sections were plotted. The cross-sections established clear lines of sight, allowing interpolation of the changes in relationship between observer and road to be made with greater confidence.

2.5 A visual envelope map (VEM) was prepared and shows the area of land from which there is a view of the proposed road, its structures or traffic. Although the VEM is primarily an aid in the assessment of visual effects, it is also of use as an indication of areas of land affected by the scheme. It can, however, be misleading in circumstances where the visual envelope extends for some miles to include distant views. For this reason, the distant viewing points have been excluded from the VEM, but they have been recorded separately.

2.6 Two basic assumptions were made in the preparation of the VEM. The observer's height is the assumed eye level of a person (1.8 m), and visual intrusion is taken to be traffic on the road as well as the road itself. A height of 4 m above carriageway was taken to represent the height of the average commercial vehicle. The effect of road lighting and car headlights has also been taken into account in the preparation of the visual assessments.

3.0 THE EXTENT OF THE VISUAL ENVELOPE

3.1 The extent of the area with views of the scheme, its structure and traffic, is shown on the Visual Envelope Maps (VEM) on Figure 1. The width of the envelope is generally restricted to a narrow band by landform and surrounding vegetation. At its widest point, however, at Doleham Ditch, it extends approximately 1 km to the north of the route. In addition, it is thought likely that there would be long distance views (3-4 km) of the route from properties on the northern edge of Hastings near the cemetery and Bachelor's Bump.

4.0 VISUAL IMPACT ON PRIVATE PROPERTY

4.1 General

4.1.1 The properties within the VEM (both residential and non residential) which have been assessed, are shown on the VID Figures 2 - 3, 6 - 7 and in Appendix 1 and 2.

4.1.2 Groups of properties in which residents are likely to experience the same level of visual change have been placed together and given the same reference number.

Residential Property

4.1.3 Out of the 87 residential properties assessed within the visual envelope (including 11 mobile homes at Whitegates Park), the residents of 32 would experience no discernible deterioration in their view during the first winter. Of the remaining 55 properties, the residents of the following sixteen would experience a substantial adverse impact - Pinehurst, Harrow Lodge, four properties at the northern edge of Baldslow Down, the house at Woodlands Park, Freshfields, Fruit Farmhouse, Little Buckhurst Farm, Lidham House and five properties on Fourteen Acre Lane south of the bypass and Copshall Barn. Residents in the remaining 39 properties would experience either a slight or moderate adverse impact.

4.1.4 By the fifteenth year only the residents at Freshfields Fruit Farmhouse would continue to experience a substantial level of impact during the winter months. With the beneficial effects of summer foliage, this would reduce to moderate during the summer months.

4.1.5 The effects on residential property is summarised in Table 1 below.

Table 1 Summary of the Visual Impact on Residential Property

	1st Winter	Winter 15	Summer 15
SUBSTANTIAL	16	1	0
MODERATE	12	10	6
SLIGHT	27	32	11
NO CHANGE	32	44	70
TOTAL	87	87	87

4.1.6 The effects of nightime lighting would be very restricted, with the residents of most properties experiencing no discernible deterioration in their view. Two properties would, however, be substantially affected during the first winter after opening. These are the residents of Copshall Barn which would be affected by the lighting around the roundabout with the existing A259 at Guestling and residents of Freshfields Fruit Farm which would see car headlights head on. During the winter of the fifteenth year, the impact would remain substantial, but during the summer the impact would be reduced as the intervening vegetation would help screen out the light.

Non Residential Property

4.1.7 There are very few non-residential properties along the route. Of the four assessed, two are schools, the third is the Freshfields Fruitfarm Shop, from which customers would not have a view of the scheme, apart from the parking area. The fourth is the Plough Inn at Westfield which would not have a direct ground floor view of the scheme. Claremont School at the western end of the scheme, despite losing part of its grounds, would remain well screened by remaining woodland and consequently the school buildings are outside the visual envelope. The staff and pupils of Broomham School at the extreme eastern end of the scheme would experience a moderate adverse impact during the first winter after opening due to the close proximity of the roundabout. By year 15, however, the woodland planting surrounding the junction, would have established sufficiently to screen all but the tops of the lighting columns.

5.0 VISUAL IMPACT ON THE USERS OF PUBLIC RIGHTS OF WAY

5.1 General

5.1.1 The Public Rights of Way within the VEM which have been assessed, are shown on the VID, Figures 4 - 5, 8 - 9 and in the VIS in Appendix 3.

5.1.2 In addition, footpaths which have been severed or re-aligned to cross the road via an overbridge or underpass would generally reduce their enjoyment value as the diversion would follow existing roads or would be adjacent to the scheme.

5.1.3 There are relatively few public footpaths within the corridor of the Published Scheme. In total approximately 4 km of path within the visual envelope has been assessed of which just over 500 m would be either lost, redundant or taken beneath the road, whilst a similar length would be created through diversions. There would be a substantial adverse impact during the first winter, along 2.5 km of footpath, which would generally be reduced significantly by the fifteenth year through establishing vegetation. The specific effects are discussed below.

5.1.4 Footpath 37 would be truncated and joined to the diverted Three Oaks Lane. Despite the main carriageway and traffic being largely screened from view, the extensive disturbance to the local landscape would result in a substantial visual impact during the first winter after opening. In the longer term, however, with the landscape structure replaced the visual impact to the users of the footpath would be slight.

5.1.5 Footpath 45 would be severed by the bypass and diverted via the Three Oaks Lane overbridge (an additional distance of 145 m). The visual impact on the diversion would initially be substantial, due to the open character of the landscape. Once established the highway planting would partially screen the traffic and earthworks and the residential impact would be slight to moderate.

5.1.6 Footpath 10a, which becomes Footpath 47 would be severed by the bypass. A pedestrian underpass would be provided for users of the footpath. The visual impact would be substantial during the first winter after opening, but in the longer term once the planting has established, the impact would be slight to moderate.

5.1.7 Footpath 17 would also be severed by the scheme and diverted via the new access overbridge and along the northern boundary of the new road (an additional distance of 100 m). The visual impact would initially be substantial over much of its 900 m length, although with the beneficial effect of maturing planting the residual impact would be more evenly divided between substantial, moderate and slight levels of visual impact.

APPENDIX 1

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PRIVATE PROPERTY

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PRIVATE PROPERTY

WINTER ASSESSMENT MARCH 1994
SUMMER ASSESSMENT JUNE 1994

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	BALDSLOW												
1	Pinehurst	1	2 storey house	65 m	Set below A21 in wooded surrounds - view across garden to woodland.	Sub	Mod	SI	-	-	-	5 m mound and woodland planting.	During the first winter there would be views of the mound and overbridge, but traffic would be largely screened. Established planting in year 15 would reduce the impact.
2a	Harrow Lodge	1	2 storey house	85 m	View across garden to dense woodland.	Sub	Mod	Mod	-	-	-	3 m noises barrier.	During the first winter the embankment and noise barrier would be visible. Traffic largely screened. Established planting in year 15 would reduce the impact.
	BALDSLOW DOWN												
3	No. 18, 19, 20	3	2 storey houses	320-350 m	No ground floor views.	-	-	-	-	-	-		Traffic partially visible above false cutting for short distance between 23, 24 from 1st floor. Established planting in year 15 would reduce the impact.
4	No. 21	1	2 storey house	310 m	No ground floor view.	-	-	-	-	-	-		No. 23 screens any view of scheme.
4	No. 22	1	2 storey house	290 m	View NW to Baldslow Wood, no NE window.	-	-	-	-	-	-		Existing dense woodland screens view.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
5	**BALDSLOW DOWN contd.** No. 23, 24	2	2 storey house	270 m	View from both floors to rural landscape from elevated position. Powerline crosses view.	Sub	Sl	-	Mod	Sl	-	2-3 m false cutting and regraded area between Dines Wood and Roughlands Wood with dense woodland planting.	Traffic partially visible above false cutting during first winter. Established planting in year 15 would largely screen the scheme.
6	No. 25-27	3	2 storey houses	275 m	Semi open view from elevated position from both floors across rural landscape. Power-line crosses view.	Sub	Sl	-	Mod	Sl	-	2-3 m false cutting and regraded area between Dines Wood and Roughlands Wood with dense woodland planting.	Traffic partially visible above false cutting during 1st winter. Established planting in year 15 largely screens view of traffic.
7a	No. 28-29	2	2 storey house	285-385 m	Semi open view from elevated position from both floors across rural landscape with scattered development. Power-line crosses view.	Sl	-	-	-	-	-	2-3 m false cutting and regrading area between Dines Wood and Roughlands Wood with dense tree planting.	Angled view to scheme with traffic partially visible above false cutting during the first winter.
7b	No. 31	1	2 storey house	380 m	Narrow view between properties opposite.	Sl	-	-	-	-	-		Narrow view to scheme with traffic partially visible above false cutting during the first winter.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	WESTFIELD LANE												
8a	Fir Tree House	1	2 storey house		Open, rural landscape from high vantage point.	Sl	-	-	Sl	-	-	-	Scheme partially visible between Westfield Lane overbridge and Stonestile Lane during the first winter.
8b	A28 Westfield Lane No. 101, 103, 107, 113, 115	5	2 storey house 103 (bungalow)	720-800 m	No ground floor views.	-	-	-	-	-	-	-	Scheme partially visible from 1st floor windows.
9a	Whitegates	1	2 storey large house	530 m to Stonestile Lane	Open rural view eastwards across Westfield Lane from both floors.	Sl	-	-	-	-	-	False cutting along Stonestile Lane diversion and dense woodland planting ono embankment.	Views of embankment for Stonestile Lane diversion, but traffic partially screened by false cutting. Established planting in year 15 would largely screen traffic from view.
9b	Whitegates Park	11	Residen-tial park homes		Views SE restricted by tree belt and Freshfield Fruit Farm.	Sl	Sl	-	Sl	Sl	-	-	Road in deep cutting to pass beneth Westfield Lane. Overbridge visible.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WIINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
10	**WESTFIELD LANE contd.** Woodgate House	1	2 storey house and loft	490 m	Open rural view from top floors. Ground floor views restricted by hedge on Westfield Lane.	Sl	-	-	-	-	-		Glimpsed view of Stonestile Lane diversion, but traffic partially screened by false cutting from ground floor through hedge. Established planting in year 15 would largely screen traffic from view.
11a	Woodlands Park Cottage	1	1 storey timber cottage and loft	70 m	Local view of woodland and rural landscape.	Sub	Mod	Sl	Sl	-	-	3 m noise mound, mass planting and woodland.	View of mound and high sided traffic entering cutting. Established planting in year 15 would largely screen traffic from view.
11b	Cockmartins Farm	1	2 storey house		Semi open rural landscape.	-	-	-	-	-	-	-	No ground floor views. Glimpsed views from 1st floor of scheme in direction of Woodlands Park Cottage.
11c	Adjacent to Cockmartins Farm	1	1 storey + loft		Semi open rurallandscape.	Sl	Sl	-	Sl	-	-		Glimpsed view of traffic from ground floor through intervening vegetation.
12a	Freshfields Fruit Farm (House)	1	2 storey large house	160 m	Open rural view to Roughlands Wood.	Sub	Sub	Mod	Sub	Mod	Mod	Mass planting.	View of traffic on embankment and balancing pond. Established planting in year 15 would partially screen traffic on embankment.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	WESTFIELD LANE contd.												
13	Whitelands Kennels	1	1 storey cottage	350 m	Semi enclosed by woodland and outbuildings.	Sl	Sl	-	Sl	-	-	Regrading and hedgerow.	Angled, glimpsed view of traffic on embankment and balancing pond through intervening hedgerows.
14	Little Buckhurst Farm	1	2 storey house	170 m	Semi open view north west of rural landscape.	Sub	Mod	Sl	Mod	Sl	Sl		Traffic visible emerging from cutting. Overbridge also visible. Established planting in year 15 would largely screen traffic and earthworks.
15	Moor Farm	1	2 storey farm house	250 m (to over bridge)	Foreground view of Westfield and angled view to rural landscape.	Mod	Sl	-	Sl	Sl	-	False cutting, regrading and return to agriculture.	Views from both floors and garden over hedge towards embankment for Stonestile Lane diversion of overbridge. - Main carriageway not visible. Traffic on Stonestile Lane, partially screened by false cutting, but established planting in year 15 would largely screen traffic from view.
16	Stonestile Cottage	2	2 storey house	240 m	Thick hedge screens ground floor view.	-	-	-	-	-	-		Regrading and Stonestile Lane diversion visible from first floor.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	WESTFIELD LANE contd.												
17	Greenways, Pennyfields (The Plough Inn is in Appendix 2)	2	2 storey houses	180-230 m	High hedge screens ground floor view.	-	-	-	-	-	-		Regrading and Stonestile Lane diversion visible from first floor.
18	The Cottage and Corner Cottage	2	2 storey semi	170 m	View through garden planting over low hedge to rural landscape from both floors.	Mod	Sl	Sl	Mod	Sl	-	2-3 m false cutting and planting.	View towards embankment for Stonestile Lane diversion. Main carriageway not visible and traffic partially screened on Stonestile Lane by false cutting. Established planting in year 15 would largely screen traffic from view.
19	Oak Loom Cottage	1	2 storey cottage	140 m	No ground floor view.	-	-	-	-	-	-	-	Foreground vegetation screens view.
20a	Old Beams	1	2 storey cottage and loft	120 m	No ground floor view.	-	-	-	-	-	-		Foreground vegetation screens view.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WIINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
20b	**WESTFIELD LANE contd.** Moorefield House	1	2 storey house		Restricted views of rural landscape by garden vegetation.	Mod	Sl	Sl	Mod	Sl	-	2-3 m false cutting and planting.	View towards embankment for Stonestile Lane diversion. Main carriageway not visible and traffic partially screened on Stonestile Lane by false cutting. Established planting in year 15 would largely screen traffic from view.
21	Lankhurst Farm	1	Farm house	-	Open panoramic view of rural landscape to south.	-	-	-	-	-	-	-	Farm house set back beyond ridge. No view of scheme from house, but views likely from farm surrounds.
22a	Downoak Farm	1	2 storey farm house		Open rural landscape.	Sl	Sl	-	-	-	-		Intermittent views of traffic on main carriageway and above false cutting on Stonestile Lane diversion.
22b	Downoak Farm	1	3 storey house		Open rural landscape.	Sl	Sl	-	-	-	-		Angled views from east side of house of main carriageway.
22c	Downoak Farm	1	2 storey house		No ground floor view.	-	-	-	-	-	-		Views prevented by surrounding vegetation.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	WESTFIELD LANE contd.												
22d	Downoak Farm	1	2 storey house		No ground floor view.	-	-	-	-	-	-		Glimpsed view from first floor of traffic near Oak Wood.
23a	Doleham Cottages	5	2 storey terraced houses		Rural views.	Sl	-	-	Sl	-	-		Views of scheme and traffic restrictred by intervening vegetation.
	FOURTEEN ACRE LANE												
23b	Birkett Lodge	1	2 storey house	145 m	No ground floor view.	-	-	-	-	-	-		Direct view of overbridge and embankment from first floor.
24	Hastings brickwork cottages (Ridge view)	2	Bungalow	160 m	No ground floor view.	-	-	-	-	-	-	-	Topography, brickworks and low planting screen view.
25	Lidham House	1	2 storey house	50 m	Intermittent view to rural landscape through large hedges on property boundary.	Sub	Mod	Sl	Mod	Sl	-	3 m noise mound. Regrading and mass planting.	During 1st winter view from both floors to overbridge over regraded area & noise mound to opposite cutting. Traffic largely screened and established planting in year 15 would largely screen traffic from view.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
26	**FOURTEEN ACRE LANE contd.** Wayside	1	1 storey bungalow	70 m	Views largely screened to east by conifer hedge. Views across enclosed rural landscape to south.	Sub	Sl	-	Mod	-	-	Mass planting.	View of realigned Fourteen Acre Lane and overbridge. Main carriageway at low level screened from view. Established planting in year 15 would screen side road diversion from view.
27	Holmewood (Crofton)	1	1 storey bungalow	75 m	2.5 m property hedge. Angled view to Lane and rural landscape through hedge.	Mod	Sl	-	Mod	-	-	Mass planting.	Angled narrow view through garden hedge to main c/way and traffic. Established planting in year 15 would screen the scheme in view.
28	Sunnymead, The Haven + The Willows	3	1 storey bungalow s	90-120 m	Intermittent view through high hedge to rural landscape.	Sub	Sl	-	Mod	-	-	Mass planting.	Short section of scheme visible. Retained vegetation screens farm overbridge. Established planting in year 15 would screen the scheme in view.
29	Little Maxfield	1	2 storey farm house	280 m	Rural landscape.	-	-	-	-	-	-		Angled view from first floor over Fourteen Acre Lane to balancing pond and main c/way and traffic.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
30	**THREE OAKS** The Doone	1	1 storey house with loft	340 m	View over low hedge across Fourteen Acre Lane to rural landscape.	Mod	Sl	Sl	Sub	Mod	Sl	Mass planting.	Trafic visible on roundabout and its approach. Lighting columns visible above establishing vegetation which would otherwise largely screen the scheme.
31	Hillview	1	1 storey house with loft	390	View over low hedge across Fourteen Acre Lane to rural landscape.	Mod	Sl	Sl	Mod	Sl	Sl	Mass planting	Top of cutting and traffic on low embankment visible from both floors and front garden. Roundabout partially screened by Plashet Wood.
32	Thatchlands	1	1 story house with distinctive loft (3 floors total)	390 m	Ground floor view screened by roadside Holly/deciduous hedge and semi-mature private hedge.	-	-	-	-	-	-		Top of cutting, overbridge, traffic on embankment and roundabout visible from loft.
33	Tiffenden	1	1 storey house	400 m	View largely prevented by roadside hdges	Mod	Sl	-	Sl	-	-		Traffic on main carriageway crossing present Butchers Lane visible.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WIINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
34	**THREE OAKS contd.** Laburnums + Willow Stream	2	1 storey house	410 m	View largely prevented by roadside hdges	-	-	-	-	-	-	-	Hedge screens view of scheme.
35	**GUESTLING THORN** Capsemer, Fairhaven, Lovelace and Dalkeith	4	3 x 1 storey (Fairhaven + Lovelace have lofts) Dalkeith 2 storey	270-330 m	Southerly views across a well wooded landscape.	Mod	Mod	Mod	Mod	Sl	Sl		Intermittent view from ground floor through boundary vegetation of traffic emerging from cutting & approaching roundabout.
36a	Copshall Farm and Oast	1	2 thatched 2 storey farm buildings	25 m	View restricted by farm buildings.	Mod	Sl	Sl	Mod	Mod	Mod		View of lit approach to roundabout, and restricted view through farm buildings to main carriageway. The West Farm building has recently received planning approval for office use and the oast for residential use.
36b	Copshall Barn	1	Converted barn		Restricted view by roadside hedge and trees.	Sub	Mod	Sl	Sub	Sub	Mod		Direct view of traffic on lit roundabout. Established planting in year 15 would largely screen traffic from view.

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
	GUESTLING THORN												
38	Parkside, No. 8-12	6	2 storey semis	370-460 m	Open rural views across A259 (T).	-	-	-	-	-	-		Angled view from first floor to roundabout lighting columns and tops of traffic.
39	Stocks Green Farmhouse	1	1 storey farm house + loft	600 m	Open rural view.	-	-	-	-	-	-	Siting	Lighting columns and high sided vehicles visible from first floor.

APPENDIX 2

A259 BEXHILL HASTINGS EASTERN BYPASS

VISUAL IMPACT SCHEDULE - NON RESIDENTIAL PROPERTY

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - NON-RESIDENTIAL PROPERTY

WINTER ASSESSMENT MARCH 1994
SUMMER ASSESSMENT JUNE 1994

REF NO	ADDRESS/ LOCATION	NO. OF PROPERTIES	TYPE	DISTANCE TO C/LINE	EXISTING VIEW	VISUAL INTRUSION						MITIGATION	COMMENTS
						DAYTIME			NIGHTIME				
						FIRST WINTER	WIINTER 15 YRS.	SUMMER 15 YRS.	FIRST WINTER	WINTER 15 YRS.	SUMMER 15 YRS.		
2b	Claremont School	1			Wooded grounds	-	-	-	-	-	-		The route would be visible on embankment in views from the school grounds. Views prevented from school building by remaining woodland.
17	The Plough Inn - Westfield	1	2 storey building			-	-	-	-	-	-	-	Regrading and Stonestile Lane diversion may be visible from 1st floor.
37	Broomham School, Guestling	1		210 m	Panoramic rural view of traffic visible in foreground on A259.	Mod	Sl	-	Mod	Sl	-		Angled view of lit roundabout and traffic. Established planting in year 15 would largely screen traffic from view but light columns would remain visible.
12b	Freshfields Fruit Farm (Shop)	1			Northerly views through hedgerows along Westfield Lane.	-	-	-	-	-	-		Views of overbridge and down cutting visible from customer car park.

Key: Sub = Substanial Mod = Moderate Sl = Slight - = No change

APPENDIX 3

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PUBLIC RIGHTS OF WAY

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PUBLIC RIGHTS OF WAY

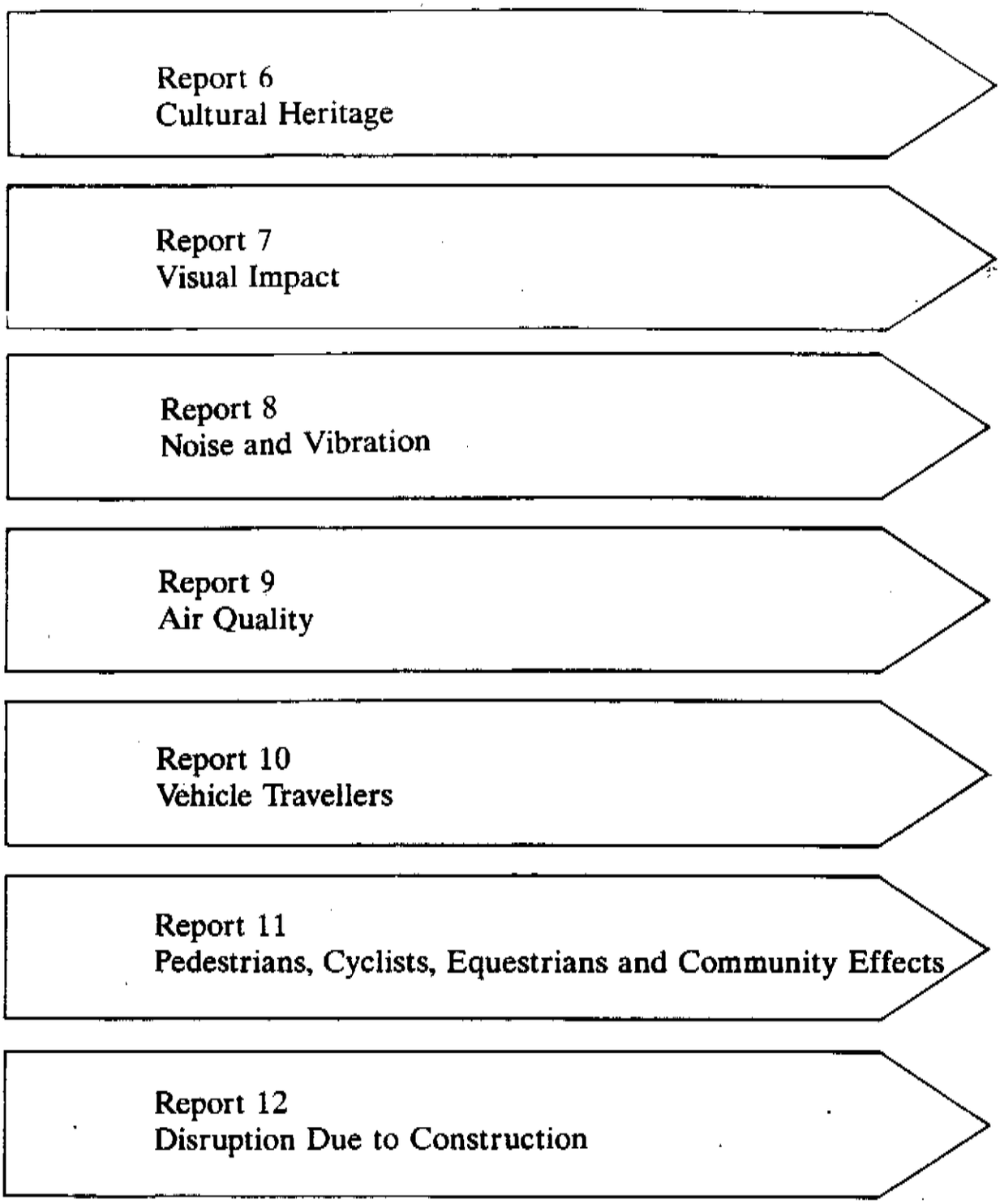
Footpath	Location	Distance to C/L	Existing View	Ist Winter	Winter Yr. 15	Summer Yr. 15	Mitigation	Comments
FP 43	Gt Crab Wood to Westfield Lane	300 m	Footpath ascending hillside with views across rural landscape towards Westfield.	In views to the N/W, traffic visible above 2-3 m high false cutting along 550 m length of path resulting in a substantial impact over 100 m, reducing to moderate for 200 m and slight over 250 m.	Mature planting largely screens the view of traffic resulting in a slight impact for 300 m and no change for 250 m.	Summer foliage would effectively screen traffic resulting in no change in the view over its entire length.	2-3 m high false cutting and woodland planting.	North easterly views of the route in cutting and the Westfield Lane overbridge would be restricted by the overhanging trees within the adjacent hedgerow further downslope.
FP 44	Moor Farm to Westfield Lane	300 m	Semi open rural view with longer distance views across to the Battle Hastings Ridge.	Traffic on Stonestile Lane and main carriageway largely screened by false cuttings. Stonestile Lane embankment and overbridge would result in a substantial impact over 80 m decreasing to moderate over 40 m.	Overbridge still visible but established vegetation would largely screen traffic in view and soften appearance of earthworks, resulting in a moderate adverse impact over 80 m and a slight impact for 40 m.	The summer foliage would further contribute to the screening effect, but the level of impact anticipated for winter year 15, would remain.	2-3 m high false cutting, woodland planting and the regrading of earthworks with a return to an agricultural afteruse.	
FP 37	Lankhurst Farm to Three oaks Lane	90 m	Northerly views across rural landscape to Westfield.	Substantial impact over 300 m with direct views of Stonestile Lane diversion and overbridge.	With the land returned to agriculture and the planting established, the visual impact would be slight.	As Year 15 Winter.	Regrading of earthworks and planting.	The main carriageway and traffic would be screened from view by Stonestile Lane diversion.
FP 31c	Downoak Farm east to FP 31b	800 m	Views southwards across rural landscape and Battle Hastings Ridge.	Intermittent views of road and traffic through intervening vegetation - slight impact over 150 m.	As Year 1.	The beneficial effect of summer foliage would largely screen the road and traffic, resulting in no change to the view.	Planting on the highway earthworks.	

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PUBLIC RIGHTS OF WAY

Footpath	Location	Distance to C/L	Existing View	1st Winter	Winter Yr. 15	Summer Yr. 15	Mitigation	Comments
FP 45	Extending south east from Westfield	Crosses Scheme at Chainage 18100	Semi open rural landscape.	Direct views of traffic on road as it emerges from cutting. Earthworks to Stonestile Lane diversion also visible, although false cutting would partially screen traffic. This would result in a substantial impact over its entire length (500 m).	Established planting adjacent to the road would help to further break up the view of traffic, but not sufficiently to reduce the level of impact.	The effect of summer foliage would sufficiently screen the traffic on the road and reduce the level of impact to moderate.	Planting on the highway earthworks.	The footpath would be severed by the bypass and to cross the road from the south, users would have to take FP 46a to Three oaks Lane.
FP 46a	Extending east from Three Oaks Lane to FP 46b	180 m	Views of an enclosed rural landscape to the south and east.	Adjacent hedgerow would partially screen views of road and traffic. Consequently, the impact would be moderate over 250 m. Footpath diversion for 120 m along Three Oaks Lane would have a slight adverse impact.	As Year 1.	Summer foliage would largely screen views of the road and traffic, although occasional glimpse views would result in a slight impact. No chang in view from footpath diversion.	Planting on the highway earthworks.	
FP 46b	Extends from FP 46a and SE to FP 12a	180 m	Well wooded rural landscape and Battle Hastings Ridge to the south.	Existing hedgerow to north of the path restricts the views, resulting in a moderate impact over 160 m length. Beyond the hedge the road and its traffic are visible resulting in a substantial impact over 60 m.	As Year 1.	Summer foliage would largely screen views of the road initially resulting in a slight impact over 160 m. Planting on the highway embankment would partially screen traffic, but the paths elevated position would allow users a view resulting in a moderate impact over 60 m.	Planting on the highway earthworks.	

