

EIS No

1417

PART 1 of 3

Kildare

County Council



National Roads Design Office

HEATH MAYFIELD MOTORWAY

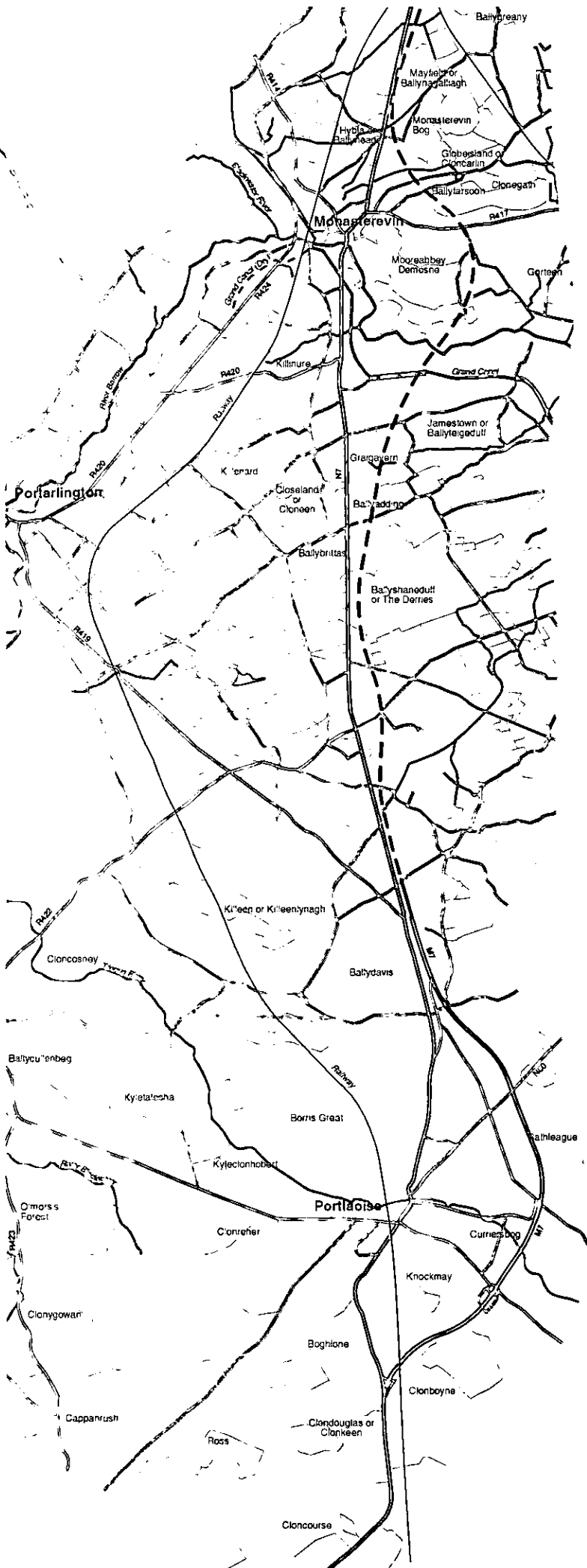
Environmental Impact Statement

Volume 1

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PREFACE

Kildare County Council has prepared a scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge, Kildare Motorway with the 13km of Portlaoise Motorway already constructed.

This document forms part of the Heath/Mayfield Motorway Scheme Environmental Impact Statement.

The structure of the statement is as follows:

- **Volume 1**
Non-Technical Summary
- **Volume 2**
Environmental Impact Statement (including a repeat of the Non-Technical Summary)
- **Volume 3**
Environmental Impact Statement Drawings
- **Volume 4a, 4b, 4c, 4d, 4e**
Reference reports and data used in the compilation of the statement. The reference reports contained in these Volumes are as follows:
- **Volume 4a and 4b** **Preliminary Route Selection Reports**
 - Volume 4a* *Reports on Route Selection, Traffic, Accident Analysis, Socio-Economic.*
 - Volume 4b* *Reports on, Heritage, Flora and Fauna, Noise, Soils, Receiving Waters, Landscape, Soils & Agriculture, Archaeology, River Barrow Crossing.*
- **Volume 4c, 4d and 4e** **Preferred Route Reports**
 - Volume 4c* *Reports on Traffic, Noise, Air Quality, Socio Economic, Planning & Development, and Bloodstock.*
 - Volume 4d* *Reports on Agriculture, Geotechnics, Water and Human Beings, Receiving Waters, Portlaoise Aquifer*
 - Volume 4e* *Reports on Landscape, Tree and Wood Survey, Flora & Fauna, Archaeology, Public Lighting, Bridges and Structures and Cost Benefit.*

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The writer wishes to express appreciation to the Heath/Mayfield Technical Steering Committee Members,

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1. NON TECHNICAL SUMMARY

1.0 NON-TECHNICAL SUMMARY

1.1 INTRODUCTION

Kildare County Council has prepared a Scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge and proposed Kildare Town Bypass Motorway with the 13km of Portlaoise Motorway already constructed.

In conformity with European, National and Regional objectives the proposed Scheme will form part of an overall network which will provide a continuous motorway link from the N7 and N8 south of Portlaoise to Naas and a continuous Dual Carriageway link from Portlaoise to the M50 Dublin C ringroad.

The proposed route forms part of Euroroutes E20 and E201 and is part of the Trans European Road Network.

The proposed motorway forms part of the Southwest Road Corridor. This road corridor links the cities of Dublin, Cork and Limerick. It provides access from Counties Clare, Limerick, Kerry and Cork, important tourism areas, to Dublin Airport and the Seaports of Dublin and Dun Laoighaire. It further links Dublin Airport and the Seaports to the airports in Cork and Shannon and the Seaports at Cork and Foynes.

The proposed Scheme, in addition, provides ease of access to the Midland Counties of Tipperary, Offaly and Laois.

1.2 THE PROPOSED SCHEME

The purpose of the proposed Scheme is to connect the exiting Portlaoise Bypass at The Heath, east of Portlaoise Town to the proposed Kildare Town Bypass at a point east of Monasterevin Town in the townland of Mayfield. Figure 1 titled "Heath/Mayfield Motorway 1/50,000 shows the proposed route of the alignment.

The Scheme consists of:

- *17.5 km long 2 x2 lane Motorway which will link the proposed Kildare Town Bypass at Mayfield to the existing Portlaoise Bypass at the Heath.*
- *Provision of a link road from the existing half interchange at Ballydavis to the R445.*
- *The upgrading of Ballydavis interchange and Mayfield interchange to full grade separated junctions.*
- *One motorway interchange at New Inn.*
- *Improving the Vertical Alignment of the existing N7 at Sugar Loaf Cross Roads. This road will become a Regional Road R445 on completion of the Motorway.*

- *Provision of new roundabout junction at the existing New Inn cross roads.*
- *Interfacing with the N7 over a 500m section between the proposed New Inn interchange bridge.*
- *The provision/realignment of 5.2km of Local and Regional roads.*
- *Construction of 10 structures.*
- *Associated ancillary works.*

Drawings PR01 to PR10 inclusive illustrate details of the proposed Scheme.

If the proposed Heath/Mayfield Scheme does not go ahead the “Do-Nothing” situation will result in the following:

- *The increase in traffic volumes will place further pressure on the exiting road network, at present operating above its capacity levels. This will result in more hazardous driving conditions and delays.*
- *Accident Rates will increase*
- *Maintenance costs of the existing road will rise in accordance with the increased traffic usage*
- *Noise levels in Monasterevin, Ballybrittas and Jamestown will continue to rise.*
- *Air pollution levels will rise in these areas.*

1.2.1 Traffic

The assessment of the need for the scheme is based on peak hour traffic assignments for the year 2024. The traffic model was developed based on traffic figures from 1998 and traffic growth figures as set out in the National Road Needs Study, published by the National Roads Authority.

The traffic study recommends the development of the Heath/Mayfield route to motorway standard having interchanges at Ballydavis, New Inn and Mayfield.

Assignment of traffic flows between the existing road and the new route indicates that the flows on the new route will be significant. It is anticipated that 80% of the existing traffic flow on the N7 will transfer to the new motorway facility.

The impact on the local road network will be a decrease in existing traffic volumes. The removal of such traffic from the villages of Ballybrittas, and Jamestown and from the town of Monasterevin will greatly enhance the living environment for their inhabitants by improving air quality and reducing noise pollution. In addition the reduced traffic volumes traversing the streets will lead to a reduction in fatal and personal injury and traffic accidents.

1.2.2 Corridor Assessment

The location of Monasterevin Town and its associated urban developments north and south of the N7 effectively divided the routes to be considered to be either routes traversing to the north of Monasterevin Town or traversing south of Monasterevin Town.

Two routes to the north of the town and three southern routes were identified. Rather than compare each route individually the Northern and Southern corridors were assessed with a view to determining which area could absorb the proposed Scheme with the least impact on the surrounding environment.

A comparison identified the Southern Corridor as the optimum corridor choice.

1.2.3 Southern Route Options Considered

Three alternative routes within the southern corridor were examined. A process of comparison of positive and negative effects of the various routes was used to help identify the preferred route. When the preferred route was identified a more detailed environmental impact study was undertaken to specifically assess the impact of the preferred route on the environment into which it has to be absorbed. Summaries of the findings are given in Chapter 1, Section 1.3 and the detailed assessment is given in Chapter 8, Volume Two of the Environmental Impact Statement.

The choice of the preferred route S2 was based on the following:

- *Superior geometrics, providing a safer route for the road user*
- *Proximity to the N7 allowing for maximum interaction between the existing road network and the new motorway*
- *Less adverse environmental impact*
- *Allows for the development of Monasterevin, Jamestown, Ballybrittas and New Inn.*

The preferred route was also compared to the "Do-Nothing Situation". It was concluded that, should the Scheme not be provided, the following would occur:

- *The existing road network, operating above capacity at present, would reach saturation point.*
- *More dangerous driving conditions and delays would result.*
- *Accident Rates along the N7 would increase.*
- *Maintenance costs would increase.*
- *Noise levels, already above permissible levels in settlement along the N7, would increase even further.*
- *Air pollution levels would increase.*

In conclusion route S2 was selected as the preferred route.

1.2.4 Structures

There are 10 structures associated with this scheme. The larger structures are the crossing of the Grand Canal and the River Barrow. These structures will carry the motorway over these landmarks. The smallest structure to be provided is a pedestrian/farm underpass at Grange Road.

The likely affect of each structure is assessed in Chapter 8, Volume Two of the Environmental Impact Statement.

1.3 DESCRIPTION OF PROPOSED SCHEME

The Heath/Mayfield Motorway scheme links the Portlaoise Bypass to the Kildare Town Bypass. The total length of the mainline is 17.5km. There are 10 structures to be built in association with the scheme. The motorway alignment commences at Heath East bridge south of the N7.

Drawings number PR01 to 10 inclusive illustrate the scheme. Additional landtakes are required to provide for landscaping, noise barriers, and drainage easements are shown hatched in red. Other areas of landtake are outlined in red. These areas are required to provide for road diversions associated with the construction of bridges and embankments. Accommodation roads to be provided are illustrated in yellow. These roads are provided to reduce severance.

The works associated with the scheme commence at Bloomfield cross on the N80. A new roundabout will be constructed at the existing cross roads and the R425 from Bloomfield Cross to Ballydavis interchange will be upgraded to cater for the anticipated increase in traffic requiring access to and from the N80 and the preferred route.

The Ballydavis Interchange will be upgraded to a full interchange with the construction of west facing ramps and a link road directly to the R445. The existing half interchange at Heath West is being removed. The temporary eastern off ramp at Heath East is on the line of the preferred route and will be removed to facilitate the construction of the motorway. The proposed tie-in to the Portlaoise Bypass is required on engineering, traffic and safety reasons. The above details can be seen on drawings number PR01 and PR02.

A general description of the preferred mainline motorway follows. Details of the preferred route mainline are shown on Drawings PR03 to PR10 inclusively.

1.3.1 Chainage 235+00 to Chainage 260+00 (PR03)

The mainline commences at Ch. 235+00 at the termination point of the Portlaoise Bypass. The route traverses agricultural land to the south of the N7. It passes through the townland of The Great Heath and Morett.

A new overbridge will be constructed at Ch. 253+60 to carry the re-aligned Castle Road over the motorway. At Ch. 254+00 the motorway crosses the existing Castle Road at a similar level to the existing road. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway.

Additional landtakes shown on drawing PRO3 are for the following purposes:

- Ch 240+00 North Landscape

- Ch 245+100 to Ch 250+00 North Noise Barrier/Landscape
- Ch 250+00 South Drainage Easement
- Ch 254+00 to Ch 256+50 South Landscaping
- Ch 255+00 North Drainage Easement
- Accommodation Road Number 2 South Side
- Accommodation Road Number 1 South Side

1.3.2 Chainage 260+00 to Chainage 286+00 (PR04)

From Ch. 254+70 to Ch. 269+80 the motorway moves further south away from the N7 entering the townland of Cappakeel. The route crosses the New Inn /Vicarstown Road at its intersection with Priory Lane. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. The crossing point utilises a gap in the residential development along the New Inn/Vicarstown Road to the south of Cappakeel House.

Having moved south to avoid residential development the motorway returns closer to the existing N7 through the townland of The Derries or Ballyshaneduff. At Ch. 274+00 an overbridge crosses the motorway to cater for the New Inn Interchange, the only intermediate interchange on the scheme. This interchange is a full interchange catering for all movement east and west from the surrounding local roads and all movement north and south from the motorway. At Ch. 277+20 the preferred route crosses a private lane. This lane will be severed by the scheme. Given the proximity of New Inn interchange it is not proposed to provide an overbridge at this location.

The next local road to be crossed is the Cappakeel Road. On completion of the Scheme this road will also be a cul-de-sac both north and south of the motorway. The present movements along this road will be catered for by the New Inn Interchange.

The alignment returns to fill at Ch. 279+50. At Ch. 284+50 the preferred route enters the Derries Wood. The Derries is a Coillte owned commercial conifer plantation. The route is in fill throughout the wood to a maximum height of 3m.

Additional landtakes shown on drawing PR04 are for the following purposes:

- Ch 270+00 to Ch 275+00 North Realignment of Exiting Drain to Emo Lake
- Ch 285+80 South Drainage Easement
- Accommodation Road Number 3 South Side
- Accommodation Road Number 4 South Side

1.3.3 Chainage 286+00 to Chainage 313+00 (PR05)

From Ch. 292+50 the preferred route swings south away from the N7 traversing the townlands of Ballyadding. The alignment crosses the Ballybrittas Road at Ch 309+00. An overbridge is provided at this location to cater for the realigned Ballybrittas road (L3931).

At Ch. 308+30 the preferred route alignment fenceline coincides with the wall of residence to the north. Noise mitigation measures are required for this dwelling. In order to provide such measures additional landtake would be required thus demolishing the dwelling house. As mitigation measures are not possible here this property is to be purchased by the scheme.

Additional landtakes shown are on drawing PR05 for the following purposes:

- | | |
|--------------------------------|-------------------|
| • Ch 308+00 to Ch 309+00 North | Landscape |
| • Ch 307+00 South | Drainage Easement |
| • Accommodation Road Number 5a | North Side |
| • Accommodation Road Number 5 | South Side |
| • Accommodation Road Number 6 | North Side |

1.3.4 Chainage 313+00 to Chainage 335+00 (PR06)

Continuing on its southerly direction through the townlands of Jamestown and Killagish the preferred route traverses agricultural land intersecting Jamestown Road at Ch. 329+00 south of the Jamestown Turkey Hatchery and north of Jamestown House. An overbridge is provided at Ch.329+00 to cater for the realigned Jamestown Road.

From Ch. 328+00 the motorway starts to rise to allow the preferred route to clear the Grand Canal and the River Barrow.

Additional landtakes shown on drawing PR06 are for the following purposes:

- | | |
|-------------------------------|-------------------|
| • Ch 320+00 North and South | Drainage Easement |
| • Ch 326+00 South | Landscape |
| • Ch 328+00 North | Landscape |
| • Along Jamestown Road East | Road Diversion |
| • Accommodation Road Number 6 | North Side |
| • Accommodation Road Number 7 | North Side |

1.3.5 Chainage 335+00 to Chainage 352+00 (PR07)

At Ch. 340+60 the preferred route crosses over the Canal road. The route then crosses the Athy branch of the Grand Canal and heads for the River Barrow. The route traverses the River Barrow north of Sally Island.

From the River Barrow the route enters County Kildare and the townlands of Lughill and Dangan Wood.

Additional landtakes shown on drawing PR07 are for the following purposes:

- | | |
|-----------------------------------|-------------------|
| • Ch 336+00 South | Drainage Easement |
| • Ch 340+00 South | Drainage Easement |
| • Landtake West of the Canal Road | Road Diversion |
| • Accommodation Road Number 8 | North Side |
| • Accommodation Road Number 9 | South Side |

1.3.6 Chainage 352+00 to Chainage 380+00 (PR08)

The route then passes south of three dwelling houses located at the end of Grange Road. The route cuts through the old Moore Abbey Demesne wall at Ch. 354+50 and Ch.357+00. It is intended to remove this wall and rebuilt to the north of the realigned Grange Road.

An underpass is provided at Ch. 357+00 along the line of the existing Grange Road. The provision of this underpass provides access to severed lands south of the motorway and also provides for the replacement of an existing amenity walk through farm lands south of the motorway and utilised by many people in the local community.

Ch. 365+00 is the most southerly point of the route. At this location the route begins its journey northwards to link with the termination point of the Kildare Town Bypass at Mayfield. At Ch 366+50 an underpass known as Grange Road Link provides access to these houses from Green Road.

The preferred route now enters the townlands of Mooreabbey Demesne, Ballyfarsoon and Kill. The route enters the extreme southern end of Hill Wood at Ch 369+20 and exits at Ch. 374+00. The existing demesne wall to the south of Hill Wood will be retained and in so far as possible the majority of mature trees lining the wall will be retained.

The carriageway passes within 57m of houses on Green Road which are adjacent to Hill Wood. These houses are screened from the motorway by the demesne wall.

On exiting Hill Wood at Ch. 374+40 the preferred route crosses under the Athy Road. This Road will require an overbridge to carry it over the motorway.

At Ch. 377+50 the route enters Kill Plantation a Coillte owned commercial coniferous forestry plantation. This section of the alignment would be screened from the surrounding landscape.

Additional landtakes shown on drawing PR08 are for the following purposes:

- | | |
|--------------------------------|---------------------------------------|
| • Ch 356+00 South | Landscape |
| • Ch 363+00 to Ch 365+00 South | Landscape |
| • Ch 366+50 North | Drainage Easement |
| • Ch 367+00 to Ch 369+00 North | Landscape |
| • Ch 370+00 to Ch 374+00 North | Drainage Easement & Landscape |
| • Ch 369+00 to Ch 374+00 South | Landscape |
| • Ch 374+00 South | Drainage Easement |
| • Ch 378+00 to Ch 383+00 N & S | Landtake for Berms |
| • Ch 374+00 to Ch 381+00 | Drainage Easement and Retention Tanks |
| • Accommodation Road Number 9 | South Side |
| • Accommodation Road Number 10 | North Side |
| • Accommodation Road Number 11 | South Side |

1.3.7 Chainage 380+00 to Chainage 399+00 (PR09)

At Ch. 383+50 the motorway exits Kill Plantation. The alignment crosses Nurney Road Upper at Ch. 384+50. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. The alignment then crosses Nurney Road Lower at Ch.387+20. The Upper and Lower Nurney Roads will be served by one over bridge located at Ch. 385+40 linked to each minor road.

At Ch. 397+00 the preferred route crosses another local road. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. A link road will provide access to the south from Mayfield Interchange. The construction of this access will be carried out as part of the Kildare Town Bypass works.

Additional landtakes shown on drawing PR09 are for the following purposes:

- | | |
|--------------------------------|-----------------------------|
| • Ch 383+00 to Ch 384+50 North | Landscape |
| • Ch 386+00 to Ch 387+50 South | Landscape and Noise Barrier |
| • Ch 389+00 North | Drainage Easement |
| • Accommodation Road Number 12 | South Side |
| • Accommodation Road Number 13 | North Side |
| • Accommodation Road Number 14 | South Side |
| • Accommodation Road Number 15 | North Side |

- *Accommodation Road Number 16 North Side*

1.3.8 *Nurney Road South (PR09a)*

A realignment of the existing Local Road Nurney Road Upper is required to facilitate Coillte machinery exiting Kill Bog and requiring access onto the new realigned Nurney Road. The road realignment and associated landtake is illustrated on this drawing.

1.3.9 *Chainage 399+00 to Chainage 407+00 (PR10)*

The preferred route then traverses Monasterevin Bog and ties into the M7 Kildare Town Bypass at Ch. 406+92.

Additional landtakes shown on drawing PR10 are for the following purposes:

- *Accommodation Road Number 17 South Side*

1.4 PREFERRED ROUTE ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Impact Statement (EIS) is prepared in accordance with EC Directive 85/337 as transposed into Irish law by the Roads Act 1993.

The Roads Act 1993 Section 50 requires a description of the likely significant affects of the proposed Scheme on the environment. There follows a summary of the impacts direct and indirect as identified. Full details of impacts are given in Volume 2 of the Environmental Impact Statement.

1.4.1 Traffic

Assignment of traffic flows between the existing road and the new route indicates that the flows on the new route will be significant. It is anticipated that 80% of the existing traffic flow on the N7 will transfer to the new motorway facility.

The impact on the local road network will be a decrease in exiting traffic volumes. The removal of such traffic from the villages of Ballybrittas, and Jamestown and from the town of Monasterevin will greatly enhance the living environment for their inhabitants by improving air quality and reducing noise pollution. In addition the reduced traffic volumes traversing the streets will lead to a reduction in fatal and personal injury and traffic accidents.

1.4.2 Noise and Vibration

1.4.2.1 Noise

Baseline noise measurements were taken at 23 locations adjacent to the proposed motorway and along the exiting N7. Predictions were made as to what the levels would be in the year 2019 at those locations. Noise reduction measures will be implemented where increased noise levels exceeding 68Db(A) L10 (18 hour) are predicted.

Four locations were identified as requiring noise mitigation measures. The locations in question are at The Heath, one dwelling house on Grange Road Lower and one house south of the motorway on Nurney Road Lower.

On completion of the proposed Scheme the existing noise levels in settlements along the N7 will decrease.

1.4.2.2 Vibrations

Ground vibration measurements were taken on the existing N7. The ground vibration generated from the operation of the new roads and ramps would be expected to be of a

magnitude less than that required to cause disturbance or structural damage. The vibration will be less than that caused by traffic on the surfaces of the existing roads.

Ground vibrations during construction including piling of bridge foundations, would not be expected to cause disturbance or structural damage.

1.4.3 Air Quality

A baseline study of exiting ambient air quality was carried out and predictions made of future air quality along or adjacent to the preferred route for the year 2019.

The conclusions of that study state that the emissions from the motorway will have no significant impact on air quality at nearby residences. It will result in an improvement in air quality along the route of the existing N7.

1.4.4 Socio-Economic Impact

The main impacts of a proposed bypassing scheme are the impacts on the local communities. These impacts can take the form of perceived community severance, affect on local recreational facilities, schools, institutions and other community facilities.

Loss of passing trade can affect income levels, employment and property values. A more positive impact, counter balancing these affects, is that the bypassing of the town and villages creates a more pleasant, attractive and safer pedestrian and traffic environment within the towns and villages.

In order to reduce severance the design of the scheme, where practicable, leaves local roads open, or alternatively provide access adjacent to the existing roads. The placement of the intermediate interchange at New Inn will enhance and develop tourism potential in the area countervailing the impact on trade due to the reduction in passing trade.

1.4.5 Planning and Development

The Motorway Route does not conflict with any of the provisions of the Kildare County Development Plan, or of the Laois County Development Plan, in which latter county the bulk of the route lies.

The Motorway route complies with the specific provisions of the Kildare County Development Plan, 1999, and the provisions of the Laois County Development Plan, 1998.

Two planning applications are affected by the Scheme, at Ballybrittas in Laois and along the Nurney Road Upper in Kildare. These applications will be modified under the Scheme.

1.4.6 Property

Residential property can be affected in two ways by the Scheme:

- 1) Directly affected residential property relates to the acquisition of the property*
- 2) The acquisition of part of the curtilage of the property or the alteration of access to a property.*

Four dwelling houses are to be acquired by the Scheme. Thirteen dwelling houses will have curtilage acquired under the Scheme. Thirty-five residential properties will have the access to their properties regraded to tie in to the newly realigned minor roads.

Residents whose houses are acquired or from whom curtilage is acquired will be appropriately compensated for loss and injurious affection.

Indirectly affected residential properties are properties adjacent to the motorway that may be impacted upon by an increase in noise levels, visual impact or short term impacts due to construction. Where such impacts are identified and where possible appropriate mitigation measures are incorporated in the Scheme. These measures include the provision of additional landscaping areas and the provision of noise barriers.

1.4.7 Bloodstock

One bloodstock owner is being affected by the preferred route. The preferred route severs the holding in two.

The reduction in land and severance will result in the overall operation of the bloodstock operation being reduced from its present size.

1.4.8 Agriculture

The proposed Scheme impacts on numerous agricultural holdings between the Heath and Mayfield. The majority of these holdings are considered to be small holdings.

1.4.8.1 Farming Systems

Many farming activities are to be found on the farms affected by the Scheme, namely Beef Production, Dairying, Sheep Production, Tillage Cropping, Pig Production, Forestry, Poultry Production. These systems are operated at varying levels of intensity. The impact on these farms of the motorway varies greatly from farm to farm. The range in farm size also shows big variation. Some farms are owner operated, while others have some or all of their farms let to other farmers.

1.4.8.2 Land Loss

Approximately 90.50 ha. of land is required for motorway construction. Land take occurs on approximately 45 agricultural holdings. The landtake from any one farm varies from an approximate maximum of 5.2ha. to an approximate minimum of 0.0004 ha. The affect of land take is specific to each property. If land take occurs in a highly productive area of the farm or from the area close to the farm buildings, which is used to graze a dairy herd, the impact can be very significant. Land take on non dairy farms with young animals, e.g. lambs, calves, can be significant if the land taken is close to the farmyard and is being used to turn out young animals for grazing.

Land take has an impact on the many schemes farmers may be involved with, for example Livestock Premia, Headage, Area Aid payments on tillage crops, Rural Environment Protection Scheme (Reps), Early Retirement Scheme, Milk Quotas and eligible land for Tillage Premia. Regarding these Schemes, it is important that adequate one to one consultations takes place between the landholders affected and the Local Authority involved in the motorway development. It is essential that the landholders affected seek professional advice and guidance well in advance of any land take so that the impact on their specific farming business can be quantified and steps taken to mitigate any potential losses which may arise.

The Department of Agriculture and Food can provide advice on the exact situation and consequences of land take in these situations and indeed in regard to all agricultural schemes that may be impacted on as a result of land take, etc.

Land take obviously leads to income loss to the farmer in question. Depending on the farm involved, income loss may be small or large, and in some cases may negatively impact on the future viability of the farm business.

The farmer will be appropriately compensated for loss of land and injurious affection.

1.4.8.3 Drainage

Many of the farms through which the motorway passes have artificial drainage systems in place in combination with open drainage systems. These drainage systems have led to vast improvements in productivity, indeed in some cases without adequate drainage some lands could not even be farmed.

These drainage systems when located will be retained in embankment areas and catered for in the mainline drainage system to ensure the continued productivity of these lands.

Compaction of soils significantly reduces their productivity. This may occur during construction as a result of the movement of heavy machinery particularly on wet soils when they contain elevated moisture levels. If this should occur remedial action would be taken to return these soils to full production.

1.4.8.4 Severance

On 44 farms, severance of a portion of land occurs. The impact of severance depends on the area of land severed, its present use, and the long term access to the severed lands.

Accommodation roads are being provided to all severed lands where it is viable to do so. Land plots to which access is not provided will be acquired under the Scheme.

Provisions for adequate water supplies for livestock on severed lands will be made.

1.4.9 Geotechnical Aspects

The proposed route crosses boggy areas of peat and soft ground. The investigations indicate that, apart from the River Barrow flood plain, the depth of the peats and very soft clays are generally less than 2m, locally up to 3m and therefore can be excavated and replaced with suitable material where these occur under embankments. Some extra land take will be required to allow the road fill to be taken down to firm ground where soft soils are to be excavated.

Initial estimates indicate that there may be a significant shortfall of material from cuts which could be placed as embankment fill. Construction measures employed will maximise the use of excavated material in order to limit the amount of material which would have to be disposed from site and to minimise imported fill.

A survey of wells in the vicinity of cut areas was made to assess the impact if any that the motorway drainage might have on the viability of the wells. No longterm impacts are expected. However in the short term the cut areas may result in a lowering of ground water which may impact on some wells. If this should occur the possibility that the wells could be deepened or an alternative water supply provided can be examined.

Experience of excavations in the soil type identified adjacent to dwelling houses along Green Road has indicated that the movements arising from the construction of the cut and from any resulting groundwater lowering would not have a significant affect on the houses.

1.4.10 Drainage

All motorway run-off eventually discharges to the River Barrow in a number of ways:

- 1. Directly, using a surface water collector pipe.*
- 2. Directly, using the existing drainage from the Kildare Town Bypass.*
- 3. Indirectly, using existing surface water drainage channels along the route.*
- 4. Indirectly, constructing a new lined open drain, which discharges to the Glasha River and which in turn discharges to the River Barrow.*

The River Barrow rises in the Slieve Bloom Mountains and initially flows east until Monasterevin where it turns south through Athy, Carlow, New Ross and enters the Irish Sea.

The total area of the proposed works is less than 1km² and is contained entirely within the catchment area of the River Barrow. Given the relative size of the motorway catchment and the receiving water catchment it is not anticipated that there will be a significant impact on peak flow in the River Barrow or Glasha River as a result of the proposed motorway works. In addition the drainage network incorporates retention in areas to minimise any possibility of surcharging in peak flow.

To mitigate any adverse effects on the quality of the receiving waters all the run-off from the motorway to the proposed outfalls will pass through oil/grit interceptors prior to entering the surface water network.

1.4.11 Aquatic Ecology of Receiving Waters

The most serious threat to water quality along any main roadway is posed by the possible release of toxic or dangerous substances from road tankers following accidents involving such vehicles. The upgrading of the existing N7 to motorway standard will reduce the frequency of road accidents. The very high standards used in the design of this proposed motorway and its link roads will reduce the occurrence of such incidents to a minimum thereby reducing, to the greatest extent possible, the likelihood of such events.

The existing drainage network from the N7 to the Glasha River and River Barrow were assessed in terms of water quality and water ecology. Ten drains in total were assessed. The overall water quality was described as poor while two drains within the Derries wood were identified as containing a diverse community of species which include the

lamprey and the whiteclawed crayfish. Both of these species are protected in law and appropriate measures as outlined below in 1.4.11.1 will be taken to ensure that the habitats in these two drains are not adversely affected by this proposed development.

1.4.11.1 Ameliorative Measures

No surface water from the paved area of the motorway will discharge to either of these two drains. A new lined drain with settlement facilities is being provided within the wood to discharge road drainage.

Appropriate measures will be taken to protect all of the watercourses from the discharge that may arise during the construction of the motorway and associated ancillaries works. These discharges tend to carry solids in suspension and therefore could adversely impact on the Rivers Glasha and Barrow if not settled prior to discharge.

1.4.12 Ballydavis Interchange Vs Portlaoise Aquifer

The upgrading of the Ballydavis Interchange to a full interchange and the associated construction works have the potential to pollute the surface water entering the Portlaoise Limestone Aquifer at the swallow hole. Clearly, any such ingress of pollution waters must be avoided and measures implemented to allow for an adequate response in the event that some pollution does in fact take place. The remedial measures proposed relate to:

- (i) construction activities and*
- (ii) monitoring and response measures.*

1.4.13 The Landscape

The landscape and visual impact assessment examined the existing landscape in terms of its character, its scenic quality and its ability to absorb change. The proposed development was assessed for its impact on the landscape in terms of its visibility and its potential to alter the character of the area. Views into and out of the site were assessed, as were views from adjacent residences. In determining the impact, consideration was given to reducing any significant impact and mitigation measures were suggested.

The assessment was carried out as follows:

- Site survey and photographic survey to determine the character of the site and the surrounding area.*
- Site analysis to determine views into and out of the site*
- Assessing the proposed development using layout plans and sections to determine impacting features*
- Evaluating these impacts on the landscape in accordance with EPA Guidelines.*

Areas of landtake have been identified to be included in the Scheme to allow for screening of dwelling houses from the motorway.

1.4.14 Flora and Fauna

A survey of existing flora and fauna was carried out for the length of the preferred route. The Scheme will have a low negative impact on the natural diversity of the area traversed. It traverses land which is at present occupied for the most part by open fields divided by hedgerows of relative recent origin. However every tree lost and every hedge removed represents a loss in terms of natural diversity, in terms of the loss of species of flora and the habitat provided by the connected pattern of boundary features.

A population of Fallow Deer resides in the Derries Wood.

1.4.14.1 Ameliorative Measures

To mitigate against the identified losses it is considered that landscape design in connection with construction can more than compensate for this loss. Every opportunity will be taken during landscape design to increase the natural diversity and provide habitat for wildlife in this area of generally low natural value. This can be done by planting of species of native trees in small groups or strips within the overall landscape design, connected where possible by lines of hedge.

Cutting slopes and banks associated with the construction offer scope for the creation of new grassland habitats of considerable wildlife value. Some planting of natural grassland species mixes appropriate to soil and other local ecological constraints, where appropriate, will enhance not only the species composition of local flora, but also of the invertebrate fauna. Planting of native tree species in small groups within the overall landscape design will be undertaken where practicable.

Deer fencing will be provided throughout the Derries Wood to protect the Fallow Deer population which resides there.

Fences and other boundaries will attempt to match the character and composition of the exiting hedgerow. Topsoil in Hill Wood which is rich in ground flora will be carefully stripped during the course of construction, protected and reused to topsoil the sideslopes of the cutting within the wood.

1.4.15 Architecture, Culture and Heritage

1.4.15.1 Architecture

The preferred route interferes with no buildings of architectural significance. The preferred route does pass approximately 120m north of Jamestown House, a Georgian building. Some visual impact will occur but appropriate landscaping can mitigate this. Lands have been included in the Scheme for this purpose.

1.4.15.2 Culture and Heritage

Characteristic field patterns are part of the fabric of the landscape. Inevitably the construction of a motorway Scheme, primarily through a green field site, will lead to some disruption of existing patterns, but it is anticipated that such disruption will be modest. The disruptions can be alleviated by matching the composition and character of the traditional hedgerows of the district where the opportunity arises in connection with the construction of the motorway.

1.4.16 Archaeology

The preferred route directly impacts on four archaeological sites. Three other sites adjacent to the motorway are considered in such proximity that preliminary site investigation should be carried out in advance of the works. It is proposed to investigate the sites directly affected by the scheme prior to the commencement of any road construction. In addition during construction the following monitoring will take place:

- Monitoring during topsoil stripping for all elements of the proposed route, with the provision for full excavation of any archaeologically significant material uncovered at this time.*
- Intensive monitoring within the fence lines where the route is adjacent to an archaeological site and where associated material may extend from the archaeological site into the land take area of the route. This also applies to areas identified as having archaeological potential.*
- Monitoring during any testing and probing on the route prior to or during construction is also recommended.*

1.4.17 Road Lighting

It is proposed to provide lighting to traffic route standard at the Ballydavis Interchange, the New Inn Interchange, the Mayfield Interchange and associated link roads. Consideration will be given to the appearance of the lighting installation by day, and in environmentally sensitive areas, the use of a light source which allows colour discrimination will be used.

1.4.18 Bridges & Structures

The main impacts of the proposed bridges and structures identified were visual impact, impact on water quality and the affects on river hydrology, e.g. flooding. The likely affect of each structure is assessed in Chapter 8, Volume Two of the Environmental Impact Statement, with mitigation measures addressed in Chapter 11.

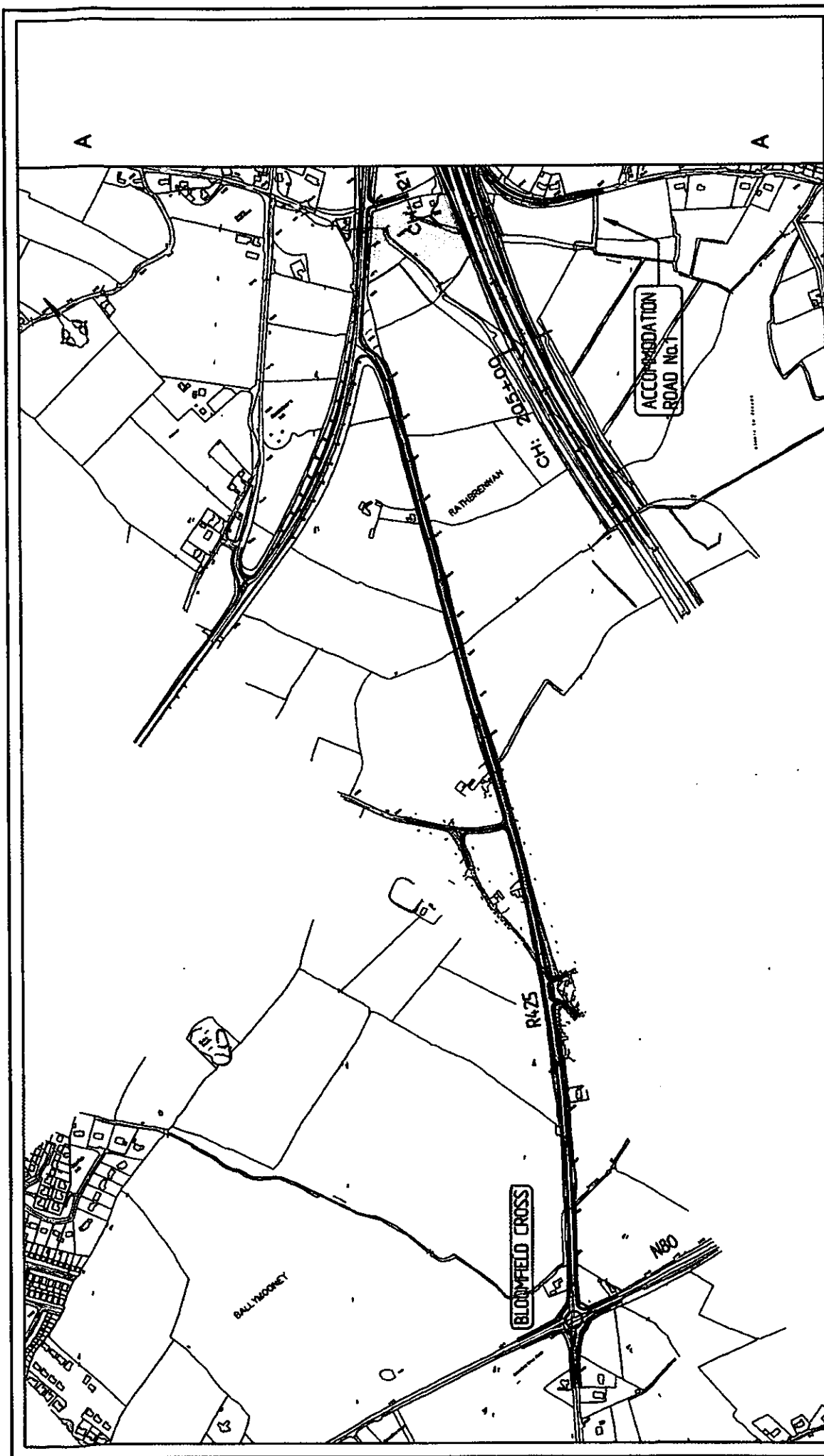
1.4.19 Construction

The construction time for this scheme is estimated between two and a half and three years. During this time residents living adjacent to the proposed scheme and local to access routes will be subject to some disruption resulting from construction activities.

The necessity to import considerable volumes of fill material for the construction of the motorway and in particular the construction of the embankment in the flood plain between the River Barrow and the canal will result in considerable volumes of construction traffic using local roads. This will be controlled/ minimised in the contract.

In order to comply with the Safety, Health and Welfare at Work (Construction) Regulations, 1995, the contractor will be conditioned to prepare (i) a detailed traffic management proposal in order to minimise the traffic disruption and (ii) method statements in relation to the construction of all structures.

In order to mitigate against the impact of noise pollution from construction plant the works specification will specify hours outside which certain noise levels may not operate. The Specification for the works will further require the contractor to take adequate measures to limit dust.