A259 HASTINGS EASTERN BYPASS
VISUAL IMPACT SCHEDULE - PUBLIC RIGHTS OF WAY

Footpath	Location	Distance to C/L	Existing View	1st Winter	Winter Yr. 15	Summer Yr. 15	Mitigation	Comments
FP10a	Extending north/south along Doleham Ditch and Sailors Stream	Crosses route at Chainage 19400	Funnelled along valley.	Extensive earthworks across the valley and traffic on the road would be widely visible. Users along the 850m length of path would experience a substantial impact (including culverted length beneath bypass).	Extensive areas of planting would reduce the impact to a moderate level over a 720 m length. The culverted section would remain substantial.	The beneficial effect of summer foliage would reduce the impact further but the views along the valley would remain truncated and the level of impact would stay at moderate over 720 m and substantial in the culvert.	Regrading, a return to agriculture and mass planting.	
FP 31a and 4c	Crossing Dolehams Ditch from Fourteen Acre Wood to Pattletons Farm	600 m	Well wooded rural landscape.	Angled views to the south of the scheme on embankment crossing the valley and partially screened by existing vegetation. The impact would be moderate over 220 m.	The effect of screen planting would reduce the impact to slight over 220 m.	As winter year 15.	Regrading and extensive woodland planting.	
FP 14b	Extends S W from little Maxfield to cross the Railway,		Well wooded landscape.	Glimpsed view of road crossing head of valley on re-graded embankment immediately south of Fourteen Acre Wood resulting in a slight impact over 60 m.	As Winter year 1.	Summer foliage would largely prevent a view of the scheme. Consequently, there would be no change in the view.	Regrading and planting.	The footpath lies beyond the visual envelope and consequently landform and generally existing vegetation prevents views of the scheme.
FP 16	From Fourteen Acre Lane to Copshall Farm	Crossroad at Chainage 20750	Undulating rural landscape.	The road and traffic would be visible emerging from cutting and approaching the roundabout. The impact would be substantial over 720 m and moderate over 140 m.	Established planting would help reduce the overall impact, reducing the substantial impact to 690 m and moderate to 300 m.	The beneficial effects of summer foliage would further reduce the visual impact. 390 m would experience a substantial impact, 300 m a moderate impacts and a further 300 m a slight impact.	Extensive planting.	440 m length of the path would be redundant or lost but 550 m would be created through diverting the path via the new overbridge.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September 1994

REPORT 8

NOISE AND VIBRATION

September 1994

NOISE AND VIBRATION IMPACT ASSESSMENT

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APPENDICES

FIGURES

1 INTRODUCTION

1.1 This report has been prepared generally in accordance with the Highways Agency's Design Manual for Roads and Bridges (DMRB) Volume 11 which covers environmental assessment.

1.2 Assessments reported include the following:

- Traffic noise and vibration impacts;
- Construction noise effects;
- Relief to the existing A259 corridor between Ore and Guestling Thorn.

Proposed mitigation measures are described.

2 ASSESSMENT METHODOLOGY

2.1 Description of Technical Terms

A description of noise and its effects unavoidably requires the use of technical terms. Definitions and explanations of the acoustical terms used in this report are given in Appendix A.

2.2 Traffic Noise

2.2.1 Traffic noise is conventionally described using the A-weighted statistical level L_{A10} averaged over the eighteen hours from 6.00am to midnight. Traffic noise levels quoted in this report follow this convention and are facade levels (see Appendix A).

2.2.2 The calculation procedure is defined in the Department of Transport's Memorandum 'Calculation of Road Traffic Noise' (CRTN) [Ref 1].

The procedure may be summarised as follows:

(i) The road is divided into convenient segments.

(ii) For each segment, a basic noise level is determined from empirically based charts at a reference distance of 10m from the carriageway edge. This noise level includes the effect of 18 hour traffic flow, average speed, percentage of heavy goods vehicles, gradient and road surface type and texture.

(iii) Corrections for attenuation due to distance, ground absorption, angle of view and intervening obstructions are then applied to the basic noise level for each segment.

(iv) Finally, the results for each segment are summated and corrected where appropriate for facade reflection effects.

The calculations are normally executed by means of computer programs, which follow the CRTN method.

2.2.3 The assessment of traffic noise impact has been carried out on the assumption that the scheme opening year would be 1998 and the design year (15 years after opening) would be 2013. Noise has been assessed from the predicted traffic flows for these years which are shown on Figure 2 in Appendix B. The traffic predictions assume that high economic growth would occur.

Traffic flows have recently been reassessed and the year of opening of the scheme and design year revised to 2000 and 2015 respectively. Revised traffic flows for these years are given in Volume 1 (Drawings)

of this Statement. Changes in the results of the impact appraisal, from a reassessment using the revised flows, are discussed in paragraph 4.2.6.

2.2.4 The noise impact assessment, in accordance with DMRB Volume 11, requires the comparison of forecast noise levels in the design year with those for the year of opening for the scheme. The resulting changes are presented for properties in noise increase or decrease bands, such as 3-5 dB, in a series of tables. Each table summarises the impact on properties within a particular ambient noise level band such as 50-60 dB. This method effectively groups together properties with the same current noise environment.

2.2.5 Relief to the existing A259 between Ore and Guestling Thorn was assessed by forecasting the reduction in noise which would immediately occur after the opening of the bypass. Only properties fronting the A259 have been assessed for noise relief.

2.3 Noise Nuisance

2.3.1 The correlation between public satisfaction and traffic noise is based, in the main, on the results of two surveys carried out by the Building Research Station in 1968 and 1976, together with measurements carried out by the Transport Research Laboratory, published in 1977. More recent research indicates that people are more sensitive to abrupt changes in traffic noise associated with new road schemes than would be predicted by evidence of 'steady state' noise dissatisfaction. The assessment method takes account of noise increases or decreases in 1998, the year of opening for assessment purposes, and estimates changes in the percentage of people 'bothered very much or quite a lot' by the traffic noise in that year. Changes in noise nuisance are presented in ranges of 10 per cent and are summarised together with the noise level changes in the ambient level bands.

2.3.2 The likelihood of sleep disturbance, resulting from increased traffic flow at night, is assessed by establishing whether the average weekday flow between 10.00pm and 6.00am is likely to exceed 10% of the total and, if so, identifying properties where traffic noise would be increased above 68dB L_{A10} 18 hr.

2.4 Construction Noise

2.4.1 Since the methods of working, type, number and location of plant equipment cannot be known at this stage and would vary from day to day, precise predictions of construction noise cannot be made in advance. At best, only a broad assessment can be made, using the various methods described below. Construction noise is conventionally described using the equivalent continuous noise level, L_{Aeq} and peak level L_{Amax} (See Appendix A).

2.4.2 The principal sources of noise during the construction phase would be earthworks and piling, with other processes such as demolition, bridge and pavement construction contributing to a lesser degree, and over a shorter period.

2.4.3 For earthworks, a broad-brush method has been used, based on Appendix 3 of TRRL Report LR 756 [Ref 2].

2.4.4 For piling operations, noise has been estimated using the method and data given in Table 9 of CIRIA Report 64 [Ref 3] and other sources eg BS 5228 [Ref 4].

2.5 Vibration

2.5.1 Ground-borne vibration from road traffic can be generated if heavy vehicles pass over irregularities in the road. Properly designed and constructed road pavements are not sufficiently uneven to cause a problem.

2.5.2 Traffic-induced vibrations from low frequency sound emitted by vehicle engines and exhausts may also occur and on occasion result in perceptible vibrations in building elements, particularly loose fitting windows and doors.

It has been found that for a given increase in traffic noise, the increase in the percentage of people bothered by vibration is similar to that for noise over much of the exposure range.

3 EXISTING NOISE CLIMATE

3.1 Introduction

Since much of the route lies in a rural area, the existing noise levels are low except near the main roads, there being no major industrial sources of noise in the vicinity.

3.2 Ambient Noise Survey

3.2.1 A noise survey was undertaken in May 1992. Data was taken at 16 sites, selected as being representative of dwellings or sensitive locations likely to be most affected by the scheme, based on the shortened measurement procedure defined in CRTN. This requires three separate measurements of 15 minutes duration during three consecutive hours between 10.00am and 5.00pm on weekdays. From these, the 18 hour levels can be obtained. The results are summarised in Appendix C. The tabulated levels are free-field values in all cases.

3.2.2 Noise levels were measured using CEL sound level meters type 393A or 393B mounted on tripods 2.0 m above the ground.

3.3 Interpretation of Survey Results

Great care is needed in interpreting measured levels since they relate only to the particular conditions, for example, wind, local traffic and other activities, at the time of measurement and these can vary greatly. The measurements may therefore be unreliable as indicators of the existing noise environment.

3.4 Calculation of Existing Noise Levels

As a result of the above, where traffic is the dominant noise source, existing noise levels are determined by calculation from current traffic flows. This technique also has the advantage of being consistent with the method of forecasting future noise levels. However, in areas distant from roads carrying significant traffic flows both measurement and calculation methods may be inappropriate on occasion. In such a situation a typical value representative of the existing noise level (L_{A10}) in the area, for example 45 dB in a rural area or 51 dB within a housing estate, would be used to assess changes in noise level.

4 ASSESSMENT OF IMPACT

4.1 Introduction

4.1.1 The construction and opening of the bypass would result in noise and vibration impacts within the scheme corridor. The reduction in traffic flows along the A259 between the B2093 junction at Ore and Guestling Thorn would reduce the environmental impact of traffic on this route.

4.1.2 The noise impacts described take account of the proposed mitigation measures, described in Section 5 of this report, with the exception of the noise insulation measures which clearly do not affect the facade noise levels.

4.2 Traffic Noise Impact on Bypass Corridor

4.2.1 The incremental noise bands used in this report are as follows, together with an indication of the subjective reaction to the changes.

Change	
3 to 5 dB	A perceptible change in loudness.
5 to 10 dB	10 dB change is equivalent to a doubling or halving in loudness. A 5 - 10 dB change is accordingly significant.
10 to 15 dB	A more significant change, being equivalent to greater than a doubling or halving of loudness.
15 to 20 dB	A 20 dB change is equivalent to a quadrupling or quartering of loudness. 15 - 20 dB therefore represents a substantial change.

A change of 1 dB is considered to be just noticeable as an 'immediate' change in loudness, for example, as an increase at the day of scheme opening. It is not considered to be perceptible as a long term change where a 3 dB increase or decrease needs to occur for it to be noticeable to the average person. Consequently changes of 1 - 3 dB have not been forecast over the 15 year period from scheme opening to design year.

4.2.2 Changes in noise level are summarised in Appendix D and are shown on Figures 4 - 8 together with forecast levels at sample properties.

The noise impact is shown in incremental bands of noise change in Tables 1 to 3 inclusive. The changes can be summarised as 63 dwellings with an increase of 3-5 dB, 46 with 5-10 dB, 18 with 10-15 dB and 5 dwellings with an increase of 15-20 dB. (See Table 4).

4.2.3 There are 105 static caravans at Beauport Caravan Park that would be affected by noise increases of 3 - 10dB, 14 static caravans at Woodlands Caravan Park affected by 5 - 15 dB and 8 residential mobile homes at Whitegates Park affected by 3 - 5 dB increases. There is scope for relocation of units at Beauport Park.

4.2.4 Even if the bypass were not to be built there would be a gradual increase in traffic flows on the road network as a whole (see traffic flow diagram Figure 2 in Appendix B). Between 1998 and 2013 this traffic growth would result in a 1.5 dB increase in the vicinity of existing roads, if high economic growth were to occur.

4.2.5 By presenting noise increases as a comparison between forecast levels for the Published Scheme 15 years after its opening and those for 1998, the opening year for assessment purposes, the impact of the scheme is exaggerated by the inclusion of the 1.5 dB referred to above.

4.2.6 A reassessment using revised traffic flows forecast for 2000 and 2015 (opening and design years) would affect impact assessment results in that the noise increases due to the bypass would be higher by up to 1 dB. Some forecast noise levels for 2000 and 2015 would be higher than those illustrated for 1998 and 2013 at locations where forecast traffic flows have been increased.

4.3 Noise Nuisance Effects

4.3.1 Unlike an assessment of noise level changes in dB, which can be measured or forecast, the concept of noise nuisance attempts to relate people's annoyance to the noise level or change in noise level which causes it. Individuals vary considerably in their sensitivity to noise which can be affected by various factors such as satisfaction with the neighbourhood in general and the visibility of traffic.

4.3.2 The changes, in numbers of properties subject to percentage increases or decreases in people "bothered very much or quite a lot", are presented in the tables in Tables 1 to 3 inclusive in Appendix D. The changes can be summarised as 139 dwellings with increases of 20-30%, 61 with 30-40% and 29 with an increase of greater than 40%. (See Table 4)

4.3.3 Sleep disturbance has been assessed using April 1994 traffic data obtained from East Sussex County Council.

Night-time traffic flows between 10.00pm and 6.00am were extracted from the data for two locations on the A259. The first location on a rural section of the A259, to the west of Bexhill, showed that 4.9% of the 24 hour flow occurred overnight between the above hours. At Glyne Gap the overnight flow was 5.2% of the 24 hour flow.

From the above it is concluded that the traffic flow on the bypass between 10.00pm and 6.00am is very unlikely to exceed 10% of the total flow and that consequently increased sleep disturbance should not be a problem.

4.4 Relief to Existing A259 Corridor

4.4.1 Relief in terms of noise decreases along the existing A259 corridor from the B2093 junction at Ore to Guestling Thorn has been estimated by comparing the traffic forecasts in the year of opening (1998) with and without the bypass, giving an indication of the immediate relief likely to be experienced at the time of opening.

4.4.2 Reductions in noise levels along the above section of the A259 would be in the range of 2.1 to 2.7 dB in 1998 as a result of the opening of the bypass.

4.4.3 Noise nuisance decreases along the A259 have also been assessed. The assessment shows that 13 dwellings would have a reduction in nuisance levels of 30-40% and 225 dwellings would have a reduction of 40-50%. Only properties fronting the A259 were considered. The numbers of dwellings which would benefit are therefore conservative.

4.5 Construction Noise Impact

4.5.1 There are difficulties in assessing the impact of noise from construction activity because of the temporary and intermittent nature of construction operations and the lack of details of the methods of working and the type, number and location of plant equipment which the contractor would use.

4.5.2 A preliminary assessment indicates that noise levels during construction would be quite high at all of the side road crossings where there would be earthworks and bridge construction taking place. Piling is the main cause of high noise levels at bridge sites. The major structures that are expected to have piled foundations are given below.

A21 Overbridge	(Figure 4)
Retaining Wall in Baldslow Wood	(Figure 4)
A28 Overbridge	(Figure 6)
Three Oaks Lane Overbridge	(Figure 6)
Railway Bridge	(Figure 7)
Access Overbridge at Hastings Brickworks	(Figure 7)

See 5.3.6 for estimated numbers of dwellings that would be affected by construction noise.

4.6 Community Land

None of the areas of open space in Westfield are significantly affected by traffic noise increases. Guestling playing fields on the A259 would benefit from a noise reduction of about 2 dB in 1998. See Figure 8.

4.7 Comments on Traffic Induced Vibration

4.7.1 The percentage of people bothered by vibration is similar to that for traffic noise and can therefore be related to the L_{A10} 18hr index. There is little evidence that noise levels below 60 dB produce significant vibration nuisance. At 75 dB nuisance may be experienced by 50% of the people exposed to this level of noise.

4.7.2 It is important to note that traffic induced vibrations from low frequency sound do not cause structural damage to buildings. Such vibrations may occur in loose fitting doors or windows.

5 MITIGATION MEASURES

5.1 Introduction

There are a variety of mitigation measures which are proposed to minimise noise impacts. They include earth mounds, acoustic barriers and property sound insulation, which would reduce both construction and traffic noise. These measures, although primarily intended for mitigation of traffic noise, would be established at the earliest opportunity in order to reduce the construction noise impact.

5.2 Mitigation Measures for Road Traffic Noise

5.2.1 Barriers and Earth Mounds

Proposed measures are listed below and shown on Figures 4-8 as follows:

(1) 5 m high earth mound of 90 m length on the south side of the bypass to screen Pinehurst.

(2) 3 m high noise barrier of 230 m length on the north side of the bypass to screen Harrow Lodge.

(3) 3 m high earth mound of 250 m length on the south side of the bypass to screen remainder of Woodlands Caravan Park.

(4) 2 m high false cutting on the north side of the bypass to screen properties on Fourteen Acre Lane.

(5) 3 m high false cutting on the north side of the bypass to screen Lidham House.

5.2.2 Sound Insulation

5.2.2.1 The Noise Insulation Regulations [Ref 5] impose a duty on the Department of Transport, as Highway Authority for trunk roads, to provide secondary glazing to qualifying windows of habitable rooms of dwellings adversely affected by traffic noise from the new scheme.

5.2.2.2 Secondary glazing must be provided where:

(a) The relevant noise level within fifteen years of scheme opening is greater than the specified level of 68 dB and

(b) The relevant noise level is greater than the prevailing level by more than 1 dB.

(c) Noise from the new carriageways makes an effective contribution to the relevant level of at least 1 dB and

(d) The property is within 300 m of the new (or altered) scheme.

(For definitions see Appendix A of this report).

5.2.2.3 Despite the proposed mitigation measures described in para 5.2.1, a number of dwellings would still experience levels which satisfy the above criteria. At this stage in the design, it is estimated that approximately 12 properties would qualify for secondary insulation against traffic noise under the Noise Insulation Regulations assuming that the mitigation measures would be provided.

5.3 Mitigation Measures for Construction Noise

5.3.1 The Local Authorities have power under the Control of Pollution Act 1974 [Ref 6] to impose requirements as to the way in which the work would be carried out, and in particular:-

(i) the hours during which work may be carried out and

(ii) the level of noise which may be emitted.

5.3.2 These requirements are normally agreed with the Local Authority and specified in the Contract. The Department's site representative would oversee the monitoring of noise levels and adherence to the limits on working hours, although ultimate control would remain with the Local Authority's Environmental Health Officer.

5.3.3 The Contractor would be required to use equipment silenced in accordance with BS 5228 "Code of Practice for Noise Control on Construction and Open Sites" [Ref 4].

5.3.4 The Highway Authority has discretionary powers under the Noise Insulation Regulations to provide sound insulation where construction noise "... seriously affects or will affect for a substantial period of time the enjoyment of an eligible building adjacent to the site ..." even if no duty has arisen under the Regulations for traffic noise.

5.3.5 The criteria previously adopted for schemes within the Department's South East Region are:

(i) The predicted construction noise level, $L_{Aeq,}$ is expected to exceed 70 dB sustained over a period of several months, and

(ii) Construction noise levels alone are at least 1 dB greater than the prevailing ambient levels.

5.3.6 At this stage in the design, it is estimated that approximately 6 dwellings would experience levels of construction noise in excess of the criteria defined above. Most of these dwellings are included in those likely to qualify for insulation against traffic noise (see 5.2.2.3).

5.3.7 Noise mounds and barriers provided to mitigate traffic noise would help the mitigation of construction noise and would, wherever practical, be constructed at an early stage.

5.4 Provisional Nature of Assessment

5.4.1 The numbers of dwellings estimated as being eligible for insulation for both traffic and construction noise are provisional and may alter with design changes.

5.4.2 When a final assessment has been made, after the Secretaries of State have issued a formal decision letter on the draft Orders, a list or map is published showing dwellings eligible for noise insulation. For traffic noise the Noise Insulation Regulations (Ref. 5) allow two appeal periods where a review of noise calculations can be requested by anyone who feels that they should be entitled to an offer of insulation.

5.4.3 Since offers of insulation for construction noise are discretionary, there is no procedure for appeal against the lack of such offers.

6 SUMMARY OF EFFECTS

6.1 Bypass Corridor

6.1.1 A total of 132 dwellings in the bypass corridor would be subject to noise increases of between 3 and 20dB. (See Table 4). The foregoing figures overstate the impact of the bypass since the increases quoted include 1.5 dB from the effect of traffic growth between 1998 and 2013, which would occur even if the bypass was not constructed. A reassessment of noise impact for the revised years of 2000 and 2015 (year of opening and design year) would lead to assessed noise increases being up to 1 dB greater.

6.1.2 The noise nuisance assessment shows 229 dwellings affected. This is a greater number than those affected by increased noise levels and reflects the shorter term reaction to perceived changes in the bypass year of opening. Increased sleep disturbance should not be a problem.

6.1.3 A total of 127 static caravans and residential mobile homes would be subject to noise increases of 3 - 15 dB. There is some scope for relocation of units at Beauport Park.

6.2 Existing A259 Route

6.2.1 In 1998, the year of opening for assessment purposes, dwellings along the existing A259 from the B2093 junction at Ore to Guestling Thorn would experience decreases in noise levels in the range 2.1 - 2.7 dB.

6.2.2 Noise nuisance reductions indicate 238 dwellings which would benefit from the opening of the bypass. Again this reflects the reaction to short term changes.

6.3 Community Land Impact

There would be no significant change in noise levels at recreational areas in Westfield. Guestling Playing Fields would benefit from a reduction of 2 dB at the day of opening of the bypass.

6.4 Noise Mitigation

6.4.1 Mitigation measures in the form of noise barriers and earth mounds would be provided to minimise the impact of the scheme. These, however, cannot fully obviate the need for secondary insulation to the dwellings but would provide the benefit of improving the noise climate of areas such as gardens.

6.4.2 It is estimated that approximately 12 dwellings would qualify for secondary insulation for traffic noise under the Noise Insulation Regulations. Approximately 6 dwellings would be likely to experience

construction noise levels above the criteria in 5.3.5 and most of these properties would be likely to be included in the above 12 dwellings.

6.4.3 Wherever practical, mitigation measures would be installed before the start of major operations to minimise the impact of construction noise.

7 REFERENCES

1 Calculation of Road Traffic Noise. DOT Memorandum 1988, HMSO

2 The Prediction of Noise from Road Construction. TRRL. Laboratory Report LR 756

3 Noise from Construction and Demolition Sites. CIRIA Report 64, April 1977

4 BS 5228 Part 1: 1984 and Part 4: 1992; Noise Control on Construction and Open Sites.

5 The Noise Insulation Regulations 1975 and Amendment 1988, HMSO

6 Control of Pollution Act 1974.

APPENDIX A

Explanation of Acoustical Terms

APPENDIX A

EXPLANATION OF ACOUSTICAL TERMS

1 Decibel, dB

Noise levels are usually quoted in decibels. This is the unit of measurement used for sound pressure levels. The decibel scale is logarithmic rather than linear. The threshold of hearing is zero decibels while, at the other extreme, the threshold of pain is 120 decibels. In practice these limits are seldom experienced and typical levels lie within the range of 30 dB - a quiet night-time level in a bedroom, to 90 dB - at a kerbside of a busy city street. Examples of typical levels of common sounds are presented in Figure 1.

2 The 'A' weighting

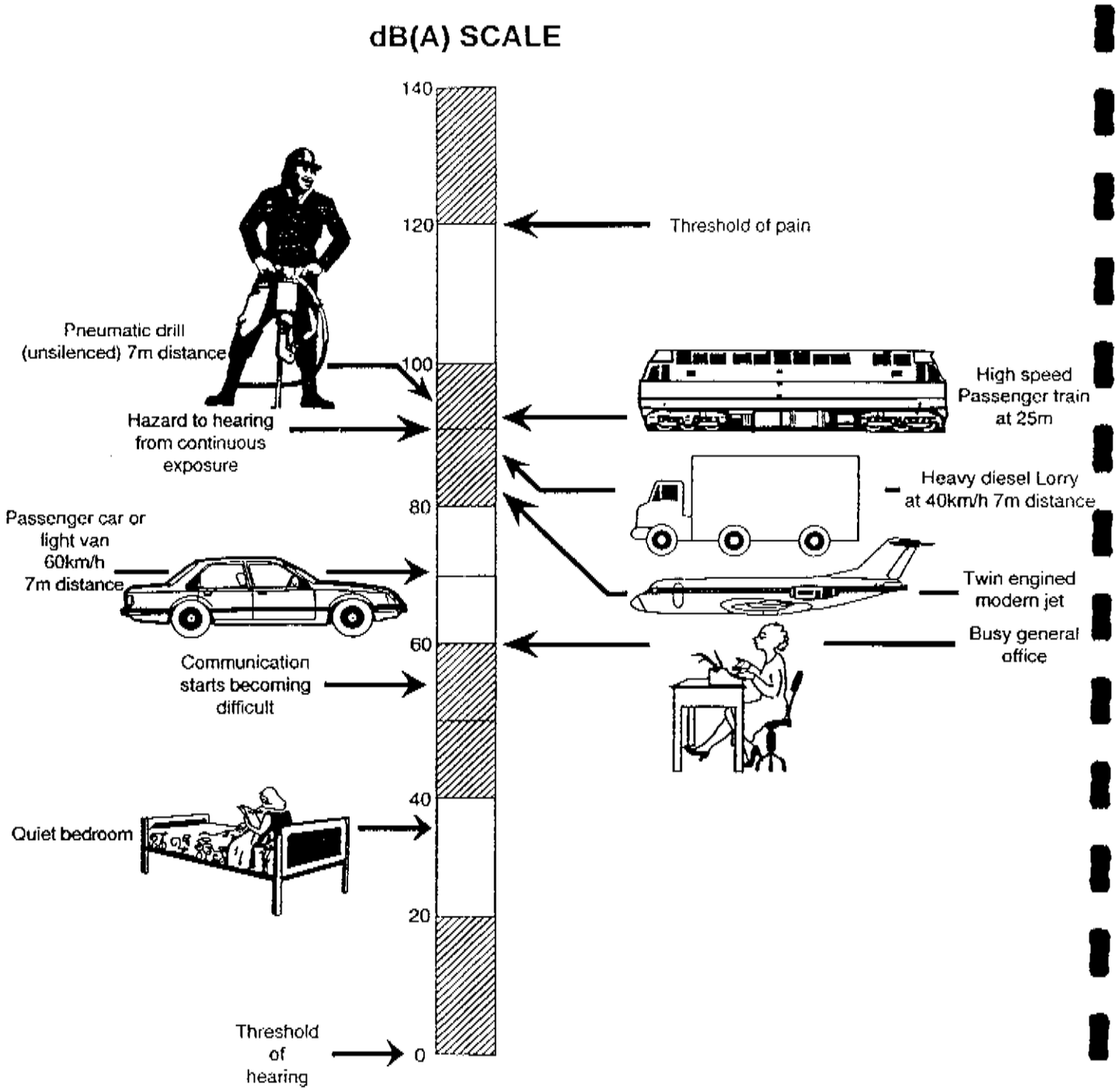
The human ear has a non-linear frequency response; it is less sensitive at low and high frequencies and most sensitive in the range 1 to 4 kHz (cycles per second). The 'A' weighting is applied to measured or calculated sound pressure levels so that these levels correspond more closely to the response of the human ear. A-weighted levels are often expressed in dB(A).

3 Statistical Sound Level Indices, L_{AN}

Noise from road traffic and other sources fluctuates continuously, both on a short and long term basis. It is therefore necessary to use indices which involve averaging over the appropriate time period. The A-weighted level L_{AN} is that level exceeded for N% of the time. The background noise level is commonly quoted using the L_{A90} index. From research over previous years it has been found that the human response to traffic noise is closely linked to the higher noise levels experienced and correlates well with the L_{A10} index.

4 The L_{A10} Index and L_{A10} (18 hour) index

L_{A10} is the sound level in dB which is exceeded for 10% of the measurement period. The L_{A10} (18 hour) index is the arithmetic mean of all the hourly L_{A10} measurements during a period from 0600 to 2400 hours on a normal working day. All traffic noise levels quoted in this report follow this convention and are facade levels.



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The Level of Common Sounds on the dB(A) Scale
Figure 1

5 **Free-field Noise Level**

Sound which is measured, or calculated, in the open, without any reflections from nearby surfaces. Sound is reflected from hard surfaces in a similar manner to light by a mirror.