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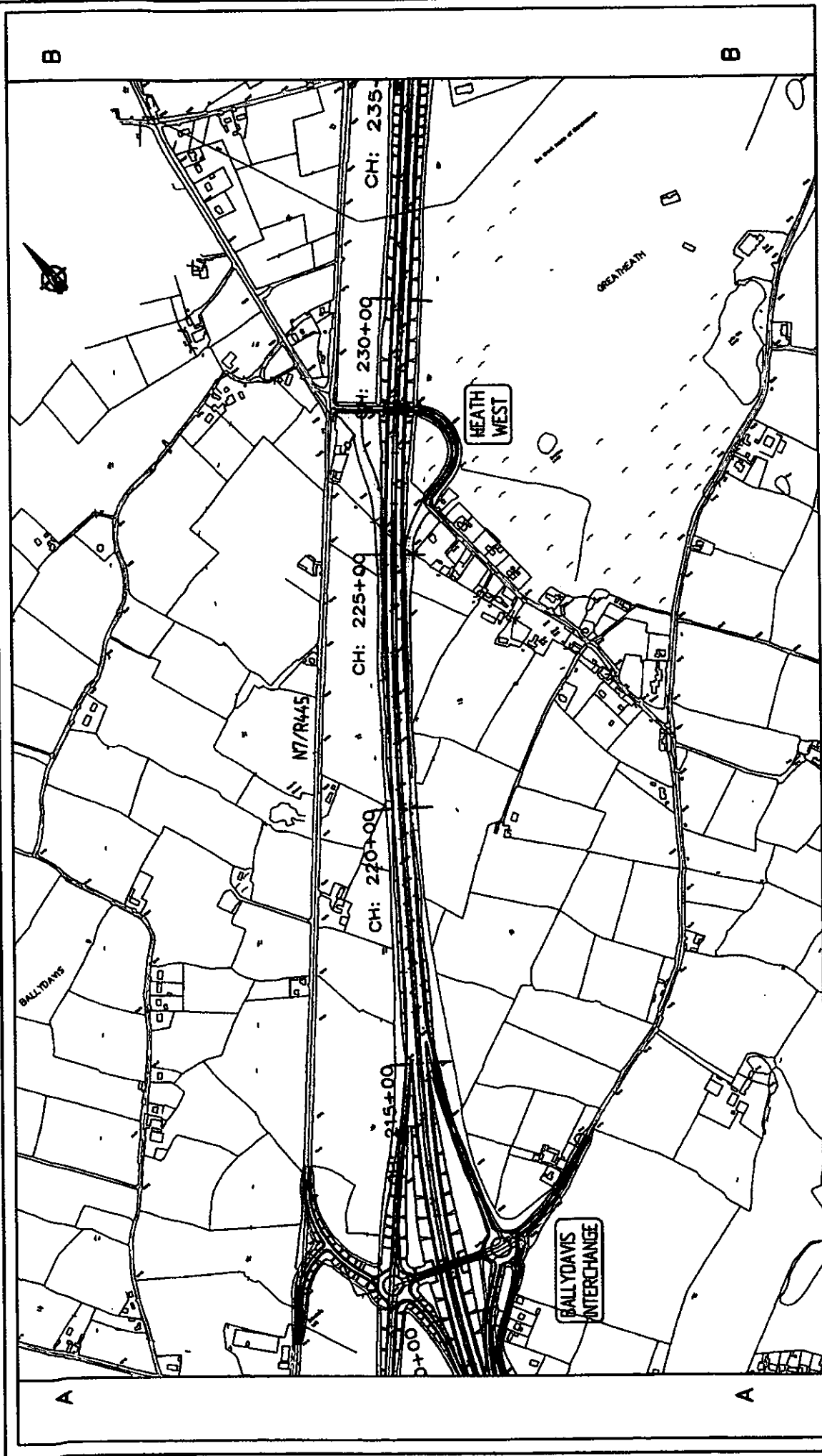
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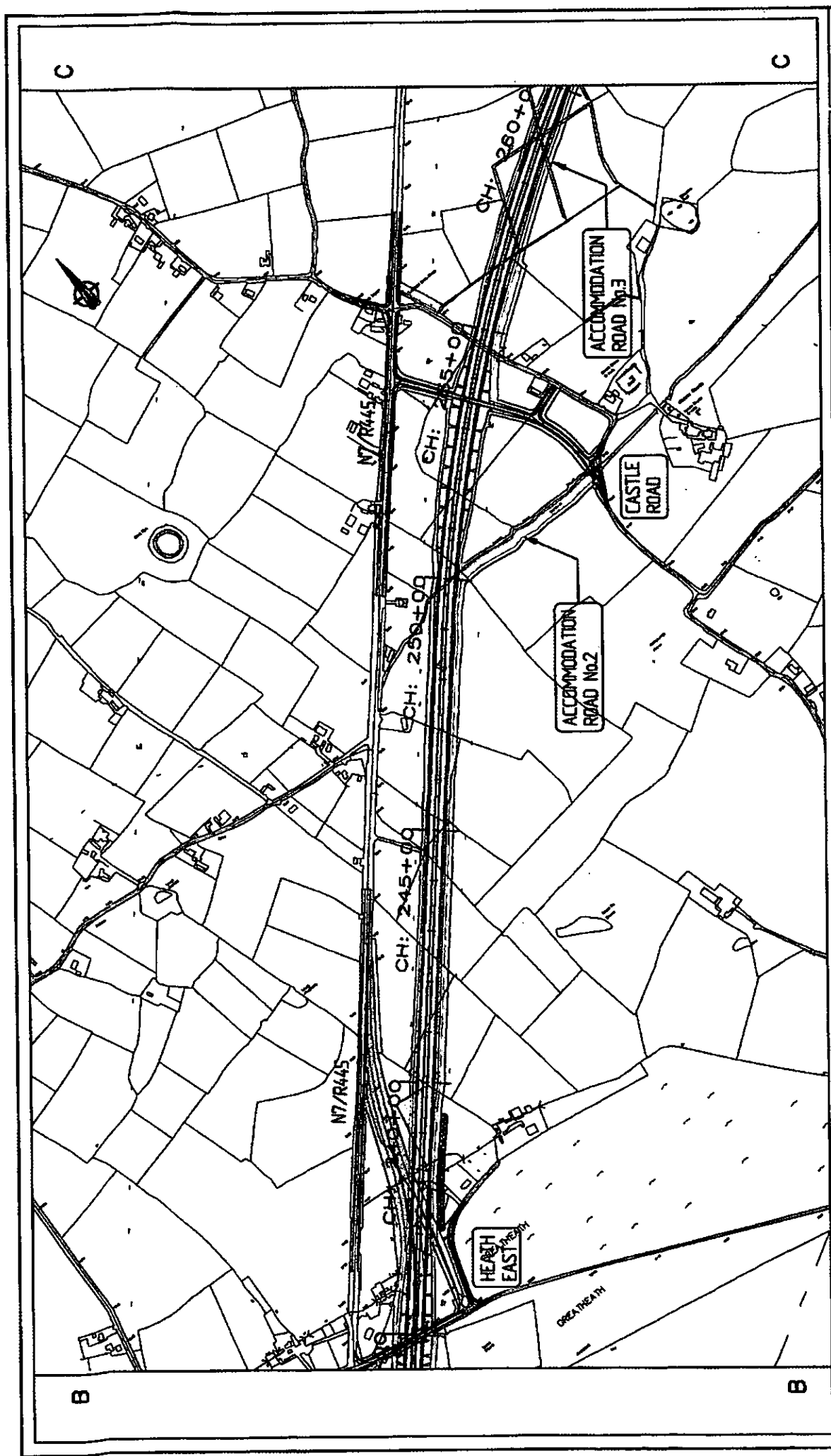
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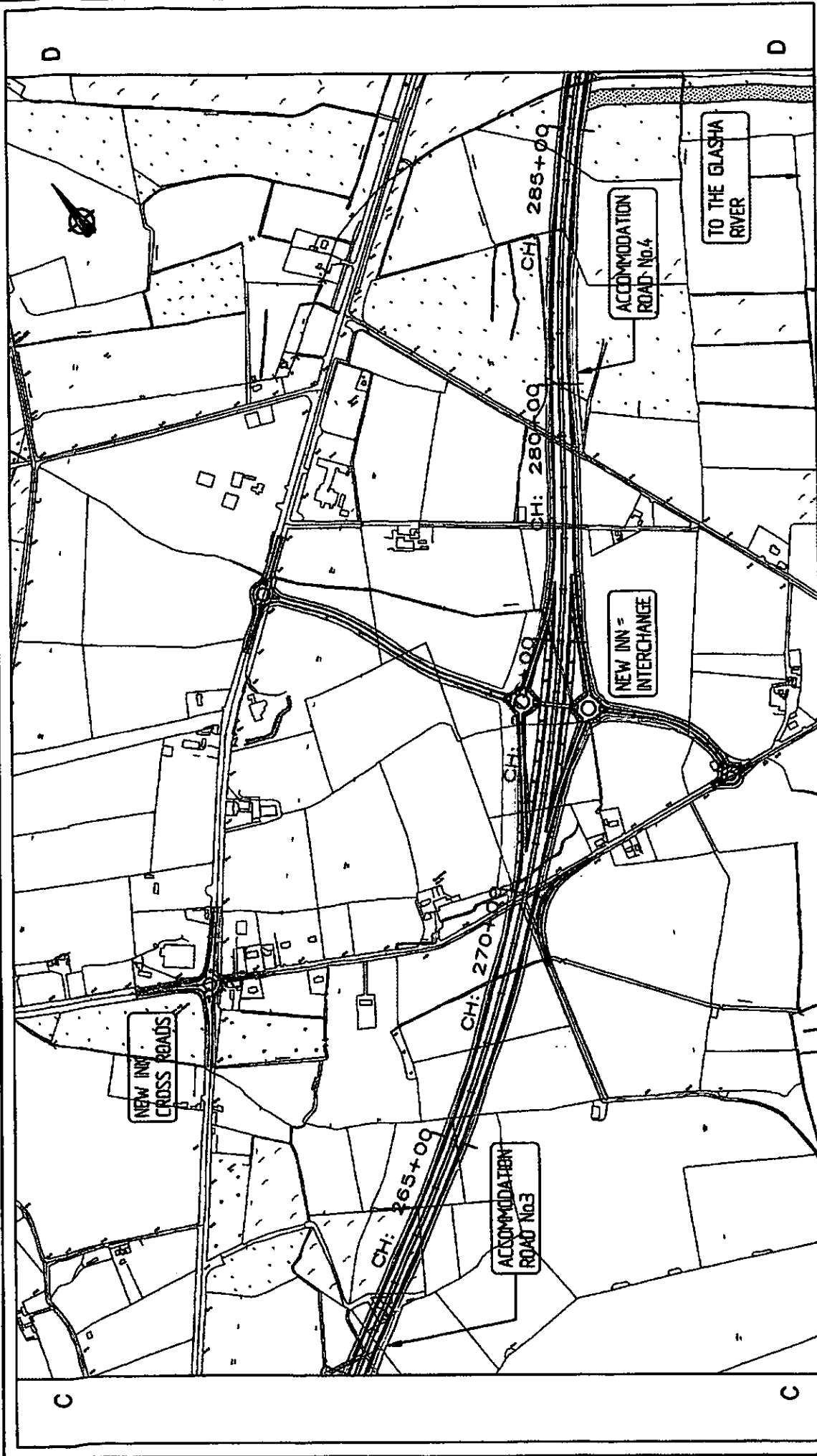
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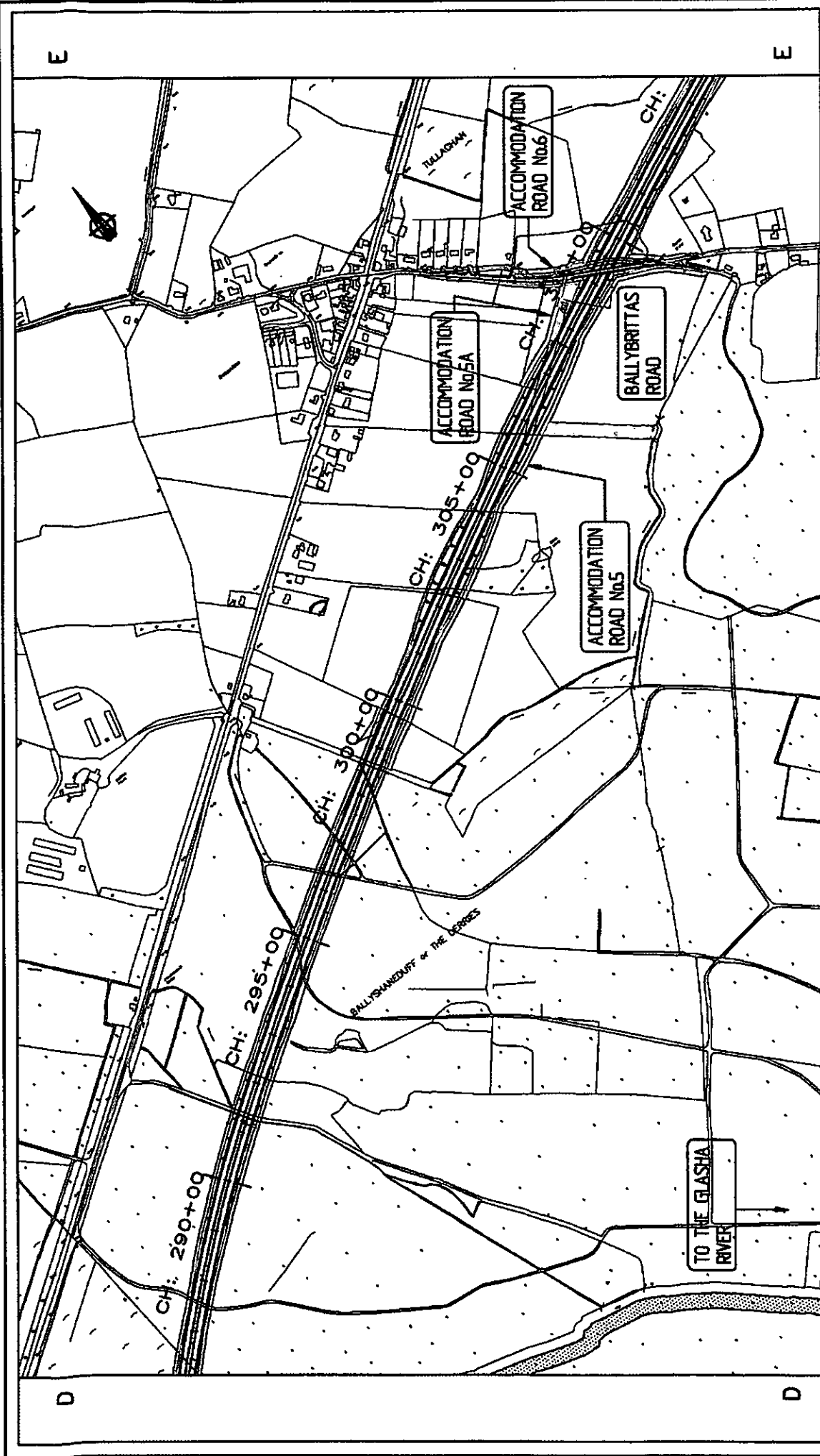
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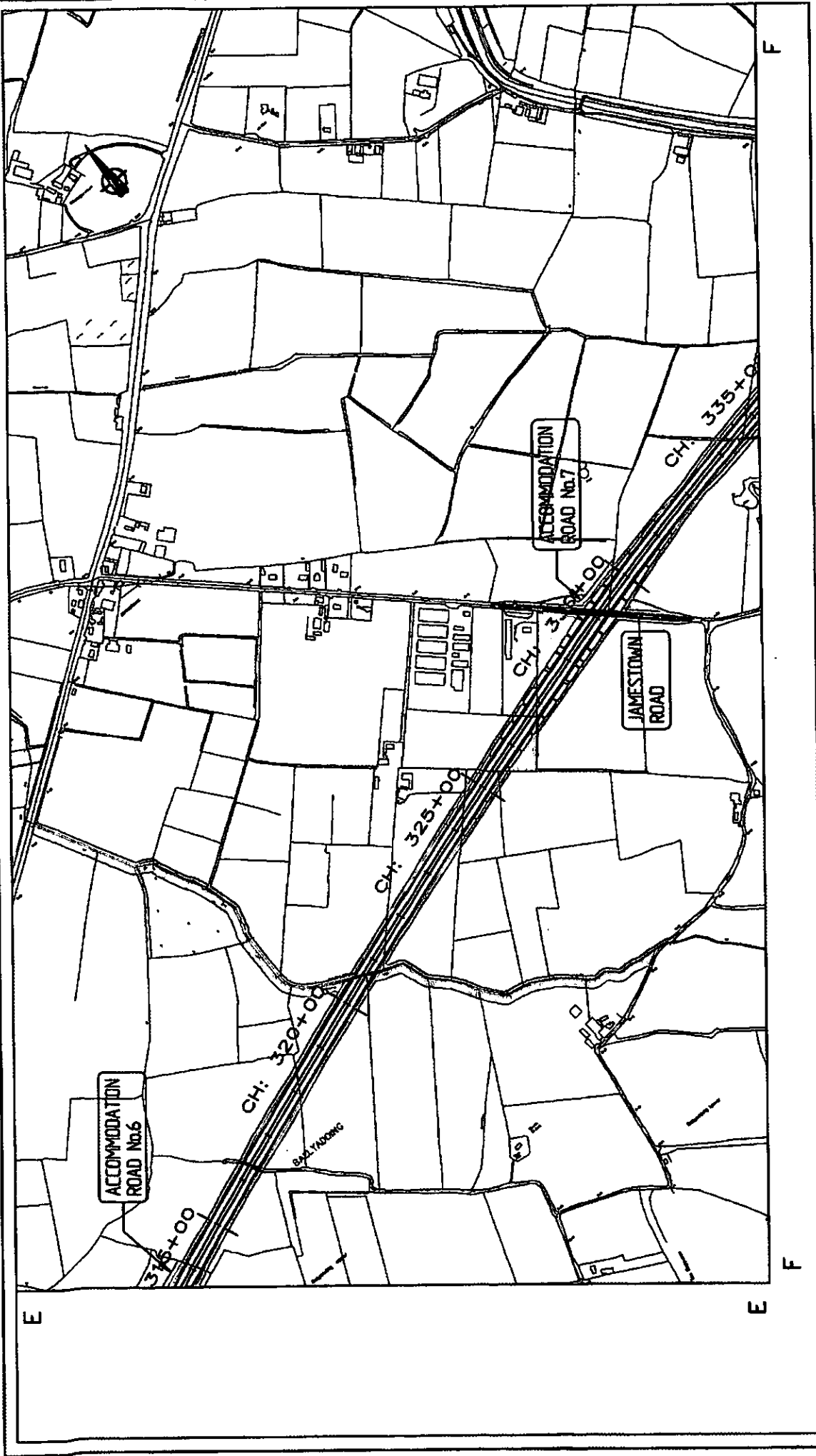
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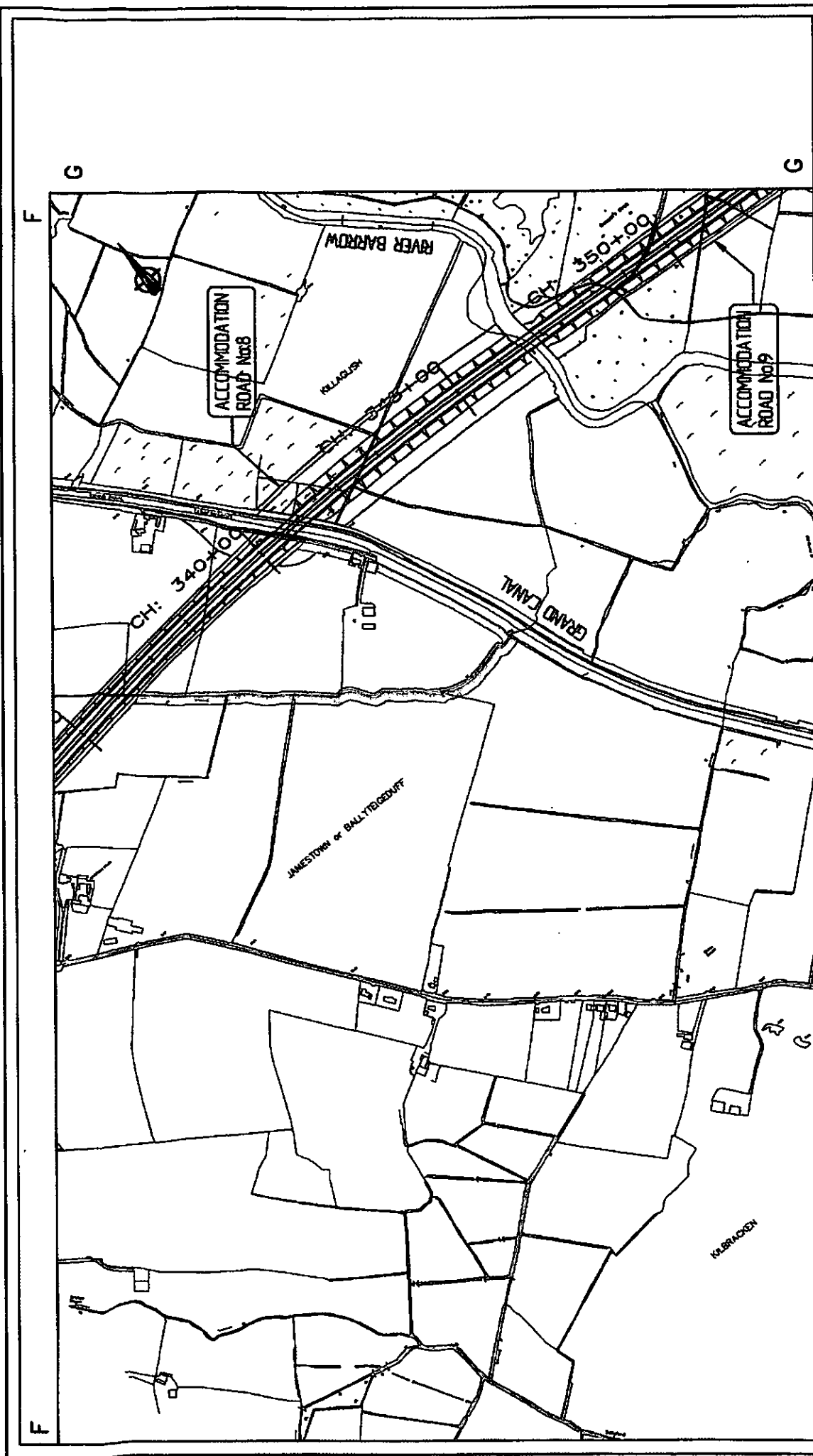
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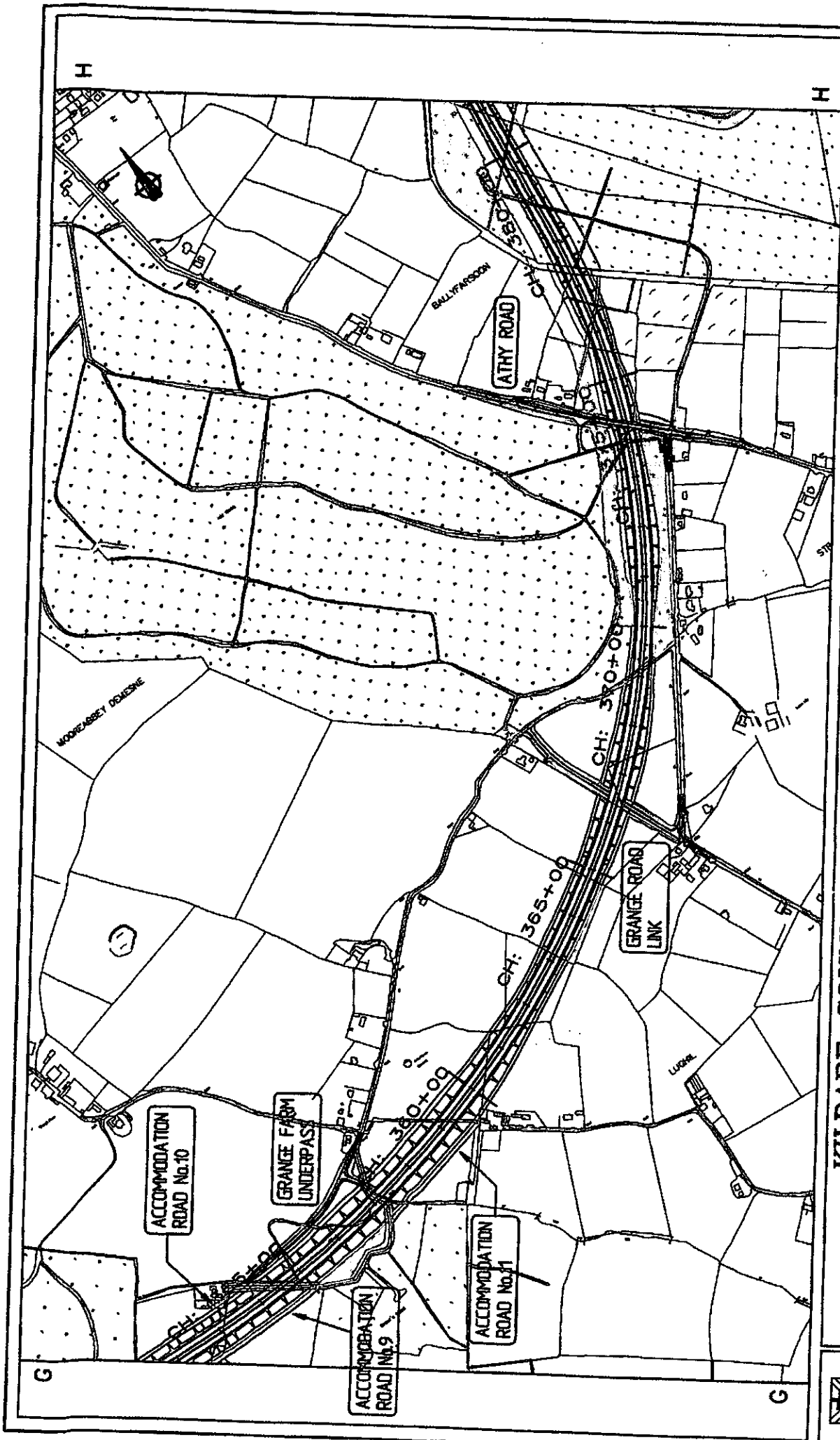
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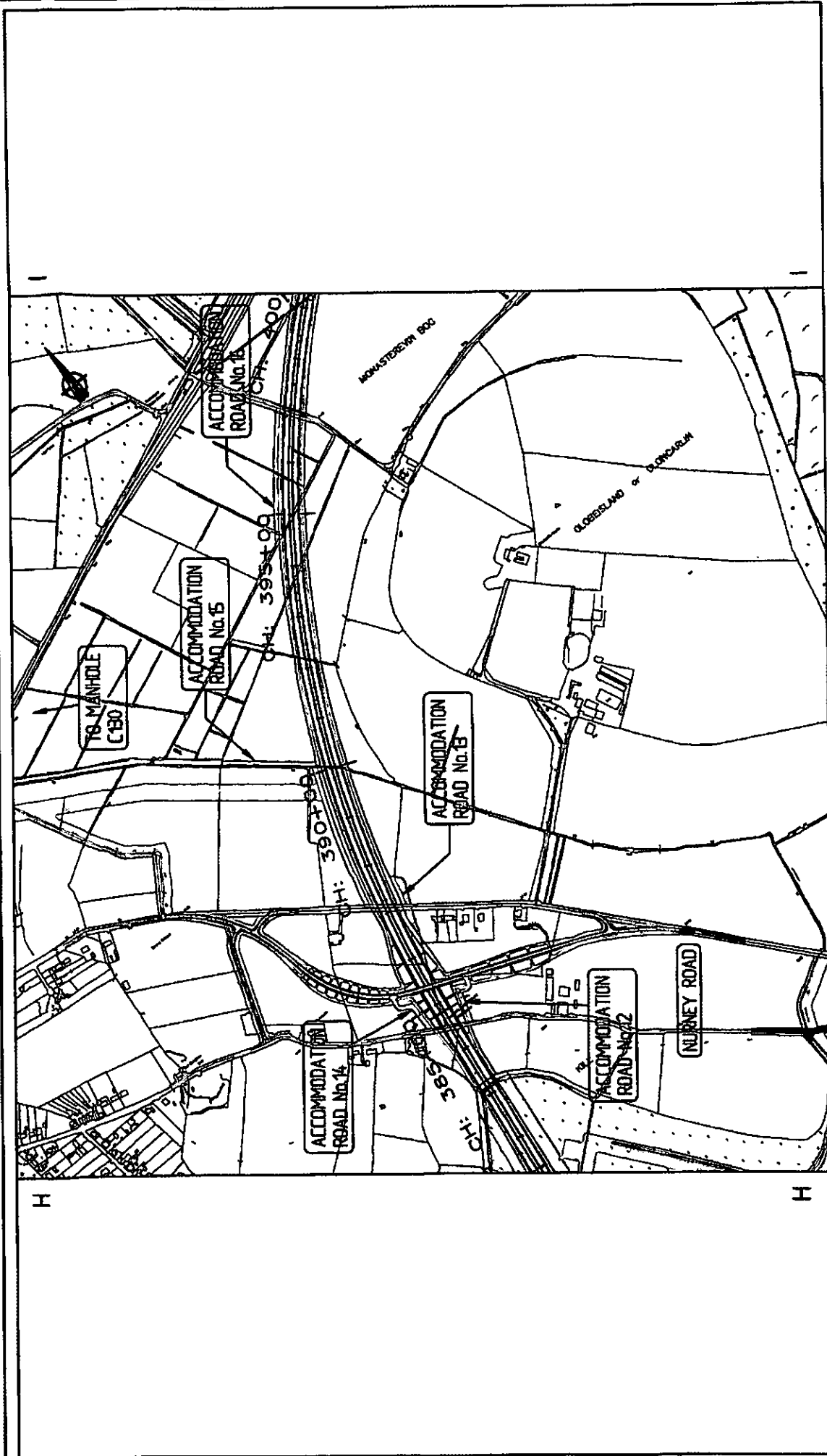
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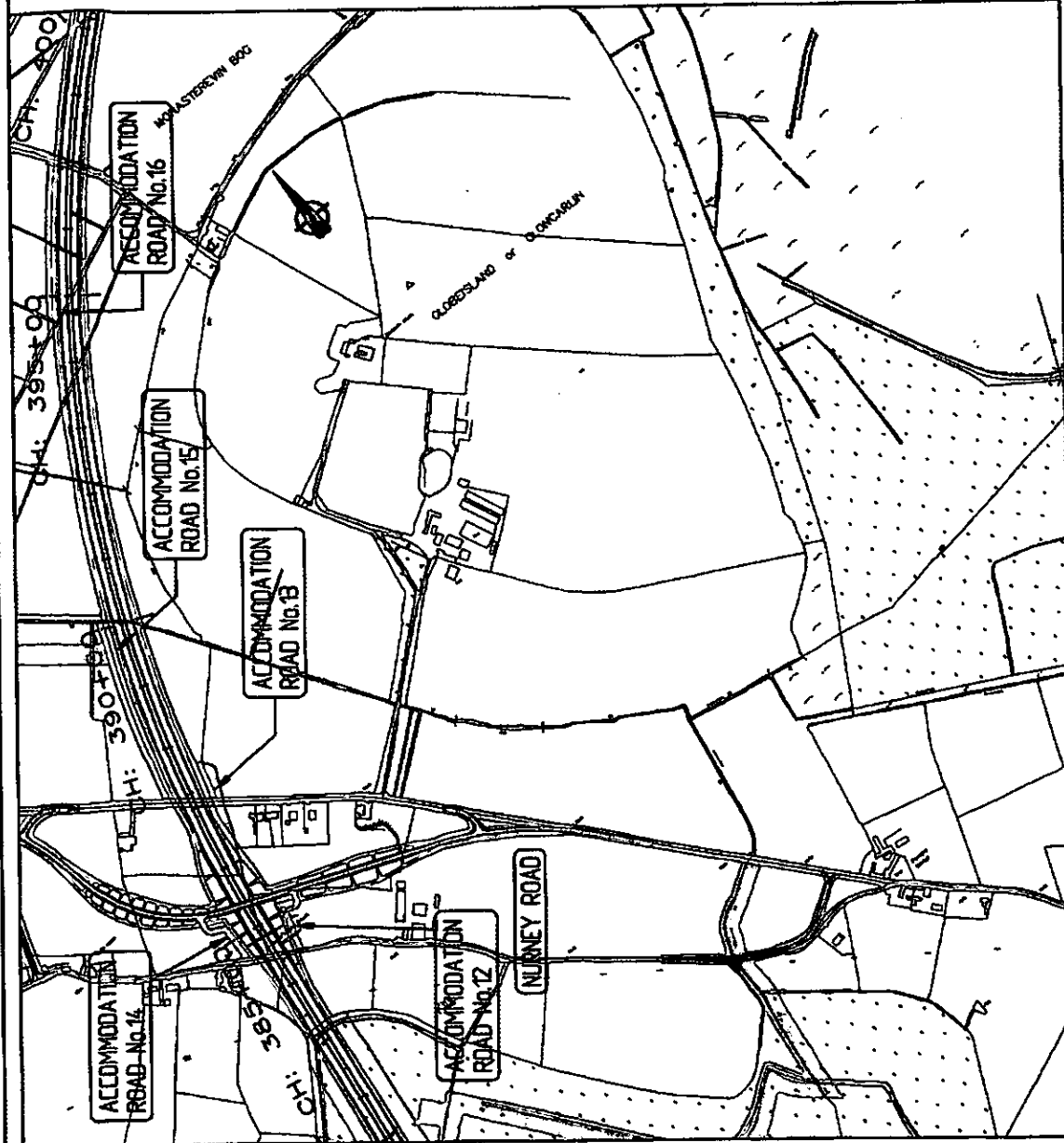
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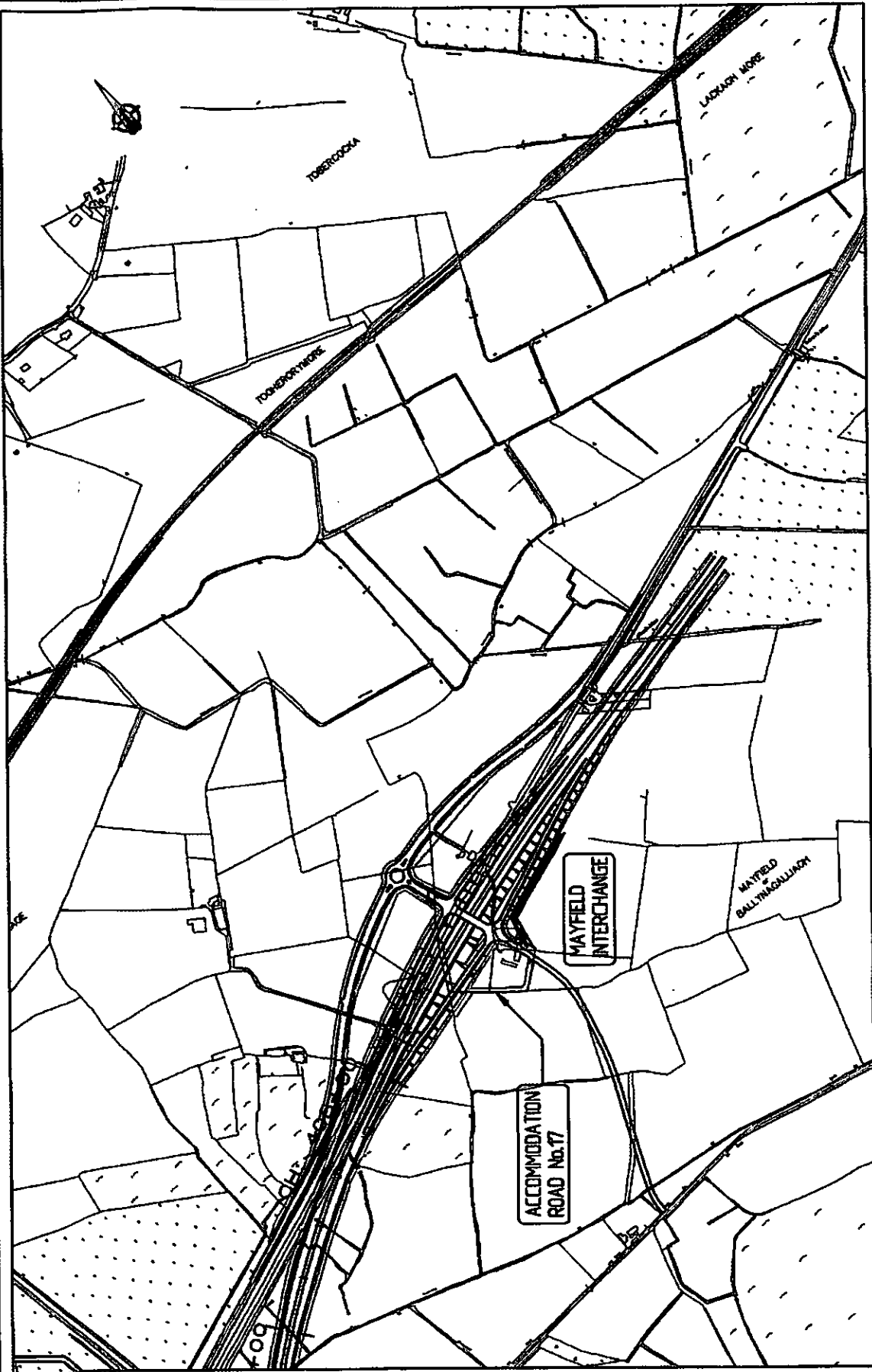
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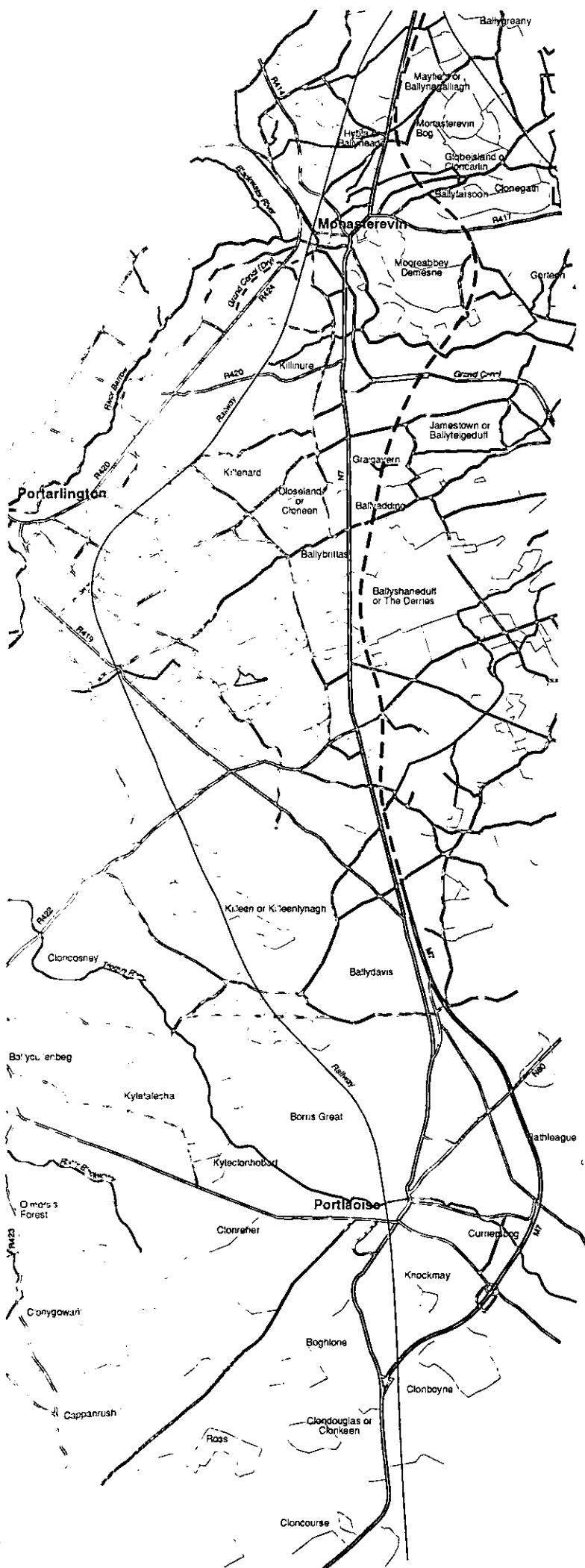
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HEATH MAYFIELD MOTORWAY

Environmental Impact Statement

Volume 2

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January 2000

PREFACE

Kildare County Council has prepared a scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge, Kildare Motorway with the 13km of Portlaoise Motorway already constructed.

This document forms part of the Heath/Mayfield Motorway Scheme Environmental Impact Statement.

The structure of the statement is as follows:

- **Volume 1**
Non-Technical Summary
- **Volume 2**
Environmental Impact Statement (including a repeat of the Non-Technical Summary)
- **Volume 3**
Environmental Impact Statement Drawings
- **Volume 4a, 4b, 4c, 4d, 4e**
Reference reports and data used in the compilation of the statement. The reference reports contained in these Volumes are as follows:
- **Volume 4a and 4b** **Preliminary Route Selection Reports**
 - Volume 4a* *Reports on Route Selection, Traffic, Accident Analysis, Socio-Economic.*
 - Volume 4b* *Reports on, Heritage, Flora and Fauna, Noise, Soils, Receiving Waters, Landscape, Soils & Agriculture, Archaeology, River Barrow Crossing.*
- **Volume 4c, 4d and 4e** **Preferred Route Reports**
 - Volume 4c* *Reports on Traffic, Noise, Air Quality, Socio Economic, Planning & Development, and Bloodstock.*
 - Volume 4d* *Reports on Agriculture, Geotechnics, Water and Human Beings, Receiving Waters, Portlaoise Aquifer*
 - Volume 4e* *Reports on Landscape, Tree and Wood Survey, Flora & Fauna, Archaeology, Public Lighting, Bridges and Structures and Cost Benefit.*

ACKNOWLEDGEMENT

This report has been produced by Kildare County Council.

The writer wishes to express appreciation to the Heath/Mayfield Technical Steering Committee Members,

<i>Michael Malone</i>	<i>Chairman, County Manager</i>	<i>Laois County Council</i>
<i>Jimmy Lynch</i>	<i>County Engineer</i>	<i>Kildare County Council</i>
<i>Gerry McGlinchey</i>	<i>County Engineer</i>	<i>Laois County Council</i>
<i>John Lahart</i>	<i>Senior Engineer</i>	<i>Kildare County Council</i>
<i>R. J. Burke</i>	<i>Senior Engineer</i>	<i>Kildare County Council</i>
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<i>Pascal Griffin</i>	<i>Engineering Inspector</i>	<i>National Roads Authority</i>

for their technical advice and support during the compilation of this document.

I would like to express appreciation to all the Consultants who contributed to the Environmental Impact Statement for their time and expertise.

I wish to acknowledge the assistance of both Kildare and Laois County Council's roads administration staff and in particular Irene Delaney, Senior Staff Officer, Laois County Council and Liam Dunne, Senior Staff Officer, Kildare County Council for their help and co-operation in compiling data.

I would also like to acknowledge the work carried out by the previous design teams of Kildare and Laois County Councils who produced the "Preliminary Route Selection Report".

I would like, in particular, to express my gratitude to the Heath/Mayfield Design Team Members,

<i>John Lahart</i>	<i>Senior Engineer</i>
<i>Sinead Johnstone</i>	<i>Executive Engineer</i>
<i>Des Butler</i>	<i>Executive Engineer</i>
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<i>Paul McDonald</i>	<i>Technician Grade 2</i>

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December 1999

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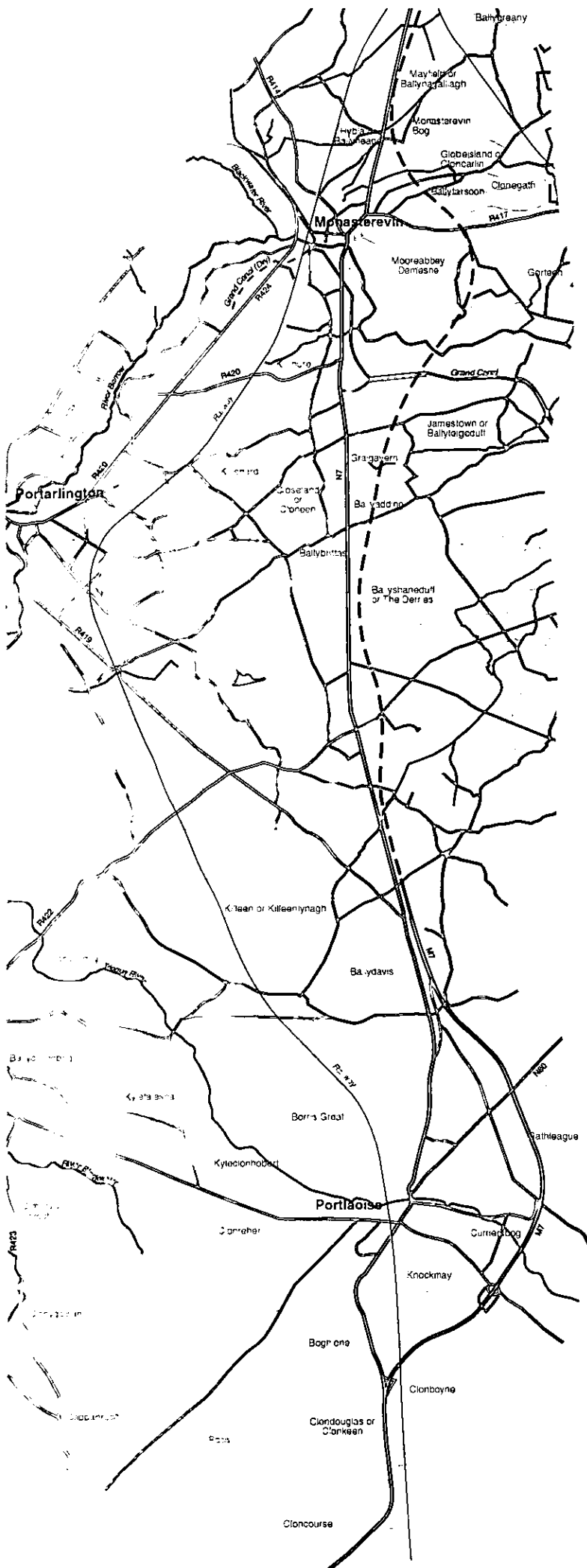
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CHAPTER ONE

Non-Technical Summary

1. NON TECHNICAL SUMMARY

1.0 NON-TECHNICAL SUMMARY

1.1 INTRODUCTION

Kildare County Council has prepared a Scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge and proposed Kildare Town Bypass Motorway with the 13km of Portlaoise Motorway already constructed

In conformity with European, National and Regional objectives the proposed Scheme will form part of an overall network which will provide a continuous motorway link from the N7 and N8 south of Portlaoise to Naas and a continuous Dual Carriageway link from Portlaoise to the M50 Dublin C ringroad.

The proposed route forms part of Euroroutes E20 and E201 and is part of the Trans European Road Network.

The proposed motorway forms part of the Southwest Road Corridor. This road corridor links the cities of Dublin, Cork and Limerick. It provides access from Counties Clare, Limerick, Kerry and Cork, important tourism areas, to Dublin Airport and the Seaports of Dublin and Dun Laoighaire. It further links Dublin Airport and the Seaports to the airports in Cork and Shannon and the Seaports at Cork and Foynes.

The proposed Scheme, in addition, provides ease of access to the Midland Counties of Tipperary, Offaly and Laois.

Drawings PR01 to PR10 inclusive indicate the proposed Scheme.

If the proposed Heath/Mayfield Scheme does not go ahead the "Do-Nothing" situation will result in the following:

- The increase in traffic volumes will place further pressure on the exiting road network, at present operating above its capacity levels. This will result in more hazardous driving conditions and delays.*
- Accident Rates will increase*
- Maintenance costs of the existing road will rise in accordance with the increased traffic usage*
- Noise levels in Monasterevin, Ballybrittas and Jamestown will continue to rise.*
- Air pollution levels will rise in these areas.*

1.2.1 Traffic (10) & (19)

The assessment of the need for the scheme is based on peak hour traffic assignments for the year 2024. The traffic model was developed based on traffic figures from 1998 and traffic growth figures as set out in the National Road Needs Study, published by the National Roads Authority.

The traffic study recommends the development of the Heath/Mayfield route to motorway standard having interchanges at Ballydavis, New Inn and Mayfield.

Assignment of traffic flows between the existing road and the new route indicates that the flows on the new route will be significant. It is anticipated that 80% of the existing traffic flow on the N7 will transfer to the new motorway facility.

The impact on the local road network will be decrease in exiting traffic volumes. The removal of such traffic from the villages of Ballybrittas, and Jamestown and from the town of Monasterevin will greatly enhance the living environment for their inhabitants by improving air quality and reducing noise pollution. In addition the reduced traffic volumes traversing the streets will lead to a reduction in fatal and personal injury and traffic accidents.

1.2.2 Corridor Assessment

The location of Monasterevin Town and its associated urban developments north and south of the N7 effectively divided the routes to be considered to be either routes traversing to the north of Monasterevin Town or traversing south of Monasterevin Town.

Two routes to the north of the town and three southern routes were identified. Rather than compare each route individually the Northern and Southern corridors were assessed with a view to determining which area could absorb the proposed Scheme with the least impact on the surrounding environment.

A comparison identified the Southern Corridor as the optimum corridor choice⁽⁹⁾.

1.2.3 Southern Route Options Considered

Three alternative routes within the southern corridor were examined. A process of comparison of positive and negative effects of the various routes was used to help identify the preferred route. When the preferred route was identified a more detailed environmental impact study was undertaken to specifically assess the impact of the preferred route on the environment into which it has to be absorbed. Summaries of the findings are given in Chapter 1, Section 1.3 and the detailed assessment is given in Chapter 8, Volume Two of the Environmental Impact Statement.

The choice of the preferred route S2 was based on the following:

- *Superior geometrics, providing a safer route for the road user*
- *Proximity to the N7 allowing for maximum interaction between the existing road network and the new motorway*
- *Less adverse environmental impact*
- *Allows for the development of Monasterevin, Jamestown, Ballybrittas and New Inn.*

The preferred route was also compared to the "Do-Nothing Situation". It was concluded that, should the Scheme not be provided, the following would occur:

- *The existing road network, operating above capacity at present, would reach saturation point.*
- *More dangerous driving conditions and delays would result.*
- *Accident Rates along the N7 would increase.*
- *Maintenance costs would increase.*
- *Noise levels, already above permissible levels in settlement along the N7, would increase even further.*
- *Air pollution levels would increase.*

In conclusion route S2 was selected as the preferred route.

1.2.4 Structures

There are 10 structures associated with this scheme. The larger structures are the crossing of the Grand Canal and the River Barrow. These structures will carry the motorway over these landmarks. The smallest structure to be provided is a pedestrian/farm underpass at Grange Road.

The likely affect of each structure is assessed in Chapter 8, Volume Two of the Environmental Impact Statement.

1.3 DESCRIPTION OF PROPOSED SCHEME

The Heath/Mayfield Motorway scheme links the Portlaoise Bypass to the Kildare Town Bypass. The total length of the mainline is 17.5km. There are 10 structures to be built in association with the scheme. The motorway alignment commences at Heath East bridge south of the N7.

Drawings number PR01 to 10 inclusive illustrate the scheme. These drawings are located in Volume 3 of this report. Additional landtakes required to provide for landscaping, noise barriers, and drainage easements are shown hatched in red. Other areas of landtake are outlined in red. These areas are required to provide for road diversions associated with the construction of bridges and embankments. Accommodation roads to be provided are illustrated in yellow. These roads are provided to reduce severance.

The works associated with the scheme commence at Bloomfield cross on the N80. A new roundabout will be constructed at the existing cross roads and the R425 from Bloomfield Cross to Ballydavis interchange will be upgraded to cater for the anticipated increase in traffic requiring access to and from the N80 and the preferred route.

The Ballydavis Interchange will be upgraded to a full interchange with the construction of west facing ramps and a link road directly to the R445. The existing half interchange at Heath West is being removed. The temporary eastern off ramp at Heath East is on the line of the preferred route and will be removed to facilitate the construction of the motorway. The proposed tie-in to the Portlaoise Bypass is required on engineering, traffic and safety reasons. The above details can be seen on drawings number PR01 and PR02.

A general description of the preferred mainline motorway follows. Details of the preferred route are shown on Drawings PR03 to PR10 inclusively.

1.3.1 Chainage 235+00 to Chainage 260+00 (PR03)

The mainline commences at Ch. 235+00 at the termination point of the Portlaoise Bypass. The route traverses agricultural land to the south of the N7. It passes through the townland of The Great Heath and Morett.

A new overbridge will be constructed at Ch. 253+60 to carry the re-aligned Castle Road over the motorway. At Ch. 254+00 the motorway crosses the existing Castle Road at a similar level to the existing road. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway.

Additional landtakes shown on drawing PRO3 are for the following purposes:

- Ch 237+00 to Ch 239+00 South Noise Barrier
- Ch 240+00 North Landscape
- Ch 250+00 South Drainage Easement
- Ch 254+00 to Ch 256+50 South Landscaping
- Ch 255+00 North Drainage Easement
- Accommodation Road Number 2 South Side
- Accommodation Road Number 1 South Side

1.3.2 Chainage 260+00 to Chainage 286+00 (PR04)

From Ch. 254+70 to Ch. 269+80 the motorway moves further south away from the N7 entering the townland of Cappakeel. The route crosses the New Inn /Vicarstown Road at its intersection with Priory Lane. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. The crossing point utilises a gap in the residential development along the New Inn/Vicarstown Road to the south of Cappakeel House.

Having moved south to avoid residential development the motorway returns closer to the existing N7 through the townland of The Derries or Ballyshaneduff. At Ch. 274+00 an overbridge crosses the motorway to cater for the New Inn Interchange, the only intermediate interchange on the scheme. This interchange is a full interchange catering for all movement east and west from the surrounding local roads and all movement north and south from the motorway. At Ch. 277+20 the preferred route crosses a private lane. This lane will be severed by the scheme. Given the proximity of New Inn interchange it is not proposed to provide an overbridge at this location.

The next local road to be crossed is the Cappakeel Road. On completion of the Scheme this road will also be a cul-de-sac both north and south of the motorway. The present movements along this road will be catered for by the New Inn Interchange.

The alignment returns to fill at Ch. 279+50. At Ch. 284+50 the preferred route enters the Derries Wood. The Derries is a Coillte owned commercial conifer plantation. The route is in fill throughout the wood to a maximum height of 3m.

Additional landtakes shown on drawing PR04 are for the following purposes:

- Ch 270+00 to Ch 275+00 North Realignment of Exiting Drain to Emo Lake
- Ch 285+80 South Drainage Easement
- Accommodation Road Number 3 South Side
- Accommodation Road Number 4 South Side

1.3.3 Chainage 286+00 to Chainage 313+00 (PR05)

From Ch. 292+50 the preferred route swings south away from the N7 traversing the townlands of Ballyadding. The alignment crosses the Ballybrittas Road at Ch 309+00. An overbridge is provided at this location to cater for the realigned Ballybrittas road (L-3931).

At Ch. 308+30 the preferred route alignment fenceline coincides with the wall of residence to the north. Noise mitigation measures are required for this dwelling. In order to provide such measures additional landtake would be required thus demolishing the dwelling house. As mitigation measures are not possible here this property is to be purchased by the scheme.

Additional landtakes shown are on drawing PR05 for the following purposes:

- | | |
|--------------------------------|-------------------|
| • Ch 308+00 to Ch 309+00 North | Landscape |
| • Ch 306+00 South | Drainage Easement |
| • Accommodation Road Number 5a | North Side |
| • Accommodation Road Number 5 | South Side |
| • Accommodation Road Number 6 | North Side |

1.3.4 Chainage 313+00 to Chainage 335+00 (PR06)

Continuing on its southerly direction through the townlands of Jamestown and Killagish the preferred route traverses agricultural land intersecting Jamestown Road at Ch. 329+00 south of the Jamestown Turkey Hatchery and north of Jamestown House. An overbridge is provided at Ch.329+00 to cater for the realigned Jamestown Road.

From Ch. 328+00 the motorway starts to rise to allow the preferred route to clear the Grand Canal and the River Barrow.

Additional landtakes shown on drawing PR06 are for the following purposes:

- | | |
|-------------------------------|------------------------------|
| • Ch 320+00 North and South | Drainage Easement |
| • Ch 326+00 South | Landscape |
| • Ch 328+00 North | Landscape |
| • Ch 331+00 to Ch 336+00 | Landscape to Jamestown House |
| • Along Jamestown Road East | Road Diversion |
| • Accommodation Road Number 6 | North Side |
| • Accommodation Road Number 7 | North Side |

1.3.5 Chainage 335+00 to Chainage 352+00 (PR07)

At Ch. 340+60 the preferred route crosses over the Canal road. The route then crosses the Athy branch of the Grand Canal and heads for the River Barrow. The route traverses the River Barrow north of Sally Island.

From the River Barrow the route enters County Kildare and the townlands of Lughill and Dangan Wood.