6 **Facade Noise Level**

A facade noise level is the noise level 1 m in front of the most exposed window or door in a building facade. The effect of reflection, referred to above, is to produce a slightly higher (+ 2.5 dB) sound level than it would be if the building was not there.

7 **Relevant Noise Level**

The relevant noise level is the maximum facade noise level expected to be caused by road traffic within the 15 year period after scheme opening. It is quoted in dB using the L_{A10} (18 hour) index.

8 **Prevailing Noise Level**

A prevailing noise level is the facade noise level caused, or expected to be caused, by road traffic immediately prior to the commencement of construction operations. It is quoted in dB, using the L_{A10} (18 hour) index.

9 **The L_{Aeq} Index**

The equivalent continuous sound level L_{Aeq} is the level of a notional steady sound which, at a given position and over a defined period of time, would deliver the same A-weighted acoustic energy as the fluctuating noise.

10 **Peak Noise Level L_{Amax}**

The highest 'A' weighted value indicated on a sound level meter, which for measurement of construction noise is set to 'slow' response.

11 **Construction Noise Levels**

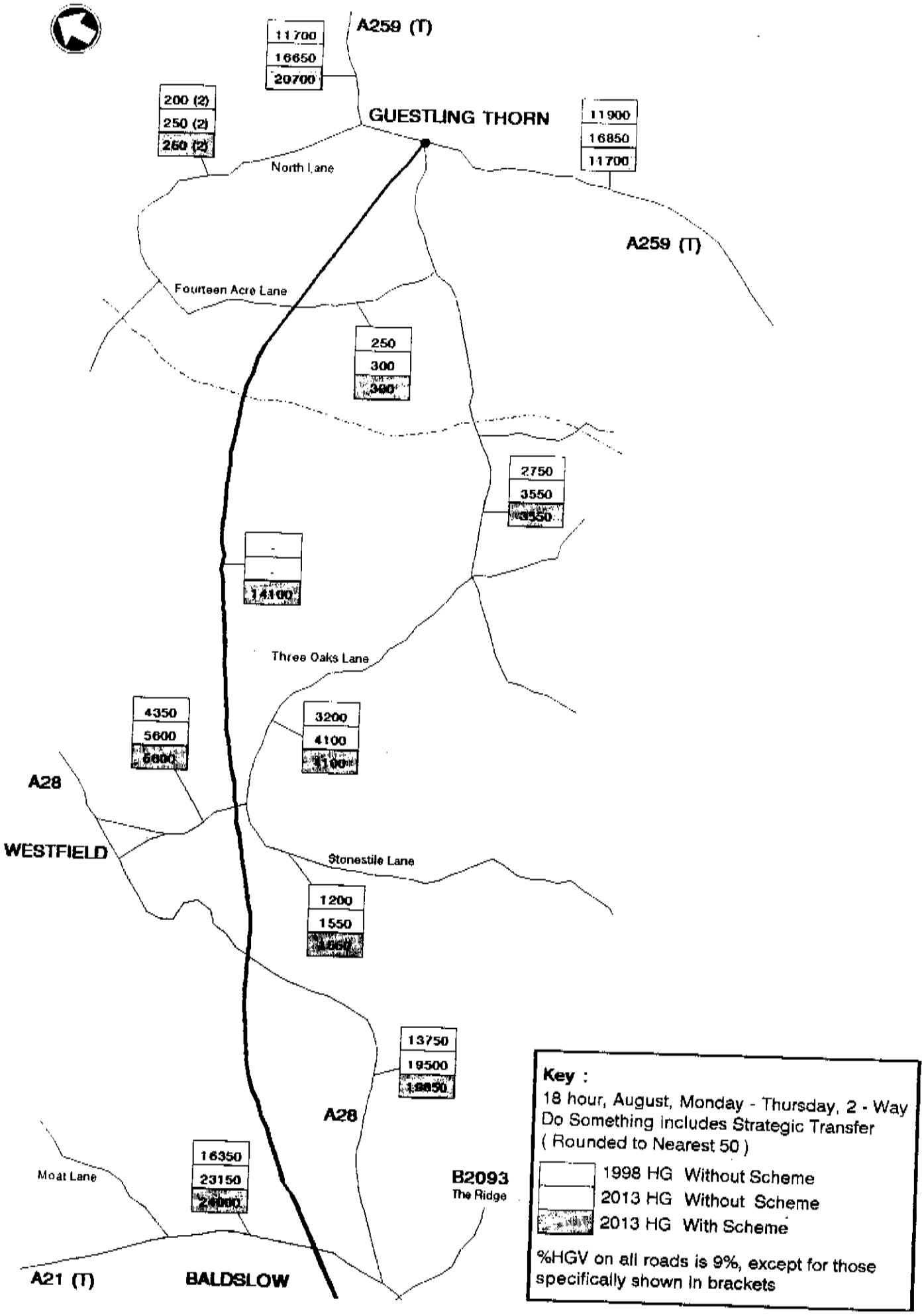
A construction noise level is the facade noise level expected to be caused by construction operations at their peak period. It is quoted in dB, using the L_{Aeq} index over a 12 hour period.

12 Ambient Noise

Ambient noise is defined as the total sound in a given situation at a given time usually composed of sound from many sources near and far.

APPENDIX B

Traffic Flow Diagram



10060/RC/029/8/A

Average 18 hour August Flows

Figure 2

APPENDIX C

Ambient Noise Survey

APPENDIX C
TABLE C - AMBIENT NOISE MEASUREMENTS (dB FREE FIELD)

Site No	Location	L_{A90}	L_{A10} 18 hrs	L_{Aeq}	Remarks
1	Beauport Caravan Park (Near Monument)	40	46	45	birds
2	Claremont School	45	54	53	
3	Pinehurst, A21 Ebden's Hill	49	59	58	aircraft
4	53 Westfield Lane	47	51	53	birds,aircraft
5	23 Baldslow Down (rear garden)	40	48	47	birds, helicopter
6	Woodlands, off Westfield Lane	44	53	52	birds,tractor
7	Whitegates Park, Westfield Lane	46	66	64	
8	Little Buckhurst Farm entrance, Stonestile Lane	40	49	53	
9	Grass verge on A28 at Westfield	49	64	63	
10	Old Beams, Three Oaks Lane	39	54	54	birds,aeroplane
11	Footpath 46a off Three Oaks Lane	37	46	44	aeroplane
12	Path alongside Doleham Ditch	36	45	44	sheep,birds, plane
13	Lidham House, Fourteen Acre Lane	39	51	50	birds,train
14	Fourteen Acre Lane verge outside 'Wayside'	36	53	53	birds,aeroplane
15	On footpath at side of 'Dalkeith', Guestling Thorn	47	55	54	birds,dog, breeze
16	Broomham School	57	60	59	children, mower

Note: For site locations refer to Figure 3.
L_{A10} (18 hours) = Average of three sample periods less 1 dB.

10060/RC/029/8/ A

Locations of Noise Measurements

Figure 3

APPENDIX D

Summary Tables of Traffic Noise and Nuisance Impact

A259 HASTINGS EASTERN BYPASS

Noise Impact Assessment

Bypass Corridor

Table 1

Ambient Noise Band < 50 dB	Published Scheme				Do Minimum	Remarks
	Residential	Caravans/ Mobile Homes	Commercial/ Industrial	Others		
Increase in Noise Level dB					Dwellings subject to 1.5 dB increase where traffic is dominant noise source.	No decreases in noise or nuisance.
3-5	18	-	-	-		
5-10	25					
10-15	16					
15-20	5					
Increase in Nuisance Level					-	
20-30%	19	-	N/A	N/A		
30-40%	25					
40-50%	19					
> 50%	6					

A259 HASTINGS EASTERN BYPASS
Noise Impact Assessment

Bypass Corridor

Table 2

Ambient Noise Band 50 < 60 dB	Published Scheme				Do Minimum	Remarks
	Residential	Caravans/ Mobile Homes	Commercial/ Industrial	Others		
Increase in Noise Level dB						1 105 caravans at Beauport Park, 8 mobile homes at Whitegates Park and 14 caravans at Woodlands Caravan Park affected. 2 No decreases in noise or nuisance occur.
3-5	37	85	-	Claremont School	Properties subject to 1.5 dB increase where traffic is dominant noise source	
5-10	18	37				
10-15	2	5				
Increase in Nuisance Level						
20-30%	68	78	N/A	N/A	-	
30-40%	30	31				
40-50%	4	18				

A259 HASTINGS EASTERN BYPASS
Noise Impact Assessment

Bypass Corridor

Table 3

Ambient Noise Band 60 < 70 dB	Published Scheme				Do Minimum	Remarks
	Residential	Caravans/ Mobile Homes	Commercial/ Industrial	Others		
Increase in Noise Level dB						
3-5	8	-	-	-	Dwellings subject to 1.5 dB increase	No decreases in noise or nuisance occur
5-10	3					
Increase in Nuisance Level						
20-30%	52	-	N/A	N/A	-	
30-40%	6					

A259 HASTINGS EASTERN BYPASS
Noise Impact Assessment

Bypass Corridor Table 4

Summary of Changes to Residential Property (Excluding Caravans and Mobile Homes)

1. Noise Level Changes

Ambient Band (dB)	Increases (dB)			
	3 - 5	5 - 10	10 - 15	15 - 20
< 50	18	25	16	5
50 < 60	37	18	2	-
60 < 70	8	3	-	-
Total	63	46	18	5

Total number of dwellings with Noise Increases is 132

2. Noise Nuisance Changes

Ambient Band (dB)	Increases %			
	20 - 30	30 - 40	40 - 50	> 50
< 50	19	25	19	6
50 < 60	68	30	4	-
60 < 70	52	6	-	-
Totals	139	61	23	6

Total number of dwellings with Noise Nuisance Increases is 229

A259 HASTINGS EASTERN BYPASS
Noise Impact Assessment

Table 5

Relief to Existing A259 between B2093 Junction at Ore and Guestling Thorn

1. Traffic Noise

No residential properties benefit from noise decreases of 3 dB or greater. (Forecast decreases in 1998, scheme year of opening for assessment purposes, are 2.1 to 2.7 dB)

2. Reduction in Noise Nuisance

Nuisance Reduction %	30 - 40	40 - 50
Residential Property	13	225

Total Number of Properties 238

APPENDIX E

Traffic Noise Impact Plans

Report 6
Cultural Heritage

Report 7
Visual Impact

Report 8
Noise and Vibration

Report 9
Air Quality

Report 10
Vehicle Travellers

Report 11
Pedestrians, Cyclists, Equestrians and Community Effects

Report 12
Disruption Due to Construction

Document Ref: 10060/RC/029/9/A
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REPORT 9

AIR QUALITY ASSESSMENT

September 1994

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Localised Air Quality Assessment:

Overall Impact Assessment:

LIST OF FIGURES

1 INTRODUCTION

1.1 Assessment of the effects of air pollution follows the methods given in Volume 11 of the Design Manual for Roads and Bridges (DMRB), incorporating up to date research into the effects of different pollutants and taking account of the introduction of unleaded petrol and catalytic converters. Increasingly stringent regulations mean that the output per vehicle of exhaust pollutants will reduce with time.

1.2 The purpose of this assessment is to establish whether or not a more detailed analysis by other methods is required.

2 EXHAUST EMISSIONS AND PROGRESS IN THEIR REDUCTION

2.1 Exhaust Pollutants and their Effects

2.1.1 Motor vehicles using hydrocarbon fuel (petrol, diesel or liquid petroleum gas) emit a wide variety of gaseous and particulate materials, of which only a small proportion are potentially harmful to people. The amount of pollution depends on the engine type, size, age, state of maintenance, speed and operating conditions. The concentration falls off rapidly with distance from the source as the emission disperses into the atmosphere or is deposited on the ground. Wind conditions in turn have a significant effect on the rate of dispersal into the atmosphere.

2.1.2 The combustion of the hydrocarbon fuel with air produces mainly carbon dioxide (CO_2), nitrogen (N_2) and water (H_20). Combustion engines are not perfectly efficient and some of the fuel is not burnt or only partly burnt. This results in the presence of hydrocarbons (HC), carbon monoxide (CO) and carbon (soot) in the exhaust emissions. The high temperatures and pressures in the engine's cylinders cause some of the nitrogen in the air and fuel to be oxidised forming mainly nitric oxide and a small amount of nitrogen dioxide.

2.1.3 Prior to the introduction of unleaded fuel, lead compounds were added to all higher octane petrols to aid the combustion properties of the fuel. Scavengers are added to 4 star petrol to help clear the lead compounds from the engine. They react with the lead additives during combustion to form fine particles of inorganic lead compounds and a small amount of volatile organic lead compounds.

Carbon Monoxide (CO)

Approximately 90% of the total UK emission (1991) of CO is from road transport, making its presence the most reliable indicator of air pollution due to traffic. CO is absorbed rapidly by the blood reducing its oxygen carrying capacity. It contributes indirectly to the greenhouse effect by depleting atmospheric levels of hydroxyl radicals and thus slowing the destruction of the powerful greenhouse gas methane.

Oxides of Nitrogen (NO_x)

Approximately 50% of NO_x produced in the UK is from road transport. Most is emitted as Nitric Oxide (NO). In the air the NO is oxidised to nitrogen dioxide (NO_2) which is more toxic, affecting the respiratory system. NO_x also contributes to photochemical smog formation and acid deposition. Nitrous oxide (N_2O) is a powerful greenhouse gas produced in very small amounts by conventional vehicles.

Hydrocarbons (HC)

Approximately 40% of HC produced in the UK is from motor vehicles. HC include all organic compounds emitted. Some HC are toxic or carcinogenic. They are important precursors of photochemical smog,

acidic and oxidising compounds. Methane contributes directly and non-methane hydrocarbons indirectly to the greenhouse effect.

Particulate Matter

Nearly half the black smoke in the UK is produced by motor vehicles. The emissions are mainly from diesel vehicles. The black smoke has a high staining power and soils buildings and other materials.

Lead (Pb)

Nearly all the lead in the air is emitted from motor vehicles using leaded petrol. Lead is toxic.

Carbon Dioxide (CO_2)

Approximately 20% of CO_2 produced in the UK is from motor vehicles. It is considered the least harmful of the major greenhouse gases, for a given volume, but it is also the largest contributor to total greenhouse gases in the atmosphere.

2.2 Reductions in Emissions

2.2.1 Since 1971 progressively more stringent regulations have been introduced governing the exhaust emissions of european cars. These regulations initially dealt with carbon monoxide and hydrocarbons and after 1977 also covered nitrogen oxides.

2.2.2 Over the same period the total amount of lead emitted has been reduced significantly by controlling the proportions of lead which is added to petrol to improve engine efficiency.

2.2.3 In particular a number of important steps have been taken in recent years to reduce emissions from road vehicles which are described in the following sections.

2.3 Lead in Petrol

2.3.1 Following legislation, manufacturers reduced the amount of lead in leaded petrol by 60% from the end of 1985 which led to a reduction in lead emitted by vehicles in the UK of over 50% in 1986.

2.3.2 Unleaded petrol is now sold at virtually all petrol stations. Since 1 October 1990 all new petrol engined cars have had to be capable of running on unleaded petrol. Indeed some vehicle manufacturers anticipated this requirement with lead-free engined models being available for several years prior to 1990.

2.3.3 Emissions of lead fell by a factor of about four between the early 1970s and 1990, due to reductions in the lead content of leaded fuel. They have fallen further as unleaded fuel has come into greater use.

2.4 Catalytic Converters

2.4.1 Since 1993 all new petrol engined cars are required to have catalytic converters fitted. These should remove 75% of harmful emissions from car exhausts.

2.4.2 Converters work by using the CO in exhaust fumes to reduce the NO_x to inert nitrogen and then use the oxygen released by this process and oxygen from the air to oxidise the CO and some of the Hydrocarbons to produce CO_2 and water vapour.

2.4.3 However, the critical air/fuel ratio for operation of a converter is not the same as that for optimum fuel economy. There is therefore a trade-off between the substantial reduction of harmful emissions and the resulting increased generation of CO_2.

2.5 Emissions from Heavy Diesels

2.5.1 Fumes or smoke and smell are primarily the products of diesel engines which, it is estimated, produce 10 times as many particulates in their exhausts as petrol engines. Diesel emissions are obviously unpleasant due to their visibility, soiling properties and odour. However, no evidence of health effects from exposures to diesel fumes has been found, even amongst those continually exposed (eg bus garage employees). Thus, it is for amenity reasons that the UK has for over 20 years prohibited visible smoke emissions from diesel vehicles.

2.5.2 In 1990, the first stage of EC regulations to limit emissions from heavy diesels was introduced. Much more stringent emission standards for heavy duty diesel engines have been applied since 1993, with further reductions planned for 1996 which will reduce the emission of particulates by a factor of about six.

3 METHODOLOGY OF ASSESSMENT

3.1 Traffic Assumptions

3.1.1 The traffic forecasts assume the opening of the bypass together with the adjacent A259 Bexhill and Hastings Western Bypass and the Bexhill Northern Approach Road (BNAR).

3.1.2 The assessment of air quality impact has been carried out on the assumption that the scheme opening year would be 1998 and the design year (15 years after opening) would be 2013. Pollution levels have been calculated from predicted traffic flows including those forecast for 2013, which assume that high economic growth would occur.

3.1.3 Traffic flows have recently been reassessed and the year of opening of the scheme and design year revised to 2000 and 2015 respectively. Revised traffic flows for these years are given in Volume 1 of this Statement. Changes in the results of the impact assessment are discussed in paragraph 4.7.2 (iv).

3.2 Assessment Approach

3.2.1 Volume 11 Section 3 Part 1 of the DMRB describes the method of assessing Air Quality.

3.2.2 Air quality can be affected in two different ways by a road scheme:

(i) Localised changes, either improvements or reductions in air quality, along all or part of a scheme.

(ii) Overall changes in the quantity of emissions from the traffic on the road network.

4 LOCALISED AIR QUALITY ASSESSMENT

4.1 Pollutants

4.1.1 Pollutants considered for the localised assessment method are, Carbon Monoxide (CO), Oxides of Nitrogen (NO_x) and Hydrocarbons (HC).

Assessment of each pollutant is undertaken in a series of stages. The result is a function of traffic flow, percentage of heavy goods vehicles, speed, distance from the road and the year for which the calculations are being undertaken. Only roads within 200m of each calculation point are considered. The dispersion rate is such that at 200m the air pollution tends to reduce to the level of the background concentration.

4.1.2 Results for CO and HC are expressed as parts per million (ppm), while those for NO_x are expressed as parts per billion (ppb). For CO the average peak hour result is translated to an annual maximum 8 hour figure, while the average peak hour NO_x result is translated to the 98th percentile of 1 hour averages of NO_2. For HC 1.7ppm is added to the result to take account of naturally occurring background levels.

4.2 Assessment Criteria

The assessment is based on whether or not the following criteria are exceeded. These are set to protect human health.

(i) Carbon Monoxide: Annual maximum 8 hour average concentration of 9ppm. Based on the US National Ambient Air Quality Standard.

(ii) Nitrogen Dioxide: 98th percentile of 1 hour concentrations of 105ppb. Based on the European Community standard (85/203/EEC).

If either of the levels are exceeded in the scheme design year a more detailed assessment is required. Forecast hydrocarbon concentrations cannot readily be assessed with respect to air quality standards, they are calculated for completeness only.

4.3 Comparison with Existing Conditions

To assess the possible air pollution impacts, a three way comparison is required between current air quality levels, those expected in the design year if the scheme is not built, and those expected in the design year if the scheme is built.

4.4 Traffic Data

The traffic flows required for the assessment method are high growth average peak hour. These are not modelled and relate to the average of 500 peak hours per annum. The COBA computer program (Cost Benefit Analysis) outputs speeds and, indirectly, flows in the base year for four flow groups. Flow group 4 represents the average of the 380 highest peak hours and is the nearest to average peak hour flow available. COBA can also be manipulated to forecast flows and speeds for a selected year. Flows from Group 4 will be slightly higher than the desired average peak hour flow.

4.5 Receptors

Receptors were selected from properties nearest to both the proposed and existing routes. Locations are shown on Figures 1 to 3.

4.6 Results

Tables 1, 2 and 3 show the results in relation to the indicator criteria for the current situation (1994), 2013 without scheme and 2013 with Published Scheme respectively. Table 3 includes additional properties which are not near any existing roads and thus have no calculable levels of pollution unless a bypass is constructed. Table 4 summarises the first three tables.

4.7 Discussion

4.7.1 Impact on Properties within the Bypass Corridor

(i) Carbon monoxide levels along the route are all insignificant in 1994, being below the threshold of the method and thus not calculable. Levels would remain below the threshold in 2013 whether or not the bypass was built.

(ii) Calculated Hydrocarbon levels for 1994 at locations near existing roads show levels between 1.78 and 1.84ppm, i.e. just above the background level of 1.7ppm. In 2013, if the bypass was not built levels would be slightly lower. If the bypass was built, in 2013 HC levels would be of a similar order to those calculated for 1994 near existing roads and at the background levels of 1.7ppb in the rural areas.

(iii) Nitrogen Dioxide levels in 1994 are calculated at between 24 and 44ppb, for locations near existing roads, which are well below the air quality indicator criterion of 105ppb.

In 2013, if the bypass was not built, the above NO_2 levels would approximately halve. If the bypass was built, in 2013 NO_2 emissions would be higher than the 2013 'without bypass' levels by a small amount.

In the rural areas of the scheme corridor calculated NO_2 levels generated by the bypass traffic in 2013 would be below the method threshold of 7ppb and thus not calculable.

(iv) Sample checks on air quality using revised traffic flows for 2015 instead of 2013 as design year indicated the following effects on the assessed air pollution results at locations where traffic forecasts have been increased:

- CO levels would still be well below the indicator criterion of 9 ppm.
- Hydrocarbon levels would be slightly higher.
- NO_2 levels would be increased but still well below the indicator criterion of 105 ppb.

4.7.2 Relief to Existing A259 Route

(i) Carbon Monoxide levels along the existing A259, between the B2093 junction at Ore and Guestling Thorn, range from below the threshold of 3ppm (uncalculable) to 8ppm, the latter being just below the indicator criterion of 9ppm. By 2013, if the bypass was not built, CO levels would drop to a maximum of 4.5ppm, with most levels below the threshold. By the same year, if the bypass was built, all levels would be below the threshold.

(ii) Calculated Hydrocarbon levels for 1994 vary between 1.81 and 2.34ppm. By 2013, if the bypass was not built, forecast HC levels would reduce to between 1.75 and 1.96. If the scheme was built, by 2013 HC levels would be 1.74 to 1.86ppm.

(iii) Calculated NO_2 levels for 1994 are in the range 28 to 104.5ppb. By 2013 if the bypass was not built, forecast NO_2 levels would approximately halve. If the bypass was built NO_2 emissions would be lower at 8-31ppb, well within the air quality standard.

5 OVERALL IMPACT ASSESSMENT

5.1 Introduction

The contribution made by traffic to regional scale air pollution problems depends on the total amount of pollution emitted, and not on the concentration at any particular location. The overall impact assessment forecasts total emissions of Carbon Monoxide, Hydrocarbons, Oxides of Nitrogen and Carbon Dioxide. The last is included as, although it is harmless to health, it is the largest contributor to greenhouse gases in the atmosphere.

It is not possible to separate the effects of the Eastern Bypass from those of the Western Bypass. This assessment therefore examines the combined impact of the two schemes and duplicates the information included in Report 12 of Volume 2 of the Environmental Statement for the A259 Bexhill and Hastings Western Bypass.

5.2 Total Emissions Assessed

To show the effect of constructing the schemes a comparison is required between the total emissions estimated for the published schemes and the 'without schemes' situation, both in the year of opening and in the design year (1998 and 2013 for assessment purposes).

5.3 Traffic Data

Input data for the overall assessment requires annual traffic flows on the road network in the appropriate year and corresponding average speeds. COBA was used to generate average hourly traffic flows in the program base year of 1976. These were adjusted to produce a yearly traffic flow, in the year under consideration, by the use of a factor which allowed for the mean traffic growth rate. Speeds from COBA Flow Group 2 were considered to be the nearest approximation to average speed throughout the day of those available. All roads included in the COBA network were assessed for changes in emissions.

5.4 Results and Discussion

5.4.1 The results are shown in Tables 5 and 6 which compare total pollutant emissions from the 'without schemes' situation with total emissions if the two bypasses were in existence, for the years 1998 and 2013.

5.4.2 Carbon monoxide totals show a reduction from 4553 tonnes, without the schemes in 1998, to 4021 tonnes in the same year if the schemes are constructed. The same comparison in 2013 shows a reduction from 3080 (without schemes) to 2699 tonnes (with schemes). The reduction being about 12% in both cases. The lower totals in 2013, indicating a reduction of 32%, result from the improved vehicle emission control

technology brought about by legislation. The 12% reduction is primarily the effect of the higher speeds of the re-routed traffic on the bypasses, which reduce emissions of CO.

5.4.3 Hydrocarbon totals show a pattern of reductions similar to Carbon Monoxide with 13-14% less emissions in 1998 and 2013 if the schemes are built. The reduction in emissions between 1998 and 2013 is 40% which is due to improved emission control equipment.

5.4.4 Oxides of nitrogen, however, show an increase from 1008 tonnes, without the schemes in 1998, to 1063 tonnes in the same year if the schemes are constructed. The same comparison in 2013 shows an increase from 597 (without schemes) to 629 tonnes (with schemes). The increase being 5.5% in both cases.

The increase is due to the higher speeds of the rerouted traffic on the bypasses which produce additional NO_x emissions, unlike CO emissions which behave differently in relation to speed. However, the 5.5% increase is small compared with the 40% reduction achieved between 1998 and 2013 as a result of improved vehicle emission control equipment.

5.4.5 Carbon dioxide shows slight decreases of 0.4% and 1% in 1998 and 2013 respectively, if the schemes are built. CO_2 overall would increase by 40% between 1998 and 2013. This would be due primarily to the general growth in traffic.

6 CONCLUSIONS

6.1 Properties within the bypass corridor, including those closest to the route, would not suffer from any air quality problems in the design year 2013. Carbon monoxide would be below the level at which it could be calculated and Nitrogen Dioxide levels would be well below the air quality indicator criterion, where further assessment would be warranted. A reassessment at the revised design year of 2015 would not change the above conclusions.

6.2 The existing A259 between Ore and Guestling is currently subject to air pollution levels below the indicator criteria for CO and NO_2. By 2013, even if the bypass was not to be built, emissions would be considerably reduced to below the above limits. Construction of the bypass would further reduce emission levels.

6.3 The overall impact assessment shows that the two bypass schemes would reduce carbon monoxide and hydrocarbon emissions by 11-14% and carbon dioxide by 1% or less. The increase in emissions of oxides of nitrogen by 5.5% should be viewed in the context of a 40% reduction between 1998 and 2013 resulting from improved vehicle emission control equipment.

6.4 A more detailed assessment of air quality is unnecessary.

TABLE 1

CURRENT

Year: 1994

Ref No	Receptor Address	Total: Carbon Monoxide (CO) annual maximum 8 hour (ppm) * Where indicator criterion is exceeded (9 ppm)	Total: Hydrocarbons (HC) average during the traffic peak hour (ppm)	Total: Nitrogen Dioxide (NO_2) 98th percentile of 1 hour values (ppb) * Where indicator criterion is exceeded (105 ppb)	Remarks
1	PINEHURST	Below threshold of assessment method	1.78	27.17	See Figure 1
2	HARROW LODGE	Below threshold of assessment method	1.84	43.90	See Figure 1
6	FRESH FIELDS FRUIT FARM	Below threshold of assessment method	1.80	24.32	See Figure 1
12	COPSHALL FARM	Below threshold of assessment method	1.78	24.23	See Figure 2
13	72 RYE ROAD	7.88	2.34	104.44	See Figure 3
14	194 RYE ROAD	4.51	2.02	28.69	See Figure 3
15	79 RYE ROAD	Below threshold of assessment method	1.85	29.45	See Figure 3
16	HOMELANDS WINCHELSEA ROAD	3.23	1.88	37.00	See Figure 3
17	GUESTLING HOUSE SCHOOL	3.19	1.88	37.86	See Figure 3
18	THE HOPE PUBLIC HOUSE	Below threshold of assessment method	1.81	33.60	See Figure 3

TABLE 2

WITHOUT SCHEME

Year: 2013

Ref No	Receptor Address	Total: Carbon Monoxide (CO) annual maximum 8 hour (ppm) * Where indicator criterion is exceeded (9 ppm)	Total: Hydrocarbons (HC) average during the traffic peak hour (ppm)	Total: Nitrogen Dioxide (NO_2) 98th percentile of 1 hour values (ppb) * Where indicator criterion is exceeded (105 ppb)	Remarks
1	PINEHURST	Below threshold of assessment method	1.74	13.23	See Figure 1
2	HARROW LODGE	Below threshold of assessment method	1.77	20.29	See Figure 1
6	FRESH FIELDS FRUIT FARM	Below threshold of assessment method	1.75	12.04	See Figure 1
12	COPSHALL FARM	Below threshold of assessment method	1.74	12.10	See Figure 2
13	72 RYE ROAD	4.45	1.96	50.46	See Figure 3
14	194 RYE ROAD	Below threshold of assessment method	1.84	14.17	See Figure 3
15	79 RYE ROAD	Below threshold of assessment method	1.77	14.35	See Figure 3
16	HOMELANDS WINCHELSEA ROAD	Below threshold of assessment method	1.79	17.59	See Figure 3
17	GUESTLING HOUSE SCHOOL	Below threshold of assessment method	1.79	17.86	See Figure 3
18	THE HOPE PUBLIC HOUSE	Below threshold of assessment method	1.75	16.04	See Figure 3

TABLE 3

PUBLISHED SCHEME

Year: 2013

Ref No	Receptor Address	Total: Carbon Monoxide (CO) annual maximum 8 hour (ppm) * Where indicator criterion is exceeded (9 ppm)	Total: Hydrocarbons (HC) average during the traffic peak hour (ppm)	Total: Nitrogen Dioxide (NO_2) 98th percentile of 1 hour values (ppb) * Where indicator criterion is exceeded (105 ppb)	Remarks
1	PINEHURST	Below threshold of assessment method	1.79	15.29	See Figure 1
2	HARROW LODGE	Below threshold of assessment method	1.83	20.30	See Figure 1
3	22 BALDSLOW DOWN	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 1
4	ROUGHLANDS	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 1
5	WOODLANDS CARAVAN PARK	Below threshold of assessment method	1.71	Below threshold of assessment method	See Figure 1
6	FRESH FIELDS FRUIT FARM	Below threshold of assessment method	1.75	16.47	See Figure 1
7	LITTLE BUCKHURST FARM	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 1
8	OLD BEAMS	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 1
9	SEWAGE WORKS	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 2
10	LIDHAM HOUSE	Below threshold of assessment method	1.71	Below threshold of assessment method	See Figure 2
11	WAYSIDE	Below threshold of assessment method	1.70	Below threshold of assessment method	See Figure 2
12	COPSHALL FARM	Below threshold of assessment method	1.73	14.89	See Figure 2
13	72 RYE ROAD	3.15	1.86	30.96	See Figure 3
14	194 RYE ROAD	Below threshold of assessment method	1.77	8.74	See Figure 3
15	79 RYE ROAD	Below threshold of assessment method	1.74	8.94	See Figure 3
16	HOMELANDS WINCHELSEA ROAD	Below threshold of assessment method	1.74	11.46	See Figure 3
17	GUESTLING HOUSE SCHOOL	Below threshold of assessment method	1.74	11.60	See Figure 3
18	THE HOPE PUBLIC HOUSE	Below threshold of assessment method	1.73	12.06	See Figure 3

TABLE 4
RESULTS SUMMARY

Ref No	Receptor Address	Carbon Monoxide (CO)			Hydrocarbons (HC)			Nitrogen Dioxide (NO_2)		
			Year	2013		Year	2013		Year	2013
		1994	Without Scheme	With Scheme	1994	Without Scheme	With Scheme	1994	Without Scheme	With Scheme
1	PINEHURST	* 3.04	* 3.04	* 3.04	1.78	1.74	1.79	27.17	13.23	15.29
2	HARROW LODGE	* 3.04	* 3.04	* 3.04	1.84	1.77	1.83	43.90	20.29	20.30
3	22 BALDSLOW DOWN			* 3.04			1.70			* 7.00
4	ROUGHLANDS			* 3.04			1.70			* 7.00
5	WOODLANDS CARAVAN PARK			* 3.04			1.71			* 7.00
6	FRESH FIELDS FRUIT FARM	* 3.04	* 3.04	* 3.04	1.80	1.75	1.75	24.32	12.04	16.47
7	LITTLE BUCKHURST FARM			* 3.04			1.70			* 7.00
8	OLD BEAMS			* 3.04			1.70			* 7.00
9	SEWAGE WORKS			* 3.04			1.70			* 7.00
10	LIDHAM HOUSE			* 3.04			1.71			* 7.00
11	WAYSIDE			* 3.04			1.70			* 7.00
12	COPSHALL FARM	* 3.04	* 3.04	* 3.04	1.78	1.74	1.73	24.23	12.10	14.89
13	72 RYE ROAD	7.88	4.45	3.15	2.34	1.96	1.86	104.44	50.46	30.96
14	194 RYE ROAD	4.51	* 3.04	* 3.04	2.02	1.84	1.77	28.69	14.17	8.74
15	79 RYE ROAD	* 3.04	* 3.04	* 3.04	1.85	1.77	1.74	29.45	14.35	8.94
16	HOMELANDS WINCHELSEA ROAD	3.23	* 3.04	* 3.04	1.88	1.79	1.74	37.00	17.59	11.46
17	GUESTLING HOUSE SCHOOL	3.19	* 3.04	* 3.04	1.88	1.79	1.74	37.86	17.86	11.60
18	THE HOPE PUBLIC HOUSE	* 3.04	* 3.04	* 3.04	1.81	1.75	1.73	33.60	16.04	12.06

* For Nitrogen Dioxide, a value of 7.0 represents the lower threshold value of the assessment method.
For Carbon monoxide, a value of 3.04 represents the lower threshold value. An asterisk indicates that actual values fall below these thresholds.
For Hydrocarbons, a value of 1.7 has been included for background concentration.

AIR QUALITY
OVERALL IMPACT ASSESSMENT

TABLE 5 **A259 HASTINGS EASTERN BYPASS**

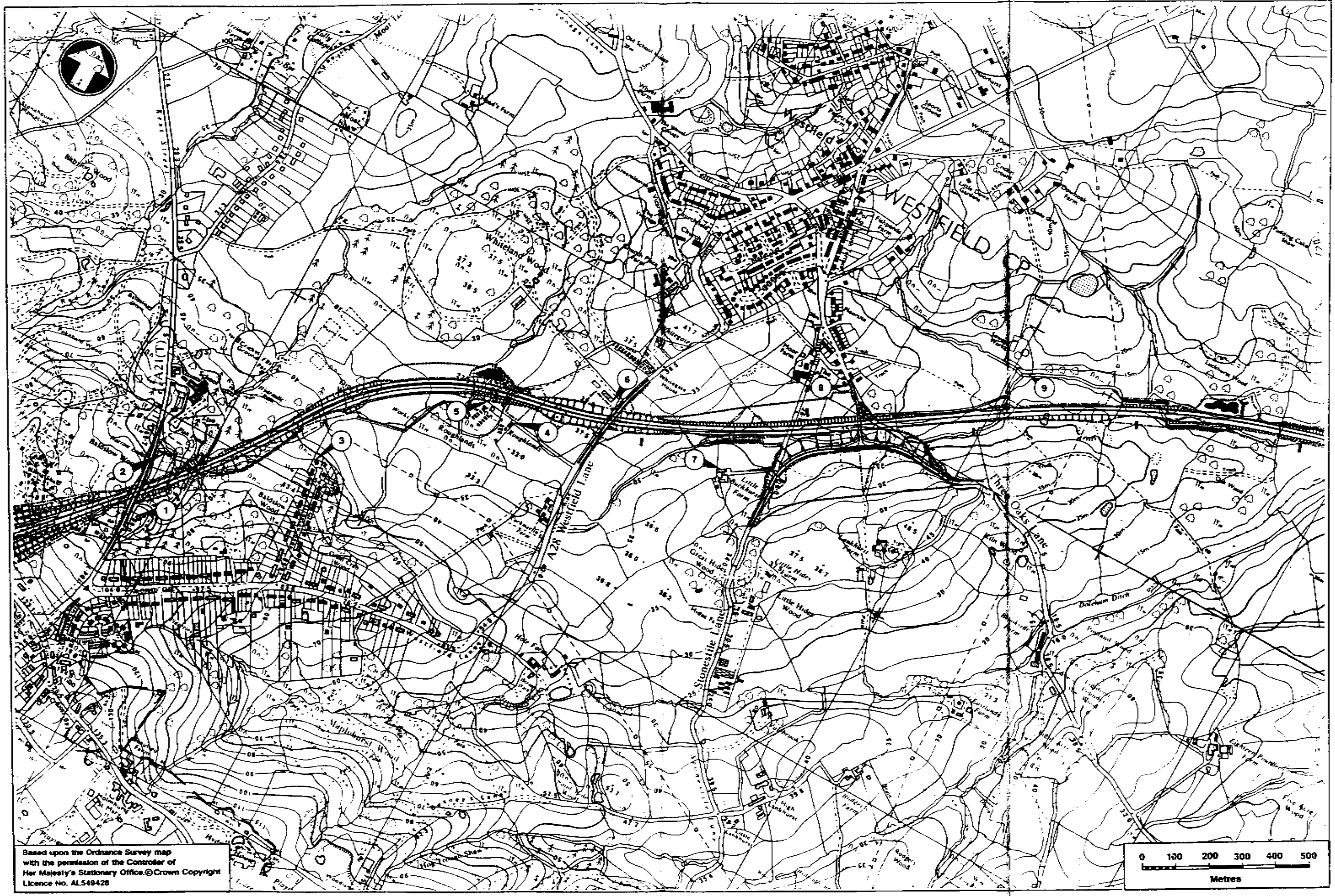
	TOTAL EMISSIONS (tonnes / year)			
	Carbon Monoxide	Hydrocarbons	Oxides of Nitrogen	Carbon Dioxide
1998 Without Scheme	4553.20	767.65	1007.80	141422
1998 Published Scheme	4021.13	664.51	1063.22	140820
Difference	-532.06	-103.14	55.42	-601.83
Percentage change	-11.7	-13.4	5.5	-0.4

AIR QUALITY
OVERALL IMPACT ASSESSMENT

TABLE 6

A259 HASTINGS EASTERN BYPASS

	TOTAL EMISSIONS (tonnes / year)			
	Carbon Monoxide	Hydrocarbons	Oxides of Nitrogen	Carbon Dioxide
2013 Without Scheme	3079.64	455.46	596.67	197298
2013 Published Scheme	2699.01	391.79	629.40	195239
Difference	-380.63	-63.68	32.73	-2059.34
Percentage change	-12.4	-14.0	5.5	-1.0



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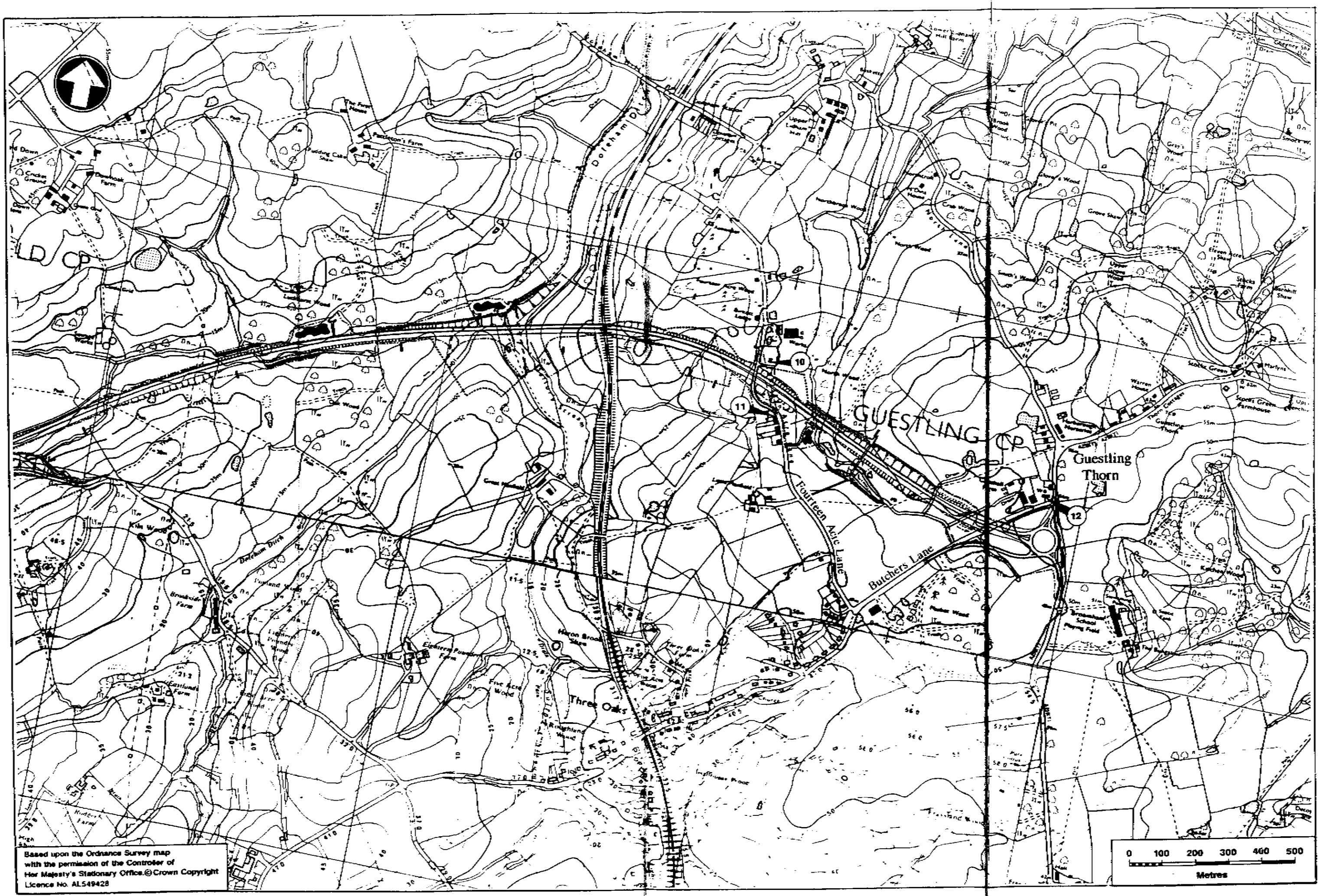
Location of Properties Assessed

Figure 1



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Location of Properties Assessed

Figure 2

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Location of Properties Assessed

Figure 3

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REPORT 10

VEHICLE TRAVELLERS

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REPORT 10 - VEHICLE TRAVELLERS

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1 VIEW FROM THE ROAD

1.1 Introduction

1.1.1 View from the road is defined under the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 9, as the extent to which travellers, including drivers, are exposed to the different types of scenery through which a route passes.

1.1.2 The construction of a new road through the countryside may enable more people to see the landscape than hitherto, providing interest on a journey and helping to alleviate driver stress. Such benefits have to be balanced however against the visual and landscape impact which could result if the road and traffic were left unscreened.

1.2 Method

1.2.1 When assessing the view from the road, consideration has been given to the landscape's character and quality including prominent landmarks and landscape features and the extent to which the traveller is able to view the scene.

1.2.2 The extent to which a view can be obtained is dependent on the relative level of the road in comparison to the surrounding landform and vegetation. Four categories are given in Volume 11 which are as follows:

(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.

1.2.3 Finally it is important to note that the view from the road would change, not only from season to season, but from one year to the next due especially to the establishment of highway planting.

1.3 Drivers' View (Figure 1)

1.3.1 The landscape along the road corridor is predominantly rural and well wooded. The woods generally lie slightly below the crests of the numerous minor ridges, as do the farmsteads. There are good views, therefore, from ridge to ridge and wide views of the dominant Battle - Hastings Ridge which lies to the south of the scheme. Away from the minor ridges, however, the landscape within the valleys is one of

small-scale intimate character with woodland and pasture on the valley sides and pasture and meadows on the valley bottoms.

1.3.2 The route would commence in deep cutting as it descends the main Battle - Hastings ridge in a north easterly direction as a continuation of the Bexhill and Hastings Western Bypass. The route would then pass through a series of low embankments and cuttings in the area south and south-west of Westfield where the route would enter and follow a valley bottom. Apart from the section south of the A21, where open views to the north over the High Weald Area of Outstanding Natural Beauty would be available, views would be contained by Dines Wood and Baldslow Wood as the route descends. From this point to the A28 Westfield Lane views would be restricted by cuttings and mounding except one open view towards Whiteland Wood.

1.3.3 Between Westfield Lane and Luckhurst Wood and Oak Wood, views would generally be restricted by earthworks. Drivers would, however, glimpse two open views to the south of the road on either side of the diversion to Stonestile Lane. These views would be foreshortened by rising ground. In contrast, drivers would obtain an open view over a wide area to the north of the scheme in this area towards Downoak Farm. It is in this area that a layby is proposed, although planting around the layby would restrict views in the long term.

1.3.4 To the east of Luckhurst Wood and Oak Wood, the bypass would cross the confluence of Doleham Ditch and Sailor's Stream on a high embankment as it climbs to cross over the Hastings to Ashford railway. This would provide an opportunity for the driver to appreciate open views along the valley, to both the north and south of the bypass.

1.3.5 To the east of the railway the route would be set in cutting or on low embankment where the combination of landform and vegetation would generally restrict views of the surrounding landscape, although until highway planting establishes there would be open views out from the road on the approach to and on the roundabout near Broomham School.

1.4 Summary

1.4.1 The high quality rural landscape through which the route would pass offers considerable interest to the traveller. The opportunity, however, for the traveller to appreciate the scenery would be restricted by the combination of route alignment, adjacent landform and vegetation and the proposed mitigation measures which are designed to screen traffic in wider views and to blend the scheme into the landscape. Despite these measures, however, there would be glimpsed views out from the road which would enable the traveller to appreciate the high quality landscape of the High Weald Area of Outstanding Natural Beauty.

2 DRIVER STRESS

2.1 Introduction

2.1.1 Driver stress is defined for the purposes of this environmental assessment as 'the adverse mental and physiological effects experienced by a driver traversing a road network'.

2.1.2 Factors influencing the level of driver stress include road layout, geometry, surface riding characteristics, junction frequency, speed and flow per lane. These factors can induce feelings of discomfort, annoyance, frustration and fear culminating in physical and emotional tension that detracts from the safety, comfort and value of a journey.

2.1.3 Research into driver stress indicates it leads to a decline in driving skills. As frustration annoyance and discomfort increase drivers become more aggressive and inclined to take risks. It can also induce driver fatigue leading to a slower response time to visual and other stimuli. Driver stress is likely to be a major contributor to road accidents, especially those in urban areas where flows are highest and speeds lowest.

2.1.4 The level of stress depends on skill, experience, temperament, knowledge of the route, state of health, anticipated ease of journey and age. Professional drivers or commuters therefore may feel a lower level of stress than other drivers.

2.1.5 In Hastings, stress is a particularly important factor as during the summer months traffic is increased by holiday drivers. These holiday drivers will have little knowledge of the routes to and around the area and feel more tension as delays detract from their pleasure time.

2.1.6 This report details the change in driver stress that it is predicted would occur following the construction of the A259 Hastings Eastern Bypass. It does so by describing the stress induced on the existing A259 and B2093 (The Ridge) in northern Hastings and describing how this would change with the construction of a bypass. It also predicts driver stress levels on the Published Scheme. The analysis assumes that the A259 Bexhill and Hastings Western Bypass would be completed at the same time as this scheme. The route of the Published Scheme is shown in Figure 1.

2.1.7 The assessment of driver stress has been carried out on the assumption that the scheme opening and design years (15 years after opening) would be 1998 and 2013 respectively and has been based on the predicted traffic flows for those years. Traffic forecasts have recently been reassessed and the year of opening of the scheme revised to 2000 (Design year 2015). Revised traffic flows for these years are given in Volume 1 of this Statement. It is anticipated that the results of an assessment for the revised years would be broadly similar to those given in this report.

2.2 **Methodology** (Figures 2 and 3)

2.2.1 The calculation is based on the method given in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 9.

2.2.2 Research does not allow for a finely graded assessment of driver stress but only allows it to be broken into three categories: low, moderate and high. No reliable correlations between driver stress and physical factors have been established, therefore the tables in the DMRB have been used as guidance on the assessment of the appropriate level of driver stress for the road conditions.

2.2.3 Tables 1 to 3 on page 4/2 of the DMRB, Volume 11, Section 3, Part 9 give a relationship between the road type, driver stress, speed and flow. The levels of speed and flow with the scheme constructed have been assessed for the worst year in the first fifteen years after opening (2013), assuming the highest predicted traffic flows for that year are achieved, and are compared with the speeds and flows predicted on the existing network at the same time with no scheme.

2.2.4 The flow and speed statistics for each section of existing and new road have been obtained from information in the report from COBA9, a computer program which assesses the economic implications of the scheme, using predicted traffic flows and speeds.

2.2.6 For the purposes of this report the effect of the A259 Hastings Eastern Bypass on traffic in Hastings has been taken as the effect on that area that includes and lies north of the B2093 'The Ridge'. It should be noted however that if the A259 Bexhill and Hastings Western Bypass were constructed prior to the A259 Hastings Eastern Bypass, traffic on the B2093 'The Ridge' would increase considerably above those flows predicted for the combined schemes. This effect is not considered here.

2.3 **Discussion of Results**

2.3.1 The results of the assessment of driver stress levels along the A259 in the year 2013 without a bypass and with a bypass open, are given in Table 2.1. Those of the B2093 "The Ridge" and the Published Scheme are given in paragraphs 2.3.4 and 2.3.5 to 2.3.8 respectively. The levels of driver stress predicted for the year 2013 without a bypass are shown on Figure 2 and with a bypass on Figure 3.

Section of existing A259	Level of Stress without a bypass in 2013	Level of Stress with a bypass in 2013
B2093 'The Ridge' - Bachelor's Bump	High	High/Moderate
Bachelor's Bump - Guestling Thorn	High	Moderate

Table 2.1 Level of driver stress on the existing A259

The Existing A259

2.3.2 This route would generally create a high level of stress for drivers in the year 2013 if the Published Scheme were not built.

2.3.3 The main features of the existing A259 that would contribute to the high level of stress for drivers include proximity of housing, numerous side road junctions, poor road alignment (tight curves and steep gradients) and high traffic flows. The predicted reduction of traffic through the urban fringe of Hastings as a result of construction of the bypass (in 2013 approximately 40%) would reduce the level of stress generally to high/moderate, but in the rural area this would reduce to moderate.

B2093 'The Ridge'

2.3.4 The B2093 'The Ridge' is predicted to have slightly higher flows with the introduction of the scheme. This would create a high level of stress with or without the new bypass.

The Published Scheme

2.3.5 Some 2km of the Published Scheme would be dual carriageway mainly passing through rural areas. The remaining 4km would be single carriageway, but with the capacity to be widened to dual carriageway at a later date. The layout would be to a high standard of design that would be familiar to all users, with free movement and limited access. The Published Scheme would consequently have a low level of stress on the dual carriageway section but this would increase to moderate stress on the single carriageway section, due to a higher predicted flow per lane. Apart from the two ends of the scheme there would be no junctions, which would benefit stress levels.

2.3.6 The high degree of transfer to the bypass from the existing A259, would benefit large numbers of drivers by the reduction in stress levels, both on the Published Scheme and local road network.

2.3.7 Some features of the new route, particularly the higher speeds and the merging of traffic from dual to single carriageway may deter some drivers, particularly the elderly or inexperienced. The reduction of flows on the existing A259 would enable them to benefit from a reduction of stress level without transferring to the new scheme if they so wished.

2.3.8 The design of the Published Scheme would be such that a high standard of direction signing would be provided to enable decisions on routes to be taken by drivers in sufficient time. The anxiety of following the signing of a route through a busy urban area would be relieved.

2.4 Summary

2.4.1 The removal of through traffic from Hastings would contribute to a reduction in driver stress level along the length of A259 from Ore to Guestling Thorn, by transferring this traffic to the Published Scheme, where lower levels of stress would be experienced. In Hastings the B2093 'The Ridge' would have driver stress levels at a similar level with or without a bypass.

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REPORT 11

PEDESTRIANS, CYCLISTS, EQUESTRIANS AND COMMUNITY EFFECTS

September 1994

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1 INTRODUCTION

1.1 This report considers the impact the construction of the Published Scheme would have on pedestrians, cyclists, equestrians and on community facilities.

1.2 The assessment has been carried out in accordance with Volume 11, Section 3, Part 8 of the Design Manual for Roads and Bridges (DMRB).

1.3 The assessment of the effects of the bypass on the above has been carried out on the assumption that the scheme opening and design years (15 years after opening) would be 1998 and 2013 respectively and has been based on the predicted traffic flows for those years. Traffic forecasts have recently been assessed and the year of opening of the scheme revised to 2000 (Design year 2015). Revised traffic flows for those years are given in Volume 1 of this Statement. It is anticipated that the results of the assessments for the revised years would be similar to those given in this report

2 METHODOLOGY (Figure 1)

2.1 In order to assess the likely impact of the Published Scheme on the pedestrians, cyclists, equestrians and other users of community facilities, consideration has been given to the effect it would have on the duration of journeys and how any local travel patterns would be affected.

2.2 The establishing of travel patterns has required that the following bodies be contacted for the purposes given:

East Sussex County Council)	-	Rights of Way, Definitive footpath plans
Hastings Borough Council)		
The Ramblers	-	Footpath usage
East Sussex County Fire Brigade	-	Station locations
Area Health Authority	-	Hospitals and Doctors
Sussex County Constabulary	-	Station locations
East Sussex County Council Education Department	-	Schools
East Sussex County Council Social Services Department	-	Aged persons retirement homes
Local Equestrian centres	-	Routes

2.3 In addition to the above, information has been gathered concerning the following:-

Routes of Bus Services
Locations of Post Offices
Locations of Railway Stations

2.4 In order to establish the usage of the Rights of Way along the scheme corridor, a footpath survey was carried out in August 1993. The footpaths were counted on a weekday and at a weekend to establish the variation in usage. The numbers of ramblers quoted in this report as being affected by the scheme are based on the results of the survey and assume similar usage on each weekday to that counted on the weekday in the survey and similarly for the weekend days. The numbers are average summer flows although it is recognised that flows will vary through the year. The effects on pedestrians are described in Section 3. The report on the survey is Appendix A to this report.

2.5 The roads in the area are not heavily used by cyclists, but the bypass proposals make due allowance for cyclists throughout and these are described in Section 4.

2.6 The equestrian centres in the area are restricted in their routes by the lack of bridleways. The effects on equestrians are described in Section 5.

3 PEDESTRIANS (Figure 1)

3.1 There are 4 public footpath routes that would be physically affected by the Published Scheme. The details are given below.

Footpath Route	Maximum No of users recorded per day	Diversion Route	Additional Length of Route	Additional Walking Time (4 kph)
37	20	Footpath re-established along existing line and truncated	-	-
45	0	Via footpath 46 and new section of footpath before joining Three Oaks Lane and over new bridge	145 m	3 mins
10a/47	21	Via new Doleham Ditch pedestrian underpass	-	-
16	3	Via new access bridge and along boundary of bypass	100 m	2½ mins

3.2 The changes in amenity for pedestrians using the above footpaths are as given in the following paragraphs. Details of the visual impact of the scheme on the footpath routes are given in Volume 2, Report 7 of this Statement.

With Published Scheme in opening year (1998)

3.2.1 Reduction in amenity for around 200 ramblers each week. The Annual Average Daily Traffic (AADT) flows on the bypass in this area are predicted to be 9000 vehicles (two-way, 1998) assuming high growth for traffic in the intervening period. All footpaths would however be carried over or under the bypass with no access thereto.

3.2.2 Views from the footpaths would be affected by the new road and the new side road and access bridges.

Without Published Scheme in opening year

3.2.3 Existing good amenity would remain unchanged.

The Existing A259

3.3 The usage of the existing A259 by pedestrians is heavy through the urban fringe areas of Hastings. The road has footways on both sides and in the area south of Bachelor's Bump is used by children attending local schools. In Guestling Green, access is required to the primary school which abuts the road, and there are other facilities which have pedestrian access. The changes in amenity for pedestrians would be as follows:-

With Published Scheme in opening year (1998)

3.3.1 Improvement in amenity for all pededstrians using footways and local facilities. Traffic flows forecast to fall by approximately 40%, to 9,200 vehicles AADT (two-way, 1998, high growth).