Additional landtakes shown on drawing PR07 are for the following purposes:

- | | |
|-----------------------------------|--------------------|
| • Ch 336+00 South | Drainage Easement |
| • Ch 340+00 South | Drainage Easement |
| • Ch 341+00 to Ch 330+00 N & S | Landtake for Berms |
| • Landtake West of the Canal Road | Road Diversion |
| • Accommodation Road Number 8 | North Side |
| • Accommodation Road Number 9 | South Side |

1.3.6 Chainage 352+00 to Chainage 380+00 (PR08)

The route then passes south of three dwelling houses located at the end of Grange Road. The route cuts through the old Moore Abbey Demesne wall at Ch. 354+50 and Ch.357+00. It is intended to remove this wall and rebuilt to the north of the realigned Grange Road.

An underpass is provided at Ch. 357+00 along the line of the existing Grange Road. The provision of this underpass provides access to severed lands south of the motorway and also provides for the replacement of an existing amenity walk through farm lands south of the motorway and utilised by many people in the local community.

Ch. 365+00 is the most southerly point of the route. At this location the route begins its journey northwards to link with the termination point of the Kildare Town Bypass at Mayfield. At Ch 366+50 an underpass known as Grange Road Link provides access to these houses from Green Road.

The preferred route now enters the townlands of Mooreabbey Demesne, Ballyfarsoon, Kill. The route enters the extreme southern end of Hill Wood at Ch 369+20 and exits at Ch. 374+00. The existing demesne wall to the south of Hill Wood will be retained and in so far as possible the majority of mature trees lining the wall will be retained.

The carriageway passes within 57m of houses on Green Road which are adjacent to Hill Wood. These houses are screened from the motorway by the demesne wall.

On exiting Hill Wood at Ch. 374+40 the preferred route crosses under the Athy Road. This Road will require an overbridge to carry it over the motorway.

At Ch. 377+50 the route enters Kill Plantation a Coillte owned commercial coniferous forestry plantation. This section of the alignment would be screened from the surrounding landscape.

Additional landtakes shown on drawing PR08 are for the following purposes:

- | | |
|--------------------------------|---------------------------------------|
| • Ch 356+00 South | Landscape |
| • Ch 363+00 to Ch 365+00 South | Landscape |
| • Ch 366+50 North | Drainage Easement |
| • Ch 367+00 to Ch 369+00 North | Landscape |
| • Ch 370+00 to Ch 374+00 North | Drainage Easement & Landscape |
| • Ch 369+00 to Ch 374+00 South | Landscape |
| • Ch 374+00 South | Drainage Easement |
| • Ch 378+00 to Ch 383+00 N & S | Landtake for Berms |
| • Ch 374+00 to Ch 381+00 | Drainage Easement and Retention Tanks |
| • Accommodation Road Number 9 | South Side |
| • Accommodation Road Number 10 | North Side |
| • Accommodation Road Number 11 | South Side |

1.3.7 Chainage 380+00 to Chainage 399+00 (PR09)

At Ch. 383+50 the motorway exits Kill Plantation. The alignment crosses Nurney Road Upper at Ch. 384+50. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. The alignment then crosses Nurney Road Lower at Ch.387+20. The Upper and Lower Nurney Roads will be served by one over bridge located at Ch. 385+40 linked to each minor road.

At Ch. 397+00 the preferred route crosses another local road. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. A link road will provide access to the south from Mayfield Interchange. The construction of this access will be carried out as part of the Kildare Town Bypass works.

Additional landtakes shown on drawing PR09 are for the following purposes:

- | | |
|--------------------------------|-----------------------------|
| • Ch 383+00 to Ch 384+50 North | Landscape |
| • Ch 386+00 to Ch 387+50 South | Landscape and Noise Barrier |
| • Ch 389+00 North | Drainage Easement |
| • Accommodation Road Number 12 | South Side |
| • Accommodation Road Number 13 | North Side |

- *Accommodation Road Number 14 South Side*
- *Accommodation Road Number 15 North Side*
- *Accommodation Road Number 16 North Side*

1.3.8 *Nurney Road South (PR09a)*

A realignment of the existing Local Road Nurney Road Upper is required to facilitate Coillte machinery exiting Kill Bog and requiring access onto the new realigned Nurney Road. The road realignment and associated landtake is illustrated on this drawing.

1.3.9 *Chainage 399+00 to Chainage 407+00 (PR10)*

The preferred route then traverses Monasterevin Bog and ties into the M7 Kildare Town Bypass at Ch. 406+92.

The additional landtake shown on drawing PR10 is for the following purposes:

- *Accommodation Road Number 17 South Side*

1.4 PREFERRED ROUTE ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Impact Statement (EIS) is prepared in accordance with the Roads Act 1993⁽⁷⁾ a, amended by SI 351 of 1998 and SI 93 of 1999.

The Roads Act 1993 Section 50 requires a description of the likely significant affects of the proposed Scheme on the environment. There follows a summary of the impacts direct and indirect as identified. Full details of impacts are given in Volume 2 of the Environmental Impact Statement.

1.4.1 Traffic (10) & (19)

Assignment of traffic flows between the existing road and the new route indicates that the flows on the new route will be significant. It is anticipated that 80% of the existing traffic flow on the N7 will transfer to the new motorway facility.

The impact on the local road network will be a decrease in exiting traffic volumes. The removal of such traffic from the villages of Ballybrittas, and Jamestown and from the town of Monasterevin will greatly enhance the living environment for their inhabitants by improving air quality and reducing noise pollution. In addition the reduced traffic volumes traversing the streets will lead to a reduction in fatal and personal injury and traffic accidents.

1.4.2 Noise and Vibration (20)

1.4.2.1 Noise

Baseline noise measurements were taken at 23 locations adjacent to the proposed motorway and along the exiting N7. Predictions were made as to what the levels would be in the year 2019 at those locations. Noise reduction measures will be implemented where increased noise levels exceeding 68Db(A) L10 (18 hour) are predicted.

Four locations were identified as requiring noise mitigation measures. The locations in question are at The Heath, one dwelling house on Grange Road Lower and one house south of the motorway on Nurney Road Lower.

On completion of the proposed Scheme the existing noise levels in settlements along the N7 will decrease.

1.4.2.2 Vibrations

Ground vibration measurements were taken on the existing N7. The ground vibration generated from the operation of the new roads and ramps would be expected to be of a magnitude less than that required to cause disturbance or structural damage. The vibration will be less than that caused by traffic on the surfaces of the existing roads.

Ground vibrations during construction including piling of bridge foundations, would not be expected to cause disturbance or structural damage.

1.4.3 Air Quality (21)

A baseline study of exiting ambient air quality was carried out and predictions made of future air quality along or adjacent to the preferred route for the year 2019.

The conclusions of that study state that the emissions from the motorway will have no significant impact on air quality at nearby residences. It will result in an improvement in air quality along the route of the existing N7.

1.4.4 Socio-Economic Impact (22)

The main impacts of a proposed bypassing scheme are the impacts on the local communities. These impacts can take the form of perceived community severance, affect on local recreational facilities, schools, institutions and other community facilities.

Loss of passing trade can affect income levels, employment and property values. A more positive impact, counter balancing these affects, is that the bypassing of the town and villages creates a more pleasant, attractive and safer pedestrian and traffic environment within the towns and villages.

In order to reduce severance the design of the scheme, where practicable, leaves local roads open, or alternatively provides access adjacent to the existing roads. The placement of the intermediate interchange at New Inn will enhance and develop tourism potential in the area countervailing the impact on trade due to the reduction in passing trade.

1.4.5 Planning and Development (5), (6) & (22)

The Motorway Route does not conflict with any of the provisions of the Kildare County Development Plan, or of the Laois County Development Plan, in which latter county the bulk of the route lies.

The Motorway route complies with the specific provisions of the Kildare County Development Plan, 1999, and the provisions of the Laois County Development Plan, 1998.

Two planning applications are affected by the Scheme, at Ballybrittas in Laois and along the Nurney Road Upper in Kildare. These applications will be modified under the Scheme.

1.4.6 Property (23)

Residential property can be affected in two ways by the Scheme:

- 1) Directly affected residential property relates to the acquisition of the property*
- 2) The acquisition of part of the curtilage of the property or the alteration of access to a property.*

Four dwelling houses are to be acquired by the Scheme. Thirteen dwelling houses will have curtilage acquired under the Scheme. Thirty-five residential properties will have the access to their properties regraded to tie in to the newly realigned minor roads.

Residents whose houses are acquired or from whom curtilage is acquired will be appropriately compensated for loss and injurious affection.

Indirectly affected residential properties are properties adjacent to the motorway that may be impacted upon by an increase in noise levels, visual impact or short term impacts due to construction. Where such impacts are identified and where possible appropriate mitigation measures are incorporated in the Scheme. These measures include the provision of additional landscaping areas and the provision of noise barriers.

1.4.7 Bloodstock (24)

One bloodstock owner is being affected by the preferred route. The preferred route severs the holding in two.

The reduction in land and severance will result in the overall operation of the bloodstock operation being reduced from its present size.

1.4.8 Agriculture (25)

The proposed Scheme impacts on numerous agricultural holdings between the Heath and Mayfield. The majority of these holdings are considered to be small holdings.

1.4.8.1 Farming Systems

Many farming activities are to be found on the farms affected by the Scheme, namely Beef Production, Dairying, Sheep Production, Tillage Cropping, Pig Production, Forestry, Poultry Production. These systems are operated at varying levels of intensity. The impact on these farms of the motorway varies greatly from farm to farm. The range in farm size also shows big variation. Some farms are owner operated, while others have some or all of their farms let to other farmers.

1.4.8.2 Land Loss

Approximately 90.50 ha. of land is required for motorway construction. Land take occurs on approximately 45 agricultural holdings. The landtake from any one farm varies from an approximate maximum of 5.2ha. to an approximate minimum of 0.0004 ha. The affect of land take is specific to each property. If land take occurs in a highly productive area of the farm or from the area close to the farm buildings, which is used to graze a dairy herd, the impact can be very significant. Land take on non dairy farms with young animals, e.g. lambs, calves, can be significant if the land taken is close to the farmyard and is being used to turn out young animals for grazing.

Land take has an impact on the many schemes farmers may be involved with, for example Livestock Premia, Headage, Area Aid payments on tillage crops, Rural Environment Protection Scheme (Reps), Early Retirement Scheme, Milk Quotas and eligible land for Tillage Premia. Regarding these Schemes, it is important that adequate one to one consultations takes place between the landholders affected and the Local Authority involved in the motorway development. It is essential that the landholders affected seek professional advice and guidance well in advance of any land take so that the impact on their specific farming business can be quantified and steps taken to mitigate any potential losses which may arise.

The Department of Agriculture and Food can provide advice on the exact situation and consequences of land take in these situations and indeed in regard to all agricultural schemes that may be impacted on as a result of land take, etc.

Land take obviously leads to income loss to the farmer in question. Depending on the farm involved, income loss may be small or large, and in some cases may negatively impact on the future viability of the farm business.

The farmer will be appropriately compensated for loss of land and injurious affection.

1.4.8.3 Drainage

Many of the farms through which the motorway passes have artificial drainage systems in place in combination with open drainage systems. These drainage systems have led to vast improvements in productivity, indeed in some cases without adequate drainage some lands could not even be farmed.

These drainage systems when located will be retained in embankment areas and catered for in the mainline drainage system to ensure the continued productivity of these lands.

Compaction of soils significantly reduces their productivity. This may occur during construction as a result of the movement of heavy machinery particularly on wet soils when they contain elevated moisture levels. If this should occur remedial action would be taken to return these soils to full production.

1.4.8.4 Severance

On 44 farms, severance of a portion of land occurs. The impact of severance depends on the area of land severed, its present use, and the long term access to the severed lands.

Accommodation roads are being provided to all severed lands where it is viable to do so. Land plots to which access is not provided will be acquired under the Scheme.

Provisions for adequate water supplies for livestock on severed lands will be made.

1.4.9 Geotechnical Aspects (26)

The proposed route crosses boggy areas of peat and soft ground. The investigations indicate that, apart from the River Barrow flood plain, the depth of the peats and very soft clays are generally less than 2m, locally up to 3m and therefore can be excavated and replaced with suitable material where these occur under embankments. Some extra land take will be required to allow the road fill to be taken down to firm ground where soft soils are to be excavated.

Initial estimates indicate that there may be a significant shortfall of material from cuts which could be placed as embankment fill. Construction measures employed will maximise the use of excavated material in order to limit the amount of material which would have to be disposed from site and to minimise imported fill.

A survey of wells in the vicinity of cut areas was made to assess the impact if any that the motorway drainage might have on the viability of the wells. No longterm impacts are expected. However in the short term the cut areas may result in a lowering of ground water which may impact on some wells. If this should occur the possibility that the wells could be deepened or an alternative water supply provided can be examined.

Experience of excavations in the soil type identified adjacent to dwelling houses along Green Road has indicated that the movements arising from the construction of the cut and from any resulting groundwater lowering would not have a significant affect on the houses.

1.4.10 Drainage (27)

All motorway run-off eventually discharges to the River Barrow in a number of ways:

- 1. Directly, using a surface water collector pipe.*
- 2. Directly, using the existing drainage from the Kildare Town Bypass.*
- 3. Indirectly, using existing surface water drainage channels along the route.*
- 4. Indirectly, constructing a new lined open drain, which discharges to the Glasha River and which in turn discharges to the River Barrow.*

The River Barrow rises in the Slieve Bloom Mountains and originally flows east until Monasterevin where it turns south through Athy, Carlow, New Ross and enters the Irish Sea.

The total area of the proposed works is less than 1km² and is contained entirely within the catchment area of the River Barrow. Given the relative size of the motorway catchment and the receiving water catchment it is not anticipated that there will be a significant impact on peak flow in the River Barrow or Glasha River as a result of the proposed motorway works. In addition the drainage network incorporates retention in areas to minimise any possibility of surcharging in times of peak flow.

To mitigate any adverse effects on the quality of the receiving waters all the run-off from the motorway to the proposed outfalls will pass through oil/grit interceptors prior to entering the surface water network.

1.4.11 Aquatic Ecology of Receiving Waters (28)

The most serious threat to water quality along any main roadway is posed by the possible release of toxic or dangerous substances from road tankers following accidents involving such vehicles. The upgrading of the existing N7 to motorway standard will reduce the frequency of road accidents. The very high standards used in the design of this proposed motorway and its link roads will reduce the occurrence of such incidents to a minimum thereby reducing, to the greatest extent possible, the likelihood of such events.

The existing drainage network from the N7 to the Glasha River and River Barrow were assessed in terms of water quality and water ecology. Ten drains in total were assessed. The overall water quality was described as poor while two drains within the Derries wood were identified as containing a diverse community of species which include the lamprey and the whiteclawed crayfish. Both of these species are protected in law and

appropriate measures will as outlined below in 1.4.11.1 be taken to ensure that the habitats in these two drains are not adversely affected by this proposed development.

1.4.11.1 Ameliorative Measures

No surface water from the paved area of the motorway will discharge to either of these two drains. A new lined drain with settlement facilities is being provided within the wood to discharge road drainage.

Appropriate measures will be taken to protect all of the watercourses from the discharge that may arise during the construction of the motorway and associated ancillaries works. These discharges tend to carry solids in suspension and therefore could adversely impact on the Rivers Glasha and Barrow if not settled prior to discharge.

1.4.12 Ballydavis Interchange Vs Portlaoise Acquiifer (29)

The upgrading of the Ballydavis Interchange to a full interchange and the associated construction works have the potential to pollute the surface water entering the Portlaoise Limestone Aquifer at the swallow hole. Clearly, any such ingress of pollution waters must be avoided and measures implemented to allow for an adequate response in the event that some pollution does in fact take place. The remedial measures proposed relate to:

- (i) construction activities and*
- (ii) monitoring and response measures.*

1.4.13 The Landscape (30)

The landscape and visual impact assessment examined the existing landscape in terms of its character, its scenic quality and its ability to absorb change. The proposed development was assessed for its impact on the landscape in terms of its visibility and its potential to alter the character of the area. Views into and out of the site were assessed, as were views from adjacent residences. In determining the impact, consideration was given to reducing any significant impact and mitigation measures were suggested.

The assessment was carried out as follows:

- *Site survey and photographic survey to determine the character of the site and the surrounding area.*
- *Site analysis to determine views into and out of the site*
- *Assessing the proposed development using layout plans and sections to determine impacting features*
- *Evaluating these impacts on the landscape in accordance with EPA Guidelines.*

Areas of landtake have been identified to be included in the Scheme to allow for screening of dwelling houses from the motorway.

1.4.14 Flora and Fauna (32)

A survey of existing flora and fauna was carried out for the length of the preferred route. The Scheme will have a low negative impact on the natural diversity of the area traversed. It traverses land which is at present occupied for the most part by open fields divided by hedgerows of relative recent origin. However every tree lost and every hedge removed represents a loss in terms of natural diversity, in terms of the loss of species of flora and the habitat provided by the connected pattern of boundary features.

A population of Fallow Deer resides in the Derries Wood.

1.4.14.1 Ameliorative Measures

To mitigate against the identified losses it is considered that landscape design in connection with construction can more than compensate for this loss. Every opportunity will be taken during landscape design to increase the natural diversity and provide habitat for wildlife in this area of generally low natural value. This can be done by planting of species of native trees in small groups or strips within the overall landscape design, connected where possible by lines of hedge.

Cutting slopes and banks associated with the construction offer scope for the creation of new grassland habitats of considerable wildlife value. Some planting of natural grassland species mixes appropriate to soil and other local ecological constraints, where

appropriate, will enhance not only the species composition of local flora, but also of the invertebrate fauna. Planting of native tree species in small groups within the overall landscape design will be undertaken where practicable.

Deer fencing will be provided throughout the Derries Wood to protect the Fallow Deer population which resides there.

Fences and other boundaries will attempt to match the character and composition of the exiting hedgerow. Topsoil in Hill Wood which is rich in ground flora will be carefully stripped during the course of construction, protected and reused to topsoil the sideslopes of the cutting within the wood.

1.4.15 Architecture, Culture and Heritage (32)

1.4.15.1 Architecture

The preferred route interferes with no buildings of architectural significance. The preferred route does pass approximately 120m north of Jamestown House, a Georgian building. Some visual impact will occur but appropriate landscaping can mitigate these. Lands have been included in the Scheme for this purpose.

1.4.15.2 Culture and Heritage

Characteristic field patterns are part of the fabric of the landscape. Inevitably the construction of a motorway Scheme, primarily through a green field site, will lead to some disruption of existing patterns, but it is anticipated that such disruption will be modest. The disruptions can be alleviated by matching the composition and character of the traditional hedgerows of the district where the opportunity arises in connection with the construction of the motorway.

1.4.16 Archaeology (33) & (34)

The preferred route directly impacts on four archaeological sites. Three other sites adjacent to the motorway are considered in such proximity that preliminary site investigation should be carried out in advance of the works. It is proposed to investigate the sites directly affected by the scheme prior to the commencement of any road construction. In addition during construction the following monitoring will take place:

- Monitoring during topsoil stripping for all elements of the proposed route, with the provision for full excavation of any archaeologically significant material uncovered at this time.*
- Intensive monitoring within the fence lines where the route is adjacent to an archaeological site and where associated material may extend from the site into*

the land take area of the route. This also applies to areas identified as having archaeological potential.

- *Monitoring during any testing and probing on the route prior to or during construction is also recommended.*

1.4.17 Road Lighting ⁽³⁵⁾

It is proposed to provide lighting to traffic route standard at the Ballydavis Interchange, the New Inn Interchange, the Mayfield Interchange and associated link roads. Consideration will be given to the appearance of the lighting installation by day, and in environmentally sensitive areas, the use of a light source which allows colour discrimination will be used.

1.4.18 Bridges & Structures ⁽³⁶⁾

The main impacts of the proposed bridges and structures identified were visual impact, impact on water quality and the affects on river hydrology, e.g. flooding. The likely affect of each structure is assessed in Chapter 8, Volume Two of the Environmental Impact Statement, with mitigation measures addressed in Chapter 11.

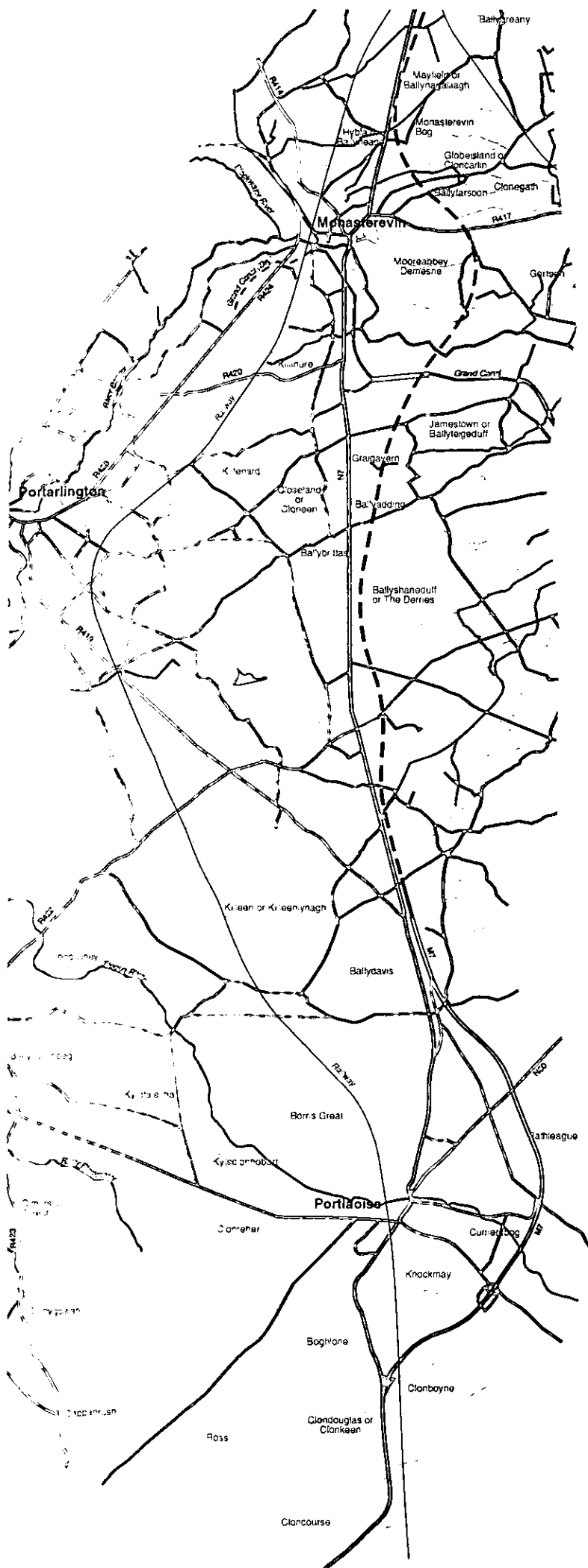
1.4.19 Construction

The construction time for this scheme is estimated between two and a half and three years. During this time residents living adjacent to the proposed scheme and local to access routes will be subject to some disruption resulting from construction activities.

The necessity to import considerable volumes of fill material for the construction of the motorway and in particular the construction of the embankment in the flood plain between the River Barrow and the canal will result in considerable volumes of construction traffic using local roads. This will be controlled/ minimised in the contract.1

In order to comply with the Safety, Health and Welfare at Work (Construction) Regulations, 1995, the contractor will be conditioned to prepare (i) a detailed traffic management proposal in order to minimise the traffic disruption and (ii) method statements in relation to the construction of all structures.

In order to mitigate against the impact of noise pollution from construction plant the works specification will specify hours outside which certain noise levels may not operate. The Specification for the works will further require the contractor to take adequate measures to limit dust.



CHAPTER TWO

Introduction

2.0 GENERAL

Kildare County Council and Laois County Council with the approval of the National Roads Authority entered into an agreement in accordance with the provisions of Section 59 of the Local Government Act 1955 as amended by Section 14 of the Roads Act 1993⁽⁷⁾. The effect of this agreement is that Kildare County Council has undertaken the preparation of the Motorway Order for the proposed Scheme.

Kildare County Council has prepared a scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge and proposed Kildare Town Bypass Motorway with the 13km of Portlaoise Motorway already constructed

The proposal is shown diagrammatically on Figure 1, titled "Proposed Heath/Mayfield Motorway" and described in greater detail in Section 4.

2.1 PURPOSE OF SCHEME

The National Road Needs Study, published by the National Roads Authority in July 1998⁽¹⁾, states as its target "the development of the National Primary and Secondary Road System in order to ensure that no section of the network would fall below "level of service D" (LOS D) equivalent to an inter-urban travel speed of 80kph.". The provision of the Heath/Mayfield Motorway Scheme is listed as one of the Schemes required in order to achieve this target.

The proposed scheme will form part of an overall network which will provide a continuous motorway link from the N7 and N8 south of Portlaoise to Naas and a continuous Dual Carriageway link from Naas to the M50 Dublin C ringroad.⁽¹⁾

The proposed scheme will provide safer driving conditions for both local road users and the long distance motorist. The reduction of traffic through the local towns and villages will relieve traffic congestion and greatly enhance the living environment of the by passed towns.

2.2 EUROPEAN CONTEXT

The proposed route forms part of Euroroutes E20 and E201 (Shown on Map 1) and is part of the Trans European Road Network.

2.3 NATIONAL CONTEXT

The proposed motorway forms part of the Southwest Road Corridor. This road corridor links the cities of Dublin, Cork and Limerick. It provides access from Counties Clare, Limerick, Kerry and Cork, important tourism areas, to Dublin Airport and the Seaports of Dublin and Dun Laoghaire. It further links Dublin Airport and the Seaports to the airports in Cork and Shannon the Seaport at Cork and Foynes.

The proposed scheme, in addition, provides ease of access to the Midland Counties of Tipperary, Offaly and Laois.

2.4 DEVELOPMENT PLAN

The National Road Needs Study⁽¹⁾, identifies the scheme as part of the N7 Dublin-Portlaoise-Limerick, Section 1-Dublin to Portlaoise as follows:

“ The outstanding section is between Monasterevin and the Portlaoise Bypass, where a 2 x 2 lane divided motorway is required linking the southern end of the Kildare Town Bypass to the completed Portlaoise Bypass. This scheme is included in the backlog phase needs and is at present being advanced to completion”.

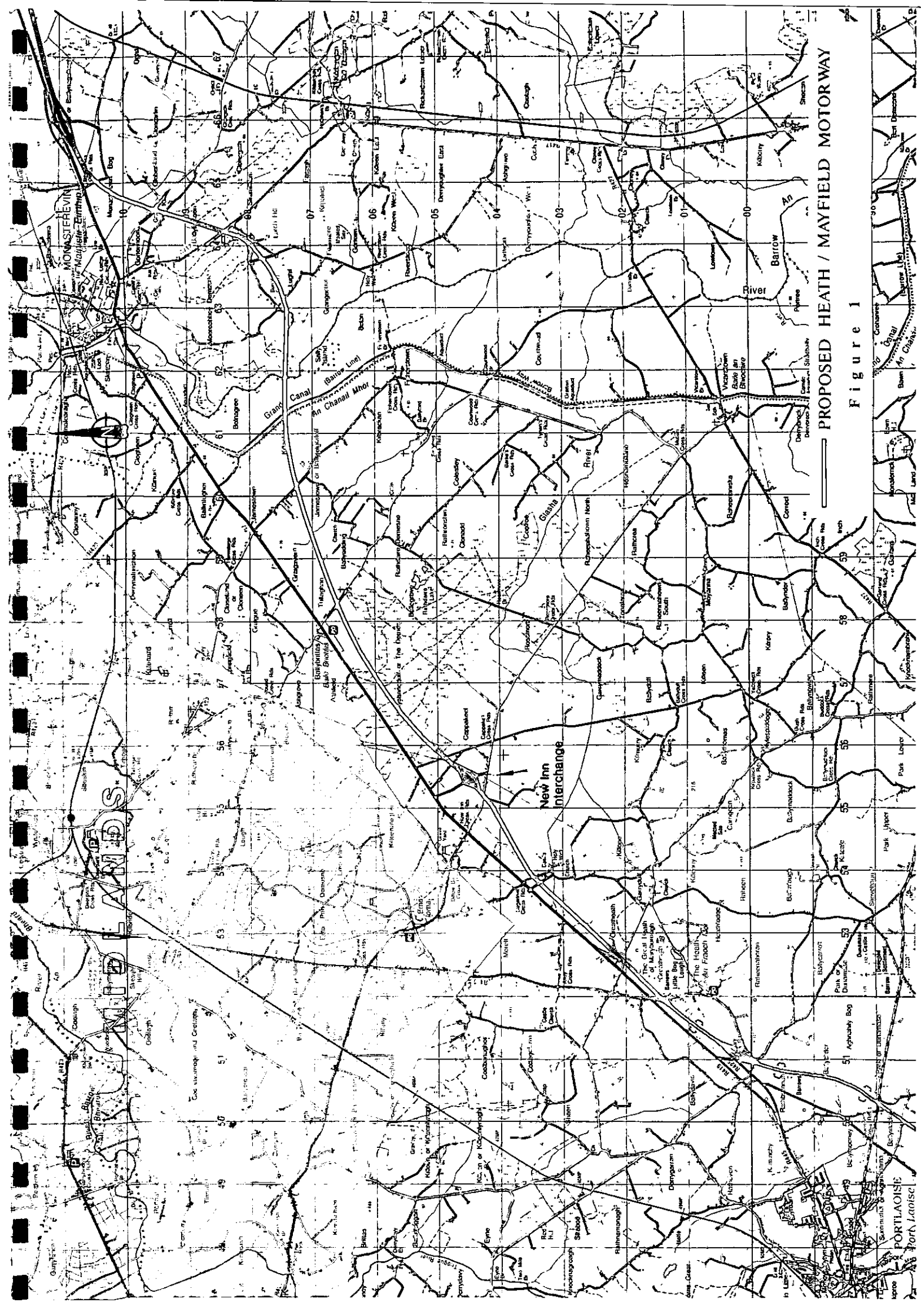
The current document, used as part of the governments application for assistance from the European Regional Development Fund, titled “The Operational Programme on Peripherally, Roads and other Transport Infrastructure, Ireland, 1994-1999”⁽²⁾, Annex 3, refers to the project under the indicative list of projects in planning which will be considered for construction in the period 1994-1999.

Its predecessor “The Operational Programme on Peripherally, Roads and Other Transport Infrastructure, Ireland, 1989-1993”, Annex 3 refers to the project as “N7 DUBLIN/LIMERICK, Kildare/Portlaoise (Kildare) New motorway from Kildare Bypass to Portlaoise Bypass”.

In terms of local planning and development the County Councils of Kildare and Laois have included for the scheme in their respective Development Plans. The current County Development Plan of Laois County Council, (1991)⁽³⁾, lists the “Monasterevin-Portlaoise Motorway”. as a specific objective under its Design and Reservation of Land section.

The current Kildare County Council Development Plan 1999⁽⁴⁾ lists as one of its specific road objectives the design and construction of “a motorway from Hybla to the Heath, bypassing Monasterevin, in co-operation with Laois County Council, as part of the National Motorway Network”.

Accordingly, National and Local forward planning policy clearly requires provision of a link to motorway standards.



PROPOSED HEATH / MAYFIELD MOTORWAY

Figure 1

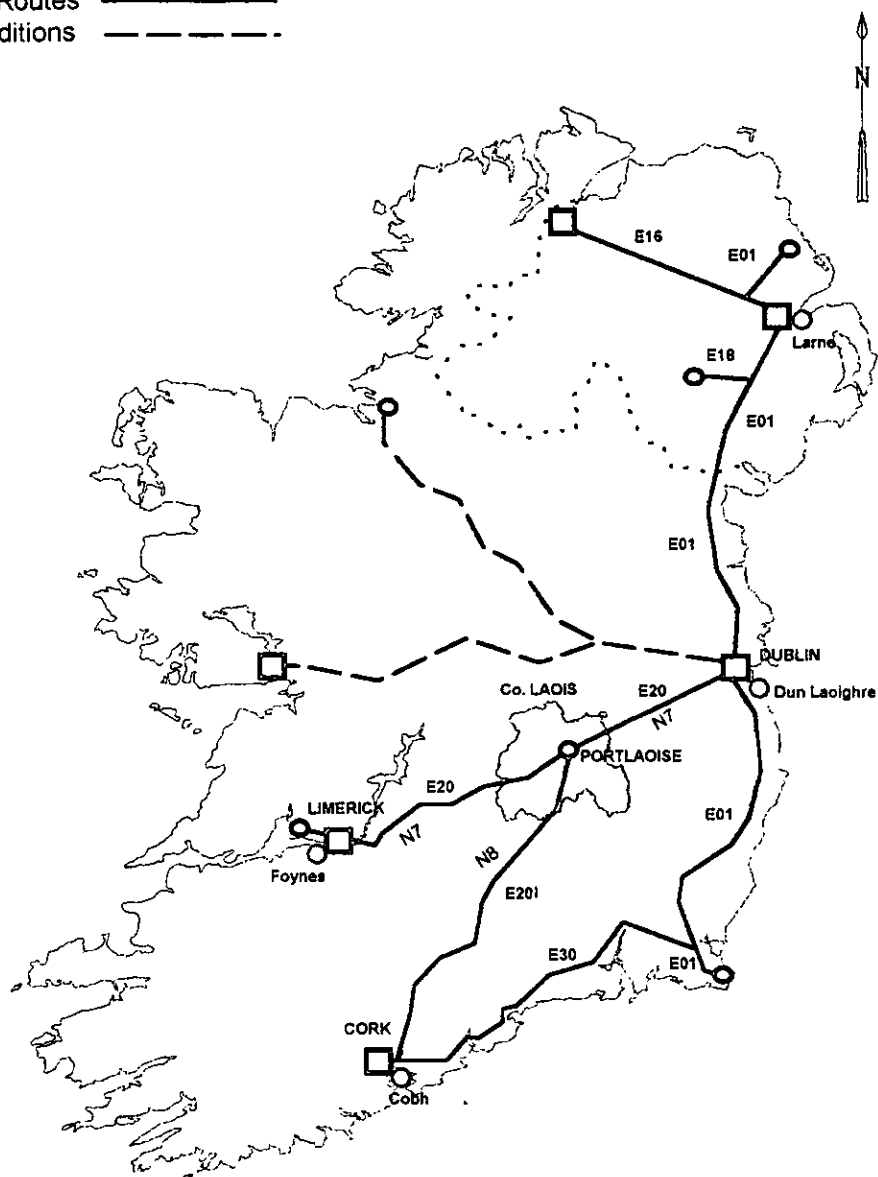
Provisional Routes _____
Possible Additions _____

Provisional Routes

Possible Additions

Cities

○ Ports



MAP 1 'E' ROUTE SYSTEM

2.5 LEGAL REQUIREMENTS

This Environmental Impact Statement (EIS) is prepared in accordance with EC Directive 85/337 as transposed into Irish law by the Roads Act 1993(7).

The Roads Act 1993, Section 50, stipulates a list of scheme types which require an Environmental Impact Study prior to submission to the Minister for Local Government and the Environment. This scheme as proposed is one such scheme. The Act in Section 50(2) sets out the information which shall and may be contained within the Environmental Impact Statement and requires that the statement be submitted to the Minister when approval is being sought for the proposed road development.

As per Section 51 of the Roads Act 1993, copies of this report will also be sent to the Secretary of the Department of Arts, Heritage, Gaeltacht & the Islands; the Commissioners of Public Works in Ireland; Bord Fáilte Éireann; An Taisce; An Comhairle Ealaíon; The National Roads Authority and the local authorities of Laois County Council and Offaly County Council. In addition the report will be furnished to the Barrow Drainage Board and the South Eastern Fisheries Board. It will also assist affected landowners and the general public to assess the impact of this proposed development.

This Environmental Impact Statement will be submitted to the Minister for the Environment and Local Government together with the Motorway Order.

The following is a synopsis version of both the Council's findings and the submissions of the Consultants. The full text of all reports is available at Kildare County Council's offices at St. Mary's Naas, Co. Kildare. Copies may be obtained in return for the cost of production.

2.6 STATEMENT STRUCTURE

The structure of the statement is as follows:

- **Volume 1**
Non-Technical Summary
- **Volume 2**
Environmental Impact Statement (including a repeat of the Non-Technical Summary)
- **Volume 3**
Environmental Impact Statement Drawings
- **Volume 4a, 4b, 4c, 4d, 4e**
Reference reports and data used in the compilation of the statement. The reference reports contained in these Volumes are as follows:
- **Volume 4a and 4b** **Preliminary Route Selection Reports**

Volume 4a *Reports on Route Selection, Traffic, Accident Analysis, Socio-Economic.*
Volume 4b *Reports on, Heritage, Flora and Fauna, Noise, Soils, Receiving Waters, Landscape, Soils & Agriculture, Archaeology, River Barrow Crossing.*
- **Volume 4c, 4d and 4e** **Preferred Route Reports**

Volume 4c *Reports on Traffic, Noise, Air Quality, Socio Economic, Planning & Development, and Bloodstock.*

Volume 4d *Reports on Agriculture, Geotechnics, Water and Human Beings, Receiving Waters, Portlaoise Aquifer*

Volume 4e *Reports on Landscape, Tree and Wood Survey, Flora & Fauna, Archaeology, Public Lighting, Bridges and Structures and Cost Benefit.*

3. BACKGROUND TO PROJECT

3.1 NEED FOR THE SCHEME

Prior to embarking on any scheme of this nature it is important to establish a need for such a scheme and an analysis to establish the best scheme to provide.

3.1.1 Adequacy of the Existing N7

The existing N7 route between the Heath and Mayfield consists of a two-lane single carriageway road. Upgrading of sections of the original N7 route has taken place in the past. The present N7 route is deficient in many respects. These deficiencies can be summarised as follows:

a) Traffic / Capacity

- The capacity of a road is the volume of traffic it can carry for given operating conditions. The National Road Needs Study sets out the minimum acceptable standard for national primary road capacity as Level of Service D (LOS D), which would be an average interurban speed of 80 km/hour. A travel time survey carried out by Kildare County Council in February and March 1999 indicates that during week days the existing road capacity is as Level of Service E, which would be an average interurban speed of 72km/hour for a two lane road. Passing conditions associated with LOS E become impossible with intense platooning.*

It should be noted that the average weekend travel time drops to 45km/hr and this LOS results in traffic congestion which is experienced in Monasterevin and Ballybrittas.

- The capacity of the existing road to carry traffic varies from section to section but ranges from 700pcu/hr to 1300pcu/hr (this excludes Monasterevin town) for the target interurban speed of 80km/hr. Hourly traffic figures regularly exceed these figures, resulting in delays.*
- The N7 passing through Monasterevin carries an AADT of 14,303 vehicles per day. Kildare County Council estimate that the N7 passing through Monasterevin is only capable of providing an acceptable level of service up to an AADT of between 7000 and 8000 vehicles per day. The National Primary route conflicts with normal activities in Monasterevin such as on street car parking, the signal controlled pedestrian crossing, passengers embarking and disembarking from buses. The same problems occur to a lesser extent in Ballybrittas.*
- The number of junctions and the access to extensive road side development reduces capacity on the N7. There are 20 minor road junctions on the N7*

between the Portlaosie Bypass and the proposed Kildare Town Bypass. Of these 4 are Regional Route which generate large numbers of turning movement. Each turning movement reduces the safety and capacity of the N7.

- *Speed limit restrictions in Monasterevin and Ballybrittas reduce the speed of traffic and contribute to the increase of overall journey times for drivers. These increased delays contribute to road user frustration and reduce the level of safety on the road.*

b) Geometric / Engineering

- *The existing N7 Route is deficient both horizontally and vertically in some locations.*
- *The carriageway widths vary along the existing N7 and overtaking is limited to specific areas.*
- *Reduced carriageway width as the road passes through Ballybrittas and Monasterevin.*
- *Poor vertical alignment at Morett which results in poor visibility at the Sugarloaf Crossroads. This creates a hazardous junction and prevents overtaking.*
- *Poor vertical alignment also exists at New Inn Crossroads where the R422 intersects the N7.*
- *At grade junctions requiring right turning lanes to serve the R417, R420, R422 and the businesses in New Inn. These right turning lanes also prevent overtaking.*

c) Pavement

- *There is evidence of extensive rutting and potholing on the route.*
- *A Dynaflect survey has shown that for significant lengths the pavement and subgrade are below the recommended limits of structural strength.*
- *The present pavement is unsuitable for the increased vehicle weights allowed by the EU.*

d) Safety

- *All the items mentioned above affect the operating safety of the route.*
- *Laois County Council carried out a study of the frequency of accidents along the existing N7 in 1994. The personal injury rate (including fatalities) between the Heath and Mayfield in 1991 was 0.13 accidents/10⁶ vehicle kilometres. Comparable figures for the N7 as a whole are 0.15 accidents/10⁶ vehicle kilometres.*
- *The fatal accident rate from the Heath to Mayfield was calculated at 0.035 fatalities /10⁶ vehicles kilometres as compared with the figure of 0.012 fatalities /10⁶ vehicle kilometres for the N7 as a whole.*

e) Environment

- *The occupiers of the properties, which front onto the N7, suffer from noise pollution, air pollution and visual intrusion of heavy traffic.*
- *Community Severance is increased due to the large volumes of traffic traversing the streets of the towns and villages along the N7.*

From the foregoing it is clear that the existing roadway between the Heath and Mayfield is not suitable to cater for the present and future needs of traffic on the N7 National primary Route.

3.1.2 Design Standard

A single carriageway road of any standard would not have sufficient capacity to cater for the present and predicted traffic flows. A standard dual carriageway would provide capacity for a maximum upper level of 44,100 vehicles per day providing a level of service D (National Road Needs Study)

However, the council has decided that a road to motorway standard should be provided for the following reasons:

a) Existing Road Network.

The proposed Motorway forms part of the Southwest Road Corridor. This road corridor links the cities of Dublin, Cork and Limerick. It consists of Euroroutes E20 and E201 and is part of the Trans European Road Network. The National Roads Needs Study 1998 identifies the future road type as motorway.

As Map 2 shows the proposed road, 17.5km in length, will link the 30-km Naas, Newbridge, Kildare Motorway with the 13km of Portlaoise Motorway already constructed. A motorway is the appropriate link, for route continuity purposes.

b) Route Selection

The Heath/Mayfield Motorway Scheme, Preliminary Route Selection Study, 1995, compiled by Laois and Kildare County Councils⁽⁹⁾, identified the requirement for a motorway link as opposed to an all purpose dual carriageway for the following reasons:

- *“ The accident rates for motorways are lower.*
- *The capacity of the road would be preserved for a greater number of years.*
- *On completion of the M7 Kildare Bypass, there will be a continuous stretch of motorway 30km long to the east of the scheme. In addition, to the west of the scheme the M7 Portlaoise Bypass Motorway is 13km long. To have a section of dual carriageway with lower permitted speeds and design standards joining these two lengths of motorway would create a hazard as drivers might not appreciate the change in type of road and continue to drive at motorway speeds. Linking the two motorway sections would create a continuous motorway 60km long*
- *Provision of a motorway is stated national policy.”*

The above report conclusions were written in 1995 and were in the main based on information and data compiled in 1993. The present traffic report titled “Heath/Mayfield Traffic Study, McMahon Design and Management Ltd.⁽¹⁹⁾,” commissioned in 1998 has furthered and reinforced the arguments in favour of providing a roadway to motorway standards. Applying traffic growth rates in accordance with the “National Roads Need Study”, published by the National Roads Authority⁽¹⁾, the predicted traffic volumes for the design year 2024 are as high as 37,000 vehicles per day an increase of 27% on previous traffic prediction volumes.

c) Safety

A road, constructed to motorway standard, would provide a significantly safer facility. The development of the route to Motorway standards would maintain operating speeds, level of service and uniformity of driving conditions. The elimination of turning movements and roadside access/cross road movements would further enhance levels of safety. If Heath/Mayfield were to be constructed to a lower standard, this would introduce a discontinuity and possible hazard in the network

The National Road Needs Study identifies, from an engineering perspective three safety principles "which should reduce the probability of encounters with implicit risk". These three safety principles are: -

- *Functional use of the road network, preventing unintended use*
- *Homogeneous use, by preventing large differences in vehicle speed, mass and direction of movement.*
- *Predictable use, preventing uncertainty among road users by enhancing the predictability of the road's course and enabling the behaviour of fellow road users to be anticipated."*

The introduction of a section of dual carriageway linking two roads constructed to motorway standard would reduce the safety of this stretch of road and enhance danger for the road user.

d) Traffic Considerations.

The current (1999) Annual Average Daily Traffic (AADT) on the N7 at The Heath is 14,335 and at Mayfield is 15,530.

Traffic growth rates based on the Road Needs Study project AADT figures for 2024 in the region of a low estimate of 32,040 to 34,264 and an upper estimate of 37,400 to 40,000. The HGV content would be 15%. Table 3.1.1 illustrates the growth of traffic along the N7 since 1988 and gives the predicted growth to the design year of the scheme 2024.

Construction to motorway standard will preserve road capacity for longer. Side interference is prohibited and access will be allowed only at interchanges, thus minimising factors, which would lower capacity and level of service.

e) Socio-Economic Considerations

The proposed scheme enhances road transport links serving industrial and tourism requirements in the Midland region. Provision of a link to motorway standard optimises that service.

The benefits of a vibrant and expanding tourism sector are-

- (1) An increase in employment due to the labour intensive nature of the industry and its strong growth prospects.*
- (2) An increase in local tourism earnings.*

(3) The high multiplier effect on local economic activity.

(4) The spatial dispersion and sectoral diffusion of benefits which make tourism a critical element in regional policy and development.

Accessibility is a key factor in the successful development of tourism. A motorway link, together with an interchange at New Inn optimises accessibility and consequential benefits to the Mid-Ireland Region.

Accordingly, the proposed Heath to Mayfield route is designed to Motorway standards.

PREDICTED TRAFFIC VOLUMES M7

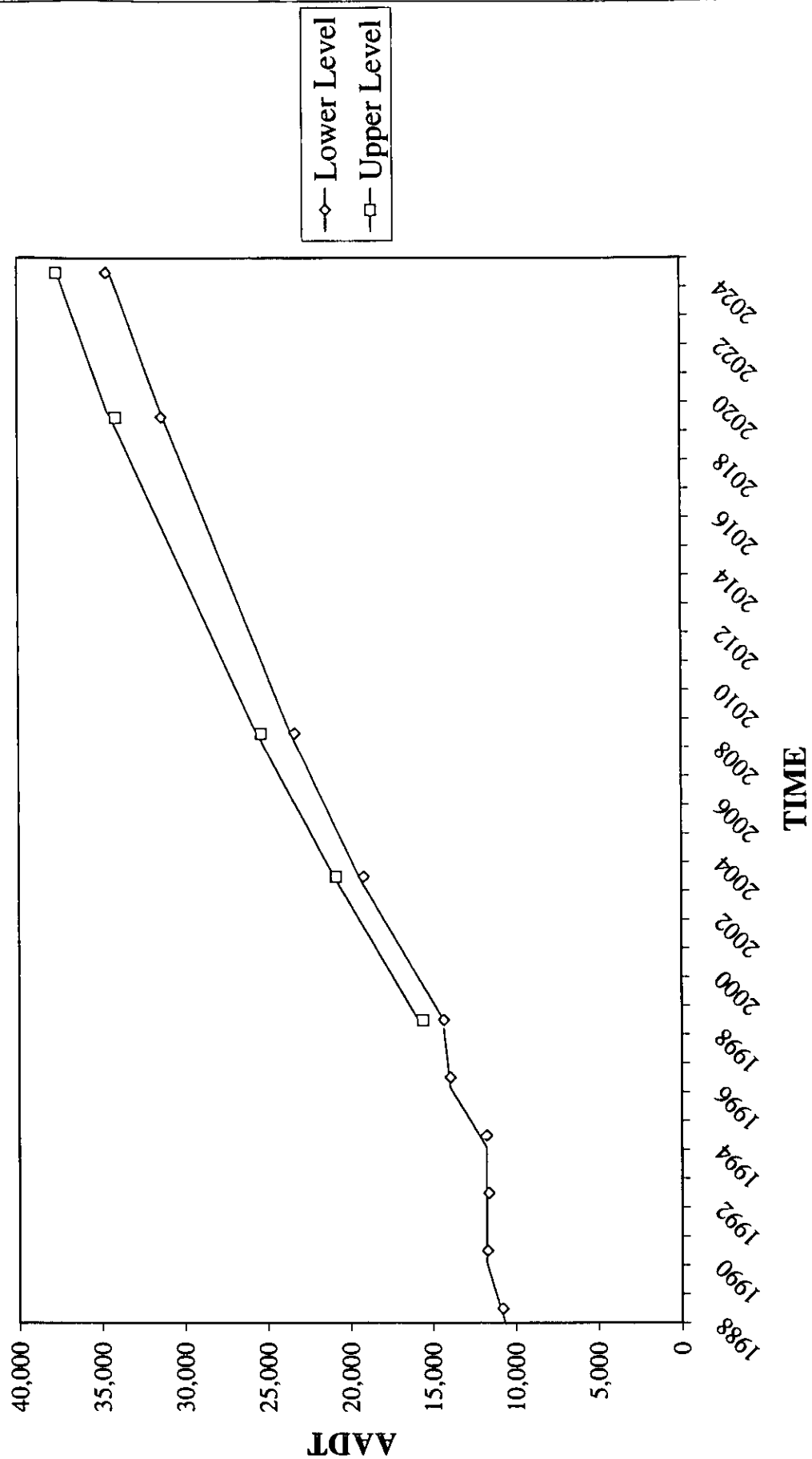


Table 3.1.1

3.2 ROUTE SELECTION

Kildare and Laois County Councils jointly undertook the route selection process. The result of this collaboration is the "Heath/Mayfield Preliminary Route Selection Study, Laois & Kildare County Councils"⁽⁹⁾ written in 1995. That report examines various route options and concludes with the selection of the optimum route.