Without Published Scheme in opening year

3.3.2 Users of footways and facilities in the urban fringes of Hastings and at Guestling Green would suffer gradual reduction in amenity with increasing traffic flows.

Consultations with other Bodies

3.4 The proposals were discussed with the Rights of Way officer for East Sussex County Council and the local officer for the Ramblers. Their comments and requests were taken into consideration and incorporated in the proposals where possible.

4 CYCLISTS

4.1 The congestion on the existing road network and the forecasted increase in traffic flows makes the option of cycling a dangerous one. The frequency of junctions and difficult alignment combined with high traffic flows produces a hazardous route for cyclists using the A259 through the area.

4.2 The provision of a bypass would help in two ways:

(1) By providing a safer route for longer distance cycling with facilities throughout and making junctions for cyclists more 'cycle friendly' by provision of crossing points and dedicated cycle lanes.

(2) By reducing flows on the existing A259, allowing safer cycling.

4.3 The provision for cyclists along the new scheme consists of the use of the one metre hardstrip marked on the nearside of each carriageway, separate from the main running lanes for vehicles. Where the two level junction that adjoins the west of the scheme would require slip roads to leave or join the main carriageway, crossing points on the slip roads combined with cycle tracks through the dividing nosings would enable cyclists to negotiate the merge or diverge area safely. The provisions of the junction are in accordance with Traffic Advisory Unit Leaflet 1/88 'Provision for Cyclists at Grade Separated Junctions' and are shown on Figure 2.

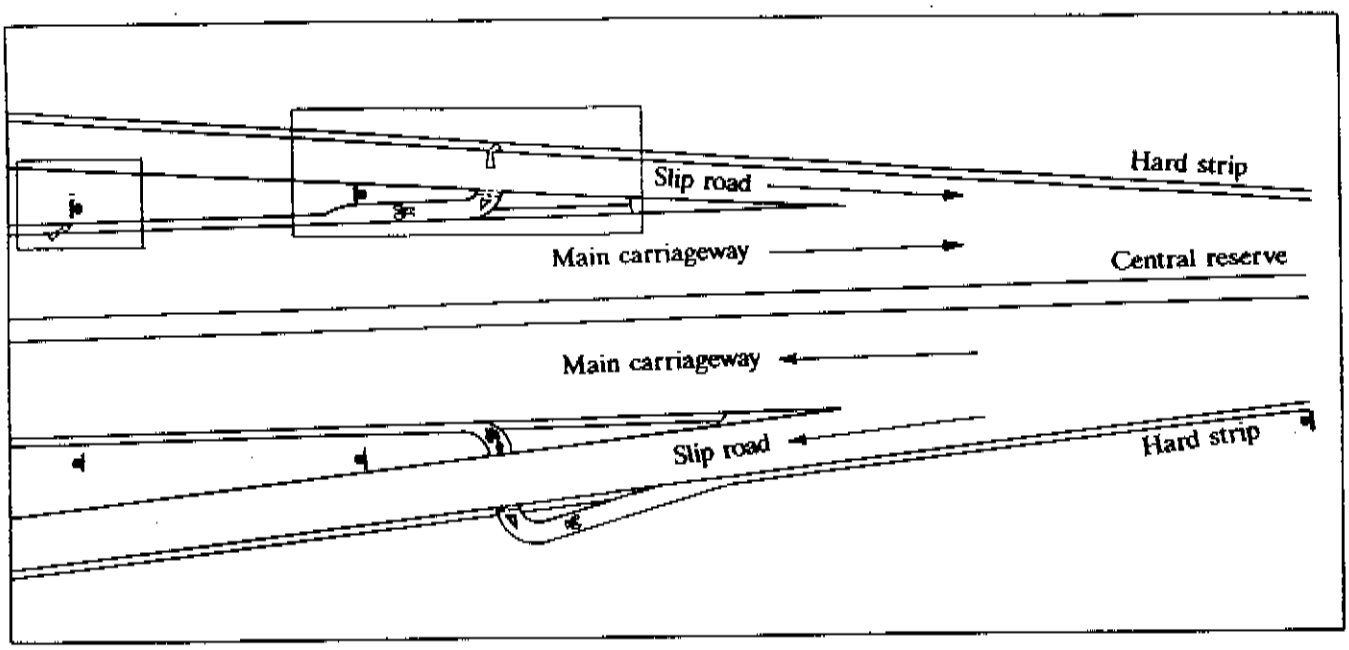
4.4 The roundabout junction of the A259 with the bypass would include facilities for cyclists. At this location dedicated crossing points and lanes would be provided for the use of cyclists to enable them to avoid the merge, diverge and weaving areas that can be dangerous. These provisions are shown on Figure 3.

5 EQUESTRIANS

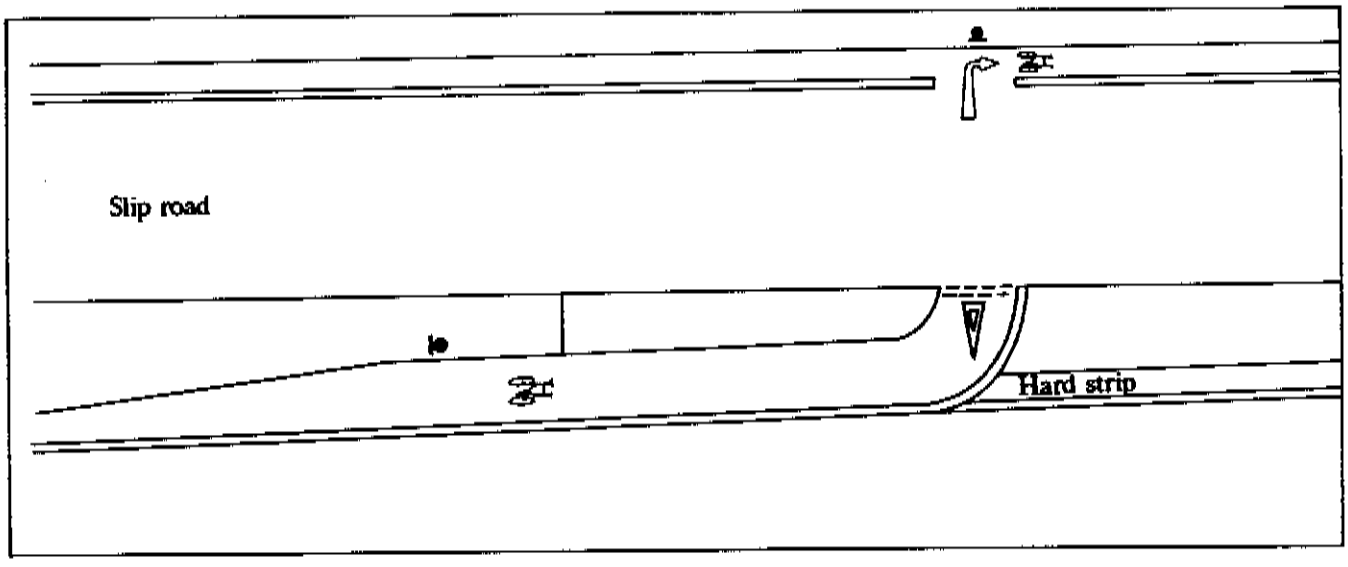
5.1 During the course of the footpath survey (see 2.4 above), the usage of Rights of Way by equestrians was also recorded. The results are shown in Appendix 1.

5.2 The locations of local equestrian centres and livery stables were established and their routes for exercise and recreation identified. The locations of these facilities are shown on Figure 1.

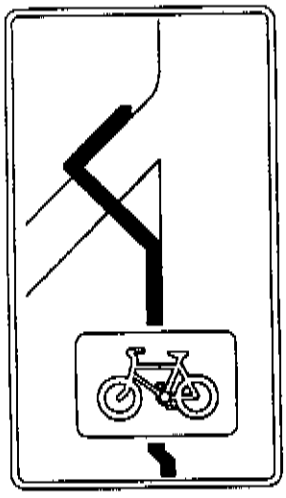
5.3 As the equestrian centres would not be in close proximity to the bypass, and the routes used by them would be maintained, there is likely to be only a minor impact, and that would be on the amenity value of the routes.



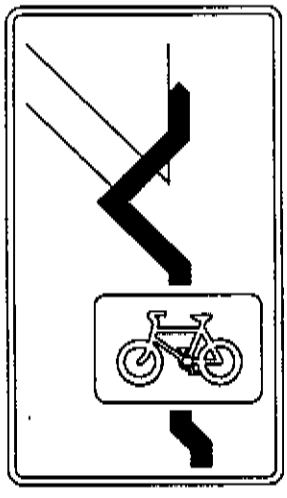
Typical Junction Detail



Slip Road Crossing Detail



Typical warning sign
for 'on' slip



Typical warning sign
for 'off' slip

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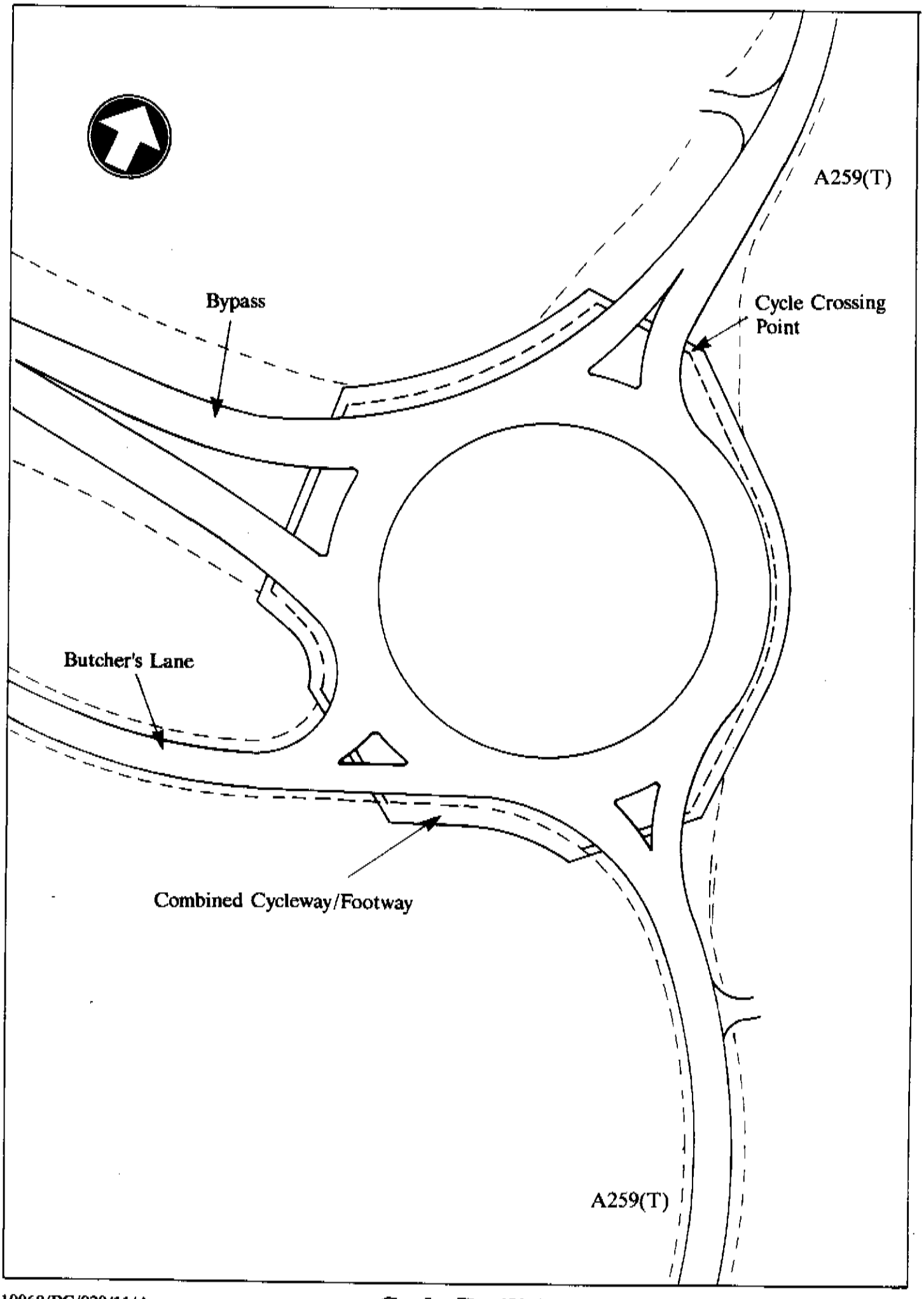
Cycle Facilities - Slip Road Crossing Standard Details

Figure 2



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Cycle Facilities at the A259 Roundabout

Figure 3

6 COMMUNITY EFFECTS

6.1 It can be seen from Figure 1 that the majority of community facilities that serve the area are located within the urban area of Hastings, lying to the south of the scheme, with some provision in Westfield. Maintaining routes from the rural areas would obviously be important in terms of access to these community facilities.

6.2 The outlying village of Westfield is served by its own post office, schools, churches and police station. People living in the outlying areas would however require access to the main facilities within the town, even though local needs could be satisfied in a some cases.

6.3 The construction of the Published Scheme would physically sever the outlying areas from the urban area, but all side roads would be maintained by the provision of bridges over the bypass. The provision of the bridges would reduce the severance effect to slight overall.

6.4 No areas of Public Open Space would be affected by the scheme.

6.5 The provision of a bypass would reduce the traffic flows through the urban areas along the A259. This is the area where a large number of community facilities are grouped and which would benefit most from the reduction in noise and air pollution. It would also allow easier access for all users of the facilities.

6.6 The relief from existing severance would be moderate through Hastings and along the A259 to Guestling Thorn.

6.7 There would be a slight increase of traffic on the B2093 'The Ridge' in Hastings which would affect the facilities along this route, which include schools and the Conquest Hospital.

6.8 No existing bus routes would be re-routed apart from following local diversions of existing roads. There would therefore be no effect on services. Bus services along the existing A259 would benefit from the predicted reductions in traffic flows.

7 SUMMARY

7.1 The usage of the footpaths is relatively light. As the majority of usage of footpaths is for recreational purposes rather than as a route between facilities, it is unlikely that the diversions proposed would affect the numbers using the footpaths, but the reduction in amenity caused by the presence of the new road may well do so.

7.2 Facilities would be provided along the new scheme and at the junctions for the use of cyclists. The reductions in traffic flows along the alternative through route would make the use of this route by cyclists safer and more enjoyable.

7.3 The scheme would affect equestrians by reducing the amenity value of those parts of their routes crossed by the bypass. The provision of bridges for side roads over the bypass would however enable access to remain virtually unchanged.

7.4 The scheme would sever the outerlying communities from the facilities in the urban area of Hastings, but the provision of bridges across the bypass at all the significant roads in the area, would limit the impact of the severance to slight.

APPENDIX 1

Footpath Survey

August 1993

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1 INTRODUCTION

1.1 This report documents the pedestrian surveys undertaken on the four public footpaths along the route of the eastern bypass, and their analysis.

1.2 The surveys were carried out by East Sussex County Council to a specification supplied by Mott MacDonald. The four survey locations are shown in **Figure 1.**

2 SURVEY METHOD

2.1 The surveys were carried out on Sunday 15.8.93 when the weather was dry and sunny. Intervention from the local landowner at site B necessitated moving the survey site further west along the footpath. The Sunday count for this site was then undertaken on 22.8.93 when the weather was showery. All four sites were also surveyed on Wednesday 18.8.93, with dry and sunny weather prevailing.

2.2 Each count was carried out over a 12 hour period from 0700 to 1900 hours and the following information recorded:

i) Time of observation

ii) Age range, i.e. 0-5, 5-18 or 18+

iii) Travel mode, i.e. by foot, bicycle, horse or vehicle

iv) Direction of travel

3 SURVEY RESULTS

3.1 A summary of the survey results in given in **Table 1**, showing the total count at each site for the 12 hour period, split by travel mode.

3.2 It can be seen that on the Sunday the numbers vary from zero at sites B and D to 21 at site C; and on the Wednesday the numbers range from 0 at site B to 13 at site C. All of these were people on foot.

Day	Travel Mode	Site Number (1)			
		A Footpath 37	B Footpath 45	C Footpath 10a/47	D Footpath 16
Sunday 15/8/93 (3)	On foot	20	0	21	0
	Bicycle	0	0	0	0
	Horse	0	0	0	0
	Vehicle	0	0	0	0
	Total	20	0	21	0
Wednesday 18/8/93	On foot	8	0	13	3
	Bicycle	0	0	0	0
	Horse	0	0	0	0
	Vehicle	0	0	0	0
	Total	8	0	13	3

Note:

1 Site locations are shown in Figure 1.
2 12-hour two-way counts at each site are given.
3 For site B the Sunday count was undertaken on 22/8/93.

SUMMARY OF PEDESTRIAN COUNTS **TABLE 1**

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REPORT 12

DISRUPTION DUE TO CONSTRUCTION

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REPORT 12 - DISRUPTION DUE TO CONSTRUCTION

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1 INTRODUCTION

1.1 The construction of the Published Scheme would take place over a period of approximately two years. During this time, there would be disruption to those people living and working in close proximity to the site of the works and accesses thereto.

1.2 This report describes the construction processes that could affect the surrounding area and assesses the likely extent of disruption caused.

2 THE CONSTRUCTION CONTRACT

2.1 The road, its associated structures and ancillary works would be constructed by a contractor who would be awarded the contract following competitive tendering. The contractors selected to tender for the contract would be chosen by their track record in carrying out similar works.

2.2 The contractor would be supervised throughout construction to ensure compliance with the design and to ensure that the requirements of the relevant authorities and other requirements of the contract in respect of environmental protection are upheld.

2.3 The contractor would be responsible for selecting working methods, the plant used to carry out the work, the sources of materials and the order in which the work would be carried out. These have a large bearing on the disruption likely to occur during construction, and would not be finalised until after a contractor has been appointed. The practices described in this report are therefore based on those that are normally used, but there would be no obligation for any contractor to adopt them.

2.4 Prior to the contract being prepared for tender, the views and requirements of the local Environmental Health Officer would be sought. He or she would provide limiting levels of allowable disruption, usually in the form of specifying maximum noise levels and limiting working hours. These requirements would form part of the contract, and the contractor's compliance would be checked by the supervising team and the local authority.

3 METHODOLOGY OF ASSESSMENT OF DISRUPTION

3.1 Disruption due to construction is generally a localised phenomenon. A study has shown that at least half the people within 50 metres of a construction site boundary were seriously bothered by the activities but beyond 100 metres less than a fifth of the people were.

3.2 For the purposes of this report the number of residences within 100 metres of the proposed construction works have been assessed to give an indication of the number of people who would be seriously bothered by the works. This line does not extend necessarily from the final scheme boundaries, as in some cases such as where landscaping works are proposed, construction practices would take place outside these. Where these works are proposed, the 100 metres has been taken from the limit of these works.

3.3 Sites of ecological and heritage value within 100m of the scheme have also been assessed and the mitigation measures proposed are described where provided.

3.4 The effects on residents, areas used by the public and the local ecology that could be expected during construction of the Published Scheme are described in the following sections together with a review of construction impacts and how they would be mitigated.

4 PROPERTIES AFFECTED

4.1 Residences

4.1.1 During the route location studies for the bypass the major constraints were identified including residential developments. The alignment selected, would keep impact on residences to a minimum, but inevitably some properties would still be affected due to their proximity. Mitigation measures in the form of earth mounding, landscaping and planting are proposed wherever possible together with the erection of a noise barrier at one location to reduce the impact of the scheme, both in its final form and during construction.

4.1.2 The main areas where residences would lie in close proximity to the bypass are in north-east Hastings where the new road would be in close proximity to Baldslow Down, and the southern part of Westfield. A total of 36 residences would lie within 100 metres of the perimeter of the construction site, and these properties are shown together with the extent of the area considered on Figures 1 - 4 incl. All these residences could expect some disruption due to construction.

4.1.3 Three static caravan parks lie in close proximity to the bypass. Beauport Park, Whitegates and Woodlands. A total of 63 caravan plots would lie within 100 metres of the construction site. All these caravans could expect some disruption due to construction.

4.1.4 The likely main effects of the site operations are described below.

Noise

4.1.5 Noise produced during the construction process would probably be one of the largest impacts experienced at nearby residences. The plant and processes used are noisy by nature, and although advances in machine and silencing technology have allowed some aspects to become relatively quiet, noise would still be a problem.

4.1.6 Under the Control of Pollution Act, 1974, the Local Authority has the power to limit working hours and noise levels, through the Environmental Health Officer as outlined in para 2.4. The daytime working hours would be set, and night time working would be agreed to only in 'exceptional circumstances', and then only following the relevant permissions being forthcoming from the local authority and after consultations with local residents. These noise limits would not stop the noise from being intrusive but would prevent excessive levels being generated whilst permitting the contractor to construct the scheme.

4.1.7 In areas where construction noise '... seriously affects or will affect for a substantial period of time the enjoyment of an eligible building adjacent to the site ...', the Highway Authority has discretionary powers under the Noise Insulation Regulations 1975 to provide insulation in the form of secondary glazing. (An "eligible building" is a dwelling or residential building not more than 300m from the

nearest point of the carriageway of the scheme.) In areas where this is the case, installation would take place at an early stage of scheme construction to enable full benefit to be derived. The criteria previously adopted for schemes within the Department of Transport's South Eastern Region for the provision of insulation under these conditions are:

(i) The predicted construction noise level L_{Aeq} is expected to exceed 70 dB sustained over a period of several months, and

(ii) Construction noise levels alone are at least 1 dB greater than the prevailing ambient levels.

A preliminary assessment concluded that residences could benefit from secondary glazing during the construction period.

4.1.8 In addition to insulation, as part of the mitigation of the final scheme, environmental barriers in the form of noise fences and earth mounds are proposed. Where feasible, these additional mitigation measures could be installed at an early stage of construction to afford the residences the benefits during construction. The location of the proposed barriers and mounds for the final scheme are shown on Figures 1 - 4 inclusive.

Dust

4.1.9 Dust caused by the movement of earthworks and other construction materials could be a problem at adjacent properties, particularly during the drier summer months. Watering by spraying could be used on site to reduce this impact, and road sweeping would be enforced to minimise the spreading of dust along access roads.

Piling

4.1.10 Noise from piling at the sites of the construction of bridges and retaining walls would often be the basis for the provision of discretionary insulation (see 4.1.6). The structures that are expected to have piled foundations are given below:

A21 Overbridge	(Figure 1)
Retaining Wall in Baldslow Wood	(Figure 1)
A28 Overbridge	(Figure 2)
Three Oaks Lane Overbridge	(Figure 2)
Railway Bridge	(Figure 3)
Access Overbridge at Hastings Brickworks	(Figure 4)

Deliveries of Materials

4.1.11 The deliveries of materials to the site would generally be limited to the main roads indicated on Figure 5, ie A271, A269, A2100, A21, A28 and A259 on the approaches to Hastings and A259, A21, B2092

(Queensway and Harley Shute Road) and B2093 (The Ridge) through Hastings. Construction traffic would not be permitted to use other minor roads for access or for through routes to gain access to the major roads except in agreed circumstances. This aspect is dealt with more fully under 7.2 and 7.3.

4.1.12 Although deliveries would generally be restricted to the roads given above, works to the side roads that cross the bypass would be necessary to enable the main carriageway and the associated bridges to be constructed and for approaches to these crossings on the side roads to be built. This would involve excavations for the diversion of services and the provision of drainage in addition to the roadworks. Much of this work would require traffic management, possibly with two way working at temporary traffic signals over extended periods. Access to properties would be affected by these works, but would be maintained at all times.

4.2 Commercial Properties

4.2.1 Three commercial properties - Freshfields Fruit Farm shop, the Plough Inn at Westfield (Figure 2) and Hastings Brickworks (Figure 4) would be within 100m of the scheme. The proximity of the bypass and the A28 overbridge would create a severe impact on the farm shop during construction although access would be largely unaffected. The other premises would suffer due to proximity and works to the bridges on the roads which serve them.

4.3 Farms

4.3.1 The permanent effects of the scheme on agriculture and farming methods are given in detail in Report 5. The effects on farm houses, which are considered as residences, are described in section 4.1. Farms would however be affected in a number of other ways during construction, including the following:

Temporary Landtake

4.3.2 Extensive areas of land would be taken under licence to blend the scheme in with its surroundings by regrading before allowing return to agriculture. The extent of these areas are shown on Figures 1 - 4 inclusive. From an agricultural point of view this would result in the loss of use of the land for a period of time, before being returned. The time the land would be out of production would be kept to a minimum and landowners compensation for loss of income would be negotiated with the District Valuer. These areas would be stripped of topsoil, regraded with additional material, and the topsoil respread. Drainage to these areas would be incorporated as necessary.

Access

4.3.3 Temporary access across the site would be maintained at all times for farm vehicles and livestock where an existing access would be affected during scheme construction. All fields affected by construction would be fenced where the possibility of livestock entering the site would exist. The

provision of permanent fencing would be a matter for agreement between the landowner and the District Valuer.

Services

4.3.4 All water and power supplies to farms and fields would be maintained during construction. Permanent diversions would however form part of the accommodation works.

5 COMMUNITY FACILITIES AFFECTED

5.1 Access across the construction site along existing roads would be maintained at all times, although there may be flow restrictions due to temporary traffic management for the reasons laid out in para 4.1.12. Access to community facilities would therefore be largely unaffected.

5.2 Recreational facilities that lie in close proximity to or would be affected by the scheme include footpaths. These facilities would be maintained during construction, although they would suffer from additional noise, dust and access disruption. Footpaths that cross the site would be clearly marked during construction, but users would in most cases be required to cross the working site prior to construction of the bridges and underpass that would eventually carry the rights of way over or under the new road.

5.3 The locations of the above facilities are shown on Figures 1 - 4 inclusive.

6 EFFECTS ON NATURE CONSERVATION AND HERITAGE

6.1 Nature Conservation

6.1.1 The route of the new road lies entirely within the High Weald Area of Outstanding Natural Beauty (AONB). Along its length the route also passes through or close to other important features of nature conservation value. The locations are shown in Figures 1 - 4 inclusive.

6.1.2 Site clearance for construction would be controlled in both timing and method to limit the effect on the ecology. Mitigation measures proposed for incorporation in the final scheme to protect the local ecology would be gradually introduced as construction of the scheme develops. Temporary measures would be necessary to protect the ecology during construction, the main concerns being:-

(1) Preservation of topsoil
(2) Protection of woodland
(3) Protection of watercourses
(4) Protection of wildlife.

Each of the above are considered in more detail below.

Preservation of Topsoil

6.1.3 Topsoil removed for construction would be carefully stockpiled for re-use after completion of earthworks. Topsoil removed from ecologically sensitive areas would be segregated from other topsoil for re-use in the same area.

Protection of Woodland and Hedgerows

6.1.4 The removal of trees, shrubs and undergrowth would be carefully timed to ensure that breeding birds would not be disturbed during the nesting season. Clearance of these areas would be restricted to the period between August and January. In areas where woodland would be partly taken by the scheme, ie a stand of trees would remain, woodland management would be necessary in the form of thinning and replanting to prevent damage to the exposed edge of the woodland from wind blow. The woodland management aspects would be undertaken immediately after the initial site clearance to minimise damage to that remaining. The areas of woodland affected are shown on Figures 1 - 4 incl.

6.1.5 Individually none of the hedgerows in proximity to the scheme are of other than local interest. Where they occur next to woodland or grassland of nature conservation value their value is increased. Management of exposed edges would occur and these would be protected by temporary fencing.

Protection of Water Courses

6.1.6 In the final scheme, all drainage outfalls would be protected by the installation of a balancing pond or tank that would limit the amount of water entering the ditch, stream or drain to a level acceptable to the National Rivers Authority. These balancing ponds and tanks would act as interceptors for pollutants existing either as part of normal run off from the road pavement and earthworks drainage or due to an accidental spillage.

6.1.7 Similar temporary holding tanks would be installed during construction to reduce the risk of pollutants from the site entering the watercourses nearby. Outfalls during construction would be limited to those proposed for permanent outfall. All watercourses would be monitored for water quality during construction to ensure that pollutants do not find their way to the watercourses from other sources on the site. Fourteen ponds would be within 100m of the site and may experience indirect effects during construction.

Protection of Wildlife

6.1.8 The limitations on the timing of clearance of trees outlined in 6.1.4 above, applies equally to shrubs and hedgerows. This would help reduce the impact on nesting birds. The clearance of aquatic vegetation and wetlands would be carried out wherever possible between late spring and early autumn, when invertebrate populations would be at their most mobile.

6.1.9 A confidential badger survey has shown that the badger population of the area is relatively high, and that there would be a direct impact on up to five setts. It is most likely that badgers from some setts would require relocation. The location and design of mitigation measures such as badger tunnels and fencing and/or the construction of alternative setts would be decided in consultation with English Nature. During construction, monitoring of the movement of the local badger population would be undertaken and established paths used by the animals for their feeding would be maintained by the provision of tunnels as necessary.

6.1.10 Specialist surveys have located a pond containing great crested newts that would lie 70 m from the new carriageway. There would be loss of terrestrial newt habitat from this site and there could also be indirect disturbance effects, due to construction or airborne sediment deposition. The need for mitigation would be decided in consultation with English Nature. Options for consideration include the bottle trapping of newts and their transfer to an alternative pond, or holding them for release into the pond after the construction period.

6.1.11 Dormice habitat in Dines Wood and Luckhurst Wood may also be affected by disturbance due to construction. The need for mitigation would be decided in consultation with English Nature. Possible measures include the trapping of doormice for release elsewhere in Dines Wood and Luckhurst Wood or their release in other areas of suitable habitat where the species is currently absent or present in low numbers.

6.2 **Heritage**

6.2.1 There would be seven listed buildings within 100 metres of the scheme as well as the archaeologically significant areas shown on Figures 1 - 4. These buildings are the former lodge at Claremont School (Figure 1), the historic building group at The Moor on the southern edge of Westfield (Figure 2) and Copshall farmhouse and barn (Figure 4).

6.2.2 The details of the archaeological finds and a detailed description of the listed buildings are given in Report 6. It is likely that archaeological finds would occur during excavation for construction, and a watching brief would be maintained to ensure that artefacts found would be recorded and stored for posterity. Some exploratory trenching for this purpose has been carried out, and further work would be required prior to construction. Construction works are not proposed in the immediate vicinity of listed buildings and they are not expected to be physically affected although they will suffer from noise and other construction related effects.

7 OTHER EFFECTS OF CONSTRUCTION

Site Compound

7.1 The contractor would be responsible for obtaining, establishing and maintaining a compound where offices for his staff and that of the supervisors, together with laboratories, storage areas for materials and plant and temporary living accommodation for workers would be provided. This compound would be situated on land close to the route, and its location would be the subject of a planning application if not contiguous with the site.

Site Access and Delivery of Materials

7.2 As previously outlined in 4.1.10 access to the site would generally be limited to major roads, with movement of materials along the site from these access points. Figure 5 shows the routes that would be permitted for access. These would be classified as 'unrestricted access' routes, whereas some less major routes may be used for 'restricted access' to carry out specified agreed works.

7.3 Most construction materials would need to be imported to the site from elsewhere, the majority being brought by road, although the proximity of the railway line could allow delivery of some materials by this route subject to agreement between the contractor and British Rail. It would be the contractor's responsibility to locate sources for the materials for the scheme. The following approximate quantities of the main construction materials would be required:

Granular Material	160,000 m^3
Bitumen-bound Material	31,000 m^3
Concrete Aggregate and Cement	9,000 m^3

These quantities would result in approximately 20,000 deliveries by road.

Earthworks

7.4 The scheme has been designed so that the earthworks approximately balance, ie so that there is no large scale removal of soil from or importing to the site. This balance has been achieved by considering the scheme in conjunction with the neighbouring scheme, the A259 Bexhill and Hastings Western Bypass. The latter would have approximately 600,000 m^3 of surplus soil, which would not be required for its construction and could be used on this scheme. These quantities form part of the balance for this scheme.

7.5 The road has been designed to blend in with its surroundings using regrading techniques. These techniques involve additional cutting in some areas to round off slopes and depositing additional soil in other areas to form earth mounding to screen the road. These earth mounds are in most cases graded into their surroundings by using gentle slopes that allow return to agricultural use.

7.6 There would be substantial movement of earthworks along the scheme to move material from areas of cut to where they would be required for embankments, landscaping areas or earthmounding. In all a total of 550,000 m^3 of material would be excavated and 1,150,000m^3 deposited. The quantities for the whole scheme (rounded to the nearest 50,000m^3) are summarised in Table 7.1 below.

Table 7.1

	Cut	Fill	Landscaping	Regrading	TOTAL
A259 Bexhill & Hastings Western Bypass	600,000	-	-		600,000
A21 - A28	350,000	- 100,000	- 25,000	-50,000	175,000
A28 - Doleham Ditch	100,000	- 350,000	-50,000	-350,000	- 650,000
Doleham Ditch - A259(E)	100,000	- 150,000	- 25,000	-50,000	-125,000
TOTAL	1,150,000	- 600,000	- 100,000	-450,000	0

7.7 The matter of earthworks and dealing with surplus soil has been the subject of discussions with East Sussex County Council (ESCC) who are the local planning authority responsible for minerals and waste disposal, and thereby for excavation and tipping of earthworks materials in the local area. At an early stage of scheme preparation ESCC investigated the possibility of off-site tip areas in the immediate area of the scheme and confirmed that none existed of a size suitable for tipping large amounts of surplus earthworks material. The balance of the earthworks for this scheme in conjunction with the neighbouring scheme was therefore seen as essential mitigation of the environmental problems associated in long distance haulage of materials to a suitable tipping area. East Sussex County Council have welcomed the current scheme proposals for earthworks.

Lime Stabilisation

7.8 It is possible that the movement of earthworks materials may be reduced by the use of lime stabilisation to strengthen in-situ materials rather than removing and replacing them with stronger imported materials. This method would involve scarifying the existing material and spreading lime either in the form of a powder or in the form of a slurry on the surface before mixing. The spreading and mixing of the powder would cause some of the lime to become airborne and produce a dust that could affect adjacent properties or land. The dust could be reduced by watering but windy conditions would

exacerbate the problem. The slurry method would be slower and more expensive and would be unlikely to be selected by the contractor. A further difficulty would lie in protecting watercourses from contamination. This would require close monitoring on site with sediment traps.

7.9 Overall, although this method would have some environmental problems, these would probably be outweighed by the advantages of reduced importing of stronger material by road. In areas of high nature conservation value, where contamination of watercourses for instance would have a major impact, the use of this method of construction would not be permitted.

A259 HASTINGS EASTERN BYPASS – ENVIRONMENTAL STATEMENT VOL 2 (REPORTS) PART 2/2 09/94

0 0.5 1.0 1.5
Kilometres

Key

- Boundary of Visual Envelope
- Long Distance Views Outside Visual Envelope
- Line of Published Scheme
- Footpath
- Diversion

Visual Envelope

Figure 1

DEGREE OF IMPACT

- Substantial Adverse Impact
- Moderate Adverse Impact
- Slight Adverse Impact
- No Change

- Angle of View
- Visual Envelope

EXISTING

- Existing Woodland/ Hedgerow
- Ridge Lines

PROPOSED

- Noise Barrier

- Cutting
- Embankment
- False Cutting
- Regrading

VISUAL INTRUSION WINTER YEAR 1

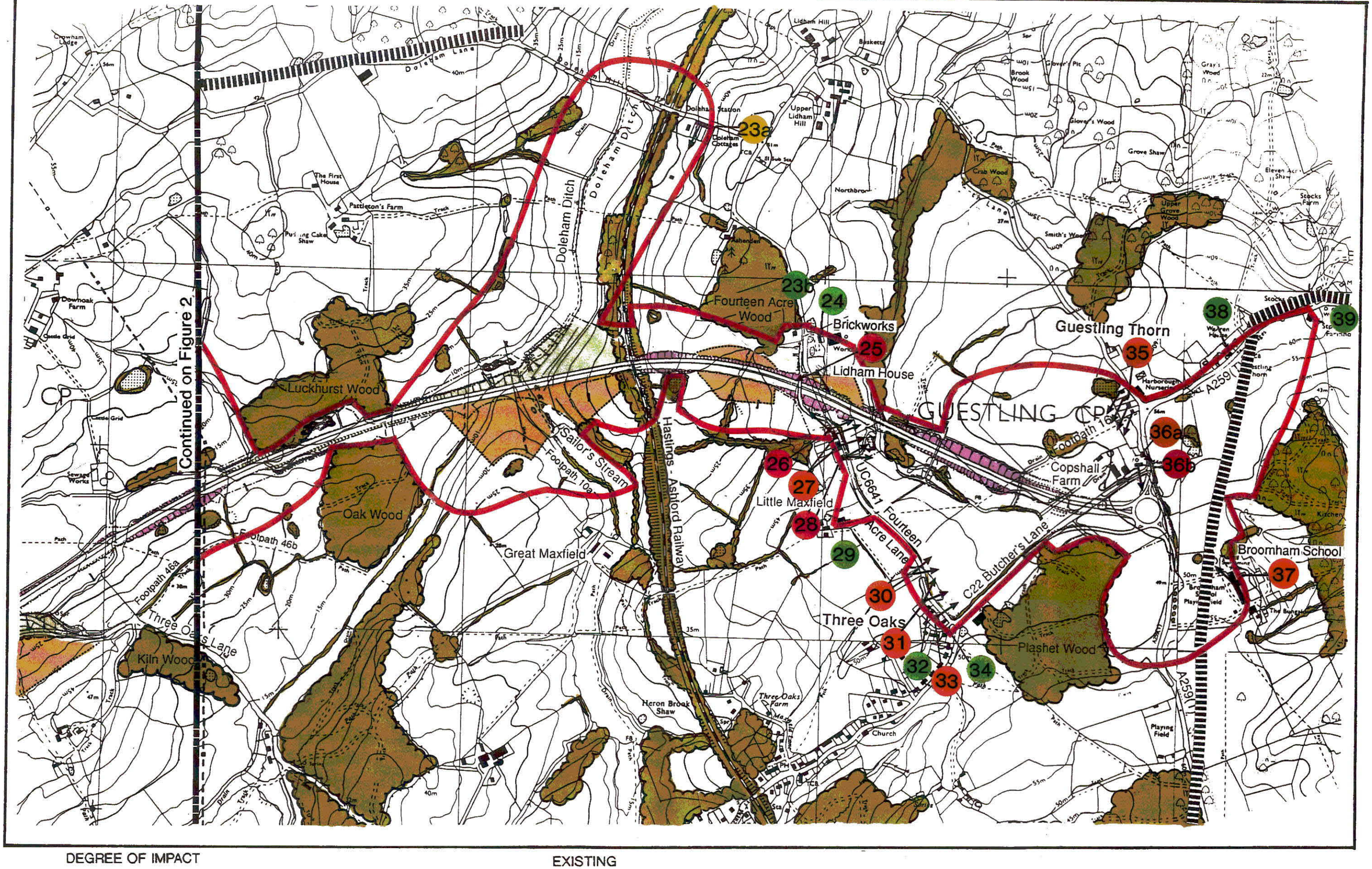
PROPERTY

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

1 OF 2 APRIL 94

FIGURE 2



DEGREE OF IMPACT

- Substantial Adverse Impact
- Moderate Adverse Impact
- Slight Adverse Impact
- No Change

- Angle of View
- Visual Envelope

EXISTING

- Existing Woodland/ Hedgerow
- Ridge Lines

PROPOSED

- Noise Barrier

- Cutting
- Embankment
- False Cutting
- Regrading

VISUAL INTRUSION WINTER YEAR 1

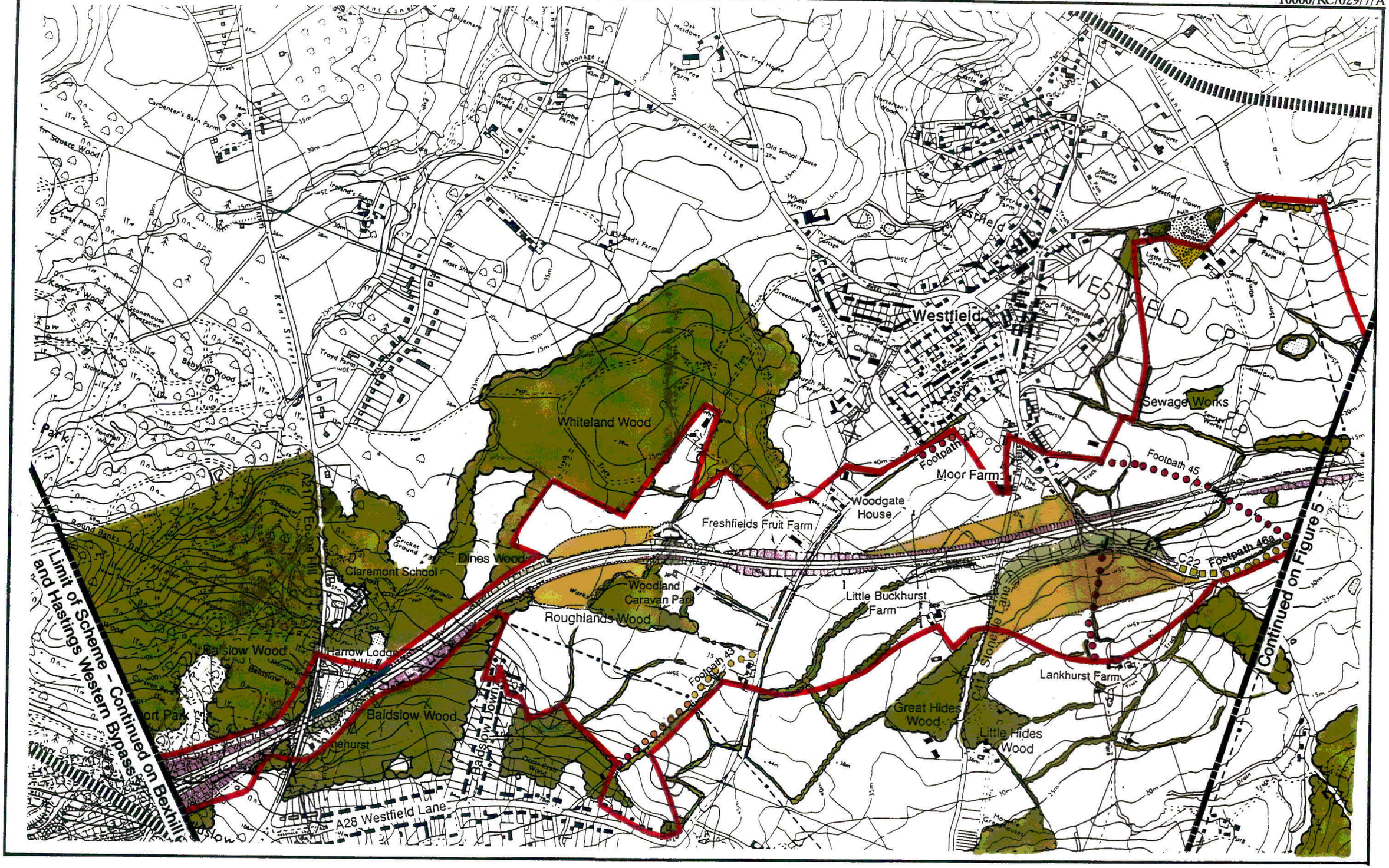
PROPERTY

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

2 OF 2 APRIL 94

FIGURE 3



- Substantial Adverse Impact
- Moderate Adverse Impact
- Slight Adverse Impact
- No Change
- Visual Envelope
- Existing Footpath
- Severed Footpath
- Diverted Footpath
- Existing Woodland/ Hedgerow
- Ridge Lines
- Public Open Space
- Noise Barrier
- Cutting
- Embankment
- False Cutting
- Regrading

VISUAL INTRUSION WINTER YEAR 1

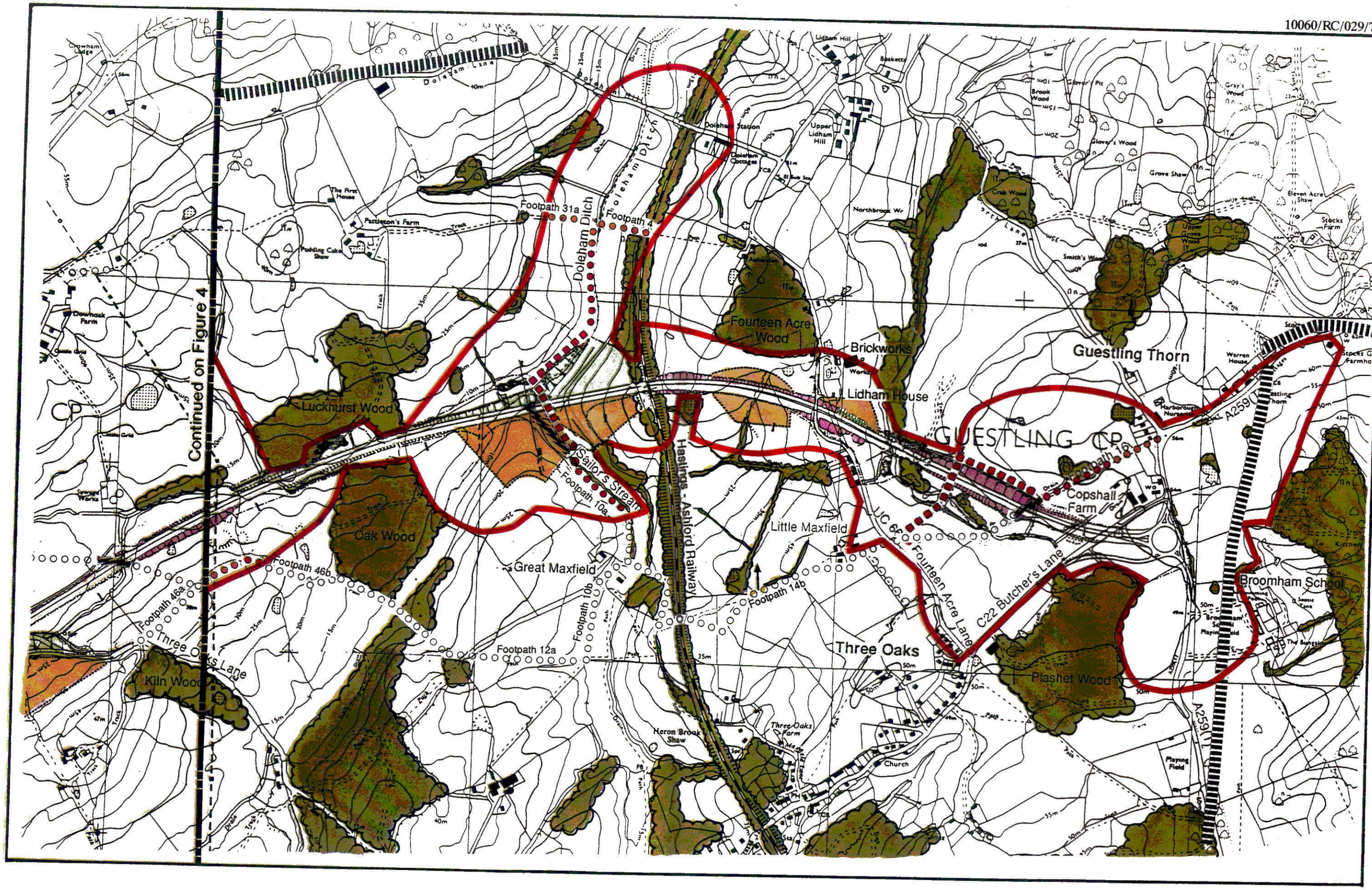
PUBLIC RIGHTS OF WAY, PUBLIC OPEN SPACE

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

1 OF 2 APRIL 94

FIGURE **4**



- Substantial Adverse Impact
- Moderate Adverse Impact
- Slight Adverse Impact
- No Change
- Visual Envelope
- Existing Footpath
- Severed Footpath
- Diverted Footpath
- Existing Woodland/ Hedgerow
- Ridge Lines
- Public Open Space
- Noise Barrier
- Cutting
- Embankment
- False Cutting
- Regrading

VISUAL INTRUSION WINTER YEAR 1

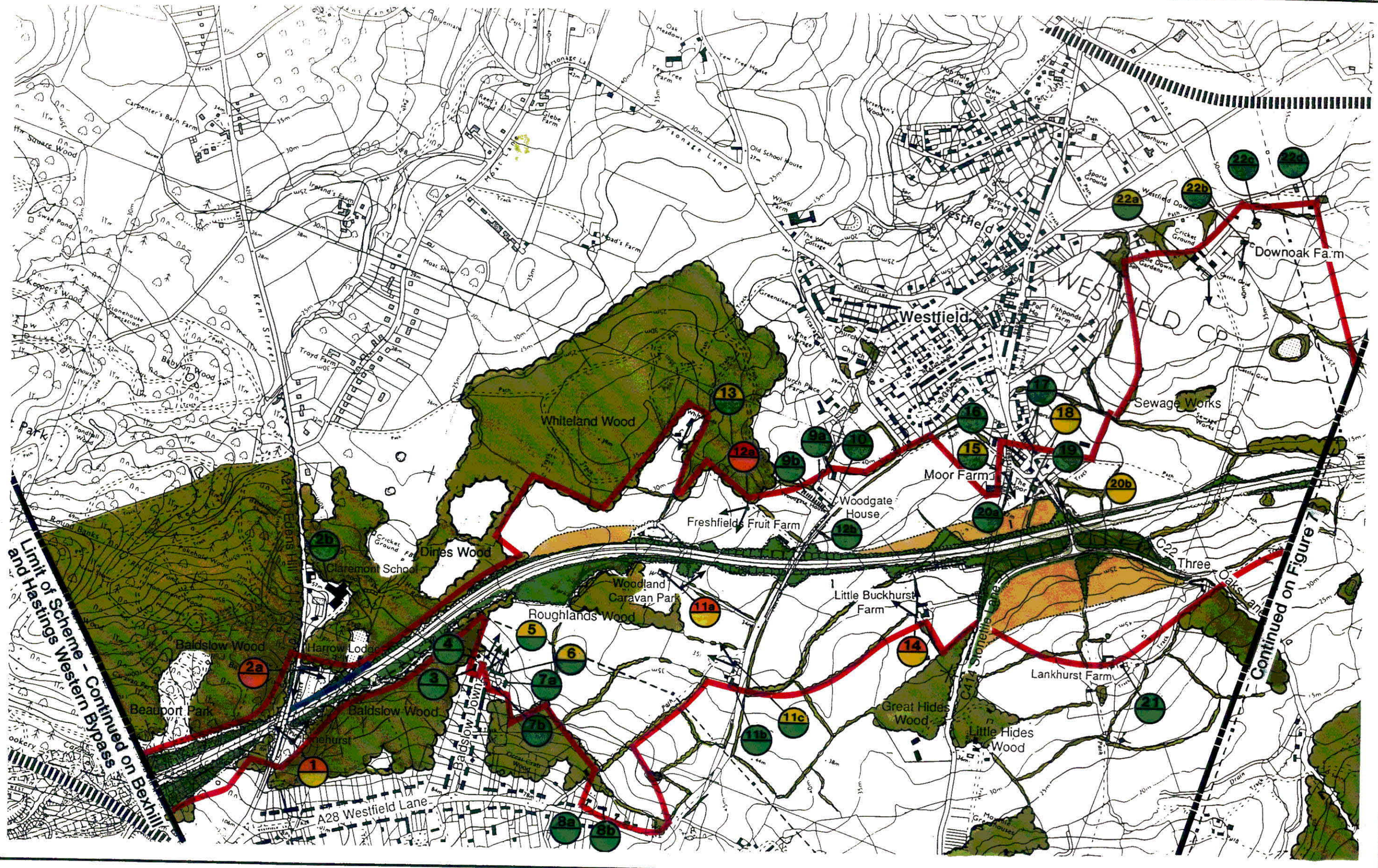
PUBLIC RIGHTS OF WAY, PUBLIC OPEN SPACE

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

2 OF 2 APRIL 94

FIGURE 5



VISUAL INTRUSION

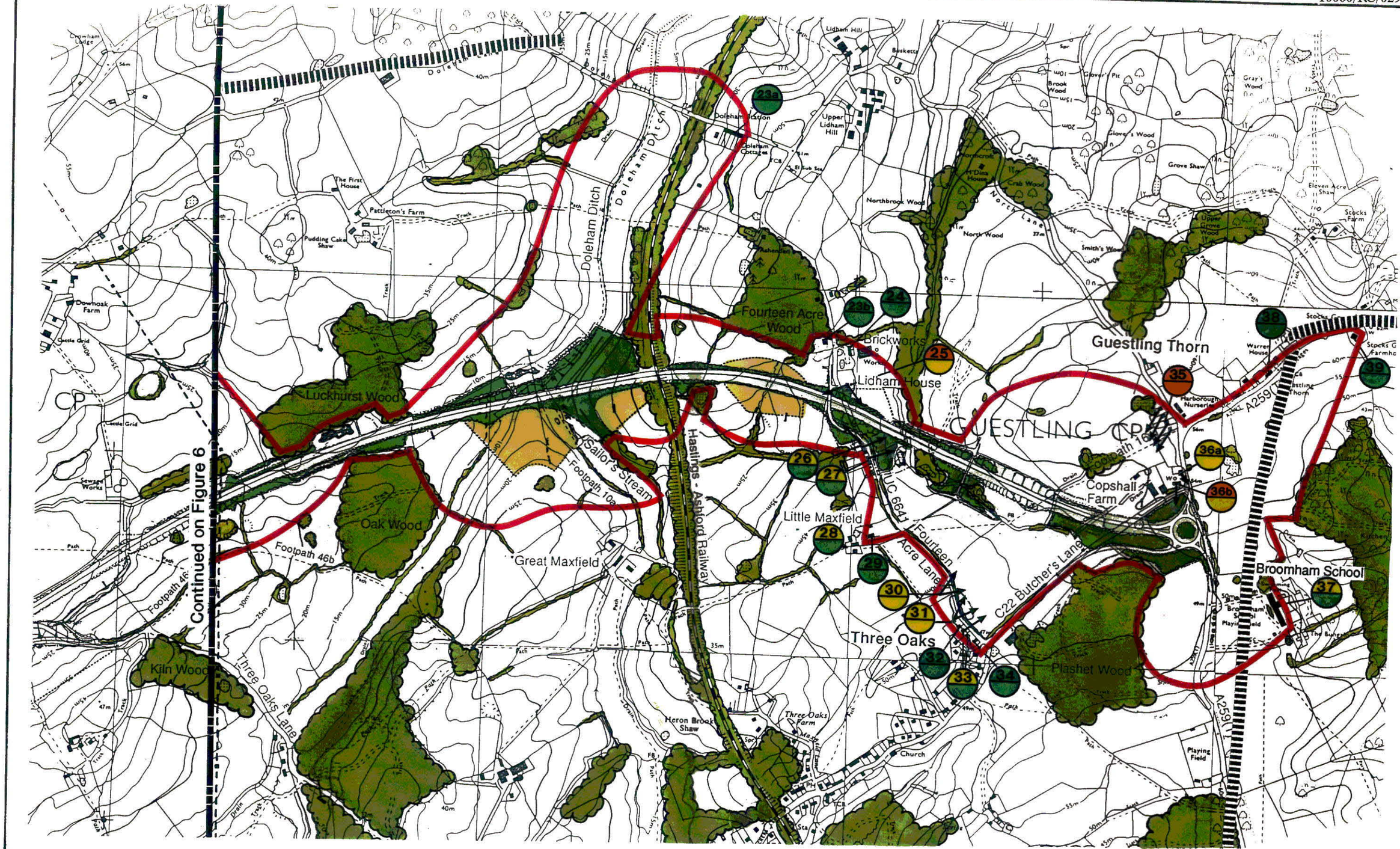
PROPERTY

A259 HASTINGS EASTERN BYPASS

YEAR 15

1 OF 2 JUNE 94

FIGURE 6



Substantial Adverse Impact
Moderate Adverse Impact
Slight Adverse Impact
No Change