This section gives a synopsis of the route selection process. More details of the route options considered and the selection of the optimum route are given in Chapter 5 and Chapter 6 of this report.

The study area was defined on the Western end by the Heath, near the terminus of the Portlaoise Bypass and at the Eastern end by the proposed interchange at Mayfield which will be partially constructed as part of the proposed Kildare Town Bypass. The study area extended north and south of the N7, a distance of approximately 2.5km in either direction. The area north of the N7 was defined as the Northern Corridor and the area south of the N7 was defined as the Southern Corridor.

For evaluation purposes, 2 feasible lines for the motorway were identified in the northern corridor, N1 and N2 and 3 feasible lines S1, S2 and S3 in the southern corridor. Rather than compare all of these routes individually the Northern and Southern Corridors were first compared to select the superior corridor. For comparison purposes the corridors were evaluated under the headings below.

- *ENGINEERING CRITERIA*
- *RIVER BARROW CROSSING LOCATION*
- *IMPACT ON THE LANDSCAPE*
- *IMPACT ON AGRICULTURE*
- *IMPACT ON THE NATURAL & CULTURAL HERITAGE*
- *COST*
- *SOCIO-ECONOMIC IMPACT*

3.3. CORRIDOR DESCRIPTIONS

3.3.1 Southern Corridor

The Southern Corridor stretches from the townland of Great Heath, Co. Laois to the townland of Mayfield, Co. Kildare. The essential feature of all routes in this corridor is that they pass to the south of Monasterevin. As these routes also start and end to the south of the existing N7, no routes in this corridor cross the existing N7. Consequently the Southern Corridor is bounded to the North by the N7. Figure STH/01 illustrates.

Heading eastwards from the terminus of the M7 Bypass of Portlaoise, Southern Corridor Routes cross Local Road L-7815. From here Southern Corridor Routes can stay close to the existing N7 or move south into open countryside.

All Southern Corridor Routes must cross Local Roads L-3817 and L-3930 while avoiding the residential development along these roads.

Further East after this they encounter the Derries Wood which is an extensive commercial conifer plantation operated by Coillte. Preliminary site investigation indicated that the Derries Wood is underlain with peat. Peat depths increased to the south of the wood. The wood also contains herd of fallow deer. Routes, which stay close to the N7, avoid the deeper peat and minimise the severance of both the wood and the territory of the resident deer.

After leaving the Derries Wood Southern Corridor Routes cross Local Road L-3931 which leads into Ballybrittas. There is extensive residential development and a church along this road.

Southern Corridor routes then cross relatively open countryside before crossing Local Road L3932 which leads into Jamestown. Again there is extensive residential development along the Jamestown Road. A major turkey hatchery is also located on this road.

From Local Road L-3932 Southern Corridor Routes moves to the extreme south of the study area. This is to avoid the following obstacles:

- Motorway lines approaching Monasterevin between Portmurraghan Island and the existing N7, would involve a difficult extreme skew angle crossing of the Grand Canal and the River Barrow.*
- Routes crossing Portmurraghan Island would require two crossings of the River Barrow or an alteration of the course of the River Barrow.*
- Ideally the line of any Motorway Route should avoid the urban area of Monasterevin as defined by the development area shown in the 1999 Kildare Development Plan.*

- *Adjacent to the town of Monasterevin, to the south, is Hill Wood where the topography rises to a level of 120m OD. This is significantly higher than the surrounding countryside. Preliminary designs indicated that the geometric requirements of a motorway would have resulted in cut depths of over 20m on any route near to the summit.*

These factors when considered together indicate a requirement that any route in the Southern Corridor would lie to the south of Monasterevin Town.

After crossing Local Road L-3932 Southern Corridor Routes will be required to cross the Grand Canal and the River Barrow on an embankment. The ground between the Grand Canal and the River Barrow is the lowest in the Study Area. The Southern Corridor then enters County Kildare in what was formerly the Demesne of Moore Abbey in the townland of Lughill.

In County Kildare the Southern Corridor passes through open farmland and wooded areas. The southern corridor is low lying when compared to the northern corridor. As such the land quality in the area is dependent on good artificial drainage. Residences along Local Roads LT-70571, LT70572 and LS-07057 must be avoided.

Having crossed the R417 Southern Corridor Routes swing sharply northwards to tie into the terminus of the M7 Bypass of Kildare at Mayfield. In doing so the Southern Corridor crosses Local Roads LS07056 and LS07055.1 avoiding the residences located along these roads.

Southern Corridor Routes can then tie into the Western Terminus of the M7 Kildare Bypass. This tie in must be to the west of the proposed overbridge at Mayfield to avoid the reconstruction of this overbridge.

3.3.2 Northern Corridor

The Northern Corridor stretches from the townland of the Great Heath, Co. Laois to the townland of Mayfield, Co. Kildare. Figure NTH/01 illustrates. The essential feature of all routes in this corridor is that they pass to the north of Monasterevin. As Portlaoise Bypass lies to the south of the N7, routes in the Northern Corridor must at some point cross the existing N7 before they reach Monasterevin. This crossing point may occur at any point along the N7 up to and slightly east of Jamestown. Any motorway line approaching Monasterevin between Portmurraghan Island and the existing N7 would involve a difficult extreme skew angle crossing of the Grand Canal and the River Barrow.

If a Northern Corridor Route crosses the existing N7 at a point to the west of Ballybrittas it will either pass through or be contiguous with the Emo Court Estate. This estate is owned by Ducas and it is intended to develop the house and grounds into a significant tourism attraction and item of cultural heritage. Work on the house has already

commenced and Duchas are now working on the revitalisation of Emo Lake. Passing any route close or through Emo Court Estate would impact visually on the Estate.

Should a Northern Corridor Route cross the existing N7 at a point to the west of Ballybrittas it will pass through the Derries Wood, as do the Southern Corridor Routes. Such a route would then have to cross the existing N7 without encroaching on Ballybrittas or Jamestown. The most suitable point to do this would be at the location where the existing N7 passes through the Derries, as there is little roadside development.

Having crossed the existing N7 the Northern Corridor Routes pass through good agricultural land. As a result routes in the Northern Corridor would have a more significant impact on agriculture.

The Northern Corridor also contains settlements at Pound Cross Roads and Killenard which should be avoided. The Local Road Network in this area is extensive and overpasses or underpasses would be required to minimise severance.

Approaching Monasterevin from the west, Northern Corridor Routes must cross the R420. To the east of the R420 ground conditions become poorer from a geotechnical aspect making road construction more difficult.

As routes in the Northern Corridor approach Monasterevin from the west they must make their first crossing of the Dublin to Cork/Galway railway line. As the Northern Corridor bypasses Monasterevin to the north it enters an area of numerous existing bridge structures. Pass Bridge carries the R424 over the River Barrow on the northern side of Monasterevin. The Barrow Line of the Grand Canal (also known as the Athy Branch) is carried on an aqueduct across the River Barrow. On the west bank there is a branch of the Barrow Line to Mountmellick and Portarlinton. The main Barrow Line of the Grand Canal travels south and is navigable. The Mountmellick and Portarlinton branch travels in a northwesterly direction and is no longer navigable. There are two road bridges over the Mountmellick and Portarlinton Branch immediately to the west. When the Cork Dublin Railway line was constructed at Monasterevin it was elevated over the Barrow Line of the Grand Canal. It then had to cross over the River Barrow on a second bridge. Finally it crosses the Mountmellick and Portarlinton Branch of the grand Canal on a third Bridge. As the canals were already elevated over the surrounding countryside the railway is on a substantial embankment in this area.

The motorway must cross the River Barrow on a bridge with sufficient clearance for navigational purposes. Due to its proximity to the Grand Canal and the railway the motorway must also pass over the canal and the railway. The implication of this for routes in the Northern Corridor is that they will require substantial embankments (approximately 13m high) to carry them over the railway which must be crossed twice. Such embankments close to residential and the amenity areas of the canal and river would greatly impact on the area.

Having crossed the railway for the first time Northern Corridor Routes must then cross the Mountmellick and Portarlinton Branch of the Grand Canal. Between the railway and the Portarlinton Branch of the Grand Canal is an area of Bog.

Ideally any route should avoid the urban area as defined by the development area shown in the 1999 Kildare Development Plan. This pushes routes northwards and requires a crossing of the Black River in addition to the River Barrow. Ground conditions between the two rivers would make construction difficult thereby increasing costs for such a structure.

The alternative is to move southwards and infringe on the urban area to the north of Monasterevin. It would then be possible to avoid crossing the Black River and avoid passing through the area of bog and the difficult ground between the two rivers. For this reason, considering bridge foundations only, the area immediately to the north of Monasterevin is the most favourable in the Study Area for a bridge crossing of the River Barrow. Thus the Northern Corridor area includes a route which infringes the urban area to the north of Monasterevin.

Having crossed the River Barrow, Northern Corridor Routes swing sharply to the Southeast in order to tie into the proposed Mayfield interchange on the M7 Bypass of Kildare. In so doing they would cross the main Barrow Line of the Grand Canal and then cross the Dublin to Cork/Galway railway line for the second time. There would also be a number of road crossings in this area.

Northern Corridor Routes can then tie into the Western Terminus of the M7 Kildare Bypass. This tie in must be to the west of the overbridge at Mayfield to avoid the reconstruction of this overbridge.

3.4 NORTHERN AND SOUTHERN CORRIDORS EVALUATION

3.4.1 Engineering Criteria

There are significant difficulties associated with constructing a motorway passing close or through the northern environs of Monasterevin. The most significant disadvantage of any route in the Northern Corridor is the need to cross the Dublin to Cork/Galway railway line twice and the height of embankments that would be required to do this.

The area to the north of Monasterevin is laden with existing bridges and the scale of the engineering work required to construct a motorway in their vicinity would be substantial.

The two routes identified within the Northern Corridor N1 and N2, shown on Figure 3, require the construction of 21 and 18 bridges respectively. The embankments associated with these structures would be visually intrusive on the town of Monasterevin. Route N2, the closer route to the town contravenes the Kildare Development Plan with respect to the development zone. It also contravenes the plan in respect of preserving views from the existing Barrow Bridge.

Ground conditions deteriorate further north of Monasterevin. For this reason a more northerly route was rejected.

The Southern Corridor does not have the same disadvantages as the Northern Corridor. There is no crossing of the railway line required and each southern route is south of the large residential areas of Monasterevin. The southern routes require a maximum of 12 structures and as such would be at least 30% cheaper to construct.

3.4.2 River Barrow Crossing

The proposed Heath/Mayfield Motorway Scheme Bypasses the town of Monasterevin. This necessitates a crossing of both the River Barrow and the Barrow Navigation arm of the Grand Canal.

Roughan & O'Donovan consulting engineers were appointed by Kildare County Council to advise on the suitability of bridging points of the River Barrow North and South of Monasterevin.

The most suitable location for a crossing of the River Barrow was identified as the area immediately North of Monasterevin. In this area, at the southern end of the Northern Corridor, overburden thickness' are low, with rock lying at depths of from 3m to 7m giving rise to favourable bridge foundation conditions.

A crossing at this point, however, would be unsatisfactory for a number of reasons. Such an alignment would have to cross the main Dublin to Cork railway line, both east and



VIEW OF BRIDGES NORTH OF MONASTEREVIN

west of the town, the Grand Canal to the north of the town, and the Mountmellick branch of the canal to the west. Additionally a number of road crossings, in and around Monasterevin, would be required.

The existing railway line lies on an embankment of 5m high. In order to traverse the railway line with appropriate clearances an embankment of approximately 12m high would be required. The construction of such an embankment in close proximity to the town would be unsatisfactory in terms of environment and visual intrusion impacts.

An alignment commencing at Mayfield would cross the railway line at a high skew angle thus increasing costs of construction.

On the basis of technical, economic and environmental considerations it was concluded that a route through the south part of the northern corridor would be inappropriate.

An alignment further north within the northern corridor would be less intrusive visually but a high embankment would still be required to cross the railway line. Two river bridges would be required in addition to crossings of the Grand Canal and Mountmellick Canal crossing and the bridges crossing a number of roads. Ground conditions between the two rivers are likely to be difficult and site investigation works indicate that the ground conditions deteriorate further north of Monasterevin Town.

For the reasons outlined Roughan and O' Donovan did not consider an alignment through the Northern Corridor to be appropriate.

Ground conditions within the Southern Corridor are not uniform. The geophysical and borehole investigation undertaken indicated that there were no specific areas that should be avoided. However, it was felt that the alignment should avoid placing bridge abutments which would coincide with former sections of river channel, filled in as part of channel straightening in the 1930s.

The River Barrow and Grand Canal within the Southern Corridor are removed from densely developed areas thus lessening the impact on a large number of residences. The number of minor roads to be traversed within the southern corridor is also greatly decreased when compared with the northern alignments, thus reducing overall costs.

3.4.2.1 Conclusion

It is preferable to locate the crossing point of the river outside of areas downstream of major river bends, as erosion of embankment toe is likely to be more severe in such situations. If a crossing point in one of these locations cannot be avoided, then positive measures will have to be taken in order to protect the embankment toes.

The River Barrow is subject to flooding in both the Northern and Southern Corridors. The question of flood discharges will be a factor for a crossing in either location, and consequently from this point of view there is no obvious advantage in locating the bridge

either to the north or south of Monastervin. However, a motorway alignment in the Northern Corridor will have to cross both the Barrow and Blackwater Rivers.

The southern section of the northern corridor area is probably the most suitable crossing point of the river, from a purely geotechnical perspective. However, an alignment crossing the river in this area is unsatisfactory for the following reasons:

- a) A greater number of bridge structures would be required, in order to cross the railway line east and west of the river, the canals (Athy and Mountmellick branches), plus a number of roads at the northern end of the town.*
- b) The height of the railway embankment dictates that a motorway embankment would need to be at least 12m high to provide minimum clearances, thus constituting a major visual intrusion on the landscape.*

Ground conditions are less favourable to the north of the northern study area. Overburden depths are greater, with unconsolidated alluvial deposits evident along the river banks, and soft material in the zone between the two river channels. Additionally, two river crossings, one of the Barrow and one of the Blackwater would be required.

Overall, the southern envelope is clearly the better location for a river crossing. Ground conditions in this area are characterised by two distinct zones:

- Boulder clay and gravel*
- Softer, higher clay content strata.*

The River Barrow lies within the former zone in the northern sector of the Southern Corridor, and as such ground conditions along this stretch of river are likely to be better than further south.

In conclusion, the southern corridor was identified as a better location for the River Barrow Crossing.

3.4.3 Landscape

Murray and Associates assessed the landscape impact of the proposed scheme within the Northern and Southern Corridors.

3.4.3.1 Northern Corridor

The landscape North of the Heath is of medium scenery. The topography is gently undulating, rising to the east, and generating panoramic views to the southeast.

Emo Village is of high scenic quality. It comprises of gently undulating parkland, with clumps of mature trees together with blocks of deciduous woodland. In terms of visual amenity this area is significant.

Emo Court and its surrounding parkland has been acquired by the State and is a nationally important historic parkland landscape. The local community also uses the parkland as an amenity area.

The landscape northeast and north west of Ballybrittas Old Village is composed of high quality parkland and farmland. There would be significant impact resulting from the location of the route in this area from a visual amenity perspective.

To the north of Monasterevin town the landscape is composed of medium-high scenic quality. The areas of landscape associated with the Grand Canal, River Barrow and Black River are of high scenic quality. The pedestrian links between these features and the town of Monasterevin are significant in terms of their scenic amenity.

The landscape north east of Monasterevin town comprises of medium-low quality landscape. There is some commercial forestry in the area. The golf course located off Porters lane is of value to the local area in terms of amenity.

3.4.3.2 Southern Corridor

The landscape within the Southern Corridor is lower lying than the northern corridor and as such generates more opportunities for the location and mitigation of the proposed scheme.

South of the N7, the landscape east of the Great Heath is low lying consisting of small fields bounded by hedgerows. The landscape in this area is of medium scenic quality.

There are extensive areas of commercial forestry known as the Derries Wood along the exiting N7 between Local Roads L-3817(Cappakeel Road) and local road L-3931 (Ballybrittas Road).

Forest trails within the Derries are utilised by walkers on an occasional basis and any route located within the wood would disrupt this amenity to a minor degree. The only significant impact, which potentially occurs in this area, is the visual impact of the scheme on individual residences located along the minor roads which any southern routes option would traverse.

The landscape south of Ballybrittas village is low quality scenery. The area around Jamestown House, located along local road L-3932 (Jamestown Road) is of medium quality scenery to the west and east.

The area of landscape associated with the River Barrow and Grand Canal is of high scenic quality. This landscape is low lying and predominantly composed of pasture with

blocks of woodland along the eastern edge of the River Barrow. Both of these waterways are significant in terms of their visual amenity value. The visual absorption of these areas is medium in nature, due to the dense vegetation present in the area, which would provide screening of any bridge structures. With mitigation any southern corridor route in this area could be successfully integrated into the landscape.

Mooreabbey Wood forms a distinctive landmark in the landscape directly south of Monasterevin Town. The landscape in the area is of high scenic quality. The wood is located on a hill, known locally as Hill Wood. The visual quality of Hill Wood is such that any development which would cut into the hill, would disrupt the visual balance of the hill, creating a notch which breaks the skyline, and would be impossible to mitigate.

The numerous trails through the woodland which could be severed by any southern corridor alignment are of significant amenity value to the local community.

The landscape to the south of Hill Wood adjacent to the Athy Road comprises of pasture which is of medium scenic quality. The top of Hill Wood slopes gently to the south. This area has medium visual absorption capacity and with correct mitigation, is capable of absorbing the proposed scheme.

East of this area there are three distinct areas of landscape. Kill Plantation is an area of coniferous forest. The scenic quality is low. Cloncarlin House is the next area of interest. The landscape around this house is elevated above the level of the surrounding landscape forming a minor landmark. Finally the area towards Mayfield is low lying and of low scenic quality.

3.4.3.3 Conclusion

Opportunities and constraints for route location within the study areas were identified. Many of the constraints can be mitigated by the appropriate use of screen planting and earthworks, which would integrate the proposed road into the existing landscape.

The northern corridor routes in the vicinity of Monasterevin present many difficulties in terms of their vertical alignment and the potential impact on the landscape resultant from the creation of 7m to 12m high embankments required to traverse the Dublin/Cork railway line.

In addition the northern routes impact on the high scenic areas of Emo Court and Ballybrittas Old. It would not be possible to mitigate many of these impacts.

The southern corridor landscape is generally considered more suitable for route location. Overall, the southern landscape presented the least potential impacts in terms of visual intrusion. It is considered that the location of the route in the southern corridor in association with detailed landscape design would result in a net improvement in the visual qualities of the particular areas.



EMO COURT

3.4.4 Agriculture

The Northern Corridor is generally of a higher elevation than the Southern Corridor, except the Banagher Series through the Kildare County section, which is low lying on both sides⁽¹⁶⁾.

Both corridors cover approximately the same acreage. Tillage and drystock are the predominant types of farming, spring barley and sugar beet being the most popular of crops.

The predomination of the Fontstown Series in the Northern Corridor and its higher elevation, giving rise to more free draining better quality land make the Northern Corridor more suitable for agricultural use than the low lying Southern Corridor. There is approximately 15% more land suitable for good agricultural product in the Northern Corridor when compared with the Southern Corridor.

3.4.4.1 Conclusion

The Northern Corridor contains more free draining land than the Southern Corridor. A route through the Southern Corridor would also impact on less suitable land for farming purposes. For these reasons a route through the Southern Corridor would be preferable.

3.4.5 Natural and Cultural Heritage

A Northern Corridor Route crossing the N7 west of Ballybrittas would impact on Emo Court and its gardens. The Northern route N1 would cause significant damage to the Wellingtonia Avenue within the Emo Court estate and would pass through an active and significant badger set. In addition the embankment height north of Monasterevin Town would detract from the town of Monasterevin.

More known features and areas of interest exist within the Southern Corridor. However, no impacts are severe enough to eliminate the Southern Corridor Routes.

There is almost no natural or semi-natural vegetation within the Corridors. The main areas of interest from an ecological viewpoint are as follows:

- *Emo Court, Wellingtonia Avenue*
- *Barraderra Marsh*
- *Monastervin bog*
- *Flynn's Fen*
- *Dease's Bog*
- *Rathdaire Lake*

- *The Rapparee*
- *Toberkine*
- *The Derries Wood*
- *The Grand Canal*

In conclusion, Northern Corridor routes would have a substantial impact on on the Town of Monastervin. In addition any Northern route crossing the N7 to the West of Ballybrittas would have a substantially impact on Emo Court.

The impacts of the Northern Corridor routes as stated would substantially outweigh any impact of the Southern Corridor routes on the areas of interest listed above.

3.4.6 Costs

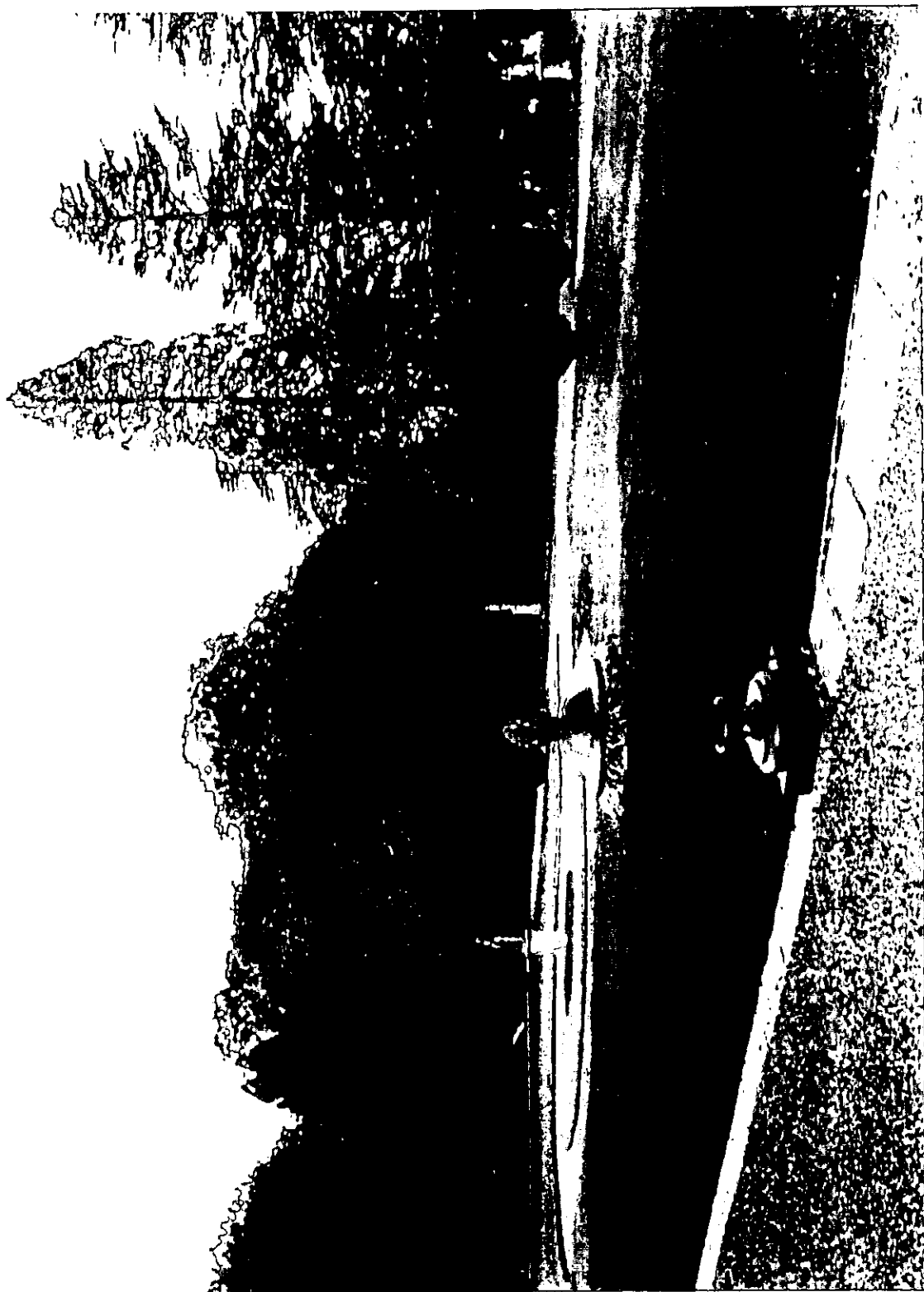
The engineering difficulties associated with Northern Corridor Routes add to their cost. Consequently, preliminary route estimates prepared by Laois County Council in 1994 indicate that any Northern Corridor Route would be at least 30% dearer than any Southern Corridor Route(s).

3.4.7 Socio-Economic Impact

In terms of the Socio Economic impact regardless of the location of the route north or south of the N7 it will impact on some businesses in the potential catchment area. These businesses will experience a fall in turnover due to the diversion of passing trade. Enterprises serving motorists needs, food, drink, vehicle servicing and accommodation are the most vulnerable to traffic diversion. However, employment and expenditure benefits generated during the construction stage of the motorway, bypass and interchange will accrue regardless of the location of the project with the Northern or Southern Corridors.

Reids and Associates were engaged to undertake a study of the Socio-Economic impact of the proposed scheme on the communities affected by it(s). As part of the study a survey was undertaken to identify the number of different land uses within the corridors including businesses providing services to passing traffic and motorists, such as food, drink, petrol and accommodation.

The survey was made up of two parts a postal questionnaire and a structured interview. The purpose of the interviews was to gain some insight into perception of the potential impact of the proposed scheme and to ascertain preferences if any for a route path either to the north or south of the town and existing N7 national primary route.



EMO COURT - WELLINGTONIA AVENUE

3.4.7.1 Views On Alternative North and South Bypass Corridors

On balance those who responded in the social groups sector tended to favour a northern corridor because it would minimise severance, expressed as disturbance/disruption of population, and because of the lower scenic quality of the area to the north of the town.

Those favouring a corridor to the south did so because of the possible severance of a school catchment from the north and the perception that a southern alignment would be more direct or shorter.

The industrial and professional services group also had a high level of non-response. Those responding tended to favour a southern alignment on the basis that it would be more direct and, in the view of one respondent, cheaper to construct.

In interview, 4 respondents in the community groups category identified the main disadvantages of a northern corridor as severance from Rathangan, severance of farmland, golf course and an industry from Monasterevin. Three referred to construction difficulties, mainly the crossing of the railway and canal. Fifteen interviewees indicated they had no views on the matter while 2 stated that there were no disadvantages in using this corridor. In sharp contrast there was wider agreement (8 interviewees) that the main disadvantage of a southern route corridor was the impact on a scenic area of very high quality.

Having regard to disadvantages, the industrial and professional services group strongly favoured the southern corridor. The only disadvantage raised was the possible difficulty in construction due to the higher ground to the south of the town. The disadvantages cited against a northern corridor related to the boggy nature of the terrain, obstacles to construction such as the canal, river and railway and the longer distances involved. Six respondents offered no views on the matter primarily because they would not be affected by either alignment.

Asked to indicate their preferred route, 8 interviewees from the community groups favoured a northern corridor and 3 a southern corridor. None in the industrial and professional services group was in favour of a northern corridor while 5 supported the southern option. A majority of interviewees, 16, were indifferent between the alternatives. Three opposed the construction of a bypass on grounds of construction costs and the lack of necessity for one.

Asked why they preferred one corridor to the other, those in favour of a northern alignment gave two main reasons :

- *Fewer people would be affected.*
- *Scenic areas to the south of Monasterevin would not be affected and remain accessible.*

Those in favour of the southern corridor did so because they expected that the bypass:

- *Would have little impact on existing customers.*
- *Would attract more people (residents) to the town.*
- *Would provide a more direct route to Dublin and other Cities.*

In conclusion, the effect on traditional travel flow patterns, real or perceived, severance of community catchment areas, and the effect on the socio-economic structure of the potential catchment area-indicate that the balance of advantage for industry, tourism, residential and community activities lies with the Southern Corridor. This is in line with the expressed preferences of the majority of those covered by the questionnaire and interview surveys.



MOORE ABBEY

3.5 PREFERRED CORRIDOR OPTION

Based on the criteria adopted for evaluation of the Northern and Southern Corridor Options the conclusion reached is that the Southern Corridor has clear advantages over the Northern Corridor in terms of engineering, environmental impact, cost and construction. Comparative tables are given in Chapter 7 of this report.

Having established the preferred Corridor option a study of the route options within that corridor was then undertaken.

Chapter 5 of this report describes each route option in detail. Chapter 6 assesses the environmental impact of each proposed route option. There follows now a brief description of the southern route options and the identification of the preferred route.

3.6 SOUTHERN CORRIDOR ROUTE OPTIONS

The three Southern Corridor Routes, which were considered, are shown in Figure 3. Each route had advantages and adverse impacts associated with it. Comparative tables are given in Chapter 7 of this report.

3.6.1 Route S1

Estimates were made of the cost of construction for each route in 1994. The current estimated cost of route S1 is £92 million.

Route S1 is the shortest route identified. The route runs parallel as far as possible with the existing N7. This would facilitate stage construction of the scheme if required. The alignment of Route S1 is forced away from the existing N7 corridor in the vicinity of Monasterevin, Moore Abbey and Hill Wood.

As Route S1 follows the existing N7 Corridor in the western portion of the study area it passes close to the settlements at New Inn, Jamestown and Ballybrittas. For this reason Route S1 would intrude to a greater extent on these settlements than the other routes. Proximity to these settlements and the existing N7 would make the design of structures to cater for the realignment of local roads more problematic for route S1 than the other routes.

The alignment passes through Hill Wood, south of Monasterevin town, close to the summit of the Hill. This would pose major construction problems due to the quantity of rock which would have to be excavated. Preliminary geotechnical investigations indicate that there is a significant risk of unfavourable dips and strikes. This would further complicate construction requiring additional land take or expensive remedial measures.

At over 15m the cut through Hill Wood is very deep. This is the single biggest negative impact of any of the three southern routes. This feature of Route S1 would be visually intrusive over a wide area. The extensive cut would also remove the larger amount of Hill Wood and cause the most severe severance to the wood. The combined impacts of this cut would not be acceptable.

As Route S1 passes close to the summit of Hill Wood the vertical alignment of Route S1 includes slopes of 3%. These slopes are 1% steeper than on the other routes. Grades over 2% reduce significantly the speeds of heavy Goods Vehicles.

Of the three Southern Corridor Routes Route S1 passes closest to the development boundary of Monasterevin which would result in it causing the greatest perceived severance.

3.6.2 Route S2

Route S2 does not attempt to follow the alignment of the existing N7 in the same way as Route S1. When compared with Route S1, Route S2 avoids to a greater extent the settlements at New Inn, Ballybrittas, Jamestown and Monasterevin. Despite this it actually passes within 100m of 22 houses which is more than Route S1 or Route S3.

Route S2 avoids the major severance that Route S1 causes to Hill Wood but it still impacts on it's southern edge.

Route S2 has a number of advantages from an engineering perspective. The geometric characteristics are better than the other routes with shallower vertical grades than Route S1 and gentler horizontal curves than Route S3. Route S2 has the most favourable crossing point on the River Barrow of the Southern Corridor Routes.

3.6.3 Route S3

Route S3 is the most southerly alignment in that it is the farthest removed from the existing N7. This makes this alignment more remote from existing settlement and Route S3 impacts less on existing residences than the other routes. However remoteness from the existing N7 has the disadvantage in making the provision of an interchange to facilitate traffic which currently turns off the existing N7 within the study area more difficult. The distance between the proposed motorway and the local road network will impact on the desired interaction of the two networks. This could have a devastating affect on the town and villages bypassed.

The more southerly alignment of Route S3 also causes greater severance to the Derries Wood than Route S1 or Route S2. Route S1 and Route S2 pass through the Derries at a similar location. As neither route is far from the existing N7 as they pass through the

Derries only minor severance occurs when compared with Route S3, whose severance will have a greater impact on the fallow deer resident in the wood.

Route S3 crosses Rathdaire Lake and the narrow wood at the Raperaree. It avoids completely Hill Wood but crosses the avenue of Cloncarlin House.

It is a major advantage that unlike the other Southern Corridor Routes Route S3 avoids Hill Wood. As against this Route S3 has significant impacts on the Derries, Rathdaire Lake, the Rapparee and the avenue of Cloncarlin House. Consequently it's impact on flora, fauna and amenity is greater than Route S2.

Route S3 has a number of engineering disadvantages. It crosses the River Barrow on a meander. It also has, at 1400m, the tightest horizontal curve of the Southern Corridor Routes. As it is the longest route it is also likely to be the dearest to construct.

The nature of the farm holdings crossed by Route S3 means that it has the greatest impact on agriculture.

3.7 PREFERRED ROUTE

As discussed above Route S1 causes severe impacts as it passes through Hill Wood. There are no major advantages associated with Route S1 which would overcome this disadvantage. None of the identified impacts of Route S2 and Route S3 are such as to allow Route S1 be evaluated favourably when compared with Route S2 or Route S3. Consequently Route S1 was rejected.

Route S3 has a number of disadvantages when compared with Route S2. These are as follows:

- Route S2 has superior geometrics to Route S3*
- Route S3 crosses the River Barrow on a meander where scour is likely to occur under the bridge abutments.*
- Route S3 is further away from the existing N7 and Regional Roads making the provision of an interchange more difficult.*
- Route S2 would cause a lower level of disturbance to Agriculture*

Although Route S3 avoided Hill Wood and affected fewer residences these advantages are not sufficient to overcome the advantages of Route S2 listed above. Therefore Route S2 is selected as the preferred route for the Heath/Mayfield Motorway Scheme.



LEGEND

- Built up Area
- Northern Options
- Route S1
- Route S2
- Route S3
- Development Boundary



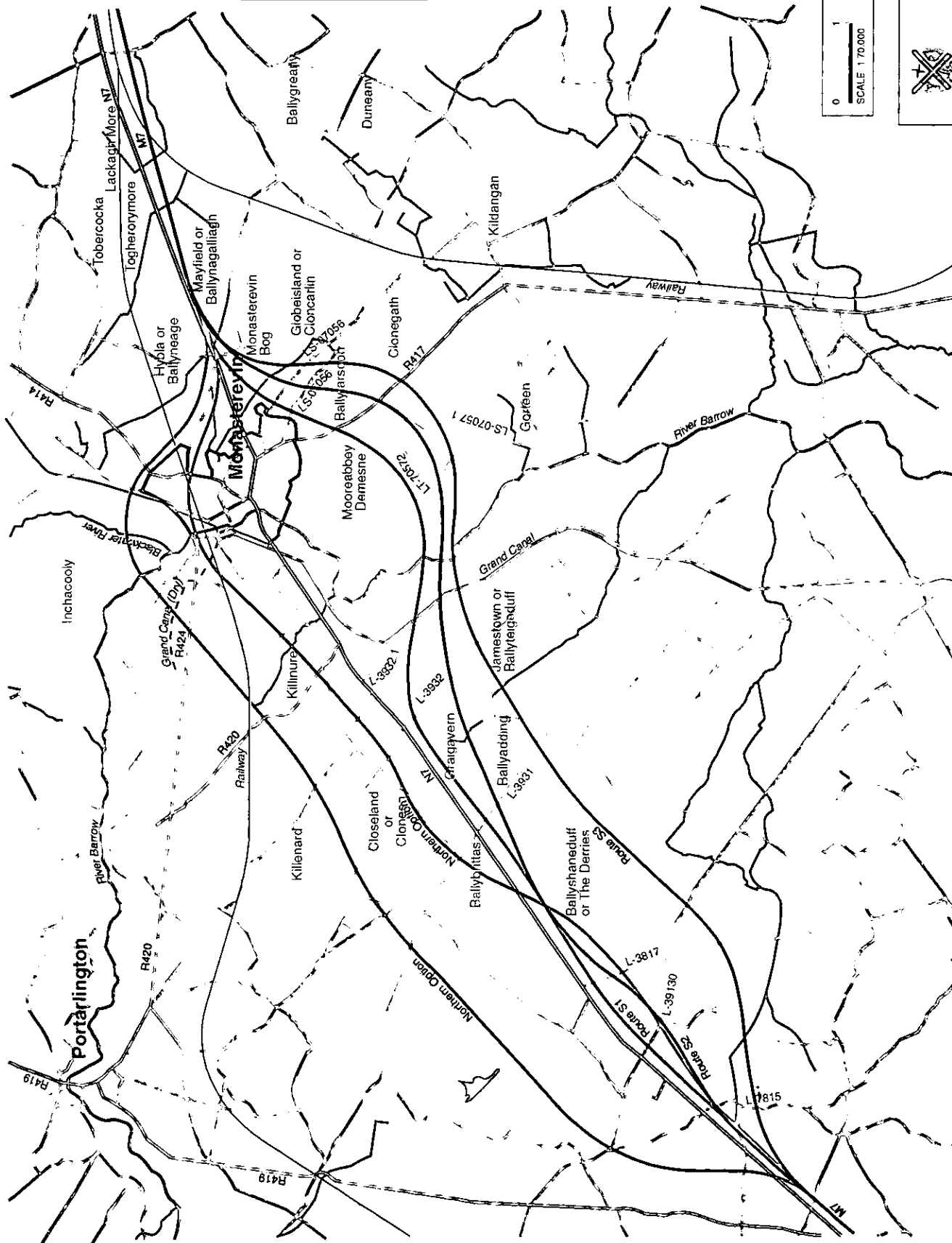
Kildare County Council

Highlight Route Options S1, S2 and S3 in different colours Northern Routes can be shown in same colour

Job No 2126

Date Nov 1999

Figure 3



3.8 PUBLIC CONSULTATION

Section 51 of the Roads Act 1993(7), requires that a public notice should be issued stating:

- a) That such application has been made to the Minister for approval; (referring to the Motorway Order)*
- b) That an environmental statement has been prepared in respect of the proposed road scheme;*
- c) That copies of the statement be available for inspection for a specific period not less than one month;*
- d) That copies are available for sale at a cost not exceeding the reasonable cost of making a copy;*
- e) That submissions may be made in writing to the Minister for the Environment of the proposed road development before a specified date (which shall be not less than two weeks after the end of the period for inspection.*

A non-statutory Public Consultation was held in June 1998. This consultation was advertised in the local papers and on local radio. In addition all landowners whose land was intersected by the Northern or Southern routes were notified by letter of the impending consultation. The consultation was held for a period of 6 days from June 15th to June 18th in the Montague Hotel, Emo, Co. Laois and from June 20th and June 22nd in the Hazel Hotel, Monasterevin, Co. Kildare.

The maps placed on display were the preferred route S2 and the four alternative routes S1, S3, N1 and N2 together with various intermediate interchange options and interchange options at the Heath.

A questionnaire was available to all that visited the exhibition and comment was invited. In addition all landowners directly affected by route S2 and who were unable to attend the public consultation, received the questionnaire and brochure by post and were invited to comment.

A total of 170 questionnaires were sent out. 41 completed forms were returned and in total a list of 87 submissions were received. The 41 questionnaires were assessed and the findings in favour as follows:

- Adoption of Route S2 68.3%*

Those opposed to the route were concerned regarding the proximity of the route to dwelling houses, its impact on Hill Wood Monasterevin, the impact of Noise, the disturbance to farming and the access to Monasterevin Town.

Intermediate Interchange Option

- *Option A New Inn* 39%
- *Option B Ballybrittas* 15%
- *Option C Killemure* 19%
- *No Preference* 27%

Heath Interchanges

- *Option 1 Full Interchange Ballydavis* 12%
- *Option 2 Full Interchange Heath West* 24%
- *Option 3 Half-Interchange Heath East* 12%
- *No. Preference* 52%

Having completed the public consultation the entire proposed scheme was reassessed taking on board all the submissions received from the public. The resultant alterations to the proposed scheme as shown in June 1998 are discussed in section 2.9 of this report.

On completion of the mainline reassessment a display of the revised line took place in November 1998 for a period of four days.

A third display in June 1999 showed all the minor roads and Interchange designs and a fourth display was held in October 1999 showing the proposed realignment of the R425. Comment was invited at all displays.

3.9 ALTERATIONS

At the public display held in June 1998 the preferred route S2 was displayed. The preliminary route selection report was available for viewing. This report included proposals for minor road realignments and intermediate interchange locations.

Having discussed the Heath/Mayfield scheme with members of the public and with a view to preparing the Motorway Order for submission to the Minister for the Environment and Local Government, Kildare County Council embarked on the preliminary design of the proposed scheme.

The preliminary design process identifies the lands necessary for the scheme. The design details undertaken tried where possible to address the issues of concern raised by the public during the consultation procedure.

The resultant scheme is a modified version of the original S2 line and will be referred to as the preferred route for the remainder of this report.

The following is a list of the main modifications made to the original S2 route.

3.9.1 Mainline S2.

- **Horizontal Alignment**

Broken backed curves from east of the Cappakell Road to Dangan Wood east of the River Barrow were replaced with compound curves. This resulted in the horizontal alignment been moved North by approximately 20m north at the River Barrow and 5m at Ballybrittas Road.

Poor co-ordination of horizontal and vertical alignments result in "hidden dips" An examination of the co-ordination of Vertical and Horizontal Alignments of the proposed route resulted in the horizontal alignment been moved 20m North through Hill Wood.

The advantages and disadvantages of these moves are shown in the Table 3.9.1 below

Advantages and Disadvantages to Horizontal Alignment Alterations

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Moves the alignment a further 20m away from Mr. Daniel O' Connell's house at the Grand Canal • Moves the alignment a further 5m away from Jamestown House. • Moves the alignment 20m into Hill Wood thereby allowing for the preservation of the mature trees along by the demesne wall. • Allows for the retention of the demesne wall of Hill Wood along by Green Road. • <i>Moves the alignment further away from houses on Green Road</i> 	<ul style="list-style-type: none"> • <i>Moves closer to Mr. Gerard Dunne's Dwelling House at Ballybrittas</i> • <i>Moves closer to Three Dwellings at the end of Grange Road</i>

Table 3.9.1

- **Vertical Alignment**

The vertical alignment has been raised throughout the Derries Wood for drainage reasons. The examination of the co-ordination of vertical and horizontal alignments as mentioned previously resulted in the vertical alignment from the River Barrow to Kill bog been altered. The vertical from the River Barrow to Hill Wood has been raised and the vertical through Hill Wood has been lowered. An assessment of the advantages and disadvantages of these alterations are given in Table 3.9.2.

Advantages and Disadvantages to Vertical Alignment Alterations

Advantages	Disadvantages
<ul style="list-style-type: none"> • Reduces the number of proposed drainage outfalls required for the mainline drainage from 7 to 5. • Allows for the protection of drain 14 and 13 during construction. • <i>The provision of a farm underpass at the end of Grange Road Lower reducing farm severance for Mr. James Walsh, Sean and Ellen McMahon and Coillte Teoranta</i> • <i>Reduces local severance by providing an alternative walkway for the public who at present walk through the lands of Mr. James Walsh to Lughill Lane from Grange Road.</i> • <i>Maintains access to the Sally Island for fishermen.</i> • The vertical alignment of the Athy road remains approximately the same greatly reducing the impact on dwelling houses along the Athy Road and Green Road 	<ul style="list-style-type: none"> • Greater visual Intrusion for dwellings along the Grange Road

Table 3.9.2

3.9.2 Castle Road (L-7815)

Option one as displayed is shown on Figure E/2674. An alternative option two was examined shown on Figure 98B/102/104. Option two was chosen as the preferred option for the following reasons:

- Relative to the original selection, the vertical alignment of the new proposal is superior. (2 no 4% approach grades)*
- The new proposal improves the existing acute bends near Morett Castle and provides a satisfactory junction arrangement.*
- The junction arrangement at the N7 is improved and still provides adequate sight distance and will improve when the vertical alignment of the existing N7 is refined*
- The new alignment is in cut and does not intrude visually on the surrounding landscape*
- Compared to the original selection, the new alignment impacts minimally upon residences of both Mr. P. Keegan and Ms. F. Moore.*
- The new alignment will not interfere with the existing location of the 110kv overhead line.*

The link road from the Old Castle Road to the new Castle Road was chosen

- To reduce severance on the farm of T. and L. Lewis*
- To remove the dangerous bend at Chainage 1100 from the public road thereby increasing safety.*
- Allows for safe egress from the houses of Mr. T. Lewis and Mr. L. Lewis.*

The disadvantages of the alterations are

- More land acquisition required*
- Greater severance on landowners*

STRUCTURE NO.1 CASTLE ROAD OPTION 1



PORTLAOSE

MONASTEREVN

88.29

N7

CH: 255+00
CH 14+00

CH 13+00

CH 12+00

CH 11+00

CH 10+00

MORETT CASTLE
(in Ruins)



KILDARE COUNTY COUNCIL Roads Design Department

St. Mary's Naas, Co. Kildare

J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

PROJECT: HEATH / MAYFIELD MOTORWAY

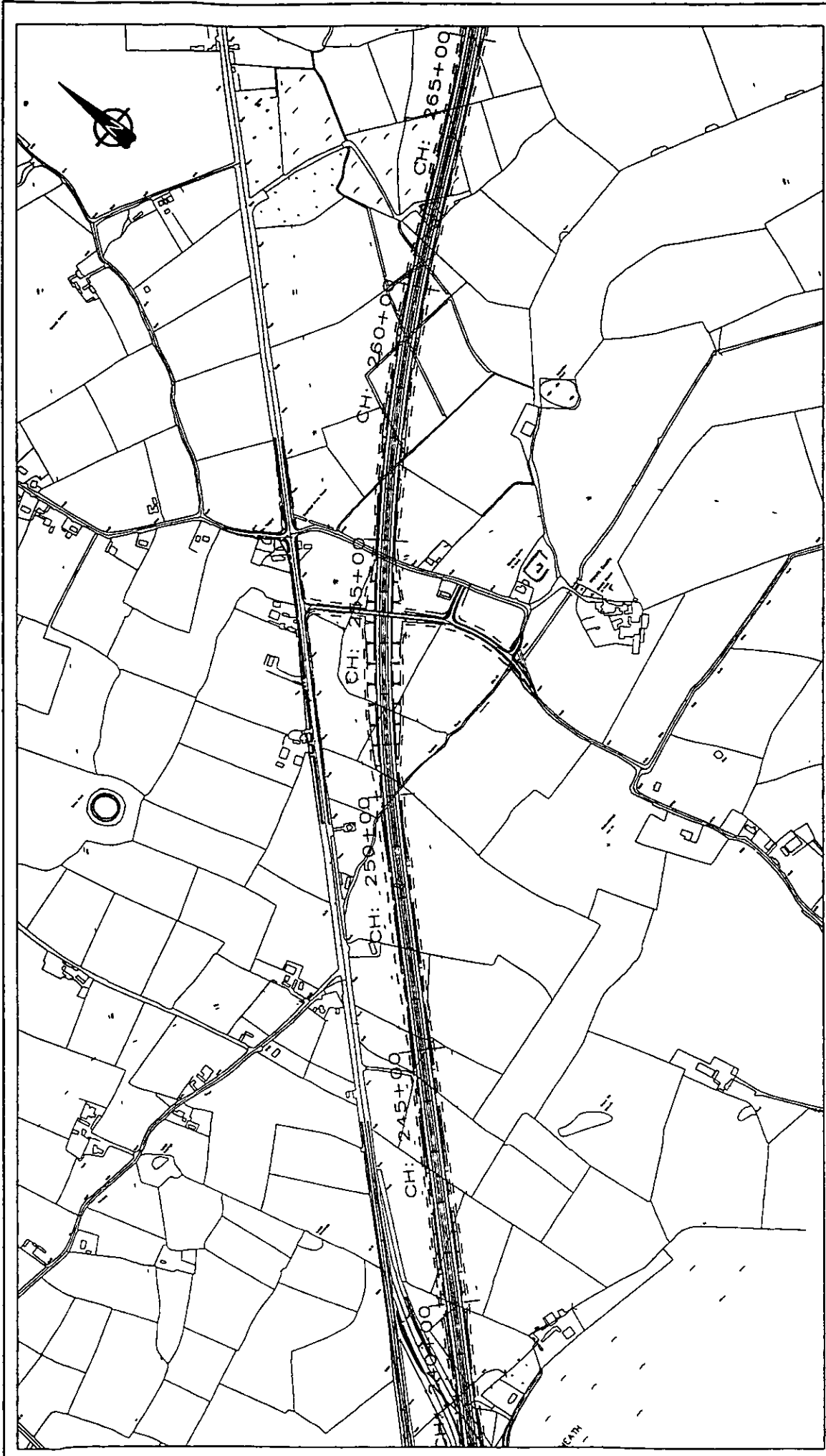
TITLE: HORIZONTAL ALIGNMENT AT CASTLE ROAD (Option 1)

Scale: 1:2500

Date: OCT'98

Drawing No.