Angle of View
Visual Envelope
Visual Impact
Winter Year 15
Summer Year 15

Existing Woodland / Hedgerow
Ridge Lines
Proposed Planting
Noise Barrier

Cutting
Embankment
False Cutting
Regrading

VISUAL INTRUSION

PROPERTY

A259 HASTINGS EASTERN BYPASS

YEAR 15

0 100 200 300m

2 OF 2 JUNE 94

FIGURE 7

- Substantial Adverse Impact
- Moderate Adverse Impact
- Slight Adverse Impact
- No Change
- Visual Impact Winter Year 15 / Summer Year 15
- Visual Envelope
- Existing Footpath
- Severed Footpath
- Diverted Footpath
- Existing Woodland
- Proposed Planting
- Public Open Space
- Ridge Lines
- Noise Barrier
- Cutting
- Embankment
- False Cutting
- Regrading

VISUAL INTRUSION

YEAR 15

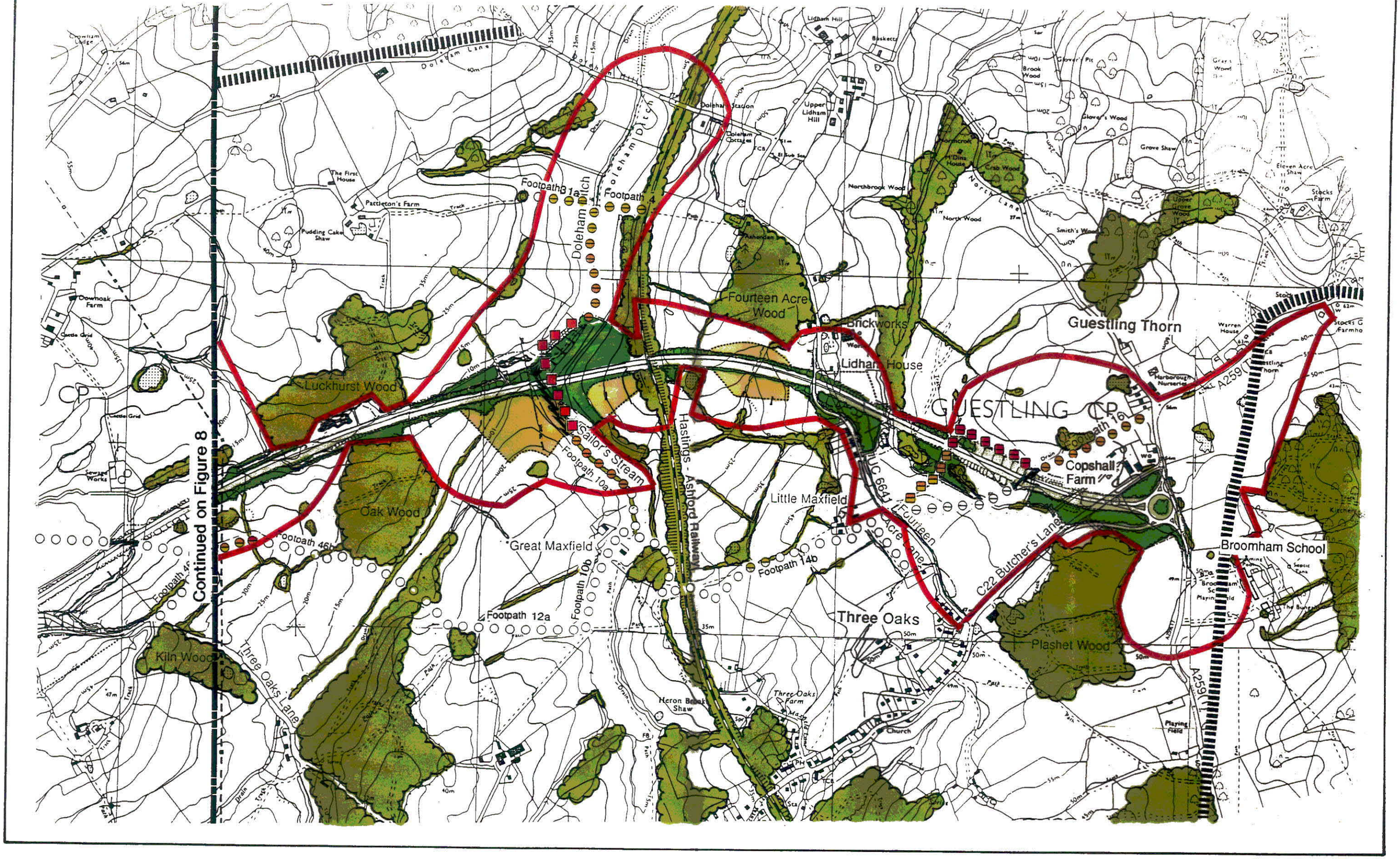
PUBLIC RIGHTS OF WAY, PUBLIC OPEN SPACE

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

1 OF 2 JUNE 94

FIGURE 8



Substantial Adverse Impact
Moderate Adverse Impact
Slight Adverse Impact
No Change

Visual Impact
Winter Year 15
Summer Year 15
Visual Envelope
Existing Footpath

Severed Footpath
Diverted Footpath
Existing Woodland
Proposed Planting

Public Open Space
Ridge Lines
Noise Barrier
Cutting

Embankment
False Cutting
Regrading

VISUAL INTRUSION

YEAR 15

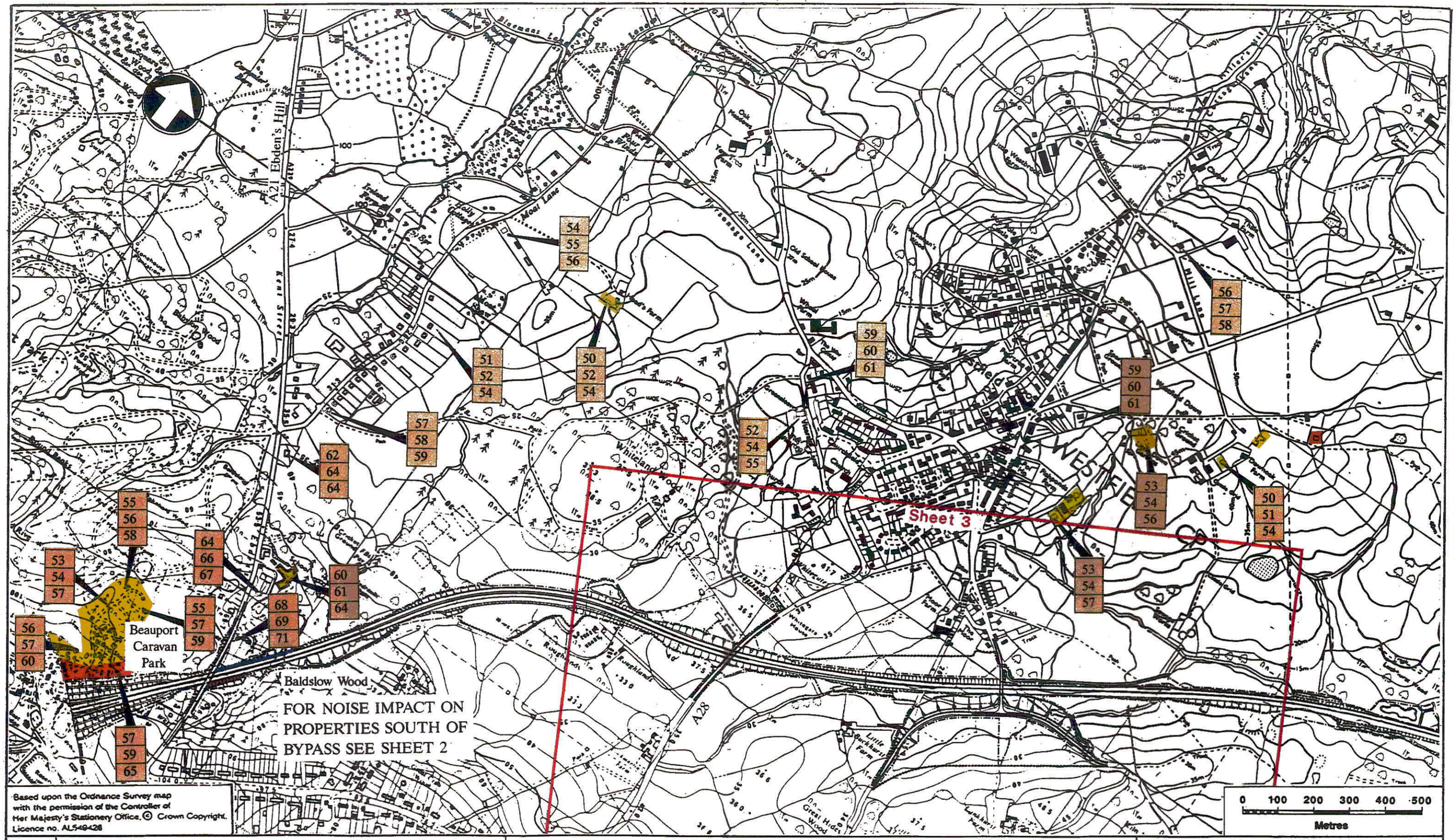
PUBLIC RIGHTS OF WAY, PUBLIC OPEN SPACE

A259 HASTINGS EASTERN BYPASS

0 100 200 300m

2 OF 2 JUNE 94

FIGURE 9



Key

Traffic Noise Levels. dB. L_{A10} (18 hour)

- Without Scheme in Year 1998
- Without Scheme in Year 2013
- With Scheme in Year 2013

Note: All Levels are First Floor Facade Levels Calculated at a Point 1m from the Building Facade

Changes in Traffic Noise Levels 1998 to 2013 With Scheme.

Increases

- 3 to 5 dB
- 5 to 10 dB
- 10 to 15 dB
- 15 to 20 dB

NOTE

Noise levels are rounded to the nearest dB. Noise change banding (e.g. 3 - 5dB) may not reflect the difference between the rounded figures quoted

Physical Barriers

- Noise Barrier
- Earth Mound

10060/RC/029/8/A

Traffic Noise Impact - Sheet 1

Figure 4

FOR NOISE IMPACT ON PROPERTIES NORTH OF BYPASS SEE SHEET 1

A28 Westfield Lane

A21(T)

Sheet 3

0 100 200 300 400 500
Metres

Key

Traffic Noise Levels. dB. L_{A10}(18 hour)

- Without Scheme in Year 1998
- Without Scheme in Year 2013
- With Scheme in Year 2013

Note: All Levels are First Floor Facade Levels Calculated at a Point 1m from the Building Facade

Changes in Traffic Noise Levels 1998 to 2013 With Scheme.

Increases

- 3 to 5 dB
- 5 to 10 dB
- 10 to 15 dB
- 15 to 20 dB

NOTE

Noise levels are rounded to the nearest dB. Noise change banding (e.g. 3 - 5dB) may not reflect the difference between the rounded figures quoted

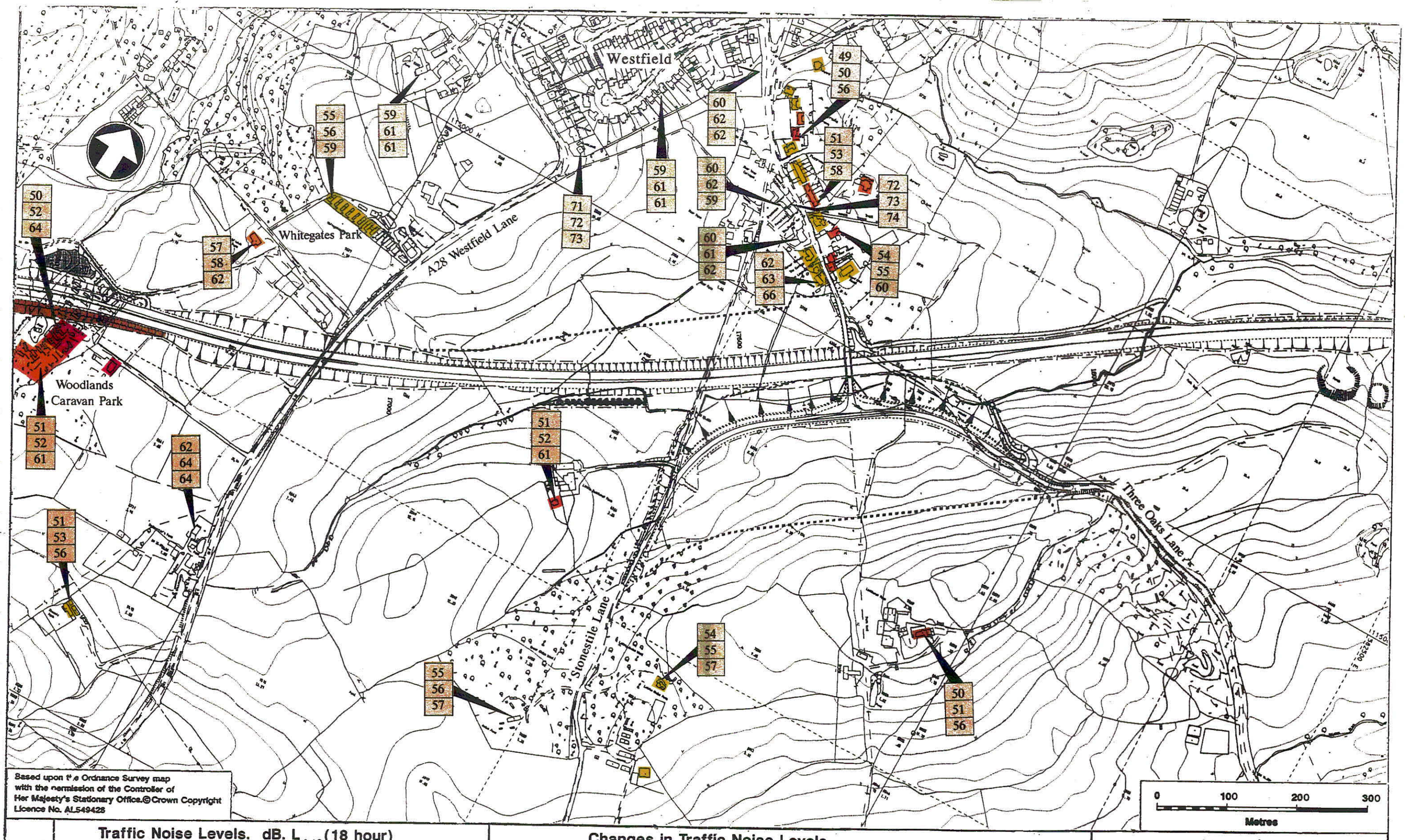
Physical Barriers

- Noise Barrier
- Earth Mound

0060/RC/029/8/A

Traffic Noise Impact - Sheet 2

Figure 5



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Key

Traffic Noise Levels. dB. L_{A10}(18 hour)

- Without Scheme in Year 1998
- Without Scheme in Year 2013
- With Scheme in Year 2013

Note: All Levels are First Floor Facade Levels
i.e. Calculated at a Point 1m from the Building Facade

Changes in Traffic Noise Levels 1998 to 2013 With Scheme.

Increases

- 3 to 5 dB
- 5 to 10 dB
- 10 to 15 dB
- 15 to 20 dB

NOTE
Noise levels are rounded to the nearest dB. Noise change banding (e.g. 3 - 5dB) may not reflect the difference between the rounded figures quoted

Physical Barriers

- Noise Barrier
- Earth Mound

10060/RC/029/8/A

Traffic Noise Impact - Sheet 3

Figure 6

48
50
51

49
50
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62
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60

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68

74
75
76

Hastings Brickworks

GUESTLING CP

A259(T)-Guestling Thorn

FOR NOISE IMPACT ON PROPERTIES SOUTH OF BYPASS SEE SHEET 5

Fourteen Acre Lane

Butchers Lane

Broomham School

0 100 200 300 400 500
Metres

Key

Traffic Noise Levels. dB. L_{A10} (18 hour)

- Without Scheme in Year 1998
- Without Scheme in Year 2013
- With Scheme in Year 2013

Note: All Levels are First Floor Facade Levels Calculated at a Point 1m from the Building Facade

Changes in Traffic Noise Levels 1998 to 2013 With Scheme.

Increases

- 3 to 5 dB
- 5 to 10 dB
- 10 to 15 dB
- 15 to 20 dB

NOTE

Noise levels are rounded to the nearest dB. Noise change banding (e.g. 3 - 5dB) may not reflect the difference between the rounded figures quoted

Physical Barriers

- Noise Barrier
- Earth Mound

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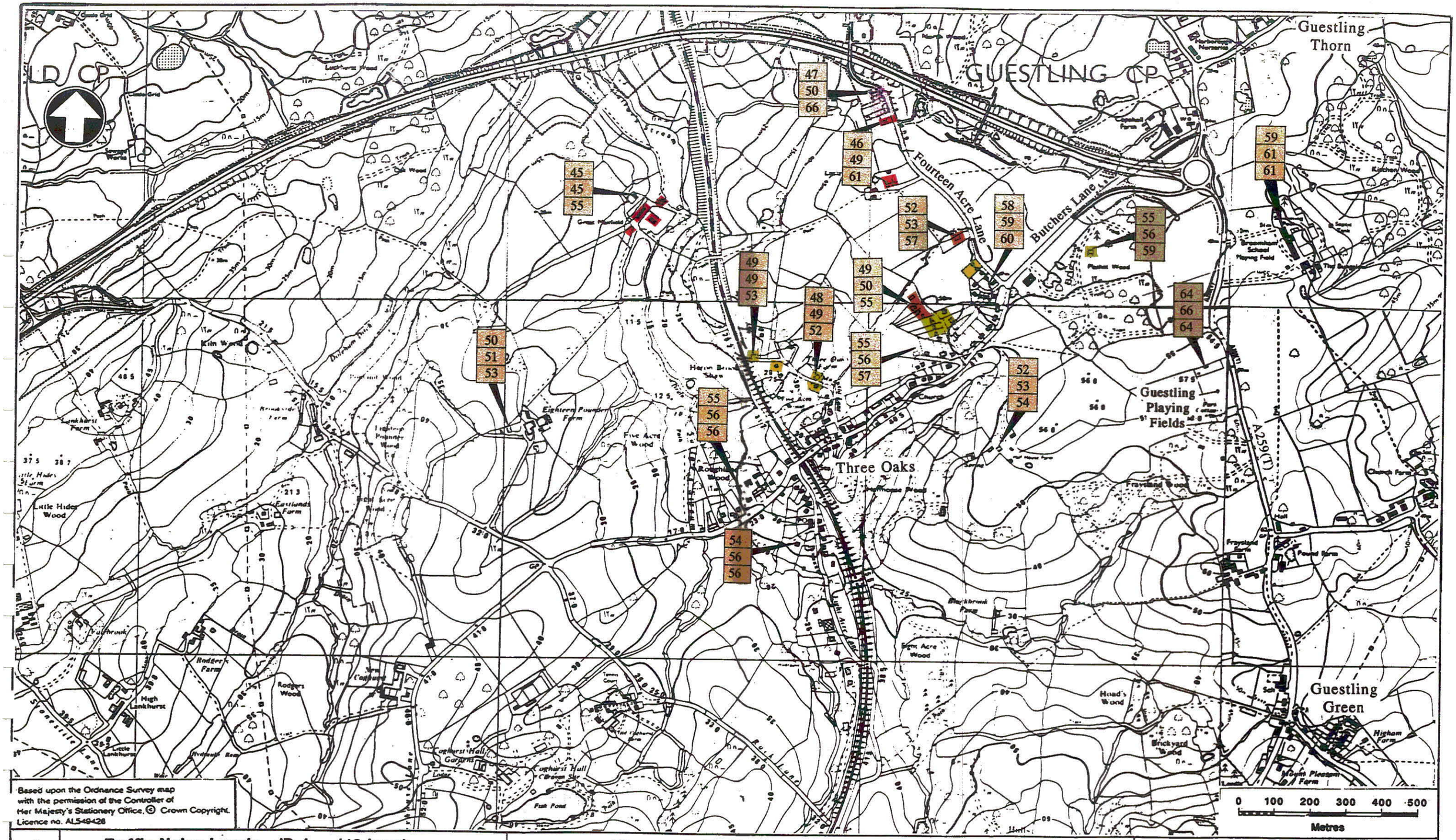
Traffic Noise Impact - Sheet 4

Figure 7



Key

Traffic Noise Levels. dB. L_{A10} (18 hour)

- Without Scheme in Year 1998
- Without Scheme in Year 2013
- With Scheme in Year 2013

Note: All Levels are First Floor Facade Levels Calculated at a Point 1m from the Building Facade

Changes in Traffic Noise Levels 1998 to 2013 With Scheme.

Increases

- 3 to 5 dB
- 5 to 10 dB
- 10 to 15 dB
- 15 to 20 dB

NOTE

Noise levels are rounded to the nearest dB. Noise change banding (e.g. 3 - 5dB) may not reflect the difference between the rounded figures quoted

Physical Barriers

- Noise Barrier
- Earth Mound

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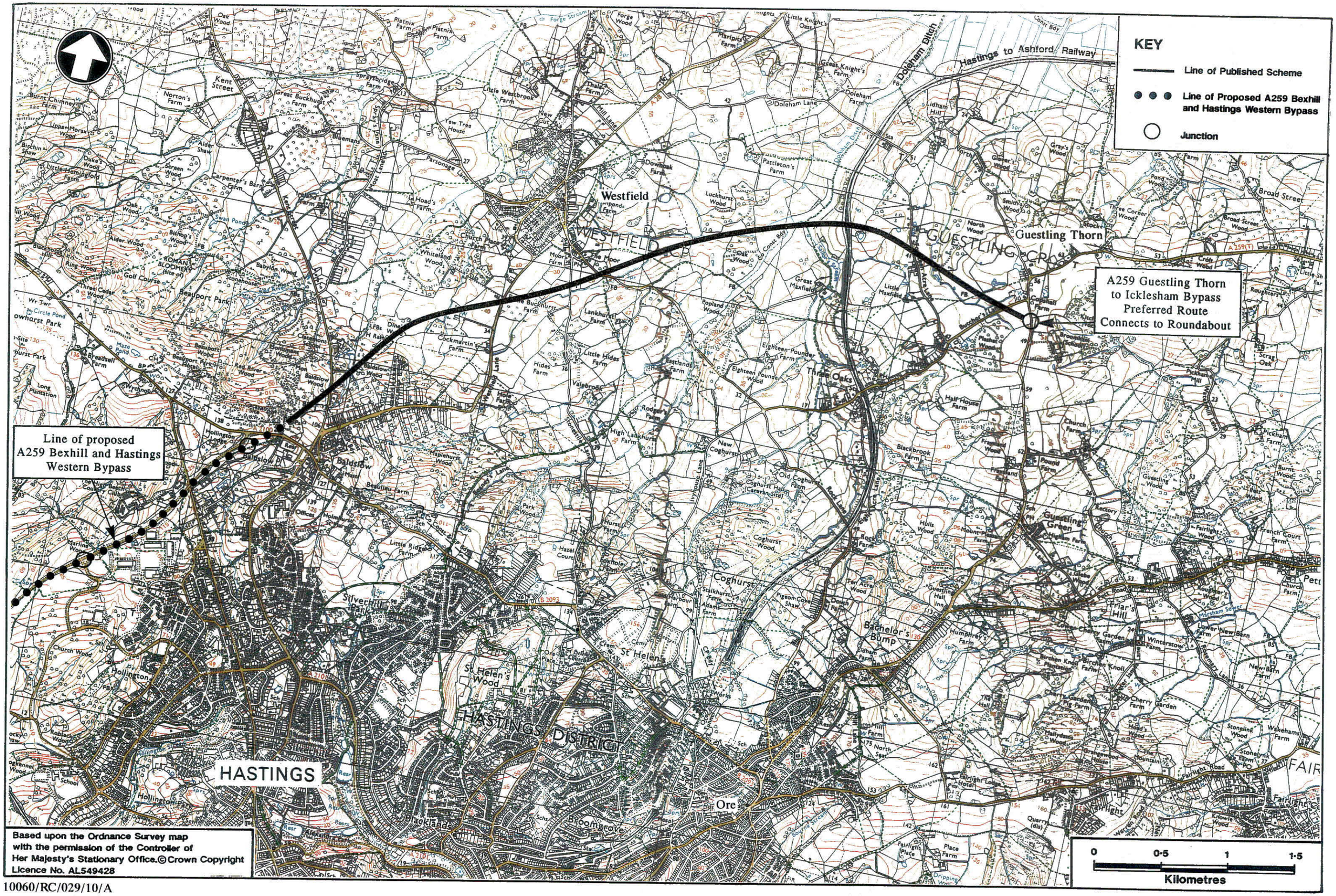
Traffic Noise Impact - Sheet 5

Figure 8



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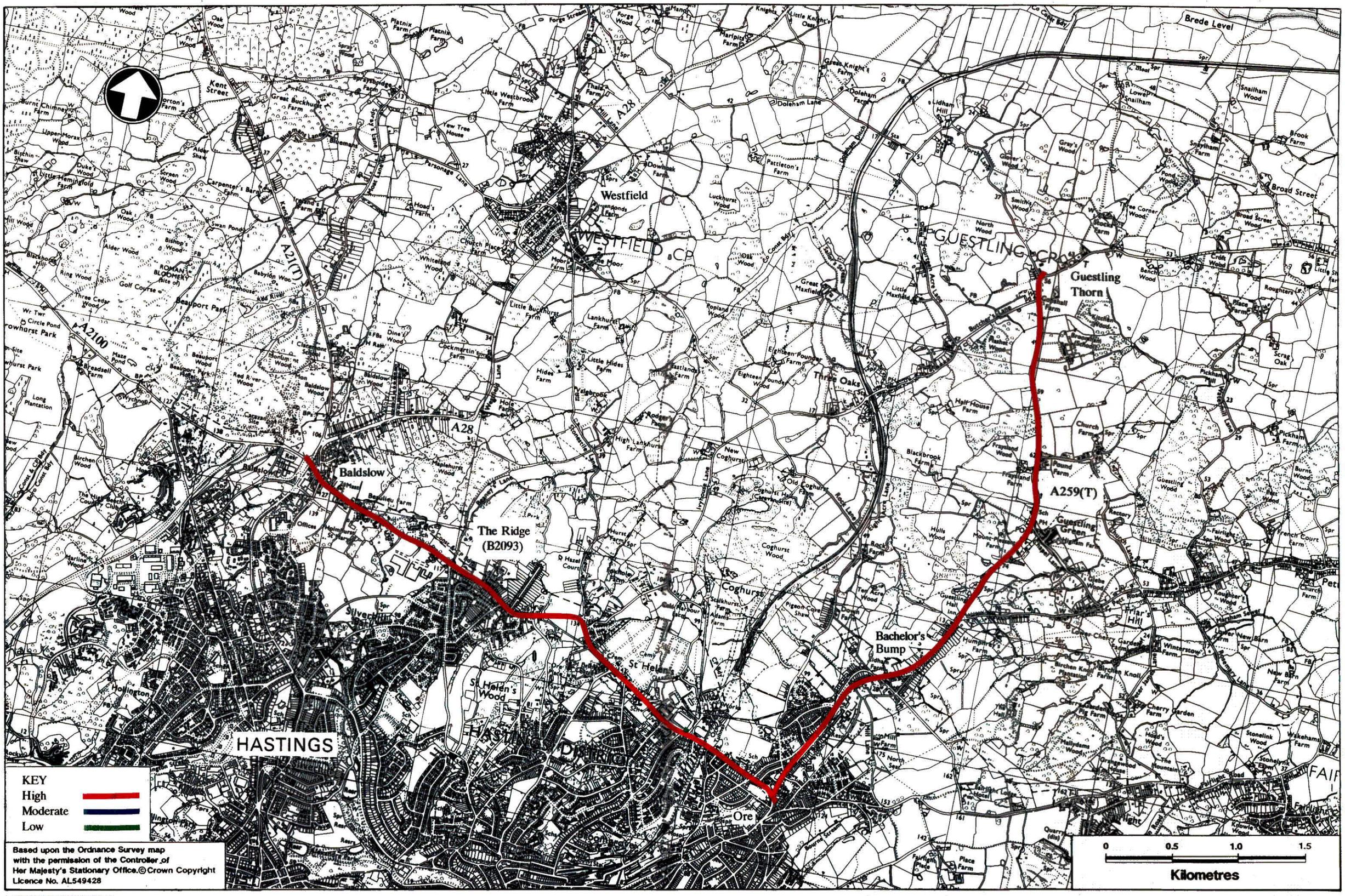
The Published Scheme

Figure 1



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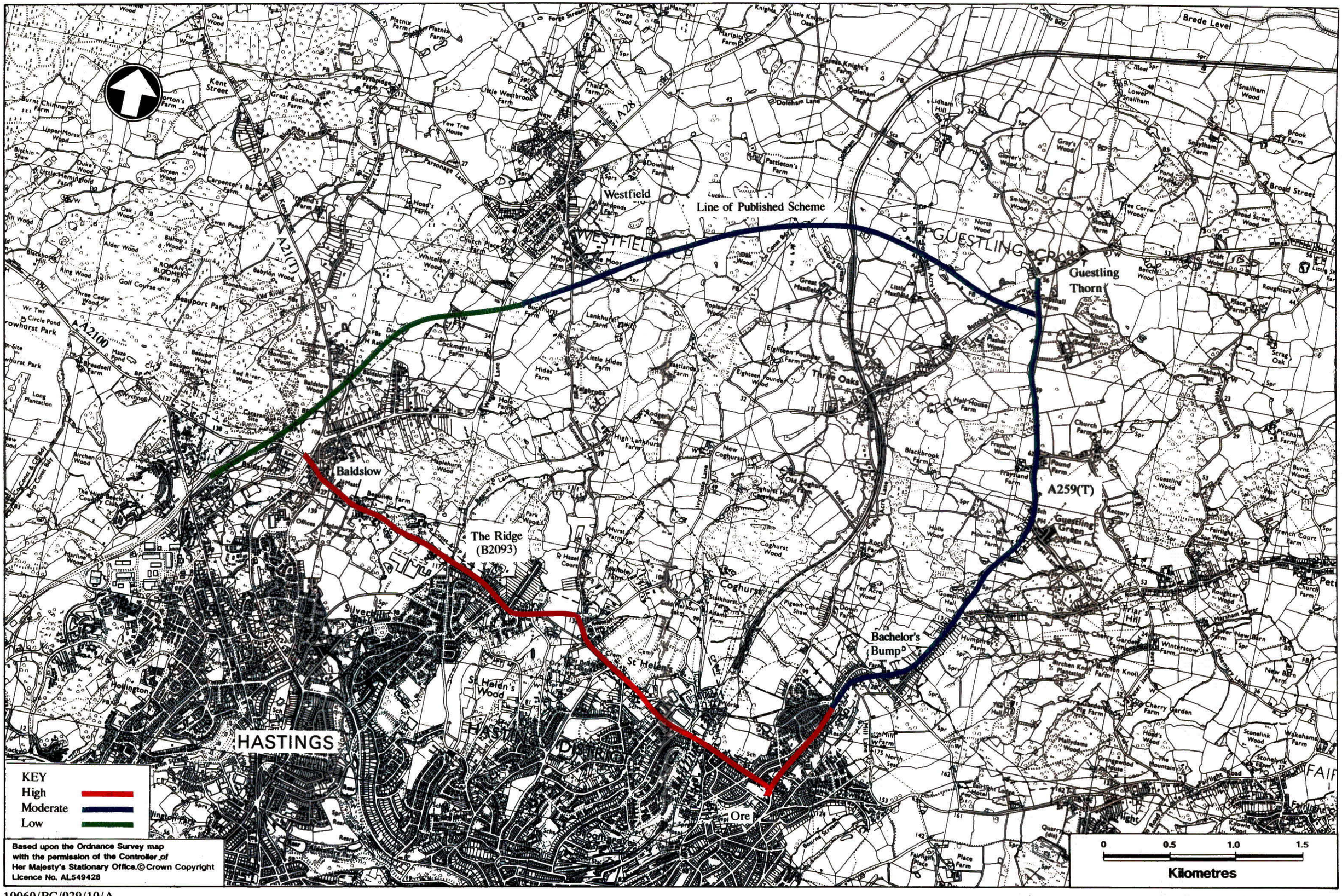
Driver Stress Levels in 2013 without Bypass

Figure 2



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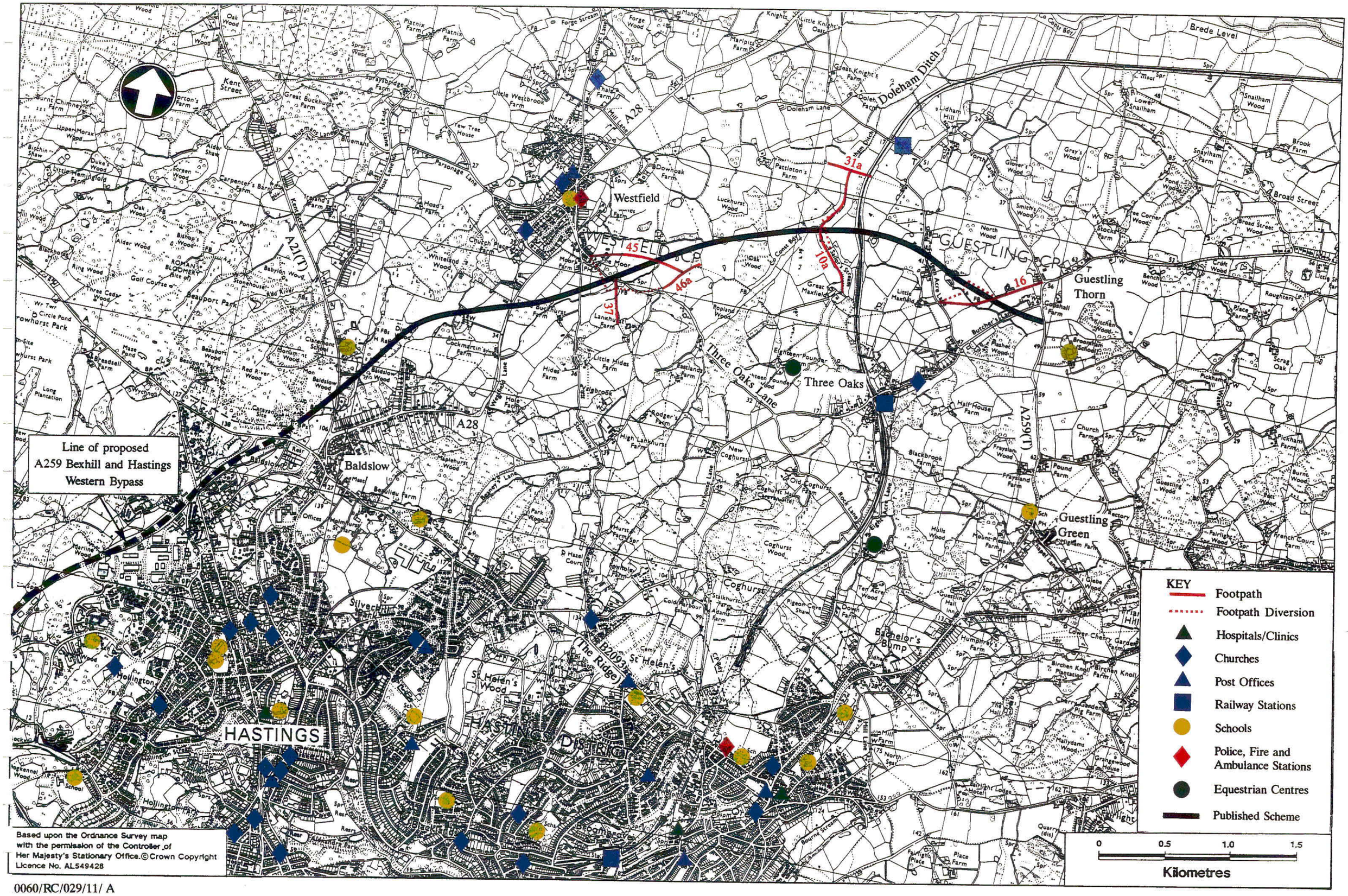
Driver Stress Levels in 2013 with Bypass
Figure 3



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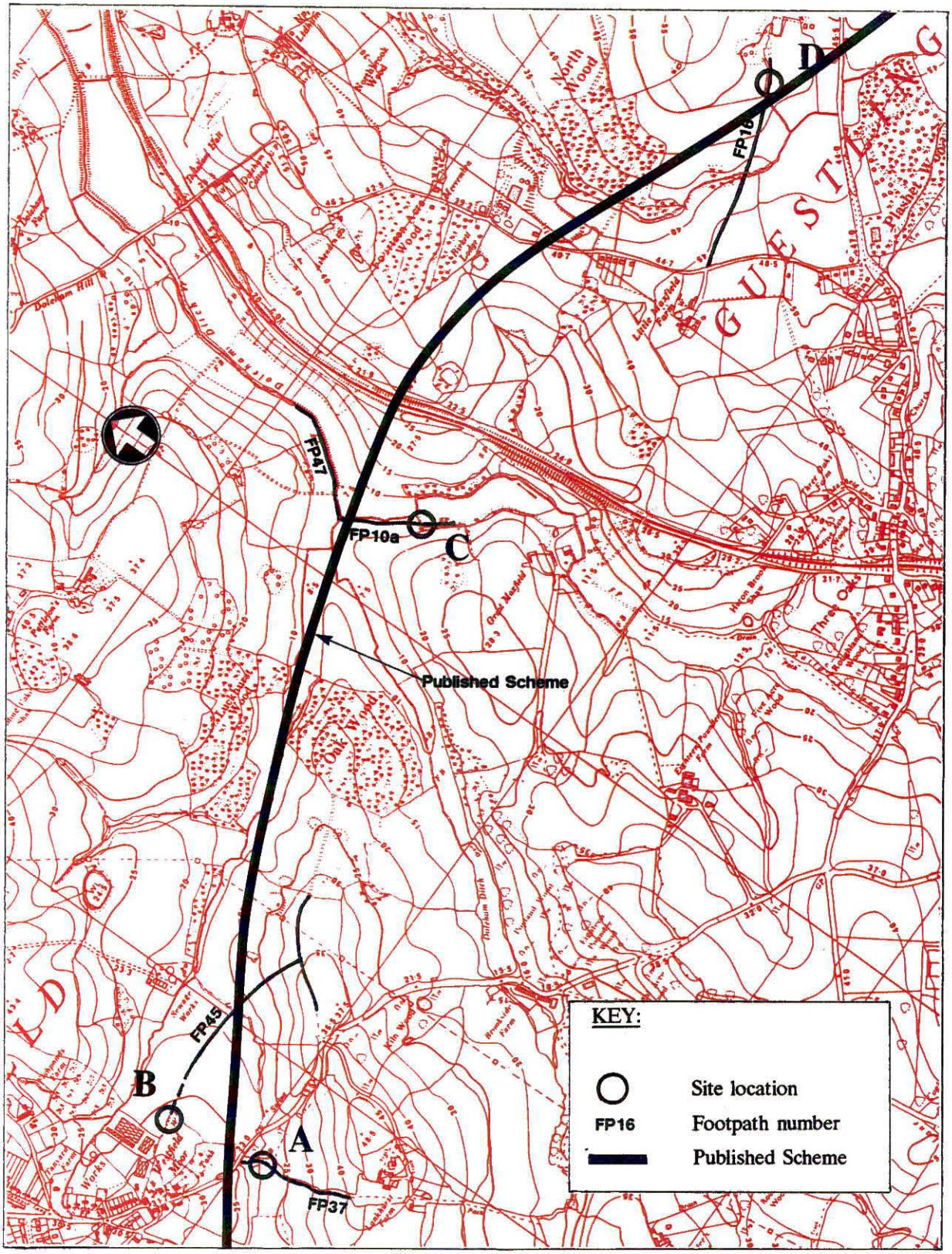
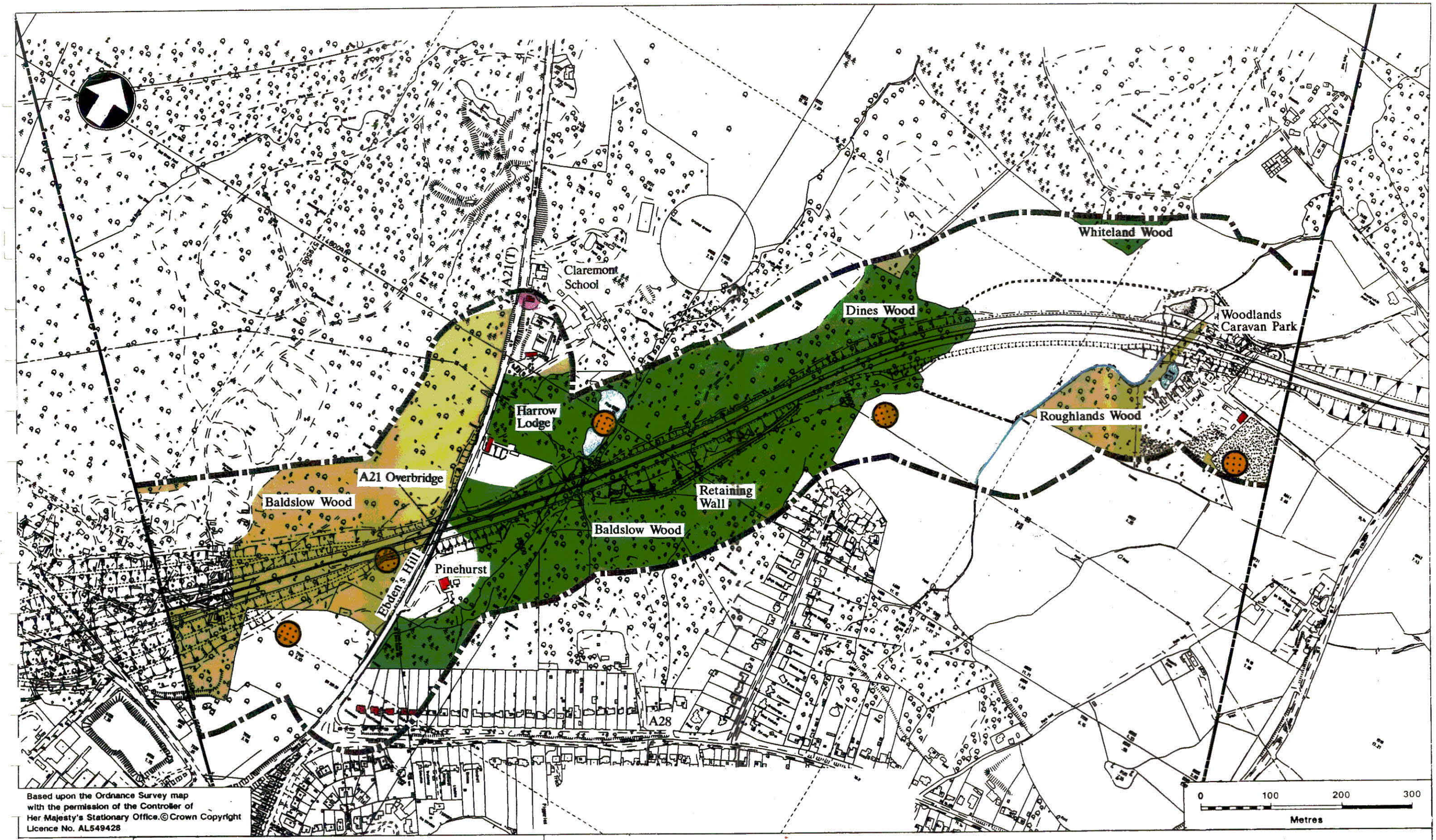
Community Facilities

Figure 1



SURVEY SITE LOCATIONS

Appendix A - **FIGURE 1**



Key

Properties & Community Facilities

- Boundary of area Assumed to be Disrupted by Construction
- Public Footpath
- Residential Properties
- Commercial Properties

Nature Conservation

- Recent Woodland
- Grassland of Nature Conservation Interest
- Ancient Woodland
- Watercourse/Pond
- Archaeological Feature
- Listed Building

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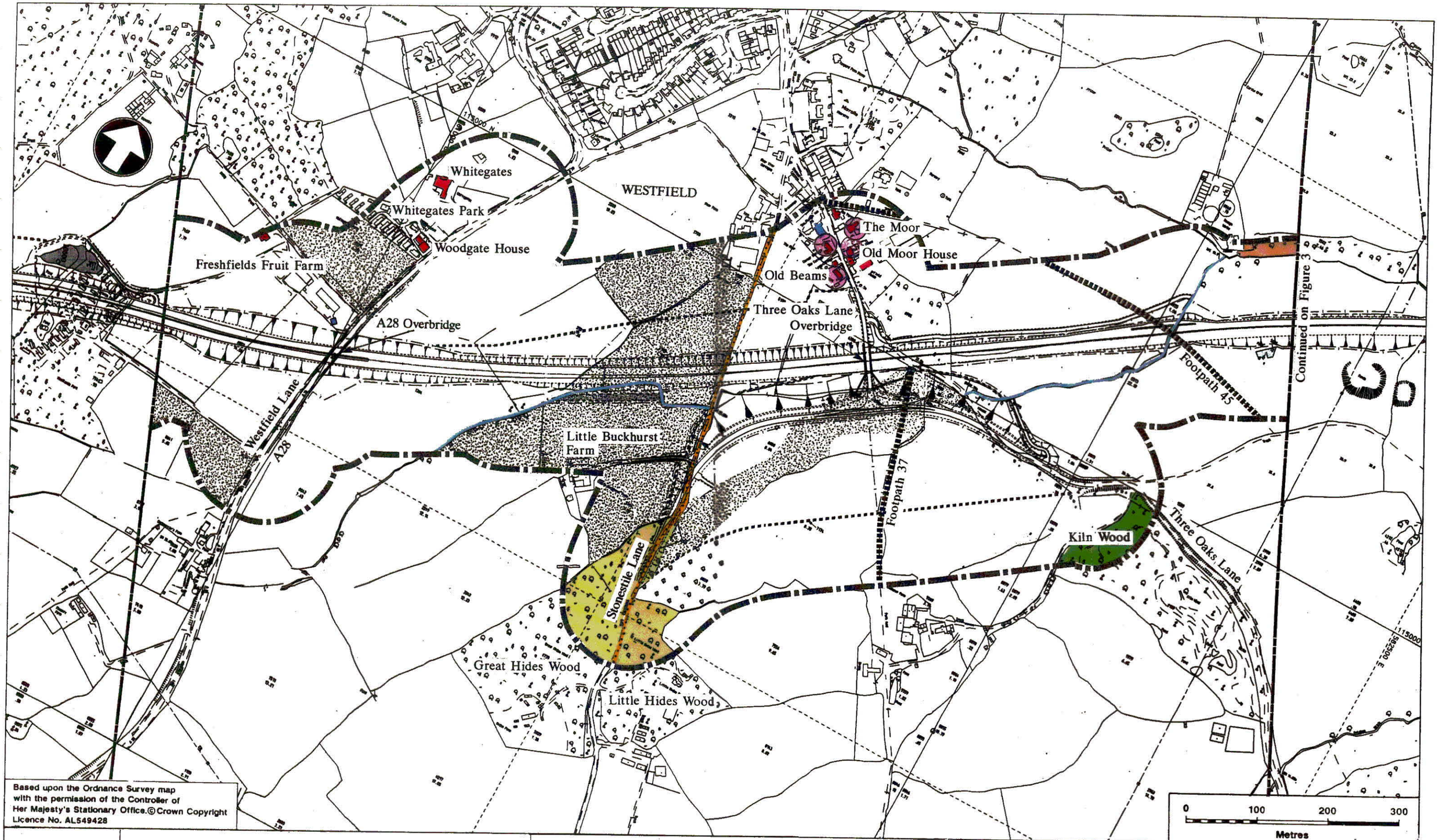
Disruption due to Construction - Sheet 1
Figure 1



Key

Properties & Community Facilities

- Boundary of area Assumed to be Disrupted by Construction
- Public Footpath
- Residential Properties
- Commercial Properties

Nature Conservation

- Recent Woodland
- Grassland of Nature Conservation Interest
- Ancient Woodland
- Watercourse/Pond
- Archaeological Feature
- Listed Building
- Small Copses and Shaws, Possible Ancient Woodland

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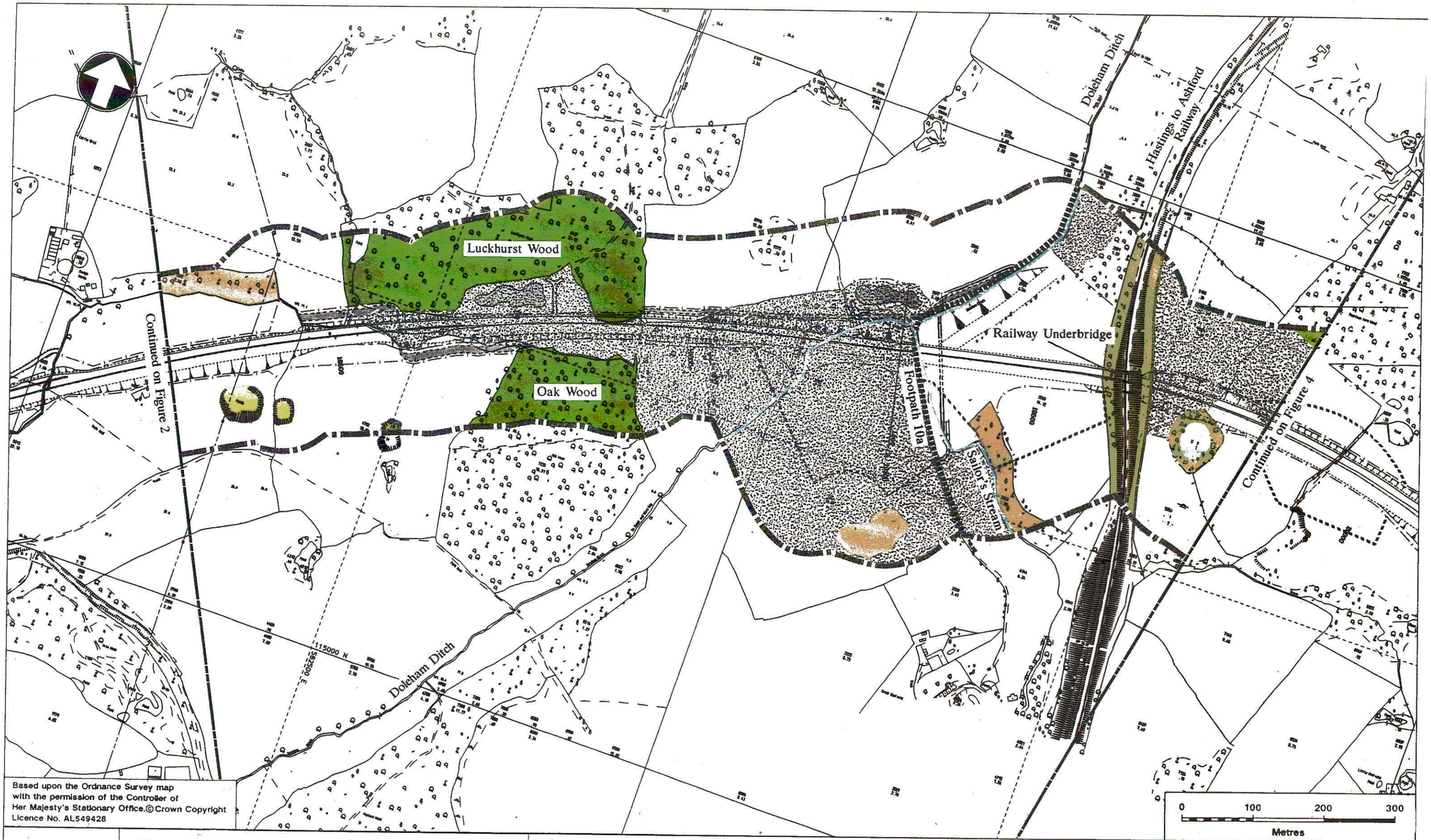
Disruption due to Construction - Sheet 2
Figure 2



Key

Properties & Community Facilities

- Boundary of area Assumed to be Disrupted by Construction
- Public Footpath
- Residential Properties
- Commercial Properties

Nature Conservation

- Recent Woodland
- Grassland of Nature Conservation Interest
- Ancient Woodland
- Watercourse/Pond
- Archaeological Feature
- Listed Building
- Small Copses and Shaws, Possible Ancient Woodland

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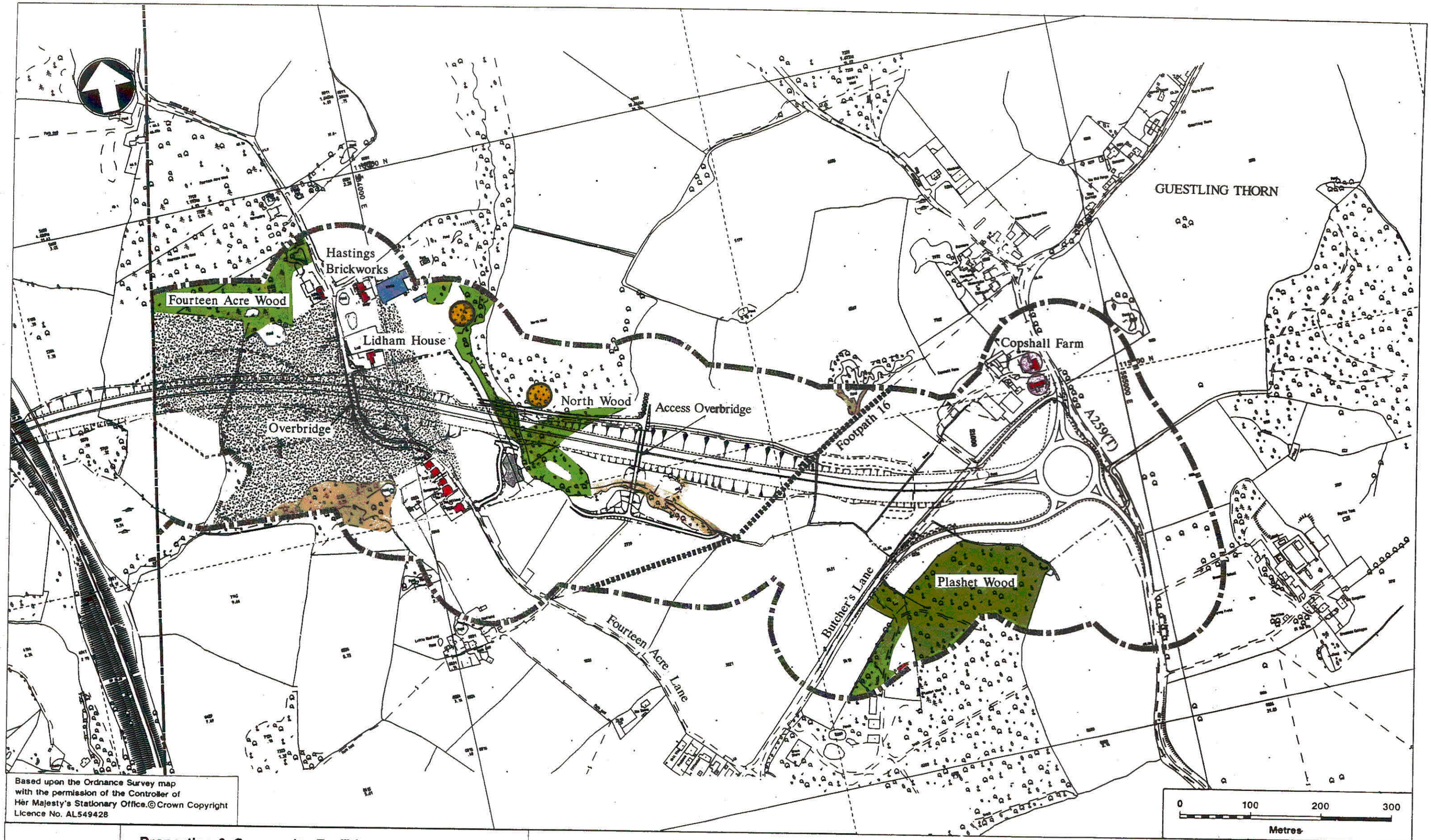
Disruption due to Construction - Sheet 3

Figure 3



Key

Properties & Community Facilities

- Boundary of area Assumed to be Disrupted by Construction
- Public Footpath
- Residential Properties
- Commercial Properties

Nature Conservation

- Recent Woodland
- Grassland of Nature Conservation Interest
- Ancient Woodland
- Watercourse/Pond
- Archaeological Feature
- Listed Building
- Small Copses and Shaws, Possible Ancient Woodland

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Disruption due to Construction - Sheet 4
Figure 4

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Site Access Routes
Figure 5