E/2674



KILDARE COUNTY COUNCIL
National Roads Design Office
Maullins, Naas, Co. Kildare

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COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: HORIZONTAL ALIGNMENT AT CASTLE ROAD (Option 2)

Scale: 1:10,000

Date: OCT. '99.

Drawing No.
98B/

102/

104

3.9.3 New Inn Interchange

The proposed location of New Inn Interchange as displayed in June 1998 is shown in Figure E/2700. The alternative location for the New Inn Interchange is shown as Option 2 in Figure 98B/102/105. Option 2 was chosen as the location of the Interchange. The advantages of this choice were as follows:

- The location of Option two is at Chainage 274+00, which is in an area of mainline, cut. In engineering terms this is a superior choice in comparison to the original proposal*
- The geometric details for the proposed Interchange show vertical grades of no greater than 2% while the horizontal radii are between 350m and 400m on the northern link and 200m on the southern link. A series of roundabouts at the extremities of both links and at the interchange will considerably calm the traffic.*
- The existing Local Road L-3930, north of the existing Interchange will not be utilised as the Interchange's northern link and will be considerably safer than even its current form. Two new links (northern and southern) will be constructed with only agricultural access onto them and as such they will be considerably safer for all traffic when compared to the original proposal.*
- Traffic from the Interchange will now be directed onto the roundabout near the Montague Hotel and then to the roundabout at New Inn crossroads and this will again calm the traffic considerably better than the existing proposal.*
- The estimated construction costs are reduced, as only one structure will be built to serve Local Roads L-3817 and L-3930.*
- The construction of the proposed Interchange would be considerably easier than that of the existing proposal. This is due to the fact that all approaching ramps and link roads will be in either marginal cut and/or fill. This will result in the elimination of any construction problems and consequently the associated risks, delays and additional cost implications will also diminish.*
- The new Interchange proposal is located between Local Road L-3817 and L-3930 and as such lies approximately equidistant from settlements on both roads.*
- Greatly reduces impact on dwelling houses on Local Roads L-3817 and L-3930.*
- Locating the proposed Interchange to mainline Ch274+00 will eliminate traffic along that part of Local Road L-3930 mentioned above.*

- *It will decrease noise pollution for the majority of properties although two properties will be affected more.*
- *The new proposal will be at worst 2 to 3 metres higher than the existing ground. This is approximately 5 metres lower than the existing proposal. This is obviously a less intrusive design on the surrounding landscape. The new proposal is further away from the majority of residences and will be easier to camouflage than the existing option.*
- *During consultation with both the affected landowners and the public in general the reaction has been more favourable for the new proposal than for the existing proposal.*

The disadvantages of the relocation of the Interchange are

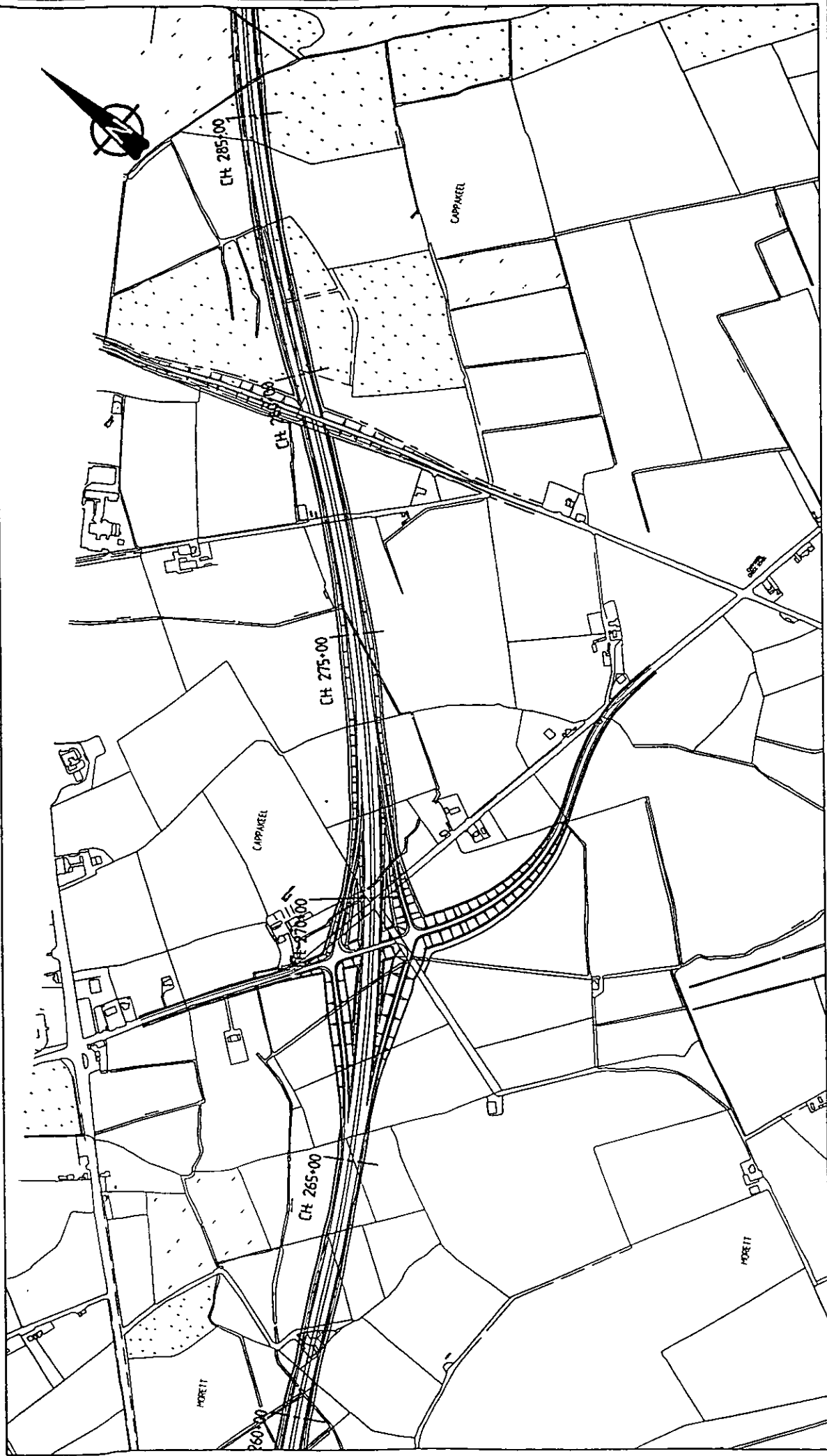
- *Increase in landtake*
- *More landowners affected*
- *One dwelling house to be demolished.*
- *Slight increase in travel distance for local occupants of dwelling Houses*


3.9.4 Tie in at the Heath

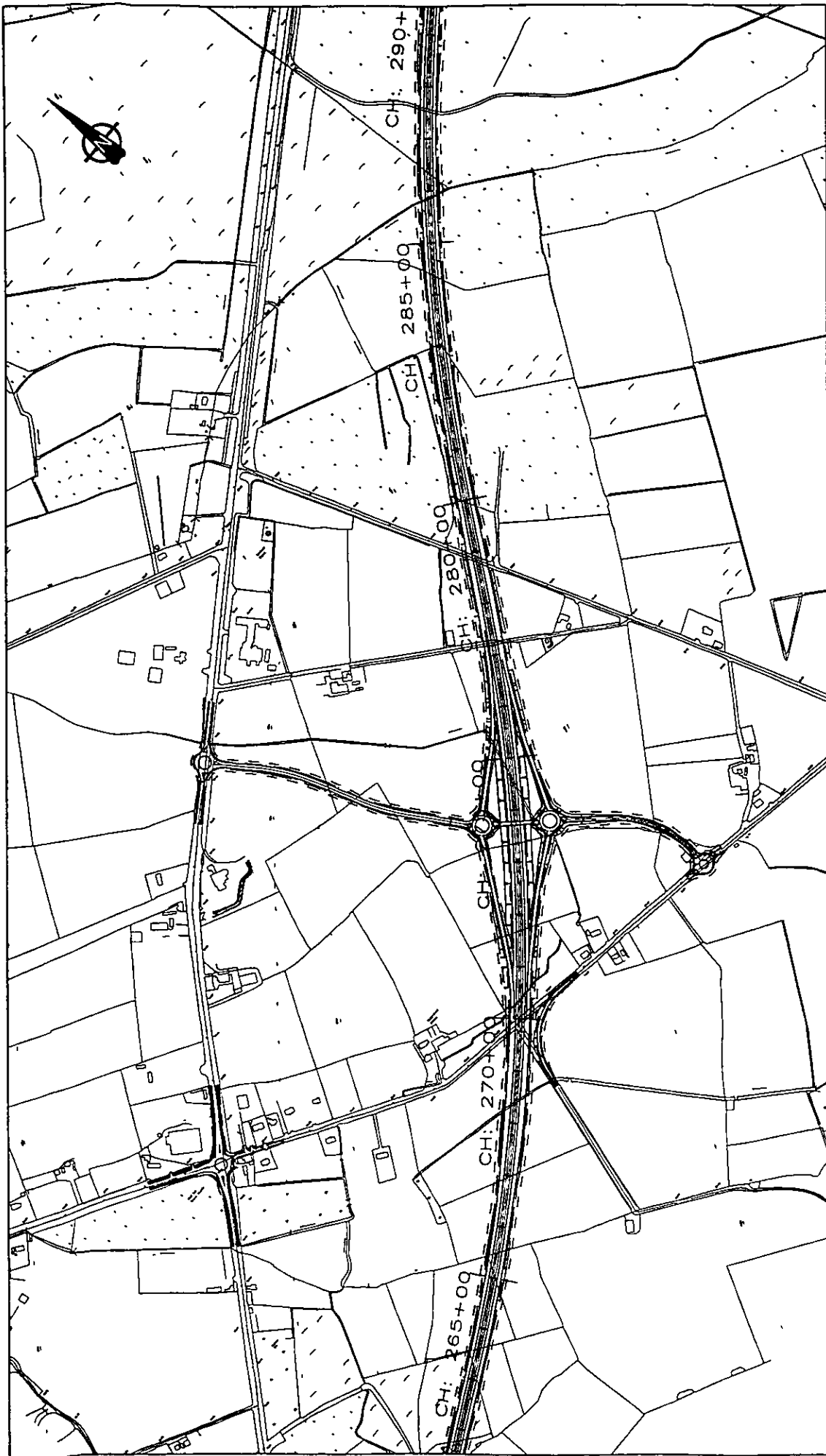
The existing Portlaoise Bypass interchange layouts at the Heath consist of two half interchanges. These interchanges are Ballydavis Interchange and Heath west respectively. Ballydavis interchange has two east facing ramps while Heath west has two west facing ramps. The proximity of these ramps is creating a safety issue where local traffic is entering the motorway at Ballydavis and existing at Heath West weaving into fast moving Motorway traffic. The predicted increase in traffic volumes over the next twenty years will only further reduce safety at this location. In addition half interchanges encourage wrong way entry onto the motorway system.

In order to address these issues it is proposed to complete the interchange at Ballydavis and remove the ramps at Heath west. A link road from Ballydavis directly to the R445 will be constructed. The advantages of this work are as follows:

- *Introduces Uniformity of Interchange type throughout the Network.*
- *Increase Safety*
- *Separates local traffic from Motorway Traffic*



	KILDARE COUNTY COUNCIL Roads Design Department St. Mary's Naas, Co. Kildare		PROJECT: HEATH / MAYFIELD MOTORWAY		Drawing No. E/2700
	J. LYNCH BE, C.Eng, FEI COUNTY ENGINEER		TITLE: NEW INN INTERCHANGE (ORIGINAL OPTION)		
	R.J. BURKE BE, MS, C.Eng, FEI, MICE, MRIT SENIOR DESIGN ENGINEER		Scale: 1:10000	Date: FEBRUARY 1999	



KILDARE COUNTY COUNCIL
National Roads Design Office

Maudlins, Naas, Co. Kildare

J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: NEW INN INTERCHANGE

Scale: 1:10000

Date: OCT. '99.

Drawing No.
98B/
102/
105

It should be noted here that the construction of the proposed scheme will remove the temporary off ramp at Heath east. This ramp was provided to allow non-motorway traffic to exit onto local roads and not enter the motorway network. The on ramp at Heath east is the exiting R445 and will revert to a two-way road as part of the local traffic network.

3.10 THE DO NOTHING SITUATION

The existing traffic volumes along the N7 are such that at present the road network cannot provide the required level of service D. As detailed in Section 3.1 the existing N7 network is deficient between The Heath and Mayfield. Additional capacity and an improved pavement could be provided along the existing N7. To provide this additional capacity it would be necessary to widen the existing carriageway to 10m width and provide hardshoulders of 3m either side. This improvement however would not provide the capacity required for level of service D. In order to provide the service required a dual carriageway would be the required standard. Provision of a dual carriageway along the existing N7 is considered a poor solution for the following reasons:

- It would not be possible to provide such a road through Monasterevin and Ballybrittas without extensive demolition of property. Such levels of demolition would be clearly unacceptable. This means that off line bypasses of Monasterevin and Ballybrittas would be required.*
- Demolition of property and encroachment into gardens would be required along the remainder of the route.*
- There would be extensive disruption of services, which are located in the grass margins of the existing route*
- The facility provided would still have below standard geometrics. This would reduce it's capacity and safety.*
- It would not be possible to restrict access to the road. This would further reduce it's capacity and safety*
- Construction work would cause major and prolonged traffic disruption.*

3.11 THE PROPOSED SCHEME (BRIEF DESCRIPTION)

The proposed scheme lies entirely south of the existing N7. The route traverses the townlands of the Great Heath, Morett, Cappakeel, The Derries, Ballyadding, Jamestown and Killagish in the County of Laois before crossing the River Barrow north of Sally Island into the County of Kildare. In Kildare the route traverses the townlands of Lughill, Mooreabbey Demense, Ballyfarsoon, Kill, Cloncarlin, Monasterevin Bog before rejoining the N7 at Mayfield.

Three grade separated interchanges provide access to and from the motorway to the local road network, villages and towns. The interchange of Ballydavis lies East of the town of Portlaoise and will provide access and egress to and from the motorway to the town of Portlaoise, the Heath, Portarlinton and the N80.

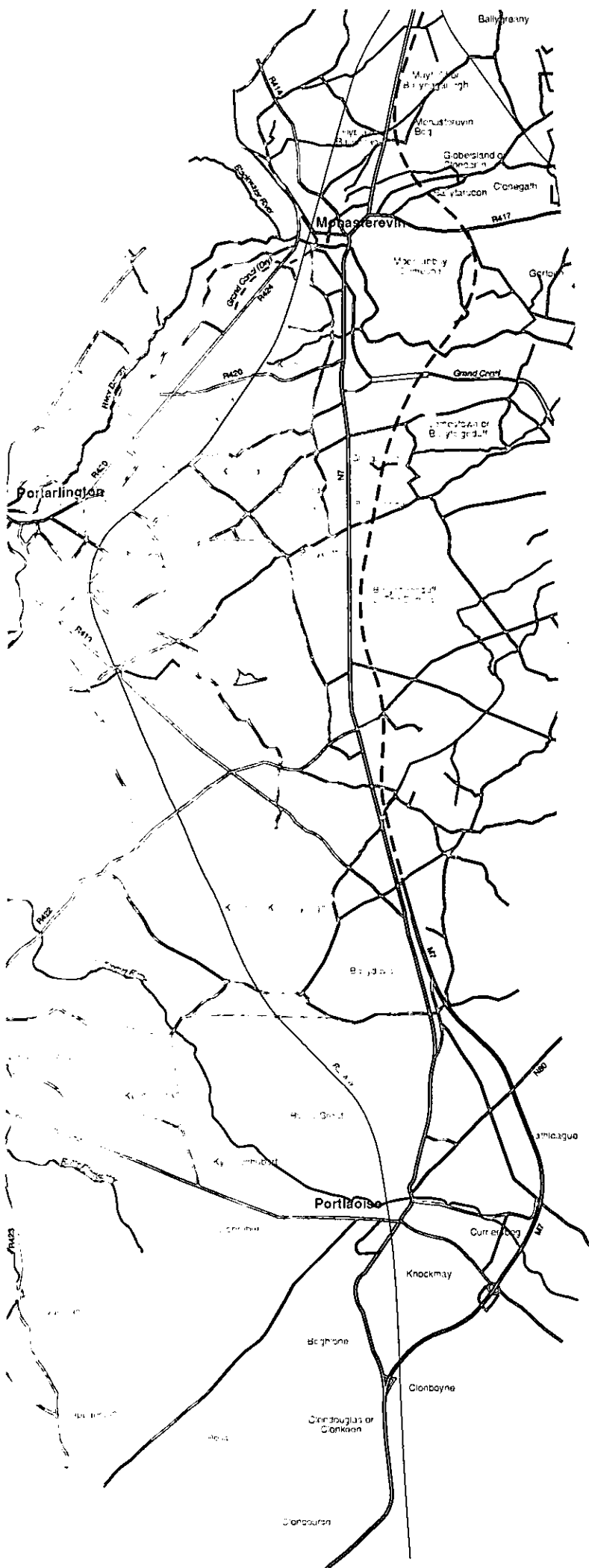
The intermediate grade separated interchange at New Inn provides access to the local road network from the Heath to Ballybrittas and beyond. In addition this interchange is strategically placed to provide ease of access to the midland towns of Mountmellick and Tullamore.

The Mayfield interchange lies East of the town of Monasterevin. The interchange will be partially constructed as part of the Kildare Town Bypass scheme. The interchange will be completed under this scheme allowing access to and from Monasterevin to the East and West. In addition it provides access from the East to the town of Portarlinton and the Village of Jamestown.

The scheme also provides for the local roads severed by the proposed motorway scheme to be realigned or alternative adjacent access to be provided. The following structures will be provided to reduce severance of the local road network:

- | | |
|---------------------------|------------------------------------|
| • L-7815 | Overbridge (Castle Road) |
| • L-3930 and L-3817 | Overbridge (New Inn Interchange) |
| • L-3931 | Overbridge (Ballybrittas) |
| • L-3932 | Overbridge (Jamestown) |
| • L-3932.1 | Motorway Overbridge (Canal Bridge) |
| • LT-70572 | Underpass (Grange Road Link) |
| • R417 | Overbridge (Athy Road) |
| • LS-07056 and LS-07055.1 | Overbridge (Nurney Road) |

A more detailed description of the scheme is given in Chapter 4 of this report.



CHAPTER FOUR

Description of The Scheme

4. DESCRIPTION OF THE SCHEME

4.1 GENERAL DESCRIPTION OF PREFERRED ROUTE

The Heath/Mayfield Motorway scheme links the Portlaoise Bypass to the Kildare Town Bypass. The total length of the mainline is 17.5km. There are 10 structures to be built in association with the scheme. Drawing Numbers PR01 to PR10 illustrate the proposed Scheme in detail. These drawings are contained in Volume 3 of this report. Additional landtakes required for the provision of landscaping, noise barriers, and drainage easements are shown hatched in red and blue. Other areas of landtake are outlined in red and blue. These areas are required to provide for road diversions associated with the construction of bridges and embankments, and the excavation and landscape of existing road surfaces to be removed. Accommodation roads to be provided are illustrated in yellow and discussed in Section 4.6. These roads are provided to reduce severance.

With reference to drawing numbers PR01 and PR02, the motorway alignment commences at Heath East bridge south of the N7. However, the works associated with the scheme commence at Bloomfield cross on the N80. A new roundabout will be constructed at the existing cross roads and the R425 from Bloomfield Cross to Ballydavis interchange will be upgraded to cater for the anticipated increase in traffic requiring access to and from the N80 and the preferred route.

The Ballydavis Interchange will be upgraded to a full interchange with the construction of west facing ramps and a link road directly to the R445. The existing half interchange at Heath West is being removed. The temporary eastern off ramp at Heath East is on the line of the preferred route and will be removed to facilitate the construction of the motorway. The proposed tie-in to the Portlaoise Bypass is required on engineering, traffic and safety reasons.

A general description of the preferred mainline motorway follows. Details of the preferred route are shown on Drawings PR03 to 10.

4.1.1 Chainage 235+00 to Chainage 260+00 (PR03)

The mainline commences at Ch. 235+00 at the termination point of the Portlaoise Bypass. The route traverses agricultural land to the south of the N7. It passes through the townland of The Great Heath and Morett. From Ch. 235+00 to Ch. 250+00 the route is in minor fill. At Ch. 250+00 the route enters its first large area of cut. The maximum depth of cut is 5m extending from Ch. 250+00 to Ch. 255+00.

A new overbridge will be constructed at Ch. 253+60 to carry the re-aligned Castle Road (L-7815) over the motorway. At Ch. 254+00 the motorway crosses the existing Castle Road at ground level. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway.

Additional landtakes shown on drawing PRO3 are for the following purposes:

- Ch 237+00 to Ch 239+00 South *Noise Barrier*
- Ch 240+00 North *Landscape*
- Ch 250+00 South *Drainage Easement (Drain 10)*
- Ch 254+00 to Ch 256+50 South *Landscaping for Residence Castle Road*
- Ch 255+00 North *Drainage Easement (Outfall from
Realigned N7/R445)*
- Ch 255+00 South *Regrading Existing Road and
Landscaping*

4.1.2 Chainage 260+00 to Chainage 286+00 (PR04)

From Ch. 254+70 to Ch. 269+80 the motorway moves further south away from the N7 entering the townland of Cappakeel. The route crosses local road L-3930 (New Inn/Vicarstown Road) at its intersection with Priory Lane. The crossing point utilises a gap in the residential development along Local Road L-3930 to the south of Cappakeel House. On completion of the Scheme Local road L-3930 will be a cul-de-sac both north and south of the motorway.

The vertical profile through this area generally follows the existing contours of the landscape with some minor fill in low lying areas.

Having moved south to avoid residential development on Local Road L-3930 the motorway returns closer to the existing N7 through the townland of The Derries or Ballyshaneduff. At Ch. 274+00 an overbridge crosses the motorway to cater for the New Inn Interchange, the only intermediate interchange on the scheme. This interchange is a full interchange catering for all movement east and west from the surrounding local roads and all movement north and south from the motorway. The motorway is in cut in this area to a maximum depth of 5.2m. At Ch. 277+20 the preferred route crosses a private lane. This lane will be severed by the scheme. Given the proximity of New Inn interchange it is not proposed to provide an overbridge at this location.

The next local road to be crossed is L-3817 (Cappakeel Road). On completion of the Scheme this road will also be a cul-de-sac both north and south of the motorway. The present movements along this road will be catered for by the New Inn Interchange.

The alignment returns to fill at Ch. 279+50. At Ch. 284+50 the preferred route enters the Derries Wood. The Derries is a Coillte owned commercial conifer plantation. The route is in fill throughout the wood to a maximum height of 3m.

Additional landtakes shown on drawing PR04 are for the following purposes:

- Ch 270+00 to Ch 275+00 North *Realignment of Exiting Drain 12 to Emo Lake*
- Ch 285+80 South *Drainage Easement to Provide New Lined Drain Through (Drain 13a)*

4.1.3 Chainage 286+00 to Chainage 313+00 (PR05)

From Ch. 29250 to Ch. 346+50 the preferred route swings south away from the N7 traversing the townlands of Ballyadding, Jamestown and Killagish before reaching the River Barrow and entering the County of Kildare. The alignment enters cut at Ch.301+00 and crosses local road L-3931 (Ballybrittas Road) at a depth of 3.2m. An overbridge is provided at this location to cater for the realigned Ballybrittas road.

At Ch. 308+30 the preferred route alignment fenceline coincides with the wall of a residence to the north. The predicted noise level at this residence is above the limit at which noise abatement measures is required. In order to provide such abatement measures additional landtake would be required thus demolishing the dwelling house. As mitigation measures are not possible here this property is to be purchased by the scheme.

Additional landtakes shown are on drawing PR05 for the following purposes:

- Ch 308+00 to Ch 309+00 North *Landscape*
- Ch 306+00 South *Drainage Easement to Cater for Embankment Drainage Only*
- Along Ballybrittas Road East *Road Diversion to allow for the construction of Ballybrittas Overbridge*

4.1.4 Chainage 313+00 to Chainage 335+00 (PR06)

Continuing on its southerly direction through the townlands of Jamestown and Killagish the preferred route traverses agricultural land intersecting Local Road L-3932 (Jamestown Road) at Ch. 329+00 south of the Jamestown Turkey Hatchery and north of Jamestown House. The motorway is in deep cut from Ch.322+00 to Ch. 332+00 to a maximum depth of 6.3m. An overbridge is provided at ch.329+00 to cater for the realigned Jamestown Road.

At Ch. 328+00 the vertical profile of the preferred route reaches a local low point of 67.105m. The alignment now starts to rise at a grade of 0.502% to allow the preferred route to clear the Grand Canal and the River Barrow at Ch. 340+80 and Ch. 346+50 respectively.

Additional landtakes shown on drawing PR06 are for the following purposes:

- *Ch 320+00 North and South* *Drainage Easement (Drain 17 regrading to pass under the motorway)*
- *Ch 326+00 South* *Landscape*
- *Ch 328+00 North* *Landscape to Screen Turkey Hatchery from the Motorway*
- *Ch 331+00 to Ch 336+00 South* *Landscape at Jamestown House*
- *Along Jamestown Road East* *Road Diversion to allow for the construction of Jamestown Overbridge*

4.1.5 Chainage 335+00 to Chainage 352+00 (PR07)

At Ch. 340+60 the preferred route crosses over local road L-39321. Clearance for this road is 5.3m. The route then crosses the Athy branch of the Grand Canal and heads for the River Barrow. The route traverses the River Barrow at a point 400m north of Sally Island. The crossing point has been identified as a suitable crossing point within the southern corridor. The maximum height of embankment through this area is 10m. The route remains in fill until it enters Hill Wood at Ch. 369+00.

From the River Barrow the route enters County Kildare, townland Lughill and Dangan Wood, exiting at Ch. 343+00. The route then passes south of three dwelling houses on local road LT-70571. The motorway is at a height of 8.8m, the carriageway is 32m and the fenceline 8m from the closest adjacent house.

Additional landtakes shown on drawing PR07 are for the following purposes:

- *Ch 336+00 South* *Drainage Easement (Drain 18)*
- *Ch 340+00 South* *Drainage Easement along Existing Canal Road Drain to cater for embankment drainage only.*
- *Landtake West of the Canal Road* *Road Diversion to allow for construction of the Canal Bridge*
- *Ch 341+00 to Ch330+00 N & S* *Landtake for Berms*

4.1.6 Chainage 352+00 to Chainage 380+00 (PR08)

The route cuts through the old Moore Abbey Demesne wall at Ch. 354+50 and Ch.357+00. It is intended to remove this wall and rebuilt to the north of the realigned Grange Road.

Noise mitigation measures are required for one dwelling house located at the junction of Grange Road and Grange Farm Road at Ch 358+00 north. The noise barrier will be

located along the top of the motorway embankment from Ch.357+00 to Ch. 363+00 and will effectively screen the houses along the Grange Road from views of traffic along the motorway.

An underpass is provided at Ch. 357+00 along the line of the existing local road LT-70571 (Grange Road). The provision of this underpass provides access to severed lands south of the motorway and also provides for the replacement of an existing amenity walk utilised by many people in the local community. The height of the motorway at this location is 9.5m.

The route continues on an embankment from Ch. 357+00 to Ch. 369+00. An underpass at Ch. 366+50 known as Grange Road Link provides access to existing houses along the Grange Road. The maximum height of fill in this area is approximately 9.6m.

Ch. 365+00 is the most southerly point of the route. At this location the route begins its journey northwards to link with the termination point of the Kildare Town Bypass at Mayfield.

The preferred route now enters the townlands of Mooreabbey Demesne, Ballyfarsoon, Kill, Cloncarlin or Globeisland, Monasterevin Bog terminating at Mayfield.

At Ch. 369+20 the preferred route enters the extreme southern end of Hill Wood and exists at Ch. 374+00. The route, at its widest point, is a distance of 100m into the wood. The route on the southern side is closest to the existing demesne wall at Ch. 372+00 a distance of 20m. The existing demesne wall to the south of Hill Wood will be retained.

The vertical alignment of the route through the Wood is in a large area of cut. The maximum depth of cut is approximately 13.8m. The carriageway passes within 57m of houses on local road LT-07057 (Green Road) which are adjacent to Hill Wood. These houses are screened from the motorway by the demesne wall and the fact that the motorway is in deep cut at this location.

The alignment now traverses an area of high scenic quality and the impact of the width of the cut in the surrounding landscape will be significant.

Located within Hill Wood, Ch. 372+00 represents the highest point on the vertical profile of the preferred route. The route now begins to fall at a .857% grade towards the M7 Kildare By-Pass.

On exiting Hill Wood at Ch. 374+40 the preferred route crosses approx. 3m under a Regional Road, the R417 (Athy Road). This Regional Road would require an overbridge to carry it over the motorway.

To the east of the R417 the ground level falls away rapidly so that by Ch. 375+30 the alignment moves onto an embankment which rises to a maximum height of 6m.

At Ch. 377+50 the route enters Kill Plantation a Coillte owned commercial coniferous forestry plantation. This section of the alignment would be screened from the surrounding landscape.

Additional landtakes shown on drawing PR08 are for the following purposes:

- | | |
|--------------------------------|---|
| • Ch 356+00 South | Landscape |
| • Ch 363+00 to Ch 365+00 South | Landscape |
| • Ch 366+50 North | Drainage Easement to allow for Drainage of Grange Road Link. |
| • Ch 367+00 to Ch 369+00 North | Landscape |
| • Ch 370+00 to Ch 374+00 North | Drainage Easement to Cater for Hill Wood runoff to Cassidy's Stream and Landscape |
| • Ch 369+00 to Ch 374+00 South | Landscape planting Hill Wood |
| • Ch 374+00 South | Drainage Easement to Drain Athy Road |
| • Ch 378+00 to Ch 383+00 N & S | Landtake for Berms |
| • Ch 374+00 to Ch 381+00 | Drainage Easement and Retention Tanks |

4.1.7 Chainage 380+00 to Chainage 399+00 (PR09)

At Ch. 383+50 the motorway exits Kill Plantation. At this point the alignment is on an embankment over 1.5m. The alignment remains on an embankment until it crosses Local Road LS-07056 (Nurney Road Upper) at Ch. 384+50. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway.

There is then a section of cut from Ch. 384+50 to Ch. 387+00, which is 9m below ground level at the deepest point.

The alignment passes back to an embankment at Ch. 387+00 and crosses Local Road LS-07055.1 (Nurney Road Lower) at Ch. 387+20. Local roads LS-07056 and LS-07055.1 will be served by one over bridge located at Ch. 385+40 linked to each minor road.

At Ch. 397+00 the preferred route crosses Local Road LS-03009.2. On completion of the Scheme this road will be a cul-de-sac both north and south of the motorway. Access to the south will be provided by a link road from Mayfield Interchange. The construction of this access will be carried out as part of the Kildare Town Bypass works.

Additional landtakes shown on drawing PR09 are for the following purposes:

- *Ch 383+00 to Ch 384+50 North Landscape*
- *Ch 386+00 to Ch 387+50 South Landscape and Noise Barrier for houses
South of Nurney Road Lower*
- *Ch 389+00 North Drainage Easement to Kildare Town
Bypass Drainage*

4.1.8 Nurney Road South (PR09a)

A realignment of the existing Local Road Nurney Road Upper is required to facilitate Coillte machinery exiting Kill Bog and requiring access onto the new realigned Nurney Road. The road realignment is illustrated on this drawing.

4.1.9 Chainage 399+00 to Chainage 407+00 (PR10)

The preferred route traverses Monasterevin Bog.. At Ch. 404+00 the alignment passes from an embankment to fill. The alignment ties into the proposed M7 Kildare Town Bypass at Ch. 406+92.

4.2 ROAD DIMENSIONS

Typical dimensions of the motorway are given in Table 4.2.1 and shown on drawing number CS01. The median width of the motorway remains uniform for the length of the alignment.

Typical Mainline Motorway Dimensions

Road Component	Dimension (metres)
Lane Width	3.75
Carriageway Widths	2 @ 7.5
Centre Median including 2 @ 1m	9
Rubbing Strips	
Hard Shoulders	3
Grass Verges	3
Overall Width of Formation	36
Overall Length of Mainline	17.5 km
Maximum Cross Sectional Gradient	3%
Maximum Longitudinal Gradient	1.27%
Typical Side Slopes in Cut & Fill Areas	1 Vert :2 Horizontal

Table 4.2.1

The minor road alignment widths reflect the existing widths of the roads and are upgraded where it is deemed necessary. Typical dimensions of minor roads are given in Table 4.2.2. and shown on drawing number CS02.

Typical Minor Road Dimensions

Road Name & Reference Number	Carriageway Width	Road Components Hard Shoulder	Grass Verge	Existing Width
R425	7.5m	1.0m	2.0m	5.5m
Ballydavis Link	7.5m	1.0m	2.0m	N/A
Ballycarrol Road	5.5m	-	2.0m	N/A
Castle Road (L - 7815)	5.5m	2.0m	2m	N/A
New Inn Northern Line	7.5m	1.0m	2.0m	N/A
New Inn Southern Link	6.0m	-	2.0m	N/A
Ballybrittas Road (L - 3913)	6.0m	-	2.0m	Av. = 4.0m
Jamestown Road (L - 3932)	5.5m	-	2.0m	Av. = 4.7m
Grange Road Link (LT - 70572)	6.0m	-	2.0m	Av. = 3.5m
Athy Road R417	7.5m	1.0m	2.0m	Av. = 6.2m
Nurney Road	6.0m	-	2.0m	Av. = 5.6m
Priory Lane	5.0m	-	2.0m	N/A

Table 4.2.2

4.3 INTERCHANGES

Three grade separated junctions are being provided on the route of the Heath/Mayfield motorway scheme. Only one of the three interchanges, New Inn Interchange, will be constructed in full under the proposed scheme. The Ballydavis interchange is a half interchange on the Portlaoise Bypass which with the construction of two west facing ramps will become a full interchange under this scheme. The Mayfield interchange will be partially built by the Kildare Town Bypass and with the construction of three ramps will be completed under this scheme.

The existing Heath West west facing ramps will be removed on completion of the Ballydavis interchange.

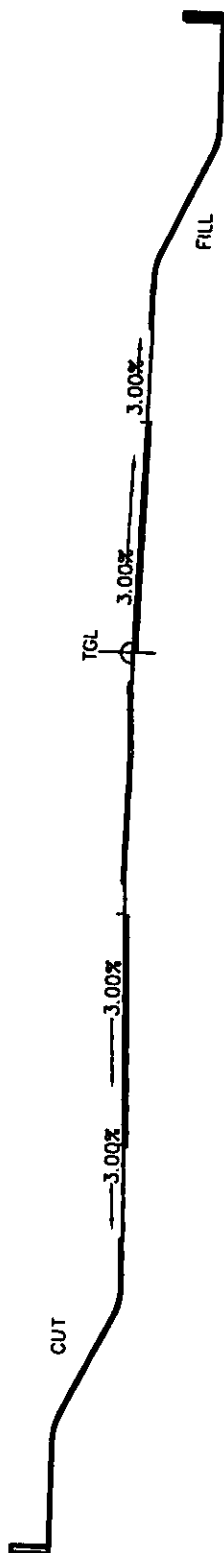
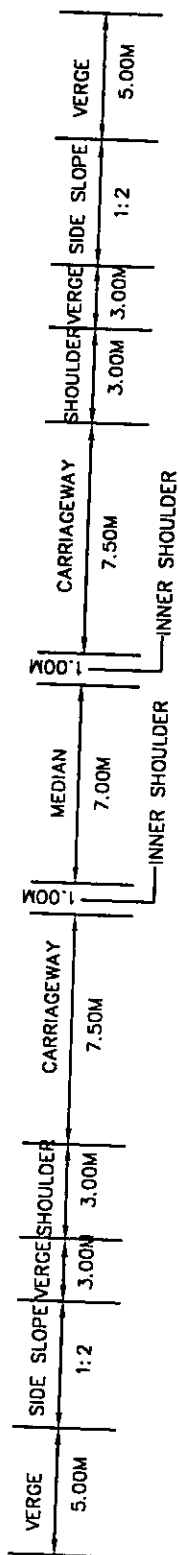
Table 4.3.1 gives a description of interchange type.

On completion of the scheme the three interchanges at Ballydavis on the Portlaoise Bypass, New Inn Interchange and Mayfield Interchange will provide uniformity of interchange type throughout the scheme thereby increasing driver safety.


Grade Separated Junctions

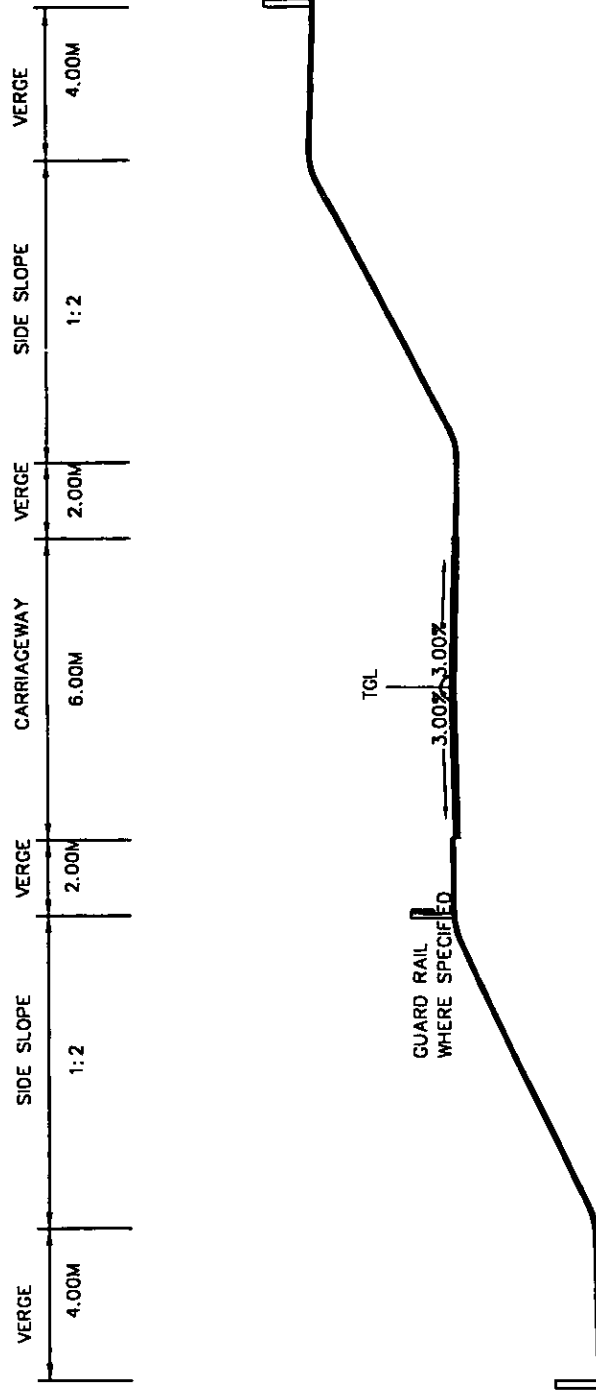
Name of Interchange	Motorway Chainage	Townland for Interchange	Description
Ballydavis		Ballydavis	" Dumbbell " grade separated junction, one bridge and two roundabouts over the motorway. The interchange is linked to the R445 north by 290m of new road.
New Inn	274+00	Cappakeel	" Dumbbell " grade separated junction, one bridge and two roundabouts over the motorway. The interchange is linked to the R445 north by 500m new road. The junction with the R445 is a roundabout. The southern road is a new road of 300m linking the interchange to L - 3901 via a roundabout.
Mayfield	407+00	Mayfield	" Diamond " grade separated junction one over bridge over the motorway. The bridge, one ramp and associated link roads will be constructed under the Kildare Town By - Pass Scheme.

Table 4.3.1



MOTORWAY - TYPICAL SECTION DESIGN SPEED 120km/hr

	KILDARE COUNTY COUNCIL Roads Design Department		PROJECT : HEATH-MAYFIELD MOTORWAY DRAWING: TYPICAL SECTION OF MOTORWAY	Drawing No. CS 01
	J. LYNDY B.E., C.Eng., M.D. COUNTY ENGINEER	R.J. BURKE B.E., M.S., C.Eng., P.D., M.Sc., M.H.T. SENIOR DESIGN ENGINEER	DATE: JAN. '99 SCALE: NOT TO SCALE	



MINOR ROAD – TYPICAL SECTION

DESIGN SPEED 60km/hr

TYPICAL SECTION APPLICABLE TO THE FOLLOWING ROADS:

NEW INN INTERCHANGE – SOUTH LINK
 BALLYBRITTAS ROAD
 JAMESTOWN ROAD
 LUGHILL\GRANGE ROAD
 NURNEY ROAD



KILDARE COUNTY COUNCIL
 Roads Design Department
 St. Mary's Road, Co. Kildare

J. LYONS B.Sc., C.Eng., M.D.
 COUNTY ENGINEER

R.L. BOWEN M.Eng., C.Eng., P.D. MACE, M.Eng.
 SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY
DRAWING: TYPICAL SECTIONS OF MINOR ROADS

SCALE: NOT TO SCALE

DATE: NOV. '99

Drawing No.
 CS 02

4.4 EXISTING ROADS BEING REALIGNED

The existing New Inn Road (L-3930), Cappakeel Road (L-3817), Nurney Road Upper (LT-07056), Nurney Road Lower (LT-07055.1) and Local Road (LS-03009.2) are being severed by the motorway. Alternative access will be provided to each road. New Inn road and Cappakeel Road will be served by the New Inn Interchange. A new road aligned between the existing roads will serve the Nurney Roads. A new road will serve local Road LS-03009.2 from Mayfield Interchange.

The remaining minor roads, Castle Road (L-7815), Ballybrittas Road (L-3931), Jamestown Road (L-3932), Grange Road (LT-70572) will be reinstated by realignments and bridges.

Table 4.4 1 gives details of proposed realignments.

Existing Roads Proposed Alterations

Road Name	Location	Main Alteration	Comments
Ballycarrol	Ballydavis	Realignment	Approximately 500m of realignment linking old road to new roundabout at Ballydavis Interchange.
Castle Road	Morett	Realignment & Overbridge	<p>Construction of 500m of new road creating new junction with R445 west of existing Sugar Loaf cross roads.</p> <p>700m of R445 realigned to cater for staggered 'junction replacing cross roads.</p> <p>Cul - de - sac existing road north and south of motorway.</p>
Ballybrittas	Ballyadding	Realignment & Overbridge	Approx. 500m of realignment.
Jamestown Rd.	Jamestown	Realignment & Overbridge	Approx. 400m of realignment
Grange Rd. Link	Lughill	Realignment & Underpass	<p>Construction of new road 450m long linking Grange Road to Green Road.</p> <p>Cul - de - sac existing road north of the motorway.</p>
Athy Road	Ballyfarsoon	Realignment & Overbridge	Approx. 500m of realignment.
Nurney Road		Realignment & Overbridge	<p>Construction of new road 1200m long linking upper and lower Nurney Roads.</p> <p>Cul - de - sac upper and lower Nurney Roads north and south of the motorway.</p>

Table 4.4.1

4.5 BRIDGES AND STRUCTURES

In all there is a total of 10 bridges/structures to be constructed as part of the Scheme as well as culverts accommodating the watercourses encountered on the route. Locations and types are listed in Table 4.5.1. The preparation of final bridge design will be carried out at detailed design stage.

Structure Number	Location	Type
1 (Existing)	Ballydavis	Overbridge located on Portlaoise By - Pass
2	Castle Road	Overbridge located west of Existing Castle Road
3	New Inn	Overbridge located between L -3930 & L - 3817
4	Ballybrittas Road	Overbridge located on Ballybrittas Road
5	Jamestown Road	Overbridge located on Jamestown Road
6	Grand Canal	Motorway Bridge over Local Road L -39321 & Grand Canal
7	River Barrow	Motorway Bridge over River Barrow
8	Grange Road	Underpass Located on existing Grange Road
9	Grange Road Link	Underpass located west of existing Grange Road
10	Athy Road	Overbridge located on Athy Road
11	Nurney Road	Overbridge located between L - 507056 & L - 507055.1
12 (Existing)	Mayfield	Overbridge located on Kildare Town By - Pass

Table 4.5.1

The EIS establishes a number of criteria, which the bridge design should meet. The visual impact of each structure is discussed in Chapter 8, Section 8.18 of this report.

4.6 ACCOMODATION ROADS

There are 16 accommodation roads being provided under the Scheme.

Accommodation Road Number	Location	Serving Landowners
1	Ballycarroll	Laois County Council
2	Heath/Castle Road	M. Hyland, P. Gleeson, P. Young, E. Mulhall.
3	Castle Road East	P. Moore, Ml. Moore, Ed. Mulhall, L & J Fitzpatrick
4	Cappakeel Road East	Coillte, E. Mulhall
5, 5a	Ballybrittas Road West	B. Hyland, P. Fitzpatrick, Ml. McCormack, I. Fox
6	Ballybrittas Road East	W. Duffy
7	Jamestown Road East	A. McLoughlin
8	Grand Canal	D. O'Connell
9	Grange Road S/West	Coillte
10	Grange Road N/West	E & S McMahon
11	Grange Road East	J. J. Walsh
12, 14	Nurney Road Upper	J. Dunne, L. Kelly
13	Nurney Road Lower	L. Maher
15	Nurney Road Lower	P. A. Purcell, D. McGuinness
16	N7	C. Purcell

Table 4.6.1

These accommodation roads, listed in Table 4.6.1 and shown shaded in yellow on drawing numbers PR01 to PR10 inclusive, are provided to maintain access to severed lands north and south of the motorway. Some lands severed but not served by an accommodation road are identified for landscaping purposes.

4.7 JUNCTION SIZING AND CAPACITY ASSESSMENT

As part of the overall traffic study McMahon Design and Management Ltd.⁽¹⁹⁾ were asked to assess the junction capacities and geometric arrangements in connection with the proposed grade separated interchanges and associated road network. The following junctions were examined with regard to their geometric arrangement:

- *Junction 1 New Inn Interchange On/Off Ramps/Link Road*
- *Junction 2 New Inn Interchange Northern Link Road/R445*
- *Junction 3 New Inn Cross Roads*
- *Junction 4 Mayfield On/Off Ramps/Link Road.*
- *Junction 5 Mayfield Interchange/R445*

4.7.1 Junction 1 New Inn Interchange On/Off Ramps/Link Road

The evaluation of junction arrangements at the top of the ramps which would be appropriate in terms of traffic capacity and road safety concludes that roundabouts need not be considered.

A Staggered Tee Junction or Cross Roads would be adequate at these locations for the year 2024 predicted traffic flows.

However, the predicted traffic flows at this interchange are based on current traffic levels and the application of appropriate traffic growth figures. It should be noted that it is an aspiration of the Scheme that the provision of an intermediate interchange at this location will attract development and tourism to this area of the Midlands. For this reason it is felt that the predicted traffic flows may be underestimated and that for future development the provision of roundabouts at these location would be more appropriate.

The provision of roundabouts also provides for uniformity of junction type throughout the New Inn Interchanges infrastructure.

4.7.2 Junction 2 New Inn Interchange Northern Link Road/R445 (N7)

The results of this junction analysis concluded as follows:

- *The provision of a Tee Junction would not have adequate traffic capacity.*
- *A roundabout with internal minimum diameter of 25m should be regarded as the practical minimum.*

4.7.3 Junction 3 New Inn Cross Roads

This cross road is located where the R422 intersects the existing N7 at New Inn. This Cross Roads has been identified as the highest accident location along the N7 between The Heath and Mayfield.

As part of the assessment of the proposed Scheme an analysis of this junction was undertaken. The conclusions were as follows:

- *The provision of a Staggered Tee Junction would not have adequate traffic capacity.*
- *A roundabout with internal minimum diameter of 25m should be regarded as the practical minimum. It should be noted that the provision of a roundabout of diameter greater than 25m would impact greatly on businesses located adjacent to New Inn Cross Roads.*
- *It is considered that it would be desirable to have a speed control on that section of the R445 (N7), from New Inn Cross Roads to New Inn Interchange Link Road Roundabout, by way of a formal 40mph speed limit, together with speed reduction facilities.*

4.7.4 Mayfield Interchange On/Off Ramps /Link Road

An analysis of this junction concluded as follows:

- *A Staggered Tee Junction or Cross Roads would be adequate at these locations for the year 2024 predicted traffic flows.*

4.7.5 Mayfield Interchange/R445 (N7)

As part of the assessment of the proposed Scheme an analysis of this junction was undertaken. This junction is being constructed as part of the Kildare Town Bypass. It was felt that a re-examination of this junction was required using the updated traffic data acquired as part of the Heath/Mayfield traffic study. The conclusions were as follows:

- *Neither the provision of a Standard Tee Junction or Wide Tee Junction arrangement would have adequate traffic capacity.*
- *Queues of up to 1.8km could be expected. This would mean that traffic would be backed up all along the link road and motorway off-ramps, onto the motorway itself.*
- *A roundabout with internal minimum diameter of 25m should be regarded as the practical minimum. This would be in conjunction with speed restriction on the R445 at the approaches to the roundabout.*

4.8 ROAD LIGHTING

It is proposed to provide lighting to traffic route standard at the following locations:

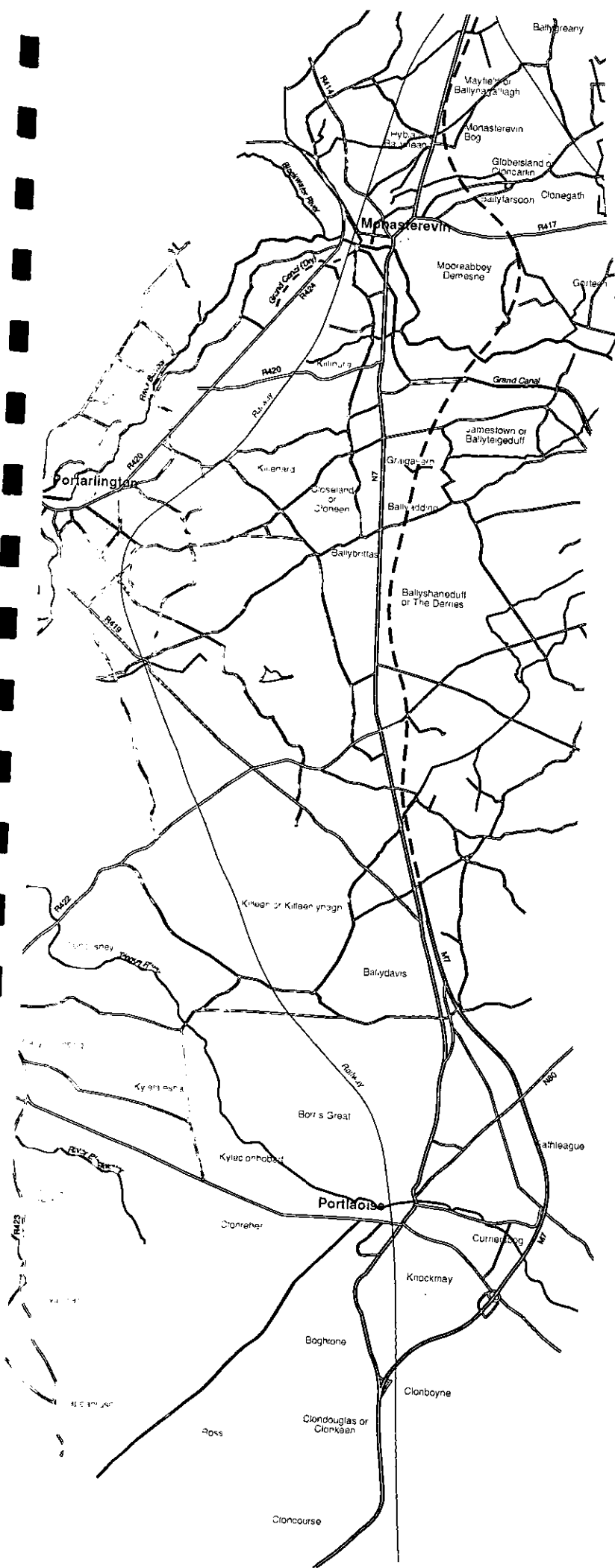
- **Ballydavis Interchange:** *existing lighting installation will be extended to cover the entire interchange, as far as the merging area of the ramps, the two roundabouts and all roads linking to these roundabouts to a distance of approximately 140 metres away from the roundabouts. Lighting along the Ballycarroll road and the link road to the R445/N7 will extend further to allow for lighting of the tight curvature of these roads.*
- **New Inn Interchange:** *lighting will be provided at the interchange between the north-east and south-west ramp merging zones, including the two roundabouts linking the on and off ramps and the three outlying roundabouts on ancillary roads. The southern link road and roundabout at the Vicarstown's road and the northern link road and roundabout junction with the R445/N7 will also be lit. The roundabout at New Inn cross road and associated roads for a distance of approximately 140m will be lit, as will all roads leading to the proposed roundabouts along the Vicarstown road and the junction of the northern link road with the R445/N7.*
- **Mayfield Interchange:** *provision has been made under the proposed Kildare Town Bypass Scheme to install lighting for this interchange. The lighting scheme proposed will have to be extended to cover the entire interchange between the ramp merging zones.*

4.9 UTILITIES

The construction of the preferred route will affect existing public utilities in the area. The scheme provides for temporary and permanent diversion of these utilities.

The utilities concerned are:

- *Telecommunications* (Telecom Eireann)
- *Electrical Equipment* (Electrical Supply Board)
- *Water Supply* (Laois & Kildare County Councils, Killenard Group Water Scheme, Heath Group Water Scheme)
- *Drainage* (Laois & Kildare County Council, Barrow Drainage Board)



CHAPTER FIVE

Scheme Route Options Considered

5. SCHEMES ROUTE OPTIONS CONSIDERED

5.1 SUMMARY OF SOUTHERN ROUTE OPTIONS

Three route options were considered in the Southern Corridor. These routes are referred to as route S1, S2 and S3 respectively. Route S1 is the most northerly of the routes commencing at the termination of the Portlaoise Bypass. From there the route runs parallel with the exiting N7 until it crosses the Jamestown Road (L-3932). From this point the route swings south to avoid the settlement of Monasterevin town. The route bisects Hill Wood in Monasterevin and then returns north to rejoin the existing N7 and link to the proposed Kildare Town Bypass.

Route S2 follows a similar line to route S1 until it crosses the Ballybrittas Road (L-3931). Both routes traverse the Derries Wood 200m south of the N7. From the Ballybrittas Road the route swings further south than route S1 crossing the River Barrow just north of Sally Island. When route S2 crosses the Grange Road (LT-70572) it begins its journey north to meet the proposed Kildare Town Bypass. At this location the route enters the southern edge of Hill Wood.

Route S3 is the most southerly of the routes. This route swings south immediately from its link to the Portlaoise Bypass. It crosses the Castle Road (L-7815) south of Morett Castle and Local Road L-3930 south of Cappakeel cross roads. The route then moves slightly north bisecting the Derries Wood. On exiting the wood the route again turns south crossing the River Barrow where the River meanders just north of Sally Island. Route S3 continues in a southerly direction until it traverses Green Road. From this point the route journeys north to tie in to the proposed Kildare Town Bypass.

5.2 METHOD OF APPRAISAL OF SOUTHERN ROUTE OPTIONS

The appraisal of the three Southern Route Options was based on the environmental considerations, and the engineering aspects of each route. Details of the complete route selection process is contained in the report titled "Heath-Mayfield, Motorway Scheme, Preliminary Route Selection Study, 1994 (9).

In summary that study appraised all three alternatives under the following topics:

- **Length**
- **Geometric Design**
- **River Barrow Crossing**
- **Impact on Landscape**
- **Agriculture, Forestry and Drainage**
- **Area of Land Acquisition**
- **Natural & Cultural Heritage**
- **Socio- Economic Impact**

- *Cost Benefit Analysis*
- *Number of dwelling houses to be demolished*
- *Geotechnical Aspects*
- *Interchange Provision*
- *Cost*

Specialist independent consultants were engaged to prepare preliminary reports on specific aspects been considered, in order to assist the County Councils in their consideration of each route option.

The optimum choice was based on an overall assessment of each route option as compared to each other. Details of the assessment are given in Chapter 6 of this report. A synoptic table of comparative analysis is contained in Chapter 7.

5.3 DESCRIPTION OF SOUTHERN ROUTE OPTIONS

The descriptions of the southern corridor route options given below are based on the route options considered in detail in the "Preliminary Route Selection Report"⁽⁹⁾ as prepared by Laois County Council in conjunction with Kildare County Council. Figure 3 illustrates the route options considered.

5.3.1 Route S1

Route S1 from the terminus point of the M7 Portlaoise By-Pass runs parallel to the existing N7 from the townland of the Great Heath, through the townland of Morett and into the townland of Cappakeel.

The alignment crosses the site of an ancient road west of Local Road L-7815 (Castle Road). There is no visible trace of the road on the ground but it is marked on Ordnance Survey 6" Sheet Laois 8⁽¹⁵⁾.

The alignment passes into cut as it passes through the hill to the south of Sugar Loaf cross roads. The alignment then emerges close to existing ground level as it crosses Local Road L-7815 at a distance of approximately 200m south of the N7. Local Road L-7815 will require an overbridge to carry it over Route S1 at this point. As the proposed elevation of the motorway would be at the level of the existing local road substantial embankments would be required for the approaches to this overbridge. The construction of such an overbridge would require the demolition of two dwelling houses.

*Route S1 continues east on an embankment traversing Flynn's Fen identified as being "A small area of species-rich fen in an area where this habitat is rare; dominated by black bog rush (*Schoenus nigricans*) and purple moor-grass (*Molinia caerulea*)"⁽¹⁵⁾.*

The alignment of Route S1 passes back into cut west of Local Road L-3930 (New Inn/Vicarstown Road). It then crosses Local Road L-3930 2m below the present road level at a distance of 200m from New Inn cross roads. Local Road L-3930 will require an overbridge to carry it over Route S1 at this point. Approach embankments to this overbridge will be substantial as the motorway is in relatively shallow cut. As ribbon development extends from New Inn Cross along Local Road L-3930 Route S1 will require the demolition of 3 residences.

From here Route S1 continues on a line which is parallel to the existing N7. The vertical alignment continues in increasing cut as the ground profile rises locally. The alignment passes to the south of the Georgian Inn and the Montague Hotel.

Route S1 emerges from cut and crosses Local Road L-3817 at ground level. As with other Local Roads an overbridge would have to be provided. Alternatively, one structure may

be provided to serve each of the Local Roads, L-3930 and L-3817. A single structure would form part of an interchange at this location.

Route S1 then enters the Derries Wood which is a Coillte Forestry Plantation. The vertical alignment is on an embankment which rises from approximately 0.5m to over 3.5m at the end eastern end of the straight. The Derries will visually absorb Route S1 as it passes through (13).

Within the Derries Wood Route S1 passes within 100m of the former site of a castellated house built in 1810 on the site of a former house of the O'Dempseys. All traces appear to have been removed by forestry work. To the south of this is the former site of another feature also removed which may have been a circular enclosure or a landscaping feature (15).

Exiting from the Derries Wood Route S1 is now passing 200m to the south of Ballybrittas. The Route passes 2m below Local Road L-3931 (Ballybrittas Road). This Local Road would require an overpass to carry it over the motorway. Although the alignment is in cut the construction of an overbridge will require embankments for the approaches. These embankments will be visually intrusive to residences along Local Road L-3931 (13).

From Local Road L-3931 Route S1 continues parallel to the N7 until it crosses Local Road L-3932 (Jamestown Road) a distance of 250m south of the N7. Route S1 crosses Local Road L-3932 in over 4.5m cut which would facilitate the construction of an overbridge to carry Local Road L-3932 over the motorway. This crossing point avoids the ribbon development along Local Road L-3932.

After passing Jamestown the route must now traverse the Athy Branch of the Grand Canal and the River Barrow. Until this point the alignment has closely followed the alignment of the existing N7. Were Route S1 to continue to follow the existing N7 it would encounter difficulties as the Grand Canal swings to the east towards Monasterevin in this area and as a result runs almost parallel to the existing N7 for almost 2000m. In addition the River Barrow meanders as it flows southward of Monasterevin. Any alignment for route S1 in this area would have to cross the Grand Canal at a significant skew angle. The crossing of the River Barrow would also be at a significant skew or would involve a double crossing at Portmurrangan Island (12). Further east the alignment would be required to move south in any event to avoid Moore Abbey and Monasterevin. To avoid these obstacles Route S1 is carried to the south away from the existing N7.

From Local Road L-3932 Route S1 heads eastwards towards the Grand Canal passing from cut to fill. The vertical profile of Route S1 is now at it's lowest point.

The vertical alignment starts to rise west of Local Road 39321 (Canal Road) to facilitate the motorway crossing the Grand Canal and the River Barrow

Route S1 crosses Local Road L-39321 which is a Cul de Sac running on the western bank of the Grand Canal. Route S1 is now on an embankment of over 6m which will allow for

the construction of underpasses to take both Local Road L-39321 and the Grand Canal under the motorway.

The ground level on the eastern side of the Grand Canal is lower than on the west and as a result the embankment carrying the motorway rises to over 10m between the Grand Canal and the River Barrow. The route will be highly visible in this area (13).

Having moved south both to avoid crossing the River Barrow in the vicinity of Portmurrangan Island and the environs of Monasterevin the alignment now swings to head in a more northerly direction towards the western terminus of the proposed M7 Kildare Bypass.

Route S1 crosses the River Barrow on a river bend. The bridge structure will be at a skew angle to the River resulting in increased costs (12).

Having crossed the River Barrow Route S1 continues on an embankment traversing Dangan's Wood which is now a Coillte conifer plantation but with elements of the original woodland vegetation and fauna. The alignment passes to the south of Grange Farm crossing the lane leading to the farm. An underpass would carry this access route under the motorway.

The alignment S1 now passes approximately 200m to the north of 4 residences and a knitwear factory along Local Road LT-70572 (Grange Road Upper). In this location the route is in cut but must commence rising to minimise the depth of cut required through Hill Wood.

Route S1 enters Hill Wood where ground level on the alignment rises to over 106mOD (Malin Head). The vertical profile of the motorway reaches it's highest point within the wood of nearly 91mOD (Malin Head). This results in a very deep cutting of over 15m through Hill Wood. Hill Wood is important as a distinctive landmark in an area of high scenic quality. The deep cutting would create a notch which would break the skyline and which would be impossible to mitigate. Hill Wood is also important in terms of it's recreational amenity value. There are numerous trails through the wood. As Route S1 runs through the middle of the wood this amenity would be severed. The construction of Route S1 will represent a significant intrusion on an area of considerable amenity and ecological value.

On exiting Hill Wood Route S1 immediately crosses the R417 (Athy Road) approximately 1.2km south of the existing N7. Route S1 is in approximately 9m cut at this point. An overbridge to carry the R417 over the motorway would be required.

Route S1 now heads towards Local Road LS07056 (Nurney Road Upper). The alignment passes almost 17m under Local Road LS07056 which will require an overbridge. The depth of cut may pose some difficulties to the construction of an overbridge.

Having crossed Local Road LS07056 Route S1 crosses a GAA pitch before traversing Local Road LS-7055.1 (Nurney Road Lower). The GAA pitch would have to be replaced.

Route S1 crosses Local Road LS07055.1 at roughly ground level at Ch. 38500. Consequently an overbridge with approach embankments would be required to carry Local Road LS07055.1 over the motorway.

Route S1 is on an embankment between Local Road LS-07055.1 and Local Road LP-03009.2. An overbridge for Local Road LS-03009.2 is not required as the proposed Mayfield Interchange at the western terminus of the proposed M7 Kildare Town Bypass provides an alternative route.

Route S1 ties into with the western terminus of the proposed M7 Kildare Bypass west of the proposed overbridge at Mayfield.

5.3.2 Route S2

The alignment of Route S2 runs from the terminus point of the M7 Portlaoise By-Pass parallel to the existing N7 from the townland of the Great Heath to the townland of Morett.

The vertical alignment of Route S2 is in cut at the point where it picks up from the M7 Portlaoise By-Pass but it quickly passes to a shallow embankment. The vertical profile follows the general trend of the ground profile which falls to the east.

The alignment of Route S2 is similar to that of Route S1 until the Route crosses Local Road L-7815 (Castle Road), approximately 200m from the existing N7. At this point Route S2 moves to the south away from the alignment of Route S1. The purpose of this movement is to bring Route S2 to a crossing point on Local Road L-3930 (New Inn/Vicarstown Road) where there are no houses and allows the alignment to avoid Flynn's Fen, thus avoiding two impacts which Route S1 had in this area.

The alignment crosses the site of an ancient road. There is no visible trace of the road on the ground but it is marked on Ordnance Survey 6" sheet Laois 8 (15).

Route S2 is in cut as it passes through the hill to the south of Sugar Loaf cross roads. The alignment emerges close to existing ground level as it crosses Local Road L-7815. Local Road L-7815 will require an overbridge to carry it over Route S2 at this point. To construct an overbridge along the line of the existing Local Road would require substantial embankments on the approaches to it. The alignment of Route S2 and such an overbridge would have a visual impact on one residence located along Local Road L-7815 and would require the demolition of one dwelling house.

Route S2 crosses Local Rd L-3930 (New Inn/Vicarstown Road) approximately 600m south of the N7. The vertical alignment of the route at this point is at a point where the alignment passes from fill to cut. The crossing point utilises a gap in the residential development along Local Road L-3930 between two residential properties. Local Road L-3930 will require an overbridge to carry it over Route S2 at this point. In addition a cul de sac, known locally as Priors Lane will have to be realigned to the south.

Route S2 crosses approximately 1m below Local Road L-3817 (Cappakeel Road) at a point 480m south of the N7. Local Road L-3817 will require an overbridge to carry it over Route S2 at this point. Alternatively, one structure to cater for Local Roads L-3817 and L-3930 may be considered.

Having traversed Local Road L-3930 Route S2 returns to a line approximately 150m from the exiting N7. At this point the Route is within the Derries Wood. The Derries Wood is a Coillte owned commercial conifer plantation. As Route S2 passes through the Derries Wood it will be visually absorbed by the wood.

The Route then turns to the south and away from the existing N7. Route S1 followed the existing N7 up to a point where it became necessary to swing south so as to avoid Portmurrangan Island, Moore Abbey and Monasterevin. Route S2 swings south much sooner to avoid these obstacles.

The alignment passes approximately 400m to the south of Ballybrittas through a landscape of medium scenic quality (13). Route S2 crosses Local Road-3931 (Ballybrittas Road) approximately 250m to the south of where Route S1 crossed. At this location the edge of the carriageway would be within 20m of an uninhabited dwelling house.

The route passes more than 3m under Local Road L-3931. Local Road L-3931 would require an overbridge to carry it over the motorway. The motorway and the bridge will be visible from dwellings along the minor road.

To the east of Local Road L-3931 Route S2 is in cut and continues in cut as it intersects Local Road L-3932 (Jamestown Road) approximately 950m south of the N7 at a depth of 5m. An overbridge to carry the minor road over the motorway would be required here. Route S2 crosses Local Road L-3932 800m to the south of where Route S1 crossed thus avoiding the ribbon development along this Local Road.

To the east of Local Road L-3932 the alignment of S2 begins to rise towards the Grand Canal. Route S2 crosses at a height of approximately 7m over the Athy Branch of the Grand Canal and Local Road L-39321, which is a Cul de Sac running on the western bank of the Canal. As Route S2 is on an embankment of over 7m both Local Road L-39321 and the Grand Canal may easily be carried under the motorway in separate underpasses.

To the east of the Grand Canal the ground level falls and the embankment carrying the motorway rises to over 11m high as it runs up to the western bank of the River Barrow.

This embankment will generate visual intrusion on the low lying landscape adjoining the Grand Canal and the River Barrow.

Route S2 then crosses the River Barrow on an embankment of over 8m high. The River Barrow will be used as an outfall for surface water runoff.

Route S2 passes into Dangan's Wood on the eastern bank of the River Barrow which is now a Coillte conifer plantation but with elements of the original woodland vegetation and fauna. On exiting Dangan's Wood the Route is on an embankment which is now over 4m high.

Route S2 passes adjacent to the three residences located at the end of Grange Road Lower (LT-70571). The location of the carriageway embankment at this location will necessitate the removal of one dwelling house. The remaining two dwelling houses will be within a distance of 30m from the bottom of the motorway embankment. The alignment is on an embankment over 3.0m high at this point. The access road to these

residences would be severed. This access road would be realigned along the northern fence of the motorway.

Route S2 passes within 120m of an archaeological feature which is marked as a disused burial ground on the 1838 OS 6" map (18).

Route S2 crosses Local Road LT-70572 (Grange Road Upper) at ground level before entering into the extreme southern end of Hill Wood. The route enters the southern end of Hill Wood in order to avoid houses along Local Road LT-07057 (Green Road) which are adjacent to Hill Wood. As the motorway is in fill prior to entering Hill Wood it will be possible for Local Road LT-75071 to be carried under the motorway in an underpass.

The alignment passes in cut through Hill Wood. The depth of cut exceeds 12m in some locations. The alignment now traverses an area of high scenic quality and the impact of the width of the cut in the surrounding landscape will be significant. The construction of Route S2 through this corner of Hill Wood would entail the loss of significant amenity trees. However most of them are over-mature and would be amply compensated for by new planting.

On exiting Hill Wood Route S2 crosses approximately 3m under Regional Road R417 (Athy Road) approximately 2km south of the N7. This Regional Road would require an overbridge to carry it over the motorway.

Immediately to the east of the R417 Route S2 is in cut. The ground level then falls away rapidly so that the alignment, as it moves into Kill Plantation, a Coillte owned commercial coniferous forestry plantation, moves onto an embankment which rises to a maximum height of 6m. This section of the alignment would be screened from the surrounding landscape.

Route S2 emerges from Kill Plantation on an embankment over 1.5m in height. The alignment remains on an embankment until Route S2 crosses Local Road LS-07056 (Nurney Road Upper). Local Road LS-07056 would require an overbridge to pass over the motorway at this point

Between Local Roads LS-07056 and LS-07055.1 (Nurney Road Lower) there is a section of cut which is approximately 9m below ground level at the deepest point. The alignment crosses Local Road LS-07055.1 at existing ground level. Local Road LS-07055.1 would require an overbridge to pass over the motorway at this point.

Route S2 crosses Local Road LS-03009.2 prior to passing through Monasterevin Bog. An overbridge for Local Road LS-03009.2 is not required as the proposed Mayfield Interchange at the western terminus of the proposed M7 Kildare Bypass provides an alternative route.

The alignment of Route S2 then ties into the proposed M7 Kildare Bypass.

5.3.3 Route S3

Route S3 differs immediately from Routes S1 & S2 in that from the terminus point of the M7 Portlaoise By-Pass it swings almost immediately, to the south, away from the existing N7.

The vertical profile of Route S3 follows the general trend of the ground profile which falls to the east. The vertical alignment of Route S3 is in cut at the point where it picks up from the M7 Portlaoise By-Pass but it quickly passes to a shallow embankment.

Route S3 passes from an embankment back to cut before crossing Local Road L-7818 (Castle Road) at more than 4m below existing ground level and approximately 700m south of the N7. Local Road L-7815 will require an overbridge to carry it over the motorway at this point, the construction of which would be facilitated by Route S3 being in cut.

Route S3 is immediately south of the ruins of Morett Church located to the east of Local Road L-7818.

The alignment then emerges from cut and passes onto an embankment. This embankment reaches it's highest point at over 7m high. The landscape in this area is strongly defined by hedgerow patterns.

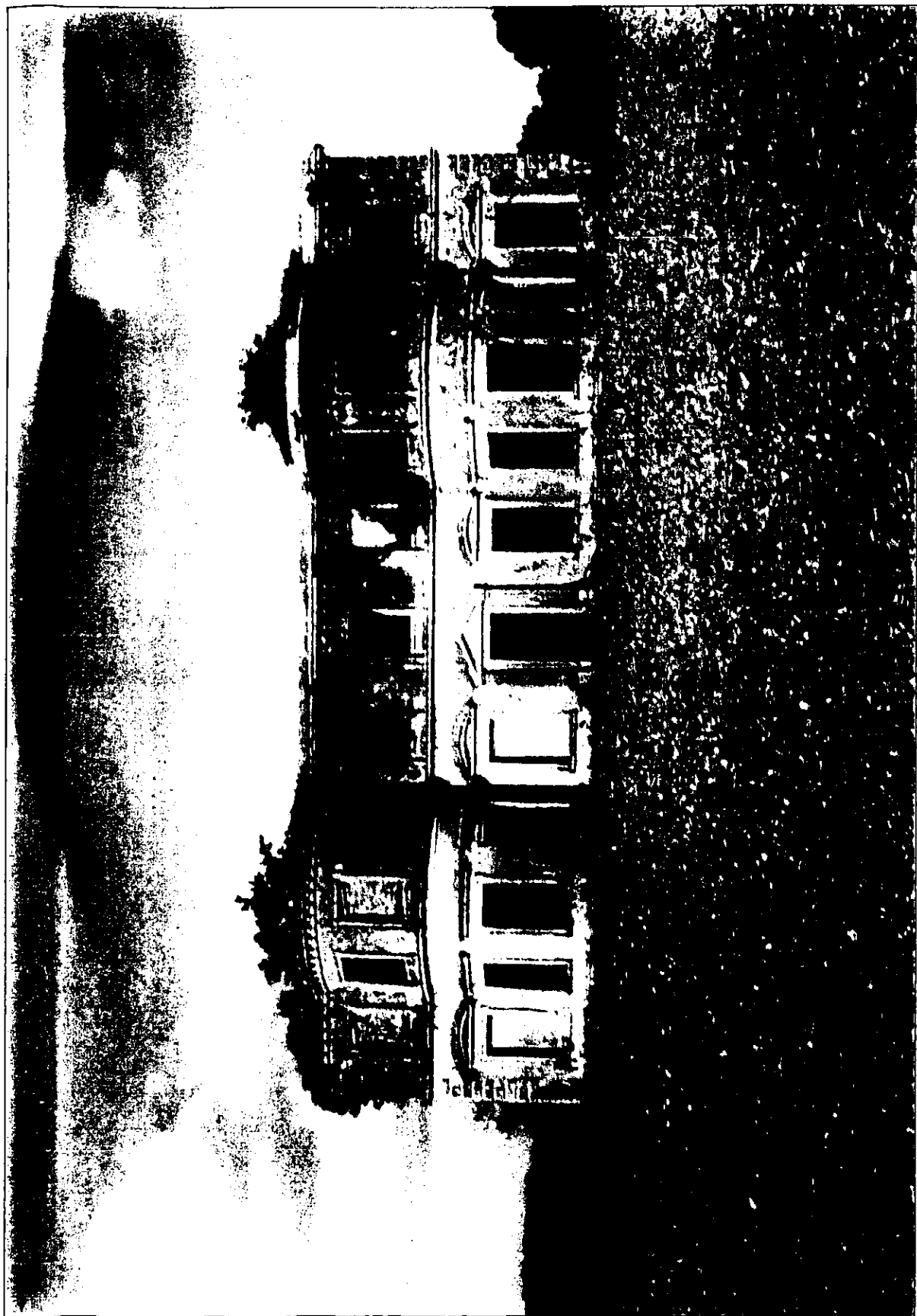
Route S3 reaches its most southerly point approximately 2.1km from the N7 as it crosses Local Road L-3817-26 (Kilmurry Road) at a height of approximately 3m above existing ground level. To the west of this road the alignment is on an embankment between 2m and 4m high. Local Road L-3817-26 will require an overbridge to carry it over the motorway at this point.

Between Local Road L-3817-26 and Local Road L-3930-16 (Vicarstown Road) Route S3 passes from a fill area into cut before traversing Local Road L-3930-16 approximately 1m below existing ground level, approximately 2.3km from the N7. Local Road L-3930-16 would require an overbridge to carry it over the motorway at this point.

To the east of Local Road L-3930-16 Route S3 moves eastward towards the Derries Wood. The alignment is now on an embankment. The Derries is a Coillte owned commercial conifer plantation. Route S3 will effectively split the territory of the resident fallow deer in two (15).

Before existing the Wood Route S3 cuts through the northern edge of Rathdaire Lake. Route S3 leaves the Derries Forestry Plantation on an embankment over 5m high. The landscape is open and defined to the east and west by mature stands of broadleaf trees. Views of Rathdaire House will be opened up to the north.

West of Local Road L-3931 (Ballybrittas Road) the alignment of Route S3 is in cut of over 4.5m. At this point Route S3 is traversing a landscape composed of pasture land



RATH HOUSE

interspersed with mature trees. Just west of this local road Route S3 passes through the curtilage of Rathdaire cottage.

Route S3 then passes approximately 3m under Local Road L-3931 at it's junction with Local Road L-39312 a distance of about 1.5km south of the N7. Local Road L-3931 will require an overbridge to carry it over the motorway at this point and Local Road L-39312 will be realigned to the north. Although the motorway alignment passes approximately 3m under Local Road L-3931, embankments would be required on the approaches to the overbridge. These embankments will have a significant impact on 3 residences at this point. Route S3 is approximately 1.5km south of Ballybrittas at this juncture.

To the east of Local Road L-3931 Route S3 crosses the Rapparee, a belt of beech dominated woodland , with abundance of garlic and other woodland species. There may be an archaeological feature at the northern end.

Between Local Road L-3931 and Local Road L-3932 (Jamestown Road) the alignment moves from an embankment, maximum height of 5m, into an area of cut crossing the L-3932 at existing ground level approximately 1.6km south of the N7. Local Road L-3932 would require an overbridge to carry it over the motorway at this point. Substantial embankments will be required on the approaches to this overbridge.

To the east of Local Road L-3932 the vertical profile of the motorway is falling but the ground level falls away more rapidly and as a result Route S3 passes to an embankment which steadily gains height in order to cross the Grand Canal and River Barrow.

Route S3 crosses at approximately 5m over Local Road L-39321 (Canal Road), which is a Cul de Sac road located on the western bank of the Athy Branch of the Grand Canal, and then crosses over the canal itself. Local Road L-39321 and the canal can be carried under the motorway in separate underpasses.

To the east of the Grand Canal the ground level falls and the embankment carrying the motorway rises to over 7m high as it runs up to the western bank of the River Barrow. This embankment will generate visual intrusion on the low lying landscape adjoining the Grand Canal and the River Barrow.

The crossing point on the River Barrow is on a bend in the river's course just before it divides to form Sally Island. The alignment was kept north of the abandoned leg of the River Barrow around Sally Island but will still have to cross the River Barrow at a point downstream from a bend where scour is likely.

Route S3 arrives on the eastern bank of the River Barrow in Dangan's Wood which is now a Coillte conifer plantation but with elements of the original woodland vegetation and fauna.

The vertical profile of the motorway starts to rise having been steadily falling. This rise in profile is necessary to minimise the depth of cutting required through the higher ground to the south of Hill Wood.

Route S3 passes through Greens Wood which like Dangan's wood is now a Coillte Conifer Plantation but with elements of the original woodland flora.

Route S3 crosses Local Road LT-70572 (Lughill Lane). The route will permanently sever this road. Moving east Route S3 then passes approximately 4m under Local Road LT-07057 (Green Road) which will require an overbridge to carry it over the motorway at this point. The construction of this overbridge will impact on several residences along this local road.

Between Local Road LT-07057 and the Regional Road R417 (Athy Road) the ground profile dips and the alignment is in cut. Route S3 then crosses approximately 6m below Regional Road R417. The alignment takes advantage of a gap in the ribbon development along the R417 at this point, a distance of approximately 2.5km from the N7. The R417 will require an overbridge to carry it over the motorway at this point. As the motorway will be in over 6m cut minimal approach embankments would be required for this bridge.

To the east of the R417 Route S3 crosses Kill Plantation a Coillte owned commercial coniferous forestry plantation. Route S3 will cut the plantation in two. Exiting the plantation the alignment is approximately 3m in cut.

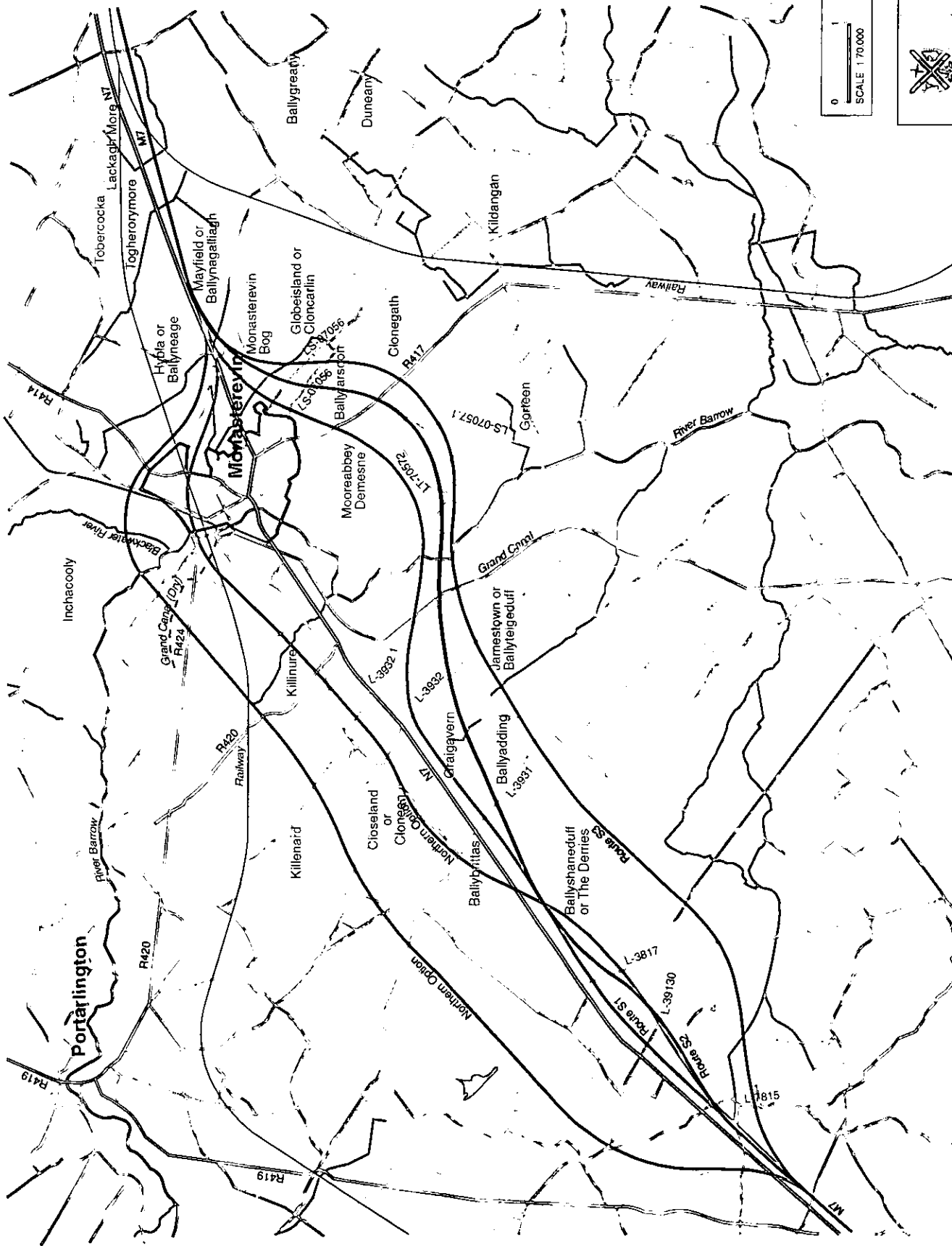
The alignment of Route S3 is now heading sharply north wards so as to tie in with the proposed M7 Kildare Bypass at Mayfield.

Route S3 passes approximately 2m below Local Road LT-070569 (Nurney Road Upper) and 1m below Local Road LT-07055.1 (Nurney Road Lower). Both these Local Roads will be carried over the motorway on the same overbridge.

Route S3 then crosses the entrance avenue to Cloncarlin House. This avenue will have to be realigned along the motorway fenceline.

The alignment of route S3 continues on an embankment never more than 2m high before passing into cut. Route S3 continues in cut before crossing Local Road LS-03009.2. This Local Road would not require an overbridge as an alternative route exists via the proposed Mayfield interchange on the proposed M7 Kildare Bypass.

After crossing Local Road LS-03009.2 Route S3 passes through Monasterevin Bog. Route S3 then ties into the proposed M7 Kildare Bypass at Mayfield.



LEGEND

- Built up Area
- Northern Options
- Route S1
- Route S2
- Route S3
- Development Boundary

0 1 2 3 4
SCALE 1:70,000
KILOMETRES



Kildare County Council

Highlight Route Options S1, S2 and S3 in different colours Northern Routes can be shown in same colour

Job No 2126

Date Nov 1999

Figure 3

6. ENVIRONMENTAL ASSESSMENT OF SOUTHERN ROUTE OPTIONS

6.1 ENVIRONMENTAL ASSESSMENT OF ROUTE CORRIDORS

As previously stated in Chapter 3 of this report the Southern Corridor was identified as the more suitable corridor in which to place the Motorway Scheme.

The Southern Corridor route options are now assessed in terms of their environmental impact on the surrounding area into which the route will be absorbed.

6.2 ENVIRONMENTAL ASSESSMENT OF SOUTHERN ROUTE OPTIONS

Each route option within the southern corridor is described in Chapter 5 of this report. The following are the environmental impacts identified for each route, concluding with the choice of preferred route.

The aspects considered are as follows:

- *Length*
- *Geometric Design*
- *River Barrow Crossing*
- *Impact on Landscape*
- *Agriculture, Forestry and Drainage*
- *Area of Land Acquisition*
- *Natural & Cultural Heritage*
- *Socio- Economic Impact*
- *Cost Benefit Analysis*
- *Number of dwelling houses Affected by Each Route Option*
- *Geotechnical Aspects*
- *Interchange Provision*
- *Cost*

Chapter 7 contains the comparative analysis table.

6.2.1 Length

The length of the mainline of each of the route options is as follow (9):

<i>Route S1</i>	<i>17.25km</i>
<i>Route S2</i>	<i>17.45km</i>
<i>Route S3</i>	<i>17.70km</i>

It should be borne in mind at this point that the proximity of route S1 to the existing National Primary Road N7 creates some difficulties in relation to the realignment of minor roads over the motorway. For example the construction of an overbridge at Ballybrittas would impact on the exiting N7/Ballybrittas Road cross roads and adjacent business' and dwellings.

The realignments associated with minor roads along Route S2 are away from the ribbon developments of Ballybrittas, New Inn and Jamestown and as such short realignment lengths only are required.

Route S3 would also have short realignment lengths to cater for the minor roads. However, the distance of Route S3 from the existing N7, which on completion of construction of the motorway scheme will become Regional Road R445 and serve non-motorway traffic, may require long lengths of local roads to be upgraded to provide for suitable and safe interaction between the local road network and the new Motorway.

6.2.2 Geometric Design

The geometric aspects of each proposed route are within the technical guidelines as established by RT180 (4). However route S2 has superior geometrics to routes S1 and S2 in two aspects (9).

- The vertical grade of route S1 approaching Hill Wood is steep at a grade of 3% exceeding any grades on routes S2 or S3.*
- The horizontal curve on alignment S3 between Cloncarlin House and Mayfield Interchange is a 1400m radius curve which is 100m smaller than the tightest curve on route S1 or S2.*

In conclusion route S2 has superior geometrics to route S1 and S3.

6.2.3 River Barrow Crossing

Roughan & O' Donovan, Consulting Engineers were engaged to assess the Northern and Southern corridors of the project to identify the suitable locations for the construction of a motorway bridge to cross the River Barrow (6). Their brief covers the area from the north of the northern corridor to the south of the southern corridor. Figure 4 shows the less favourable stretches of the River Barrow for bridge location established by Roghan & O'Donovan Consulting Engineer's in their report titled "River Barrow Crossing Feasibility Study" (12).

Route S1 straddles an area that should be avoided for the purposes of crossing the River Barrow. Piled foundations would be required but the skew angle of the bridge to the River would make piling more difficult. Route S2 avoids any areas which would not be suitable for bridge construction. Piled foundations are likely. The proposed crossing point of Route S3 is located at a point downstream from a bend in the river channel. This is likely to lead to scouring under the bridge abutments. It is preferable to locate the crossing point of the river outside of areas downstream of major river bends, as erosion of embankments is likely to be more severe in such situations. Again piled foundations would be required to construct the bridge.

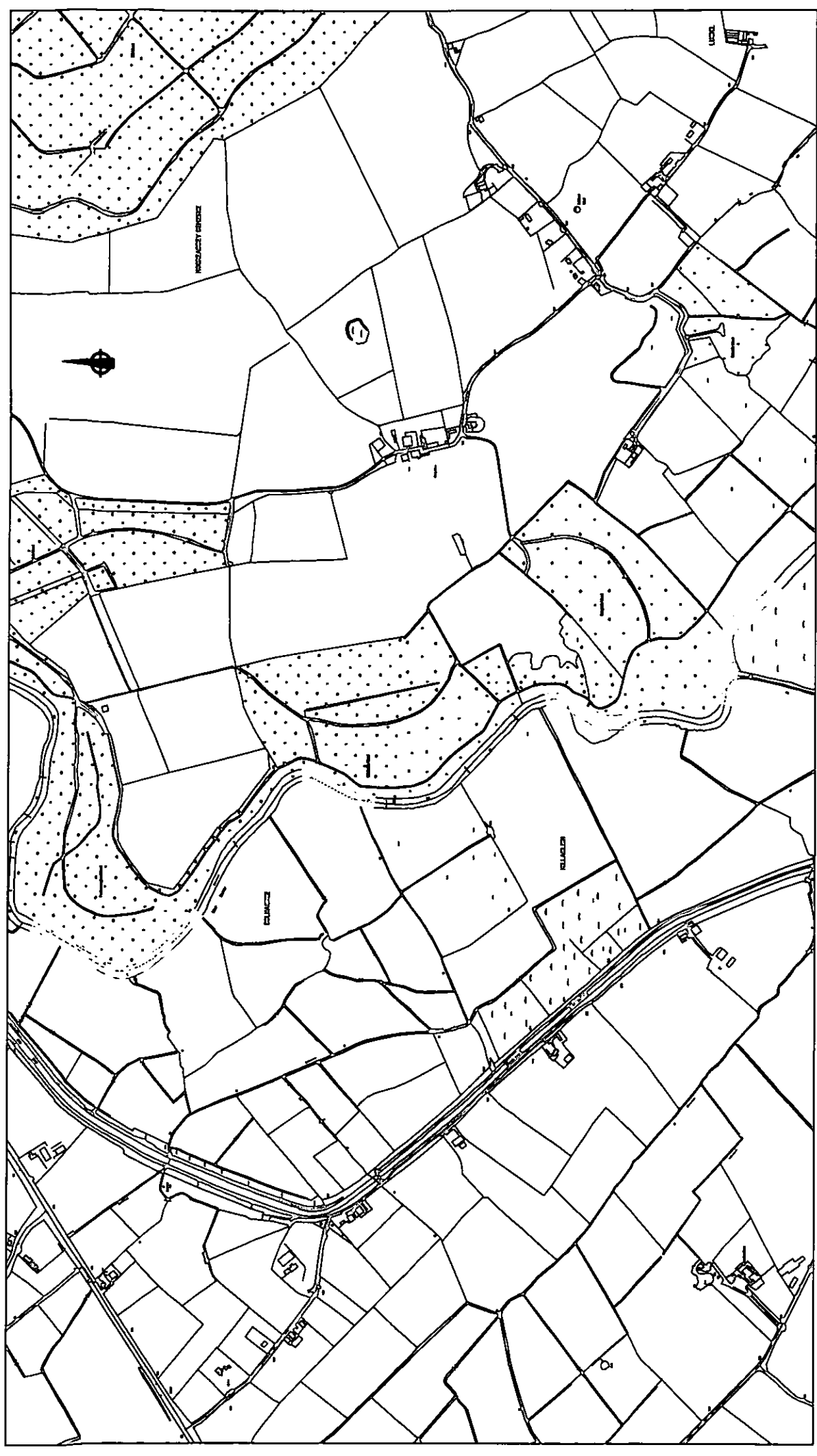
In conclusion Route S1 or S2 would be preferable to Route S3 due to hydrological reasons.

6.2.4 Impact on Landscape

Murray & Associates were engaged to assess the impact on the landscape of each of the route options considered (13). The main opportunities and constraints from a landscape perspective associated with each route option were divided into three categories, namely opportunities, impacts which can be mitigated, and significant impacts which are difficult to mitigate. Table 6.2.1 gives a comparative analysis of each Option under these headings.

The landscape of the southern corridor is generally more suitable than the northern corridor for route location. In several areas the location of the route in association with detailed landscape design would result in a net improvement in the visual qualities of the particular areas. Some local visual intrusion will occur at local road crossings. Planting and earthworks could mitigate these impacts.

Significant visual intrusion occurs in the vicinity of Hill Wood. The degree of intrusion varies between the three route options. Route S1 will generate significant visual intrusion due to its alignment and cutting of the hill crest. It will not be possible to mitigate the visual impact arising from the proposed rock cutting. The creation of this cutting will result in a significant loss in the local visual amenity and a reduction of the visual resources in the area around Monasterevin Town.



KILDARE COUNTY COUNCIL
Roads Design Department
St. Mary's Naas, Co. Kildare

J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

PROJECT: HEATH / MAYFIELD MOTORWAY

TITLE: LESS FAVOURABLE STRETCHES OF THE RIVER
FOR BRIDGE CROSSING

Scale: N.T.S.

Date: NOVEMBER 1999

Drawing No.

FIG 4

LANDSCAPE- Comparative Analysis of Route Options

	OPPORTUNITIES	IMPACTS WHICH CAN BE MITIGATED	SIGNIFICANT IMPACTS
S1	<p>Opening up of views to the south east around Morret Castle</p> <p>Opening up of panoramic views to the east and west at Hill Wood and Mooreabbey Demesne</p>	<p>Visual intrusion to single dwellings along county roads 67, 58, P11369, P11356, P11355.</p> <p>Visual intrusion to amenity areas along the banks of the River Barrow and Grand Canal arising from the construction of embankments and bridging structures.</p> <p>Potential disruption of views from Mooreabbey House.</p>	<p>Visual impact to Hill Wood resulting from the construction of a 16m cutting in the crest of the hill. Permanent visual disruption to the visual quality of the Hill as a landmark in the surrounding area.</p> <p>Permanent disruption of the visual amenity of Hill Wood.</p>
S2	<p>Opening up views to the south east in the vicinity of Morret Castle.</p> <p>Opening of views to the east and west from the section of route which passes through Hill Wood.</p> <p>Opening up of localised views of pastureland between Ballybrittas and Jamestown.</p>	<p>Visual intrusion to dwellings located along county roads 63, 67, 61, 58, 57, and the Kill Road, Athy Road and Nurney Road.</p> <p>Localised visual intrusion associated with embankments along elevated sections</p> <p>Visual intrusion associated with Grand Canal and River Barrow crossings through the creation of woodland areas.</p>	<p>The section of route which passes over Hill Wood in cut will create a notch in the hill, which would be difficult to mitigate. The location of the proposed route in this area will generate significant changes in the visual amenity of the area.</p>
S3	<p>Opening up views to the south east and to Morret Castle from Ch23800 - Ch24600.</p> <p>Opening up of landscape from Ch25600 to Ch27500.</p> <p>Opening up of views to Rathdaire House.</p> <p>Opening up views to surrounding landscape at Grand Canal and River Barrow crossing.</p> <p>Opening up views to the east and west around the Athy Road crossing at Ch37450.</p>	<p>Cut section located at Ch24600.</p> <p>Localised visual intrusion occurring at county road crossings 67, 61, 58, 57, Kill Road, Athy Road, and Nurney Roads.</p>	<p>Cut section south of Hill Wood. This section will be visible in the surrounding local landscape from Ch25800 to Ch37700 and will require extensive mitigation works to prevent significant disturbance to the surrounding area.</p> <p>Disruption to the visual quality of Cloncarlin House as a result of the removal of a line of mature Beech trees. Disruption of the visual amenity and views from Cloncarlin House.</p>

Table 6.2.1

The southern Routes S2 and S3 were found to have the lowest overall landscape impact on the study area.

6.2.5 Impact on Agriculture, Forestry and Drainage

Teagasc were engaged to prepare a preliminary report on the impact of the proposed scheme options on Agriculture, Forestry and Drainage (14).

6.2.5.1 Agriculture

Route S1 will affect approximately 50 agricultural holdings. Route S2 affects 60 agricultural holdings and route S3 affects 40 agricultural holdings. The holdings affected by routes S1 and S2 are very small holdings. Route S3, while impacting on fewer holdings, will impact on larger more viable holdings. In County Laois the agricultural disturbance created by Routes S1 and S2 will be less than the impact of Route S3. In County Kildare the agricultural disturbance created by Routes S1 and S2 will be greater than the impact of Route S1.

6.2.5.2 Forestry

In County Laois each route impacts on the existing Coillte forestry plantation of The Derries. Route S3 creates the greatest disturbance. In County Kildare routes S2 and S3 will have similar impacts. Route S1 will affect an oak plantation in Moore Abbey as well as the existing Coillte plantation south of Monasterevin, known as Hill Wood.

6.2.5.3 Drainage

All three routes will impinge on the existing drainage of the area. In County Laois drainage disturbance is less on route S1 in comparison to the other routes. This is due to its proximity to the existing N7. In County Kildare the impact of each route on the drainage network is similar. The disturbance of existing essential drainage in the area will require reinstatement regardless of which route is chosen.

6.2.5.4 Conclusion

Routes S1 and S2 are preferable to routes to S3.

6.2.6 Area of Land Acquisition

The area of land acquisition (9) required for the construction of the mainline of each route option is approximately as follows:

Route S1	274 Acres
Route S2	248 Acres
Route S3	254 Acres

Route S2 has the least landtake associated with its construction.

6.2.7 Impact on the Natural Culture, Heritage and Archaeology

Dr. John Feehan was asked to carry out a study of the potential impact of the proposed routes on the natural and cultural heritage of the surrounding area (15). In addition Dr. Feehan identified and describes features of archaeological, architectural, historical, botanical and zoological interest within the southern Corridor. Valerie J. Keeley Ltd., Archaeological Consultancy (18), prepared a more detailed assessment of the impact of the route alternatives on archaeological sites.

6.2.7.1 Route S1

Route S1 cuts through the Morett "Ancient Road". There is no archaeological evidence for the antiquity of this road. Flynn's Fen contains Fuaran Well, one of the sources of the Glasha River, which were formerly much resorted to as a source of drinking water. The fen itself is the only fen of any extent surviving in this part of the county of Laois. This fen is identified as being "A small area of species-rich fen in an area where this habitat is rare; dominated by black bog rush (*Schonenus nigricans*) and purple moor-grass (*Molinia caerulea*)" (15). Route S1 will obliterate this small fen. Drainage on this route could also have an adverse impact on this fen resulting in damage to some species.

Route S1 also cuts through wooded areas. The first of these areas is the Derries Wood. The vegetation of this wood holds little of interest. The woods contain a considerable deer population. These are not a problem at present because the territory inhabited by the animals lies more or less exclusively to the east of the road. A road constructed through the middle of their territory would be a problem. Route S1 traverses the northern edge of the wood. Red Squirrel are also present in the wood.

Route S1 clips the northern edge of Dangan Wood and bisects Hill Wood south of Monasterevin town. Dangan Wood is now a Coillte Plantation but with elements of the original woodland vegetation and fauna. Hill Wood is important as a distinctive landmark in an area of high scenic quality. Hill wood is also important in terms of its recreational amenity value. The construction of S1 will represent a significant intrusion on the area of considerable amenity and ecological value.

6.2.7.2 Route S2

Route S2 also cuts through the Morett "Ancient Road". It does not interfere with Flynn's Fen. The route traverses the Derries wood along a similar path to Route S1. Route S2 passes into Dangan Wood and the southern edge of Hill Wood. It does not interfere to any great extent with the amenity area of the wood and in particular it's walking paths.

This line runs within 120m of a Burial Ground (Disused) reference SMR No. Kildare 26:6. A second site reference SMR No. Kildare 26:5, Children's Burial Ground between local roads LS-07056 and LS-07055.1 (Nurney Roads) is impacted upon by this route.

6.2.7.3 Route S3

Route S3 does not impact upon the Morett "Ancient Road". This route divides the Derries Wood into two separate areas north and south of the motorway,, which would cause considerable difficulties for the herd of Fallow Deer population that reside within the wood.

This route impacts on Rathdaire Lake to the west of Ballybrittas Road (L-3931). This is an artificial lake about 100 years old, made as part of the landscaping of Rathdaire demesne. While overgrown at present it is of considerable amenity potential.

Route S3 impacts on the Rapparee east of the Ballybrittas Road. The Rapparee is a belt of mainly beech woodland. A very pleasant woodland ride planted with a variety of exotic species runs south-eastward to Oak Wood from near its north-eastern end.

Route S3 cuts the southern end of Dangan Wood, and avoids Hill Wood.

6.2.7.4 Conclusions

The following conclusions were drawn in terms of the impact of the routes on Natural Culture, Heritage and Archaeology as follows:

- 1) No route identified any particular advantage over another route.
- 2) The early identification of archaeological sites within the route of the proposed motorway will lessen to a large extent the impact of any route.
- 3) The impact of S1 on Flynn's Fen and on Hill Wood and its environs is substantial. For this reason routes S2 and S3 are considered preferable options to route S1.

6.2.8 Socio-Economic Impact

Reid & Associates, Planning and Development Consultants were appointed to assess the following socio- economic issues as follows (16):

- *To identify and assess the socio-economic characteristics and functions of the area, in relation to the location of the proposed Bypass for Monasterevin and the M7 motorway, and the need for an interchange or interchanges on this route.*
- *To measure the extent to which those functions are dependent on the stop-over role of the settlements in the area.*
- *To assess the effects of severance on those functions.*

6.2.8.1 Study Method

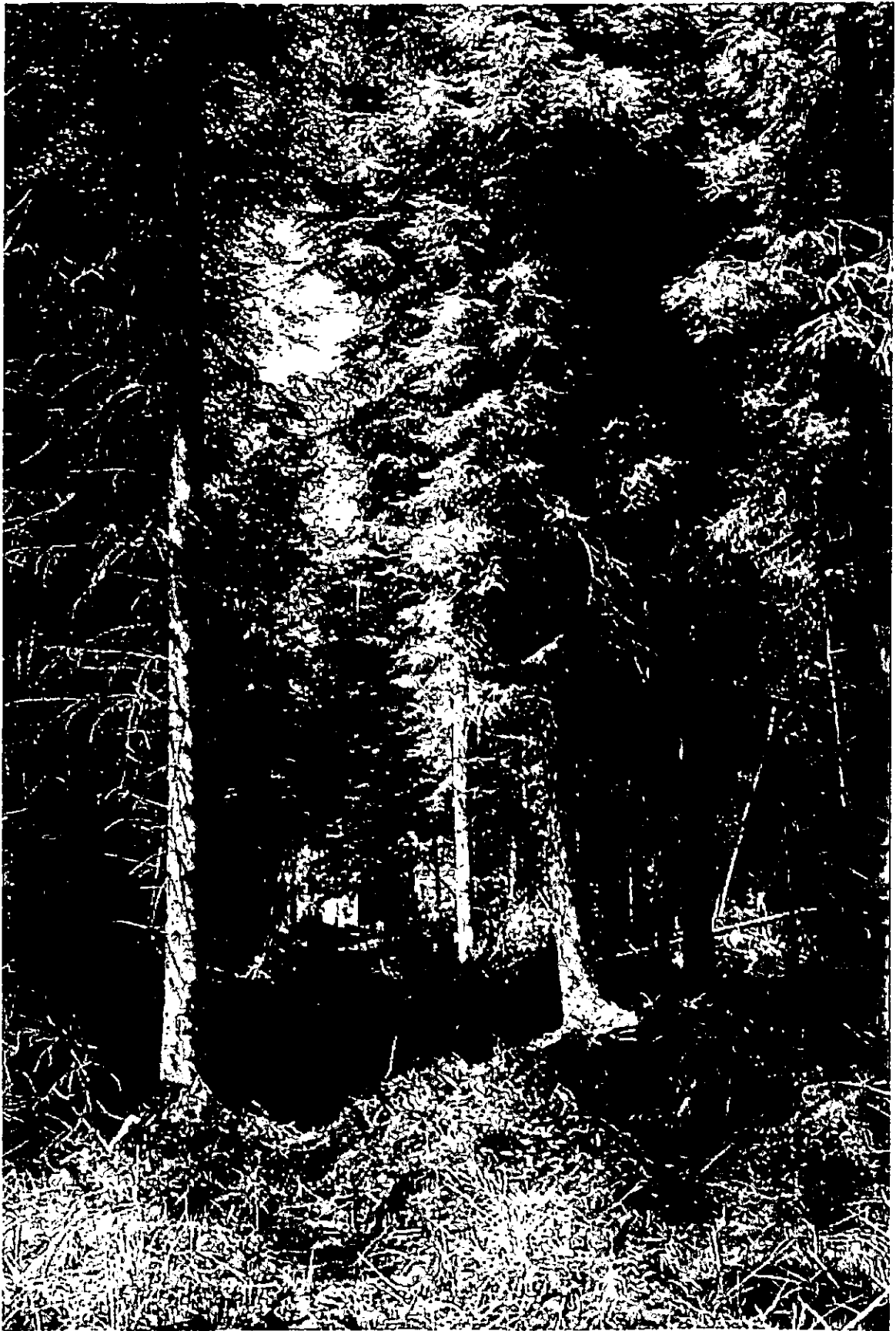
The preliminary phase of the study involved the carrying out of a windshield survey by the Consultants within the potential catchment area between Monasterevin and The Heath in order to identify the socio-economic uses within this area and the settlements therein.

The survey itself comprised of parts made up of a postal questionnaire and a structured interview. The objective of the postal questionnaire was to elicit the characteristics of the retail and service sector economy within the potential catchment area and gain some idea of the level of expenditure by travellers passing between Monasterevin and Portlaoise. The purpose of the interviews was to gain some insight into the respondents' perception of the potential impact of the proposed Monasterevin Bypass and M7 motorway section. The interview was also used to ascertain their preference, if any, for a route path either to the north or south of the town and existing N7 National Primary route.

6.2.8.2 Study Area

The potential catchment area was divided into three segments for the purpose of assessment. The three divisions were:

- *Monasterevin Catchment Area: defined as Monasterevin town and that part of its hinterland within a three-mile radius of the town.*
- *Motorway Catchment Area: defined as approximately a 6.5km wide motorway corridor running some 12km from Monasterevin to join the Portlaoise bypass. Settlements located on the existing N7 including Jamestown, Ballybrittas and New Inn/Emo are within this area.*



Hill Wood

- *Interchange Catchment: defined to include the following towns and villages and their hinterland Tullamore, Mountmellick, Portarlinton, New Inn and Vicarstown.*

The interchange catchment area was used to assess the requirements and placement of an intermediate interchange on the scheme. This is discussed in more detail in Section 6.2.12 of this report.

6.2.8.3 Route Appraisal

Route appraisal is carried out on an area basis, with the two sectors, the bypass catchment area, and the motorway corridor area being used.

6.2.8.4 The Monasterevin Bypass Catchment Area

Within the context of the southern bypass corridor there are three possible routes, S1, S2 and S3. The advantages and disadvantages of each of these are as follows:

- *S1 This has no particular advantage over S2 and S3. It has the disadvantage of running close to the south eastern suburbs of the town and through the middle of the woodlands to the south of the town. It separates, in perceived terms, some of the dwellings in the eastern suburbs.*
- *S2 Route S2 has an advantage over S1 due to it being further away from the south eastern suburbs of the town and the bulk of the woodlands to the south of the town.*

It has no particular advantage over S3.

It has the disadvantage of running through the south eastern edge of the woodland and close to a number of dwellings in that locality and in the eastern suburbs.

- *S3 This has the advantage over S1 and S2 of running outside the eastern suburbs of the town and is more removed from dwellings. It avoids the southern woodlands.*

It has the disadvantage of cutting across the access to the public road of a guesthouse.

6.2.8.5 Motorway Catchment Area

- *S1 S1 runs parallel and close to the N7. The proximity to the settlements, residences and businesses on and adjoining the N7 to the South is likely to give rise to the disadvantage of noise disturbance. Depending on the difference in noise levels before and after the proposed realignment, insulation from traffic noise may be required.*

The noise factor is significant in the case of Jamestown turkey farm and hatchery. Sudden noise can panic and frighten the poultry resulting in bird losses through smothering and injury.

Proximity to the motorway will be one of the factors affecting property values along the N7 together with the disadvantage of the loss of passing trade. The latter consideration is common to all three alternatives.

- *S2 Due to the low population density of the southern sector of the route corridor the issue of perceived severance is unlikely to arise. In this regard the location of this alignment further to the south may offer some little advantage over S1.*

S2 has an advantage over S1 in that the eastern section of the proposed alignment, from Jamestown to a point west of Ballybrittas, is located further south of the N7, thus reducing the possible impact of the noise factor.

S2 has the advantage of proximity to fewer residences than the previous option.

It suffers the disadvantage that it approaches closer to Ballybrittas Church and Jamestown turkey farm.

The alignments of S1 and S2 merge at a point between Ballybrittas and Ballyshaenduff, The Derries. This route would impinge on a smaller number of residents, in comparison with S1 and on a bed and breakfast business.

- *S3 This is the furthest south of the three options and has an advantage in being the least likely to give rise to issues of perceptual severance.*

This alignment traverses a small residential area on the Ballybrittas Crosskeys Road and passes centrally through The Derries to a point west of a camping site. It then bears north west to meet the Portlaoise Bypass.

This might have the disadvantage of residences close to this alignment being affected by noise and may require noise reduction measures.

6.2.8.5 Conclusion

It should be borne in mind that no matter where the new route and interchange are located, north or south of the N7, some businesses in the potential catchment area will experience a fall in turnover due to the diversion of passing trade. Enterprises serving traveller needs, food, drink, vehicle servicing and accommodation are the most vulnerable to traffic diversion. However, employment and expenditure benefits generated during the construction stage of the motorway, will accrue regardless of the location of these projects within the catchment areas.

In terms of the different routes within the southern corridor, S1, S2 and S3, S1 severely affects the nearby woodlands and runs closest to the N7, with its proximity to settlements, residences and businesses on that route. In perceptual terms there may be a severance of settlements along the N7 from the hinterland to the south, causing a socio-economic disadvantage.

S2 is preferable to S1 as it is located further south of the N7, thus reducing the possible impact of noise and proximity to residences. S2 affects fewer dwellings than S1, affects the woodlands to a lesser extent but affects a number of sensitive residences and industries. This is a socio-economic disadvantage.

S3 is the furthest south of the three options and has an advantage over S1 and S2, as it is the least likely to cause problems of noise, severance and residential disruption due to the fact that it runs well away from the suburbs and the woods. However, it affects the entrance to Concarlin House from the public road.

Based on the foregoing analysis of the southern route locations, route S3 has only a very marginal advantage over S2.

6.2.9 Cost Benefit Analysis

Laois County Council prepared a cost benefit analysis report in 1994 for the proposed Heath/Mayfield Motorway Scheme (9). It covers the twenty-year design life of the road.

The report concluded that the Internal Rate of Return (I.R.R.) for each route option would be as follows:

<i>Route S1</i>	<i>15.2%</i>
<i>Route S2</i>	<i>14.4%</i>
<i>Route S3</i>	<i>14.2%</i>

indicating that each scheme option is a good investment for the economy.

6.2.10 Number of Dwelling Houses Affected By Each Route Option.

Table 6.2.2 compares the mainline of each route option as regards proximity to existing dwellings in the bypass catchment area. Overall, taking a 500m distance on both sides of each route, the proximity of route S1 to the N7 and consequently the settlements thereon results in this route having the greatest impact on dwelling houses. Route S2 affects the least number of houses within the 100m band. Route S3 affects the least number of dwellings overall within the 500m band.

The construction of route S1 mainline would require the demolition of 5 dwelling houses, route S2, 2 dwelling houses and route S3, 1 dwelling house.

In conclusion a comparison of dwelling houses within a 500m band width north and south of each route option and taking into account the number of dwelling houses requiring demolition to facilitate the construction of each route option, routes S2 or S3 would be preferable to route S1.

Proximity of Existing Dwellings to Routes S1, S2 and S3, Mainline Only
(Approximate Number of Dwellings Year 1995)

Distance from Route in Metres	Route S1	Route S2	Route S3	Distance from Route in Metres	Cumulative Total		
					Route S1	Route S2	Route S3
0 - 100	22	18	21	0 - 100	22	18	21
101 - 200	78	42	29	101 - 200	100	60	50
201 - 300	45	42	27	201 - 300	145	102	77
301 - 400	25	34	26	301 - 400	170	136	103
401 - 500	32	30	20	401 - 500	202	166	123
Total	202	166	123	Total	202	166	123

Table 6.2.2

6.2.11 Geotechnical Aspects

Dr. Eric Farrell was engaged to prepare a preliminary report on the ground conditions along the proposed routes for the Motorway Scheme linking the Portlaoise Bypass and the proposed Kildare Town Bypass (17).

The resultant assessments are based on a desk study of available geotechnical information and on trial pits, boreholes and a geophysical survey, which were carried out to investigate particular aspects in greater detail. The criteria adopted for the assessment purposes were based on the following:

- a) The length of the route crossing potentially soft ground and the embankment height in that area.*
- b) The geotechnical aspects of the River Barrow crossing*
- c) The amount of rock excavation.*
- d) Proximity of dwellings to deep cuttings.*
- e) Effect of routes on local wells.*

6.2.11.1 The Length of the Route Crossing Potentially Soft Ground and the Embankment Height in that Area.

All the proposed routes involve the construction of embankments on soft ground. However, the depth of soft material is generally less than 2 to 3m (with local deep spots), thus the most economical option would be to excavate the soft material and replace with suitable compacted material. Slightly extra land take may be required when adopting this method, in comparison to an embankment on firm ground, in order to take the embankment material down to the bottom of the soft area. The amount of soil to be excavated can be significant where high embankments are required.

Routes S1 and S2 cross about the same length of soft ground, the former avoiding Kill Bog while the latter goes close to the higher ground at Clonclarin House east of Monasterevin. The depth of soft on the River Barrow flood plain and on route S3, which traverses a large area of Kill Bog, is possibly too deep for the excavate and replace option to be economical and these will probably required stage construction, possibly with vertical drains and berms. The use of berms would have land take requirements.

6.2.11.2 The Geotechnical Aspects of the River Barrow Crossing

All three southern routes cross a significant length of the River Barrow floodplain. There are no ground conditions which would indicate a preference for any of the three River Barrow crossings in the southern corridor on the basis of geotechnical considerations alone.

6.2.11.3 The Amount of Rock Excavation.

Route S1 has a significant rock excavation in the Hills Wood area, which will increase costs and also would possibly require some slope stabilisation. The available information suggests that blasting or hard ripping will be required where significant depths of rock are encountered. The cut section through Hill Wood on Route S2 will be mostly in overburden.

Route S3 also includes a variable rock profile in the cutting in the Larch Hill area, which could lead to an increase in costs.

6.2.11.4 Proximity of Dwellings to Deep Cuttings.

The geotechnical implications of deep cuts close to houses will require consideration in design. This aspect is particularly relevant to houses adjacent to the cut through the eastern end of Hill Wood associated with route S2. Should the clearance between the motorway and the houses not be sufficient consideration will have to be given to limiting the extent of the side slopes adjacent to the houses by constructing an embedded retaining structure. This will increase the construction costs of route S2.

6.2.11.5 Effect of Routes on Local Wells.

There is no groundwater abstraction scheme from a major aquifer in the vicinity of the motorway. However, private local wells close to cuttings may be affected by motorway drainage. This occurs on all routes but routes S2 and S3, being further south of large dwelling areas are closer to private wells than route S1.

6.2.11.6 Conclusion

Overall route S3 will cross a greater length of boggy ground than either of the other route options. Routes S1 and S2 cross about the same length of soft ground.

The three southern routes cross a significant length of the River Barrow floodplain. There are no ground conditions which would indicate a preference for any of the three southern routes based on geotechnical considerations associated with each River Barrow crossing.

The construction of routes S1 and S3 will require the excavation of rock. Such excavations increase costs. The excavation through the southern end of Hill Wood associated with route S2 will be mostly overburden, however these cuts go relatively close to homes. On the information available to date, the effect of the cut on houses should not be significant, but it may be necessary to install an embedded wall to limit the extent on the side slopes and to ensure that ground movements associated with the excavation of the cut do not affect the houses.

It is concluded that Route S2 is the preferred of the three southern routes.

6.2.12 Provision of an Intermediate Interchange ⁽¹⁶⁾

The Heath/Mayfield Motorway Scheme links the existing Portlaoise Bypass and the proposed Kildare Town Bypass. Access to and from a motorway is restricted to specifically designed junctions known as interchanges. Without the provision of an Intermediate Interchange access to and from the Heath/Mayfield Motorway is restricted to the Mayfield Interchange on the Kildare Town Bypass and the Heath Interchange Complex on the Portlaoise Bypass, a distance of approximately 17.5km.

In order to access the interaction of the motorway with the local road network it is necessary to examine the need for one or more intermediate interchanges.

6.2.12.1 Need for Intermediate Interchange.

In considering the need for an intermediate interchange or intermediate interchanges on the Heath -Mayfield Motorway Scheme a number of issues with regard to need must be considered. These needs can be conflicting and include the following:

a) Strategic

The M7 is developing from a series of relatively short bypasses, provided to relieve capacity bottlenecks on the N7, into a continuous long distance motorway. As part of this development the provision of interchanges should be part of an overall strategy to maximise the benefit of the motorway to all it's users. This strategy should endeavour to provide interchanges at locations which allows long distance traffic access to population, commercial and industrial centres. This will maximise the use of the motorway while at the same time avoiding the over provision of interchanges which protects the capacity of the motorway.

Within this context Monasterevin is the only major population centre in the study area and will be served by the diamond interchange at Mayfield. There are however population centres outside of the study area which fall within the catchment area of the M7. These include Portarlinton, Mountmellick and Tullamore.

b) Traffic

Ideally any interchanges should be located at those points where a sufficiently large amount of traffic wishes to leave or join the motorway. The M7 is essentially a route connecting the East of the country to the Mid-West, South-West and the South and

interchanges will therefore cater for this traffic. Along the stretch of motorway under consideration traffic from Tullamore, Portarlinton and Mountmellick will wish to join the motorway to travel east. However traffic travelling to the Mid-West, South-West and the South from within the catchment area tends to join the N7 / M7 at points to the west of the stretch of motorway under consideration.

c) *Maximise benefits of Interchanges.*

In addition to strict traffic criteria the provision of an interchange can be beneficial under a number of other headings.

The most obvious is the socio-economic benefit that accrues to those areas that gain convenient access to the motorway network. Convenient access can assist social, industrial and tourism development.

In attracting traffic to the motorway network, interchanges remove traffic from routes that pass through urban centres. While this can result in loss of passing trade this is offset by improvements to the environment of these centres. Experience has shown that the removal of through traffic can lead to an increase in trade in the long term as the ambience of the urban centre improves. This will be applicable to Monasterevin and Ballybrittas.

d) *Consistency of Motorway Network.*

The provision of interchanges should lead to consistency in the motorway network. Where possible the layout of interchanges should be familiar to drivers. The standards used for ramps and acceleration and deceleration lanes should be similar through out. If drivers are allowed to carry out a particular movement at one interchange they will expect to be able to carry out the same manoeuvre at the next interchange. The spacing between interchanges along the motorway should also be relatively consistent.

6.2.12.2 Possible Locations for an Intermediate Interchange.

In addition to the issues discussed above the places where it is possible to locate an interchange are limited by a number of practical considerations. These are now discussed.

a) *Minimum Spacing of Interchanges.*

Weaving is defined as the movement of vehicles between lanes on a motorway. Weaving occurs more frequently at interchanges as traffic joining the motorway accelerates to merge with motorway traffic and traffic exiting the motorway changes into the correct lane to leave the motorway. Each interchange will have a weaving length where these

movements occur. In order to maintain the operational characteristics of motorways it is necessary to separate areas where weaving occurs. At high speeds such movements can only take place over a reasonable distance. The current recommended minimum weaving length for rural motorways is 2km.

b) Tie into local road network.

The main location criteria for providing an interchange is at those points where long distance traffic wishes to gain access to the motorway. This is likely to be at the busier points on the existing local road network. This also reduces the need for reconstruction of minor roads or the construction of new roads.

Monasterevin is the only significant urban centre within the study area which will generate any significant volumes of long distance traffic which will wish to use the Motorway. Traffic from Monasterevin which would use the motorway would predominately be either travelling from the east or to the east.

There are also 4 Regional Roads within the study area which feed long distance traffic onto the existing N7. These are as follows.

Regional Roads Within Study Area

R417	Regional Road linking Athy to Monasterevin.
R420	Regional Road linking Portarlinton to the N7. It is one possible route from Tullamore to the N7.
R424	Regional Road branches from the R420 at Lea Cross Roads and provides an alternative link to Monasterevin. The traffic levels are limited on this road due to weight restrictions in Monasterevin.
R422	Regional Road linking Mountmellick to the N7 at New Inn. It is another possible route linking Tullamore and the N7

Table 6.2.3

As with Monasterevin, traffic from the Regional Roads which would travel on the proposed motorway would also predominately be either travelling from the east or to the east. This is because long distance traffic can use the N80, the R427 and the R419 to travel to and from destinations/origins to the west.

Given the proximity of Monasterevin and the R417 to the interchange at Mayfield and the requirement of a minimum weaving length of 2km, Monasterevin and the R417 can be adequately served by the Mayfield Interchange.

A substantial proportion of the traffic on the R422 and the R420 is traffic travelling between Tullamore and Kildare and beyond.

This would suggest an intermediate interchange should be provided on or close to the R420 or the R422. As Ballybrittas is close to the centre of the Study Area a location adjacent to Ballybrittas was also considered.

6.2.12.3 Assessment of Intermediate Interchange Options.

Four intermediate interchange options were identified:

- No Intermediate Interchange.*
- Intermediate Interchange for the R420*
- Intermediate Interchange for the R422*
- Intermediate interchange at Ballybrittas.*

These can be assessed under the headings listed below:

a) Topography

In general the land along the Heath/Mayfield Motorway Scheme is flat. The construction of all interchanges would have embankments associated with their ramps and overbridge. However the topography for an interchange for the R420 is more complicated.

In order to tie into the R420 the provision of this interchange along any southern route option must be located between the River Barrow and the Grand Canal. The approach road to the interchange would have to pass over the Grand Canal and this will require a substantial embankment with a significant visual impact. Restrictions in this area would not allow for the construction of a full interchange.

b) Traffic Assessment

The Traffic Study reached the conclusion that none of the Intermediate Interchanges would attract sufficient traffic to justify the cost of it's construction on projected traffic demand alone unless one of the existing Regional Roads the R422 or the R420 be developed as the main access to the West from the N7.

c) Socio-Economic Assessment

As current traffic patterns did not provide a clear cut answer to whether an Intermediate Interchange should be provided it was decided to investigate the socio-economic need for an Intermediate Interchange.

Investigations were carried out under two headings as follows:

- a) *To identify the socio-economic characteristics of the area containing the towns of Tullamore, Mountmellick, Portarlinton and their rural hinterlands to establish the socio-economic need for an Intermediate Interchange.*
- b) *To consider and assess the need and location of interchanges in relation to the development of the tourism sector to the north-west and south of the M7, specifically the Slieve Bloom area, Emo Court and the canal area around Vicarstown.*

The main findings of these investigations were as follows.

- *While an interchange on the R420 would provide the most direct link between the M7 and Tullamore it also requires a longer length of travel (47km) on Regional Roads. Using an interchange on the R422 would provide a route that is 6 km longer but only requires 10.5km travel on Regional Roads.*
- *While there is a need for an economic boost in the areas considered particularly in Mountmellick and Portarlinton, need, if measured in demographic terms, would appear to be greater in Mountmellick.*
- *Tourism development would be best served by an interchange on the R422 which would most directly serve Emo Park, the Slieve Bloom Environment Park and the Quaker heritage of Mountmellick.*

The conclusion reached was that an Intermediate Interchange should be provided on the R422.

d) Optimisation of Route Network

Laois County Council examined the long term development strategy for the R420 and R422 Regional Roads with particular attention as to which should be developed as the main access to the N7.

This access is essentially to provide for traffic travelling between Tullamore, Mountmellick or Portarlinton and locations to the east of Monasterevin (i.e. Dublin).

A significant amount of the R420, linking Tullamore to Portarlinton and on to the N7, requires improvement particularly the stretch from Portarlinton to Monasterevin. There is also a significant cost, estimated at £3.3m, associated with providing an interchange to link the R420 to the M7. This led Laois County Council to consider developing the R422 as a route to Tullamore. This would involve using the N80 from Tullamore to Mountmellick and the R422 from Mountmellick to the M7 at Emo / New Inn.

The distance from Tullamore to the start of the M7 Kildare By-Pass via the R420 would be 41km, all of which would be on Regional Road. Via Mountmellick and an interchange linking the R422 to the M7 at Emo / New Inn the distance would be 46.4km of which 13.6km would be on a motorway and 22.4km on a National Secondary Route, only 10.4km would be on a Regional Route.

6.2.12.4 Proposals for an Intermediate Interchange

After considering the foregoing it was concluded that an intermediate Interchange would be provided for the R422.

Each of the southern route options S1, S2 and S3 can provide an interchange at this location. However, as Route S3 is 2.1km south of the N7 at this point the local road network would have to be substantially upgraded to cater for the increase volume of local traffic travelling to and from the motorway.

6.2.13 Cost

Cost estimates prepared by Laois County Council in 1994⁽⁹⁾ indicate that the capital costs of each route are as follows:

<i>Route S1</i>	<i>IR£48M</i>
<i>Route S2</i>	<i>IR£47M</i>
<i>Route S3</i>	<i>IR£50M</i>

At current rates the cost of each scheme would be in the order of

<i>Route S1</i>	<i>IR£92M</i>
<i>Route S2</i>	<i>IR£90M</i>
<i>Route S3</i>	<i>IR£96M</i>

6.3 Preferred Motorway Alignment

6.3.1 Preferred Route in the Southern Corridor

The three Southern Corridor Routes are shown on figure 3. Each route has advantages and adverse impacts associated with it. The advantages and disadvantage of each are highlighted in Tables 6.3.1, 6.3.2, and 6.3.3 in order to identify a preferred route for the Heath/Mayfield Motorway Scheme.

The advantages and disadvantages of the “Do-Nothing” option are shown in Table 6.3.4.

6.3.2 Route S1

Route S1 Advantages and Disadvantages

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • <i>Shortest Route</i> • <i>Least impact on the Derries Wood</i> • <i>Less impact on agriculture than route S3</i> • <i>Is cheaper than route S3</i> 	<ul style="list-style-type: none"> • <i>Closest alignment to built up areas of Monasterevin, Ballybrittas and Jamestown</i> • <i>Vertical alignment least favourable of options with grades in excess of 3%</i> • <i>Crosses the River Barrow at a skew angle increasing the costs of construction</i> • <i>Results in severe visual disruption to residences and the environment</i> • <i>Severs Hill Wood amenity area</i> • <i>Impacts on Flynn's fen</i> • <i>Least favourable in terms of Socio Economic aspects</i> • <i>Proximity to town and villages may impact on development in these areas</i> • <i>Deep rock cut of 15m in Hill Wood requiring blasting works near residential area</i> • <i>The route's proximity to the N7 makes the provision of overbridges to serve local roads difficult as the construction of such realignments would impact on residential areas. This would occur in particular in the villages of Ballybrittas, Jamestown and New Inn.</i>

Table 6.3.1

6.3.3 Route S2

Route S2 Advantages and Disadvantages

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • <i>Shorter than Route S3</i> • <i>Highest geometrical standard</i> • <i>Crosses the River Barrow at an identified suitable location as compared with S1 and S2</i> • <i>Identified as a feasible route in terms of visual impact</i> • <i>Less impact than S1 on Hill Wood preserving the commercial and amenity value of the wood in tact</i> • <i>Less agricultural impact than Route S3</i> • <i>Does not severely impact on the herd of Fallow Deer in the Derries Wood</i> • <i>Preferable to Route S1 in Socio-Economic Terms</i> • <i>Allows for development of Ballybrittas, Jamestown, New Inn and Monasterevin Town</i> • <i>Avoids deep excavation through rock</i> • <i>Provision of an intermediate interchange does not require upgrading of the existing Local Road Network</i> • <i>Cheapest Route</i> 	<ul style="list-style-type: none"> • <i>Slightly longer than Route S1</i> • <i>Affects the largest number of landowners due to the size of holdings on this route</i> • <i>Highest number of dwelling houses within 100m of the route</i>

Table 6.3.2

6.3.4 Route S3

Route S3 Advantages and Disadvantages

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • <i>Avoids Hill Wood Entirely</i> • <i>Furthest away from residential areas</i> • <i>Does not restrict the development of any settlements along the N7</i> • <i>Least number of dwelling houses within 100m</i> • <i>Preferred route in terms of Socio-Economic Impact</i> 	<ul style="list-style-type: none"> • <i>Longest Route</i> • <i>Lowest standard of horizontal alignment with the minimum allowable radii used to achieve a tie-in to the proposed Kildare Town Bypass at Mayfield</i> • <i>Crosses the River Barrow at a point downstream from a bend in the river channel. This is likely to lead to scouring of the bridge abutments</i> • <i>Greatest impact on agriculture in Kildare area as compared with other options</i> • <i>Severs the Derries Wood impacting on the herd of Fallow Deer residing in the Wood</i> • <i>Realignment of Ballybrittas Road would impact on Rathdaire Cottage</i> • <i>Impacts on the Raparee in the townland of Ballyadding</i> • <i>Impacts on Rathdaire Lake a local amenity Area</i> • <i>Passes within 150m of Morrett Castle and Morrett Church</i> • <i>The route traverses the least favourable ground conditions which impacts on the cost of construction and the programme for construction</i> • <i>Rock excavation of Lughill may be required resulting in blasting near residential areas</i> • <i>Provision of an intermediate interchange requires the upgrading of long lengths of Local Roads.</i>

Table 6.3.3

6.3.5 Do-Nothing Option

Do-Nothing Option Advantages and Disadvantages

ADVANTAGES	DISADVANTAGES
<p>No capital expenditure involved</p> <p><i>No severance on landowners</i></p> <p><i>No loss of passing trade for local business</i></p> <p><i>Landscaping environment remains as is</i></p>	<p><i>The existing road usage is above the capacity of the existing road. The increase in traffic volumes will therefore result in more dangerous driving conditions and delays</i></p> <p><i>Accident rates will increase</i></p> <p><i>Maintenance costs of the existing road will rise in accordance with the increased traffic usage</i></p> <p><i>Noise levels in Monasterevin, Ballybrittas and Jamestown will continue to rise. Current levels have been recorded at 80Db(L₁₀)</i></p> <p><i>Air pollution levels will rise in these areas</i></p>

Table 6.3.4

6.4 Route Selection Conclusions

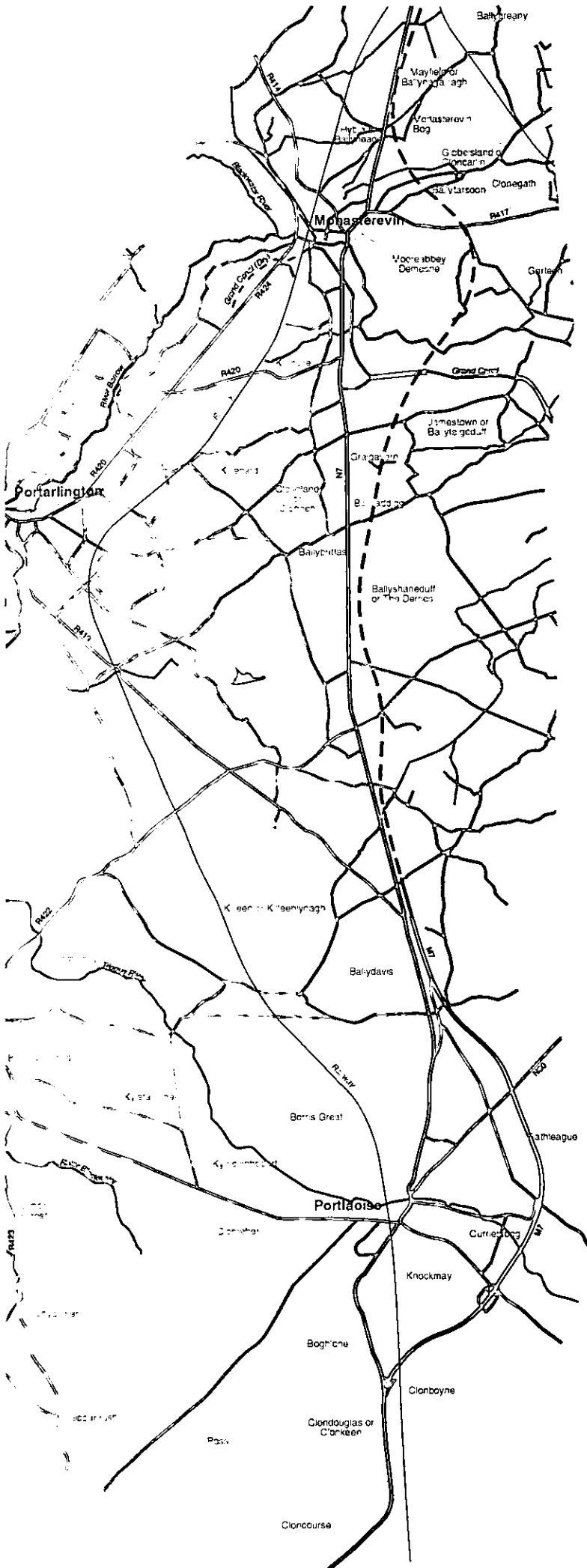
Route S2 is considered the optimum route. Route S1 was ruled out due to the poor standard of vertical alignment, its impact on Hill Wood and its proximity and consequent impact to the dwelling areas of the town and villages in the vicinity.

Route S3 was ruled out due to the poor standard of horizontal alignment and the anticipated poor ground conditions which may occur. Other negative factors considered were the impact on the natural and cultural heritage of the area.

Route S2 provides the highest standard of alignment, the best location for the River Barrow crossing and the best use of the ground conditions.

6.5 Preferred Route

The preferred route is a modification of the route selected S2. The preferred route is described in detail in Chapter 4 of this report.



CHAPTER SEVEN

Comparative Analysis

7. COMPARATIVE ANALYSIS

Corridor Comparative Analysis Table

	Northern Corridor	Southern Corridor	Comment
ENGINEERING	<p>All possible routes must tie into the Eastern Terminus of the M7 Portlaoise By - Pass and the Western Terminus of the M7 Kildare By - Pass both of which lie to the south of the existing N7. All Northern Corridor Routes pass to the north of Monasterevin. This means that any Northern Corridor Route will have to cross the N7 twice. In addition as any possible route will run broadly parallel to the existing N7 these crossing points will be at significant skew angles to the existing N7 adding further to the cost.</p> <p>The Athy Branch of the Grand Canal crosses the River Barrow in the Northern Corridor. This requires the Canal to be elevated in the area. This will force any Northern Corridor Route to be further elevated as it passes over the Canal.</p> <p>Within the Northern Corridor there is a branch of the Canal connecting Monasterevin to Portlington. Any Northern Corridor Route will require an additional structure to cross this now dry canal or further remove the prospect of its reopening.</p> <p>The Dublin to Cork/Galway Railway Line passes through the Northern Corridor. Any Northern Corridor Route must cross this line twice or encroach on the urban area of Monasterevin. Crossing the Dublin to Cork/Galway Railway would require the construction of bridges over a busy live railway.</p> <p>As the railway crosses over the River Barrow and the Canal on a substantial embankment, Northern Corridor Routes must rise onto a 1.3m high embankment to cross over the railway. The proximity of required crossings of the River Barrow and the Grand Canal preclude Northern Corridor Routes from passing under the railway.</p> <p>Requires between 18 and 21 bridges.</p>	<p>No crossings required over the existing N7 or the Dublin to Cork/Galway Railway.</p> <p>Requires between 11 and 12 bridges.</p>	<p>Southern Corridor significantly superior.</p> <p>Southern Corridor requires the construction of between 7 and 10 less bridges than the Northern Corridor.</p>

Table 7.1.1a

Corridor Comparative Analysis Table

	Northern Corridor	Southern Corridor	Comment
R. BARROW CROSSING LOCATION	<p>All Northern Corridor Routes must cross in one of two zones:</p> <ol style="list-style-type: none"> 1. To the north of the confluence of the River Barrow and the Black River. This requires an additional river crossing and passes through an area of raised bog. 2. Routes to the south of the confluence of the River Barrow and the Black River would cross the River Barrow in the most favourable location from the point of view of foundation conditions. However there are a number of factors which offset any advantage gained. First the motorway alignment required to cross in this area would be poor. Secondly any route to the south of the confluence of the River Barrow and the Black River would encroach on the Urban Area of Monasterevin. 	Ground conditions are not uniform but investigations indicate that there is no obvious area that should be avoided.	Any Southern Corridor Route Crossing point would be superior.
LANDSCAPE	The scale of embankments and areas of cut required would create significant impacts on the landscape. The Northern Corridor Routes traverse areas of high scenic quality such as Emo Court and Ballybrittas Pound.	Visual intrusion would occur in the vicinity of Hill Wood. This visual intrusion would not be as severe as that created by the Northern Corridor Routes.	Southern Corridor significantly superior
AGRICULTURE	Contains free draining better quality land.	Contains less land suitable for good agricultural production than the Northern Corridor.	Southern Corridor superior.
COST	Between £162m and £120m.	Between £90m and £98m.	Southern Corridor cheaper.
NATURAL & CULTURAL HERITAGE	Route N1 would sever Emo Court Estate and would have a severe impact on views from both Emo House and the surrounding gardens. The impact of Route N2 is less severe on the Natural & Cultural Heritage but the scale of the embankments in the environs of Monasterevin will detract from the town of Monasterevin.	Southern Routes would impact on more known features and areas of interest. However none of these impacts are severe enough to merit the exclusion of the Southern Corridor Routes.	Northern Corridor impacts on fewer known features and areas of interest. However the impact of embankments near Monasterevin is more severe.
SOCIO-ECONOMIC IMPACT	Slight advantage of encouraging stops in Monasterevin as the town would be more visible from the Northern Corridor. Environmental impact on residential areas around Monasterevin would be severe.	Discretionary Expenditure generated by stop off traffic will fall. This will affect both corridors equally.	Southern Corridor superior.

Table 7.1.1b

Southern Route Options Comparative Analysis

	Route S1	Route S2	Route S3	Comments
LENGTH	17250m	17450m	17700m	
ENGINEERING	Significantly steeper grade (3%) on the approaches to Hill Wood than Route S2 or Route S3.		Horizontal curve between Cloncarlin, house and Mayfield Interchange is 1400m radius curve which is 100m smaller than the tightest curve on Route S1 or Route S2.	Route S2 has superior geometrics to Route S1 or Route S3.
RIVER BARROW CROSSING Rioghán O'Donovan & Ass.	Piled foundations likely.	Piled foundations likely.	Piled foundations likely. The proposed crossing point of the River Barrow is located at a point downstream from a bend in the river channel. This is likely to lead to scouring under the bridge abutments.	Route S1 or Route S2 would be preferable to Route S3 due to hydrological reasons.
LANDSCAPE Murray & Ass.	There is significant visual intrusion at Hill Wood. The cutting which would be 15m deep and would create a notch in the skyline; the impact of which could not be mitigated.	The visual impact is lower than Route S1.	The visual impact is lower than Route S1.	Route S1 is rejected in favour of Route S2 or Route S3.
SOILS & AGRICULTURE Teagasc	Approx. 50 holdings affected which is more than Route S3. However many of the holdings affected are very small agricultural holdings. Therefore Route S1 would have less agricultural disturbance than Route S3.	Approx. 60 holdings affected which is more than Route S3. However many of the holdings affected are very small agricultural holdings. Therefore Route S2 would have less agricultural disturbance than Route S3.	Approx. 40 holdings affected which is less than Route S2 or S3. The holdings affected are generally bigger more viable units than for Route S1 or Route S2. As a result Route S3 has the greater agricultural disturbance attached.	Route S1 and Route S2 would be preferred to Route S3.

Table 7.1.2a

Southern Route Options Comparative Tables

	Route S1	Route S2	Route S3	Comments
NATURAL & CULTURAL HERITAGE John Fehan UCD	Route S1 cuts through the "Morett "Ancient Road". Route S1 would also destroy the small fen area "Flynn's Fen" and it cuts into Dangan's Wood a Coillte conifer plantation.	Route S2 cuts through the Morett "Ancient Road". Route S2 also cuts through Dangan's Wood a conifer plantation, Bald Scrub and the southernmost portion of Hill Wood. The line runs close to archaeological site 2605 and the disused burial ground at Lughil site 2606.	Route S3 is the only route identified which does not cut through the Morett "Ancient Road". Route S3 cuts through the centre of the Derries Wood splitting the territory of the resident deer population. It cuts through the edge of Rathdaire Lake and the narrow wood at the Raperaree.	There is no particular advantage of any route. Nor is there any impact caused by any route which cannot be mitigated. However the impact of Route S1 on Hill Wood would be most obvious.
SOCIO - ECONOMIC IMPACT J. Reid & Ass.	Route S1 is the least favourable route option with regard to socio - economic issues.	Route S2 is marginally inferior to Route S3.	Route S3 is marginally superior to Route S2.	Route S3 is marginally superior to Route S2.
COST BENEFIT ANALYSIS LCC Road Design Office	15.20%	14.40%	14.20%	
NUMBER OF DWELLING HOUSES TO BE DEMOLISHED	5	2	1	
NUMBER OF DWELLING HOUSES WITHIN 100M	18	23	17	

Southern Route Options Comparative Tables

	Route S1	Route S2	Route S3	Comments
GEOTECHNICAL E. Dillon & E. Farrell	As Route S1 passes in cut through Hill Wood it encounters rock 2m to 6m below the surface. This rock is competent and consequently will require blasting. There is also a possible risk of unfavourable dips and strikes in the bedrock leading to instability which would require the slope of the western face of excavations to be reduced to 20 degrees or the installation of rock bolts.	Although Route S2 passes in cut through Hill Wood it is far enough south to avoid rock.	Rock excavation may be required at Lughill Hill.	The cost of rock excavation for Route S1 eliminates it in favour of Route S2 or Route S3.
INTERMEDIATE INTERCHANGE	Route S1 is closest to the existing N7 and Regional Roads making the provision of an interchange easier.	An intermediate interchange can be provided on Route S2 without the requirement of realigning the N7 or substantial upgrading of the Local Road Network.	Route S3 is furthest from the existing N7 and Regional Roads making the provision of an interchange more difficult. Substantial upgrading of the Local Road network would be required to link this interchange with the N7.	Route S2 would best facilitate the provision of an interchange
COST	£92m	£90m	£96m	Route S2 cheapest

Table 7.1.2c

8. ENVIRONMENTAL IMPACT ASSESSMENT OF PREFERRED ROUTE

8.0 ENVIRONMENTAL IMPACT ASSESSMENT OF PREFERRED ROUTE

The following Chapter 8 assesses the impacts of the preferred route on Human Beings, Air, Material Assets, Soils, Water, the Landscape, Flora & Fauna and Cultural Heritage.

The following drawings referred to in the text are located in Volume 3 of this report:

- | | | |
|----|---------------|--|
| a) | NAA/01 to 06 | Noise, Air, Planning and Archaeological Sites |
| b) | P/00 to 06 | Properties |
| c) | PR01 to 10 | Preferred Route |
| d) | ANHD/01 to 06 | Architecture, Natural Heritage, Drainage Outfalls. |

8.1 TRAFFIC⁽¹⁹⁾

Kildare County Council appointed McMahon Design & Management Ltd. to assess the impact of the preferred route on traffic.

Their brief was divided into sections as follows:

- *Review existing traffic data and update where required*
- *An assessment of the likely increase/decrease in and the reassignment of traffic volumes on the existing & proposed alternatives road network. The assessment was to be on the basis of the design year 2024*
- *Comparative analysis of interchange layout options at Heath East, Heath West and Ballydavis*
- *An assessment of the road junctions type required for the preferred route option*

8.1.1 Existing Traffic Volumes

Traffic Surveys were undertaken in August/September 1998 to update previous surveys, carried out in 1994, review traffic growth and traffic characteristics and to assess specific features at the Ballydavis and Heath Interchanges.

The location of the various counts are given in Figure 5.

The Annual Average Daily Traffic (AADT) flows on the N7 for the purposes of the study were calculated as 14,335 at Morett and 15,530 at Mayfield. An important aspect of the traffic count and automatic traffic counter (ATC) records is that daily traffic volumes exceed AADT for significant periods throughout the year. The August figures, show that actual daily flows in excess of 21,000 were recorded and were generally of the order of

17,000 vehicles per day throughout the month of August 1998. It should therefore be noted that peak day flows can exceed AADT by at least 46%.

8.1.2 Traffic Growth Rates.

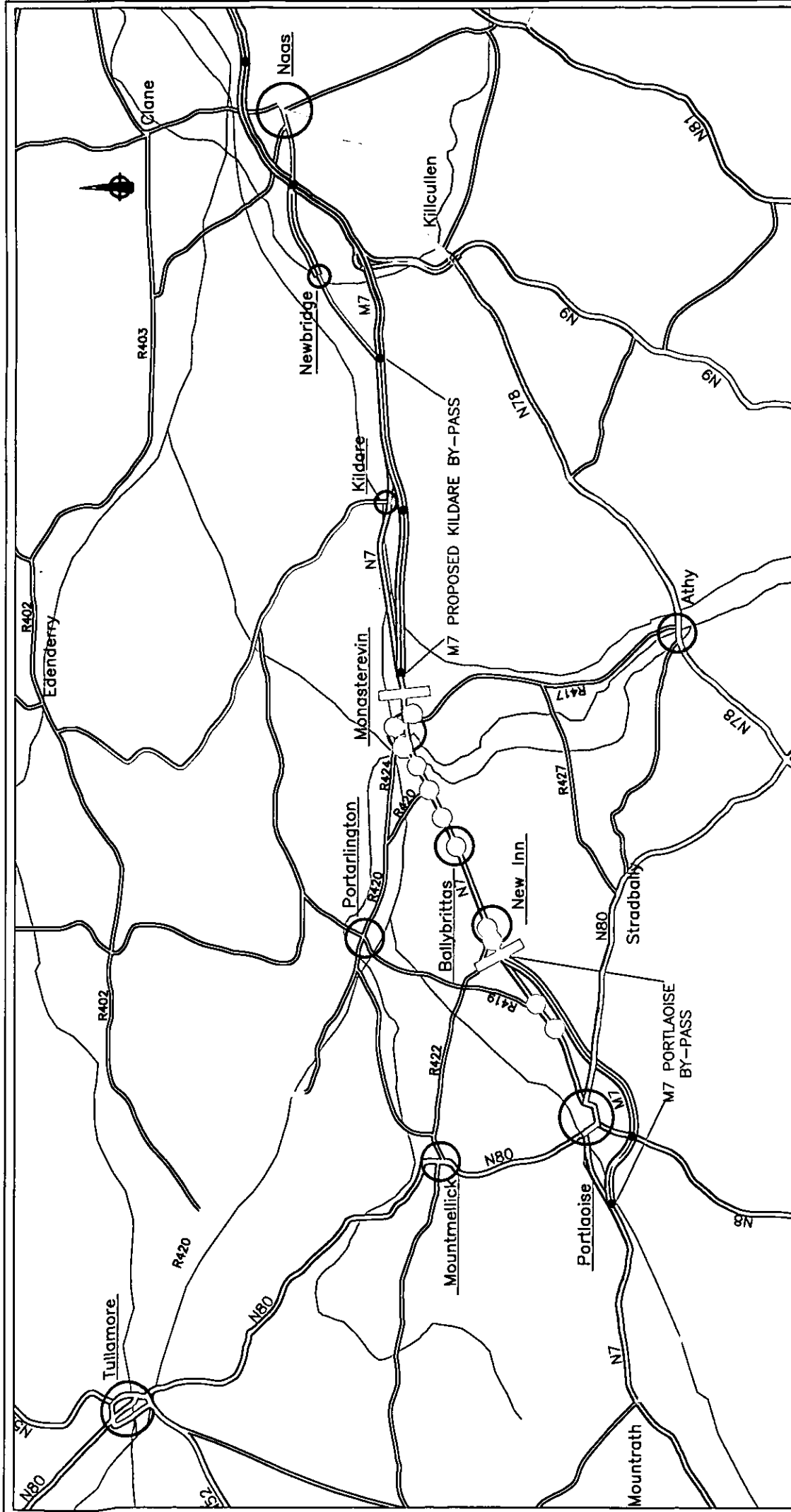
The Environmental Research Unit/National Roads Authority has compiled AADT data for ten years from 1988 to 1999. The relevant data for The Heath (Morett) and East of Monasterevin is shown in Table 8.1.1.

AADT Data 1988 - 1998

	The Heath	East of Monasterevin
1988	8,083	10,779
1989	8,606	10,165
1990	8,797	11,395
1991	9,307	10,910
1992	9,922	11,605
1993	10,775	12,133
1994	10,789	11,747
1995	11,604	11,968
1996	12,621	13,920
1997	13,359	17,361
1998	14,335	15,330

Table 8.1.1

Having regard for traffic patterns over the recent 10 year and 5 year periods, the growth rates would be as set out in Table 8.1.2.



CLASSIFICATION COUNT LOCATION
INTERSECTION COUNT LOCATION



KILDARE COUNTY COUNCIL National Roads Design Office

Maudlins, Naas, Co. Kildare

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SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: LOCATION OF VARIOUS COUNTS

Scale: N.T.S.

Date: OCT. '99.

Drawing No.

Fig.5

Annual Growth Rates

	Morett	Mayfield
10 Years		
1988-1998	5.9%	3.6%
4 Years		
1994-1998	7.4%	6.9%

Table 8.1.2

The National Roads Need Study suggests that traffic growth figures per annum should be predicted at a rate of 6% for the years 1995 to 2000, 4% for years 2000 to 2005 and 2% for years 2005 to 2015. These figures may understate the growth rate for the section of the N7 at Heath Mayfield. The present data indicates that there is a case for modifying the horizons as follows:

1998-2003	Growth Rate 6%
2003-2008	Growth Rate 4%
2008-2024	Growth Rate 2%

The application of the growth rates to 1998 figures predicts a more than doubling of traffic volumes by the year 2024. The expanded traffic volumes are shown in Table 8.1.3

Predicted Traffic Volumes 1998 - 2024

	The Heath	Mayfield
1998	14,335	15,330
2003	19,185	20,514
2008	23,343	14,962
2024	32,040	34,264

Table 8.1.3

In the event that the estimated growth rates may be underestimated these projected flows could be of the order of 37,400 at The Heath and 40,000 at Mayfield by the year 2024. These figures are based on growth rates of 7.5% for 1998 – 2003, 5% for 2003 – 2008, 3% for 2008 – 2013 and 2% for 2013 – 2024.

8.1.3 Vehicle Classification

Analyses of traffic characteristics indicate that the Heavy Commercial Vehicle (HCV) content is effectively 16%.

8.1.4 Traffic Flow Patterns

A series of Intersection Counts was carried out on the section of the N7 between the Heath and Mayfield. A traffic flow map developed from the 12-hour traffic counts is shown in Figure 6.

The diagram shows the dominance of the arterial traffic and the interaction of traffic from the adjoining road systems. A number of the roads are minor in nature and have very low traffic flows. The more significant routes are:

Significant Adjoining Routes

Route	Location	12 Hour Turning Traffic To and From the N7
R422	New Inn	1,093
R420	Killinure	1,725
R424	Monasterevin	1,733
R414	Monasterevin	2,759
R419	Monasterevin	2,845

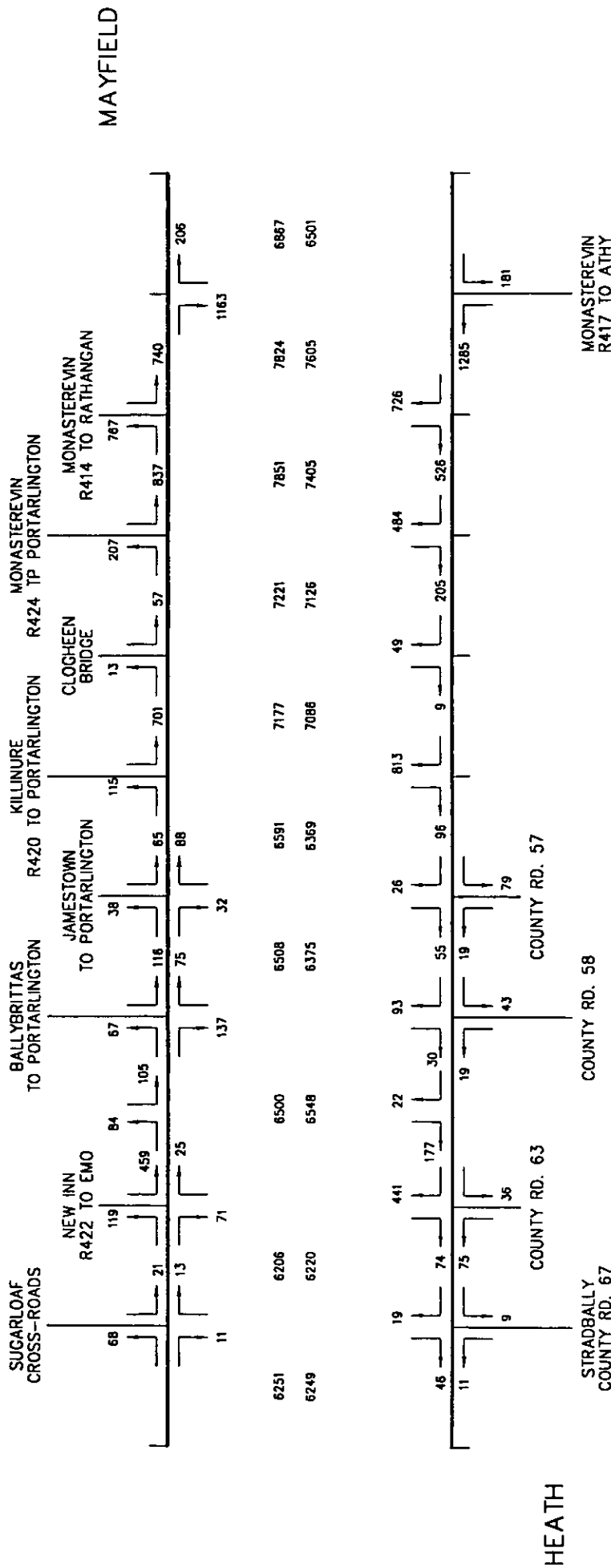
Table 8.1.4

The most notable aspects of these figures are that of the 1,725 vehicles on the R420 to Portarlington 88% (1,514 Vehicles) had an origin or destination in the direction of Dublin and in the case of the R422 to Emo, Mountmellick, Tullamore 961 (88%) of the 1,093 vehicles had a similar pattern.

Figure 7 illustrates the traffic volume patterns using estimated AADT for 1998.

8.1.5 Existing Traffic Flows Eastern End of Portlaoise By Pass

The series of half interchanges located at Ballydavis, Heath West and Heath East shown in Figure 8 have a complex traffic flow pattern. This is due to a series of factors. Ballydavis acts as the eastern interchange for the town of Portlaoise with large flows on both the on and off ramps.



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PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: TRAFFIC FLOW MAP WEEKDAY-12HRS-AUG-1998

Scale: N.T.S. Date: OCT. '99.

Drawing No.

Fig.6

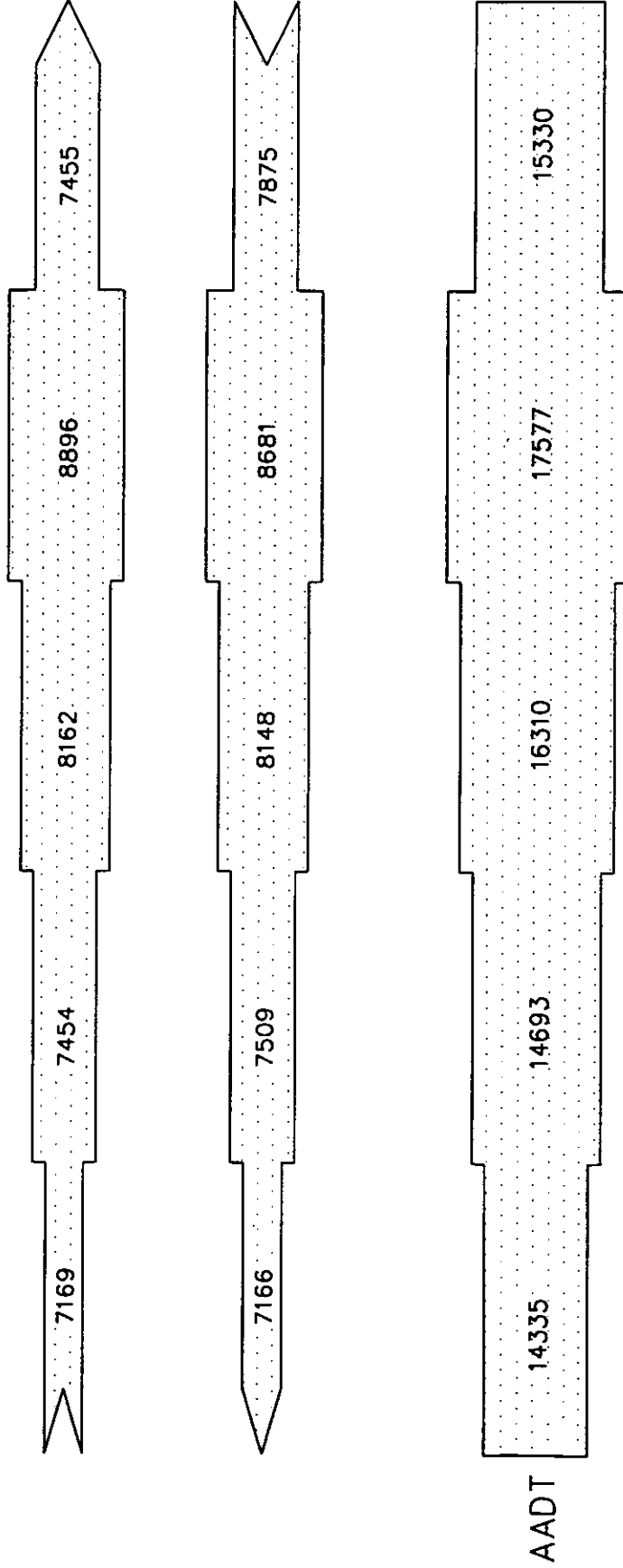
NEW INN
R422
TRAFFIC VOLUMES (1254)

PORTARLINGTON
R420

MONASTEREVIN
R424 R417
(1987) (3164) (3164)

HEATH

MAYFIELD



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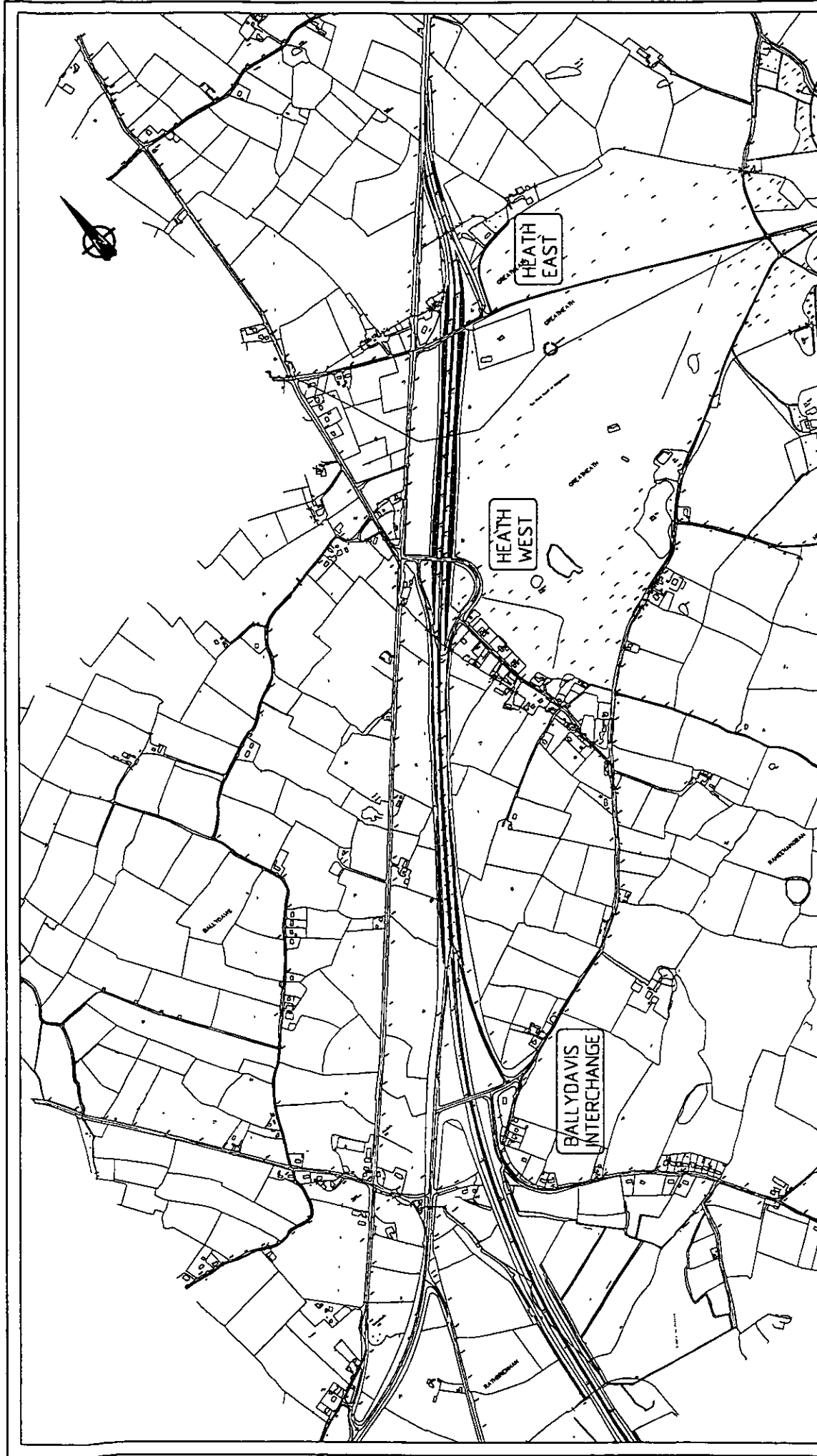
PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: TRAFFIC VOLUMES - ESTIMATED AADT 1998

Scale: N.T.S. Date: OCT. '99.

Drawing No.

Fig.7



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PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: EASTERN END OF THE PORTLAISE BY-PASS

Scale: N.T.S.

Date: OCT, '99.

Drawing No.

Fig.8

Heath West and Heath East provide a service which is more locally oriented. They interact with the R445 providing links to Portarlinton, The Heath and surrounding environs.

The traffic flow patterns are shown on Figure 9. A particular feature of the Heath/Mayfield complex is the increase in traffic volumes on the Motorway between Heath West and Ballydavis. This is accentuated by the reduction in flows to the west of Ballydavis. The patterns of traffic volumes is a clear indication of the problem of local traffic using the Motorway as a facility for local travel over a short distance.

8.1.6 The Preferred Heath/Mayfield Route

The traffic study together with earlier studies and historical data shows a pattern of sustained traffic growth over the years.

The growth rates in the National Roads Need Study are the minimum applicable to the section of the N7 between The Heath and Mayfield.

The traffic projection for 2024 indicates an AADT in the range of a low estimate of 32,040 to 34,264 and an upper estimate of 37,400 to 40,000. The HCV content would be 16%.

The reassignment of traffic expected by the year 2024 for each estimate of growth are illustrated in Figures 10 and 10a. In general the distribution of the predicted traffic volumes between the proposed motorway network and the existing N7 is approximately 80/20.

8.1.6.1 Traffic Capacity

The National Road Needs Study, has developed limiting capacities for various types of road. The capacities are based on the US Highway Capacity Manual (USHCM)⁽³⁸⁾ and a 30th Highest Hour factor of 13% of AADT for interurban roads and a HGV content of 12%.

The objective of the National Road Needs Study is to provide a minimum Level of Service (LOS) "D" as defined by the USHCM which is the equivalent to an interurban speed of 80km/h.

The projected AADTs in the Heath/Mayfield corridor for 2024 range from 32,040 to 34,264 vehicles per day at the Heath and Mayfield respectively. Specific motorway traffic would be in the range of 29,100 to 30,200 vehicles (AADT) based on these figures. However, if the higher growth rate were to be realized the corresponding figures in vehicles would be 34,000 and 35,300. The overall pattern is outlined in Table 8.1.5.

Limiting Capacities and Projected Traffic Flows

Level of Service	A	B	C	D	E
Roads Needs Study General	—	—	43,500	55,500	62,500
Heath-Mayfield Traffic Study	18,700	26,700	36,400	46,500	52,340
Lower Est. of Motorway Traffic AADT (vehs)2024			30,200		
Possible Level of Motorway Traffic AADT (vehs)2024			35,300		

Table 8.1.5

The projected traffic flows are approaching the maximum capacity of Level of Service C for a 2+2 lane rural motorway.

In terms of traffic capacity, it could be argued that a full Dual Carriageway would meet the requirements of this particular section of the N7. However, in terms of network planning, strategic development and safety there are compelling arguments for the development of this section of route to motorway standard.

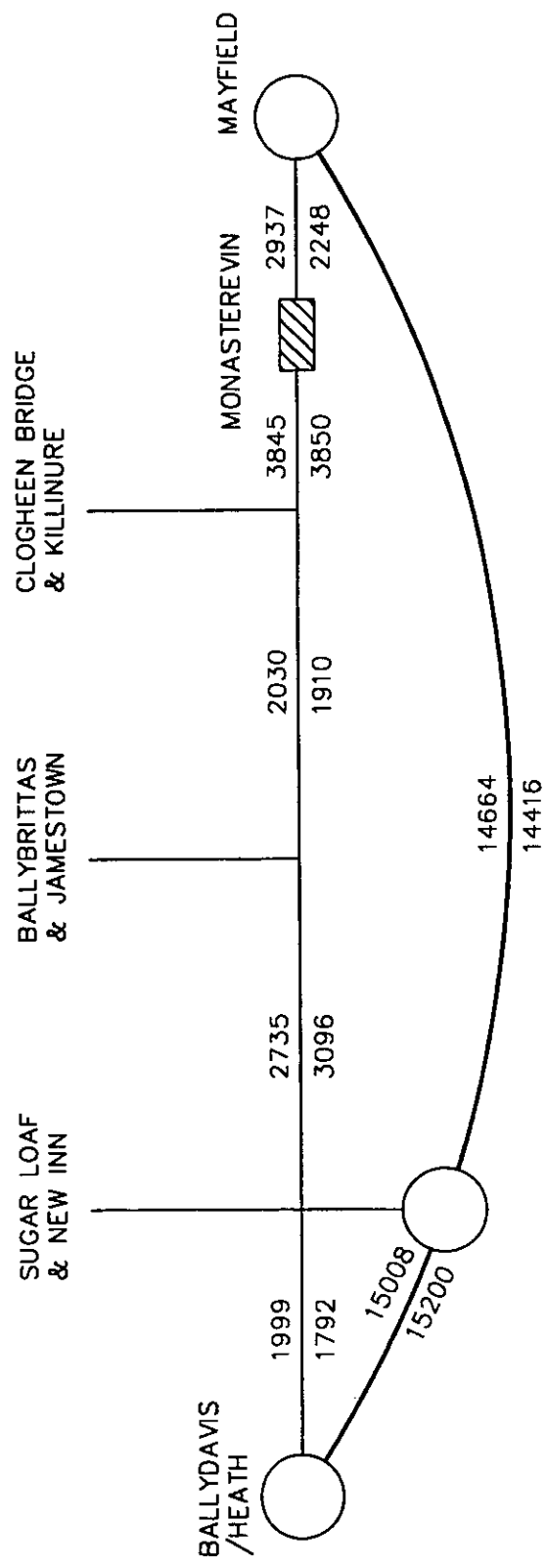
8.1.6.2 Network Planning

The proposed scheme as previously stated links the Portlaoise Bypass to the Proposed Kildare Town Bypass. Each of these road networks are designed to Motorway Standards. The introduction of a section of dual carriageway with differing driving conditions and standards linking two motorway networks would not make sense, particularly as there is no significant reduction in traffic between Kildare and Portlaoise.

8.1.6.3 Strategic Development

The extension of a route to full Motorway standards southwards to Portlaoise would provide an element of infrastructure which would contribute to growth and development in that area.

The provision of an intermediate interchange located at New Inn will increase ease of access from the Midland area to and from Dublin/Limerick/Cork. Its provision ties in with Offaly County Council's ONROUTE 2000 initiative to attract touring groups, day trippers and short term visitors to this particular section of the Midlands. The many



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PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

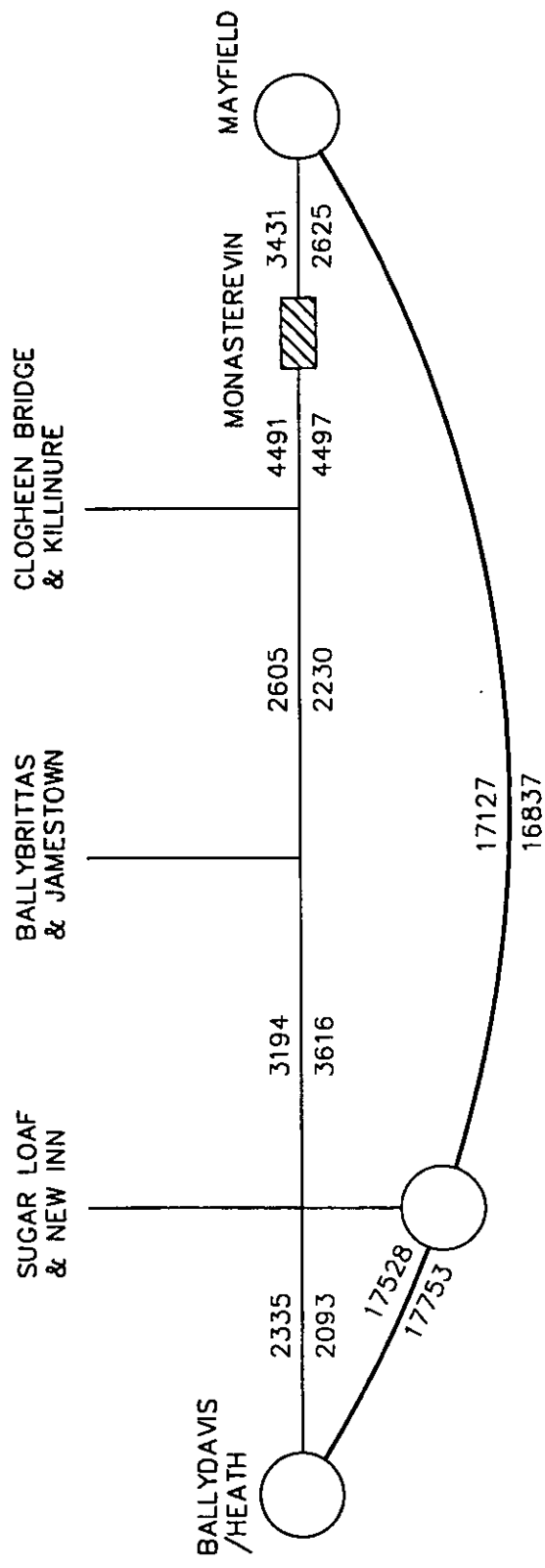
TITLE: 2024 TRAFFIC PATTERN
 LOWER GROWTH SCENARIO AADT (Vehicles)

Scale: N.T.S.

Date: OCT. '99.

Drawing No.

Fig.10



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TITLE: 2024 TRAFFIC PATTERN
POSSIBLE GROWTH SCENARIO AADT (Vehicles)

Scale: N.T.S.

Date: OCT. '99.

Drawing No.

Fig.10a

attractions, including Emo Court and the Slieve Bloom Mountains should make this a reality.

The provision of the proposed Scheme will promote growth in industry, commerce and tourism throughout a substantial area of County Laois and County Offaly.

8.1.6.4 Safety

In terms of safety, the development of the route to Motorway standards would maintain operating speeds, level of service and uniformity of driving conditions. By eliminating turning movements and roadside access/cross road movements, the level of safety would be further enhanced.

8.1.6.5 Environmental Benefits

The following environmental benefits will occur due to the provision of the new Motorway:

- *Environmental improvement in Monasterevin with the diversion of substantial volumes of non-essential traffic from the urban street system.*
- *Environmental improvements at Jamestown and Ballybrittas.*
- *Environmental improvements in terms of reduced exhaust emissions with the reduction of acceleration /deceleration.*
- *Enhanced environment for traffic movement with the facility for maintaining constant speed, ease of overtaking and less stressful driving conditions.*
- *Accident reduction.*

8.1.7 Interchange Locations

8.1.7.1 New Inn Interchange.

In traffic terms alone the provision of an intermediate interchange may not be fully justified. In terms of strategic development there is a case for locating an interchange at New Inn. At this location the provision of an interchange would provide for direct access to Mountmellick and also provide for enhanced access to the Midlands over a wide area. In addition, it would provide traffic on the R420 (Portarlinton) with an alternative route to travelling through Monasterevin.

8.1.7.2 Ballydavis Interchange.

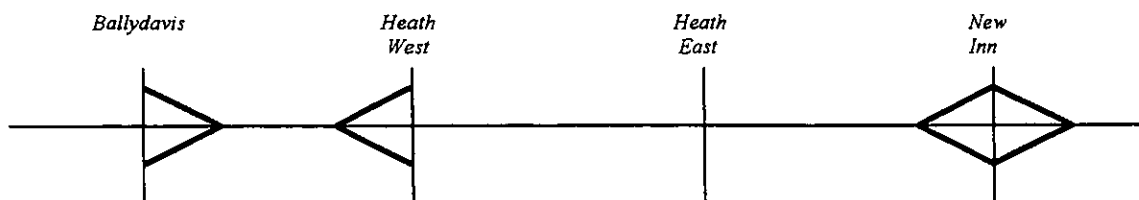
Interchange facilities are required where the proposed motorway scheme connects to the Portlaoise Bypass motorway. A number of issues were identified which required consideration prior to deciding the best interchange layout for connection to the Portlaoise Bypass.

Issues considered were:

- The present temporary arrangements of On and Off ramps at the Heath East are affected by the line of the proposed motorway and will have to be discontinued. The on-ramp will revert to 2 way use as the R445 and will not have a connection to the motorway at the Heath East. The existing temporary off-ramp at Heath East is on the line of the new motorway route and cannot therefore be retained (Figure 8).*
- The traffic study identified a pattern where local traffic enters and exits the motorway between Ballydavis and Heath West. This results in unstable traffic flows and constitutes a risk to safety.*
- There is a significant volume of traffic on the N80, which could beneficially be accommodated on the M7 but is constrained to travel through Portlaoise with significant undesirable environmental impact.*

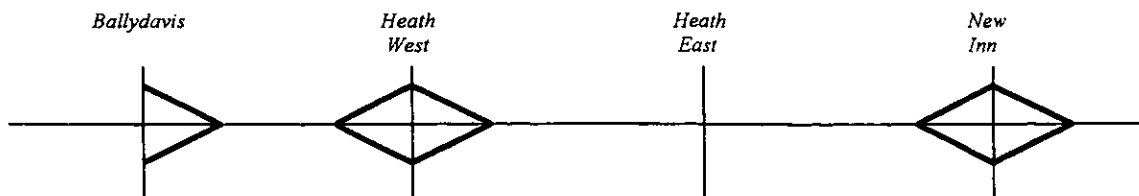
Eight Options were evaluated. The Options considered were as follows:

- Option 1 Connect the proposed motorway to the Portlaoise Bypass at Heath East with the discontinuation of the temporary On and Off ramps and with no other changes.*



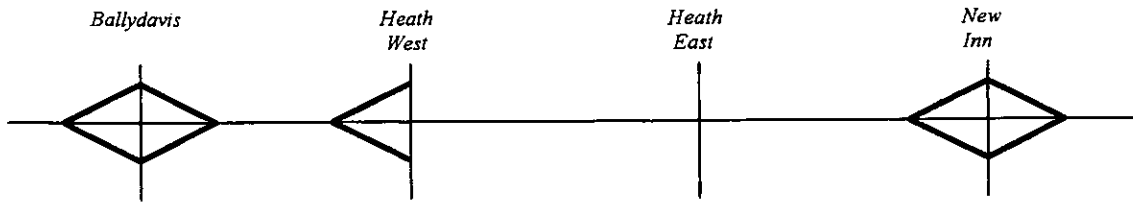
Estimated Cost £55,000

- Option 2 Connect the proposed motorway to the Portlaoise Bypass at Heath East with the discontinuation of the temporary On and Off ramps and the addition of two new ramps at Heath West to create a full interchange.*



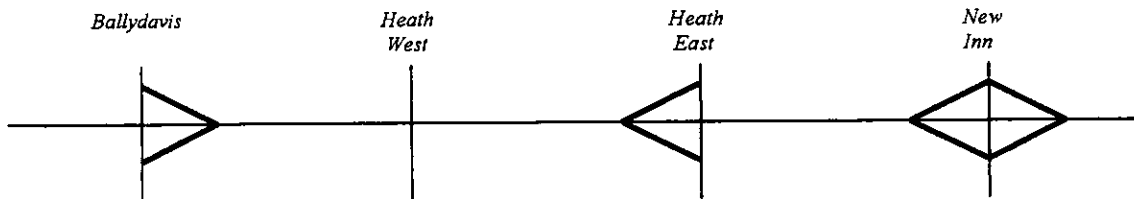
Estimated Cost £660,000

- *Option 3 Connect the proposed motorway to the Portlaoise Bypass at Heath East with the discontinuation of the temporary On and Off ramps and the addition of two new ramps at Ballydavis to create a full interchange.*



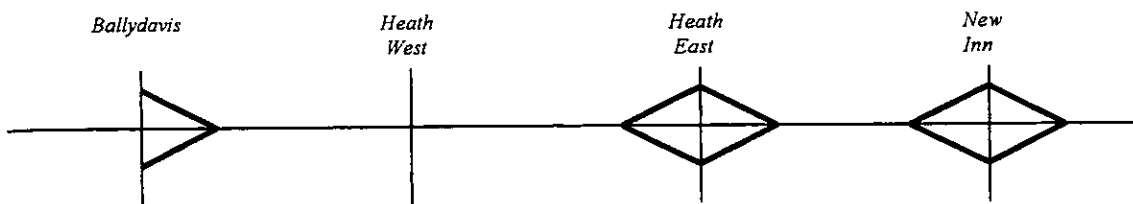
Estimated Cost £1,260,000

- *Option 4 Connect the proposed motorway to the Portlaoise Bypass at Heath East with the discontinuation of the temporary On and Off ramps. Discontinue the on and off ramps at Heath West and relocate them at Heath East*



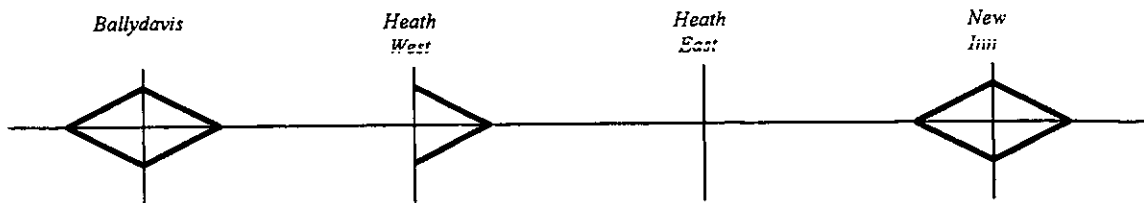
Estimated Cost £683,000

- *Option 5 Construct two new ramps to replace the temporary On and Off ramps at Heath East, discontinue the On and Off ramps at Heath West and relocate them at Heath East to create a full interchange.*



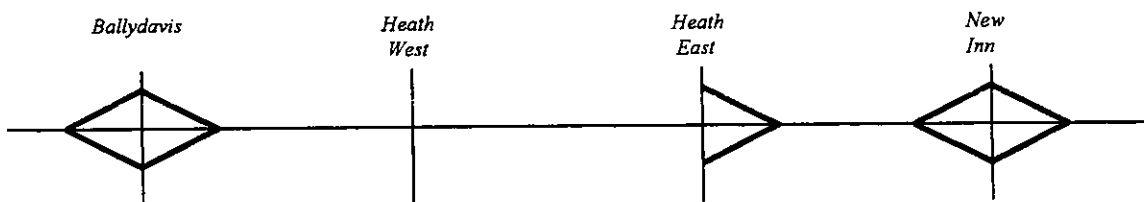
Estimated Cost £1,246,000

- *Option 6 Discontinue the temporary On and Off ramps at Heath East and also the On and Off Ramps at Heath West. Incorporate new On and Off ramps at Ballydavis to provide a full interchange and provide On and Off Ramps to the east of Heath West.*



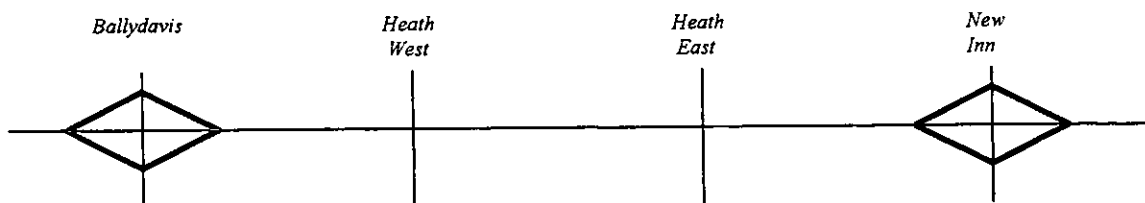
Estimated Cost 1,916,000

- *Option 7 Replace the temporary On and Off ramps at Heath East and discontinue the On and Off ramps at Heath West. Incorporate two new ramps at Ballydavis to provide a complete Interchange.*



Estimated Cost £1,765,000

- *Option 8 Connect the proposed motorway to the Portlaoise Bypass at Heath East with the discontinuation of the temporary On and Off ramps. Discontinue the On and Off ramps at Heath West and relocate them at Ballydavis.*



Estimated Cost £1,310,000

Each Option was evaluated using the following criteria:

1. Uniformity of Interchanges.

The issues considered under this heading relate to consistency in overall layout, ramp configurations and extent of facilities at an interchange (i.e. accommodation of all movements or restrictions to partial movements)

2. Distance between Interchanges.

The distance between interchanges should be maximised where possible. The greater the distance between interchange facilities, the safer the motorway network provided. The distance between successive On and Off ramps should also be maximised.

3. Local Weaving Traffic.

At present there is a pattern of local traffic accessing the Portlaoise Bypass between Ballydavis and Heath West. This traffic enters and leaves the motorway over a distance of 800m. Arterial traffic also joins the motorway in that area and traffic leaves the motorway at the off-ramp at Heath West. This results in a weaving pattern with high differential in relative speed over a short distance. This has the potential to be unsafe and should be avoided.

4. Accommodation of N80 Traffic.

A facility with the ability to provide for N80 traffic, having Stradbally/Carlow as an origin or destination, which currently traverses the Town Centre and urban streets in Portlaoise would be of benefit.

5. Impact on the R445.

The existing N7, on completion of the proposed scheme will be designated a Regional Road (R445). The R445 will be an integral and significant element of the road infrastructure. The objective is that subsequent to the completion of the Heath/Mayfield section of road, the R445 should cater for local traffic to optimum effect in terms of service to the local community, uniformity of traffic speeds and enhanced road safety.

6. Safety.

Optimisation of road safety can be achieved by facilitating access for motorway type traffic to the motorway, providing uniformity of interchanges, diversion of traffic and HGVs from town centre and urban streets, avoidance of potential for local weaving traffic on the motorway and effective utilisation of local roads for local traffic.

7. Environmental Improvements.

The Portlaoise Bypass has significantly reduced traffic flows through Portlaoise. However, traffic with an Origin or Destination in areas served by the N80 is constrained to continue to use the local street network in Portlaoise. This traffic includes a significant element of Heavy Commercial Vehicles.

If this traffic could be otherwise accommodated it would, in addition to enhanced safety, provide significant improvements on the urban sections of the Stradbally Road, the Limerick Road, the Cork Road and the Tullamore Road with substantial overall environmental improvements in Portlaoise.

Features of each Option assessed are given in Table 8.1.6.

Having considered all options, Option eight, which involves the removal of the existing ramps at Heath West and relocating these ramps to Ballydavis, was judged to be the optimum solution. This option provides:

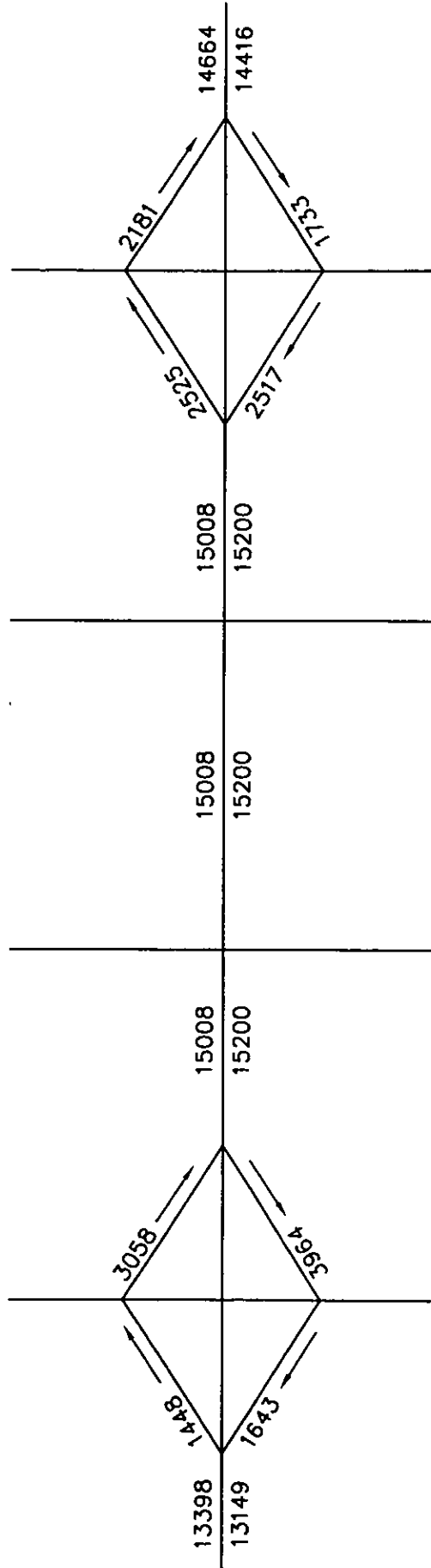
- Uniformity of Interchanges at Togher, Ballydavis, New Inn and Mayfield.*
- A consistent and safe distance between interchanges.*
- The elimination of local weaving traffic.*
- Accommodation of N80 traffic on the motorway system.*
- Effective segregation of traffic as between arterial traffic on the motorway and local traffic on the local road system.*
- Enhanced levels of safety.*
- Significant environmental improvements in the urban street system in Portlaoise.*

An assignment of traffic flows on the proposed layout, based on AADT for the year 2024, is presented in Figure 12.

8.1.8 Conclusions.

The Annual Average Daily Traffic flow on the Heath-Mayfield section of the route are predicted to be in the range of 32,040 to 34,264 vehicles in the year 2024. These flows should be regarded as base flows with the potential to be of the order of 37,400 to 40,000 vehicles per day.

BALLYDAVIS HEATH WEST HEATH EAST NEW INN



KILDARE COUNTY COUNCIL
National Roads Design Office
Maudlins, Naas, Co. Kildare

J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER

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SENIOR DESIGN ENGINEER

Scale: N.T.S.

Date: OCT. '99.

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME
TITLE: TRAFFIC FLOWS BASED ON AADT FOR YEAR 2024

Drawing No.

Fig.12

HEATH INTERCHANGE OPTION ASSESSMENT

Options	Uniformity of Interchanges	Distance between Interchanges	Local Weaving Traffic	N80 Traffic	Impact on N7/R445	Safety	Environmental Improvement
Option 1	No	0.8km	Unresolved & Intensified	Unresolved & Indirect Solution Via M7 Inadvisable	No Significant Change	Significant Disimprovement	No Improvement
Option 2	No	0.8km	Unresolved & Intensified	Unresolved & Indirect Solution Via M7 Inadvisable	Improved Utilisation	Significant Disimprovement	No Improvement
Option 3	No	0.8km	Unresolved & Intensified	Solutions Provided	Optimum Utilisation	Disimprovement	Significant Improvement
Option 4	No	1.6km	Unresolved & Intensified	Unresolved & Indirect Solution Via M7 Inadvisable	No Significant Change	Significant Disimprovement	No Improvement
Option 5	No	1.6km	Unresolved & Intensified	Unresolved & Indirect Solution Via M7 Inadvisable	Improved Utilisation	Significant Disimprovement	No Improvement
Option 6	No	1.5km	Eliminated	Solutions Provided	Optimum Utilisation	Significant Improvement	Significant Improvement
Option 7	No	2.2km	Eliminated	Solutions Provided	Optimum Utilisation	Significant Improvement	Significant Improvement
Option 8	Yes	5.7km	Eliminated	Solutions Provided	Optimum Utilisation	Optimum Improvement	Significant Improvement

Table 8.1.6

It is recommended that the section of route between The Heath and Mayfield should be developed on a new alignment to Motorway standard. Full interchanges should be provided at Ballydavis, New Inn and Mayfield. The exiting partial interchange at Heath West should be removed.

It is considered that the route should be to motorway standard so as to provide uniformity of route characteristics, an optimum level of service, an enhanced level of safety and an element of infrastructure which would attract and assist the further development of the midland region.

8.2 NOISE AND VIBRATION ⁽²⁰⁾

The Environmental Services Group of Enterprise Ireland, carried out a study of the likely noise and vibration effects of the proposed scheme. Baseline noise measurements were made at 22 selected locations along the scheme and the effects of noise due to the preferred route was assessed at 23 locations. Vibration measurements were made at one location on the National Primary Route (N7).

The traffic consultant compiled the upper traffic flow rates used and no allowances have been made for the future reduction of vehicle noise. Predictions of noise levels as a result of the preferred route were made using the HMSO publication "Calculation of Road Traffic Noise", 1988.

Road traffic noise may cause annoyance and the parameter used in most road development in Ireland, and in the U.K. for assessment of traffic noise is expressed in terms of the index L_{10} (18-hour) dB (A). U.K. legislation has a limit of 68-dB (A) (18-hour) for new road works before noise abatement at the point of reception is required.

To assess the ground vibration in relation to structural response the parameter used is the peak particle velocity expressed in millimetres per second, mm/s.

8.2.1 Existing Noise Environment

Traffic noise measurements were made at 22 locations between September 1994 and October 1995. Additional noise measurements were taken in October 1999, at Ballycarroll as part of the assessment of the impact of the proposed Ballydavis interchange. The locations are marked on Figures NAA/01 to 06. At 20 of these locations, measurements were made for periods in excess of twenty four hours.

The baseline L_{10} (18-HOUR) dB (A) levels are shown in Table 8.2.1.

8.2.2 Existing Vibration Environment

Vibrations are generated in the road as a vehicle moves along in two ways, the interaction of the wheels and the road surface and by direct transmission through the air of waves arising from the size, shape and speed of the vehicle. Ground vibrations produced by road traffic are unlikely to cause perceptible structural vibrations in buildings located near to well maintained and smooth road surfaces.

Baseline ground vibration measurements were made on the N7 in Monasterevin (location NV20) on Friday 16th June 1995. The maximum peak particle velocities recorded are shown in Table 8.2.2.

Baseline Ambient Noise

REF	LOCATION	FAÇADE	ROAD	CHAINAGE	L10dB(A)
NV0	Bungalow	Front	N7	P' L Bypass	67
NV1	Bungalow	Rear	(68A)	23800	48
NV2	Bungalow	Side	67	25350	50
NV3	Bungaiow	Rear	67	25350	47
NV4	Bungalow	Rear	67	25400	50
NV5	Bungalow	Side	63	27100	50
NV6	Bungalow	Side	61	27800	53
NV7	Cottage	Front	58	30850	48
NV8	Bungalow	Front	57	32800	53
NV9	Farm House	Front	57E	33900	47
NV10	Bungalow	Front	57E	34150	56
NV11	Bungalow	"side"	Grange	35350	40
NV12	Grange Farm	2nd Rear	Grange	35460	54
NV13	Bungalow	Front	Grange	36140	43
NV14	Bungalow	Front	P1359	37120	50
NV15	Bungalow	Front	R417	37520	61
NV16	House	Front	P1355	38630	55
NV17	Cloncarlin House	2nd Front	N7	39360	49
NV18	Ballybrittas, 2 Storey Res.	2nd Front	N7	-	81
NV19	Jamestown, L'ced Premises	2nd Front	N7	-	84
NV20	Monasterevin, 2 Storey Res.	2nd Front	N7	-	80
NV21	Bungalow	Front	N7	-	71
NV22	Bungalow	Side	Ballycarroll	-	61

Table 8.2.1

Maximum Peak Particle Velocities

<i>Location</i>	<i>Source</i>	<i>Peak Particle Velocity</i>			
<i>Roadside Residence</i>	<i>Traffic</i>	<i>Longitudinal</i> 0.03	<i>Vertical</i> 0.05	<i>Transverse</i> 0.05	<i>mm/s</i>

Table 8.2.2

The estimated maximum pseudo-vector sum, the vector sum of the absolute value of the maximum peak levels measured in each of the three planes, was 0.08 mm/s.

8.2.3 Predicted Noise Environment

The road traffic noise level was predicted at 24 locations along the preferred route S2 and at 4 locations along the existing N7. The maximum predicted traffic volumes for the year 2019 are estimated at an AADT of 31,500 vehicles with a HCV content of 16%. Minimum reduction values were used for the existing N7 once the Bypass is completed. The existing traffic AADT on the N7 based on 1998 figures is 14,303. The predicted traffic volumes on the R445 (N7) after completion of the proposed scheme is an AADT of 5,700 for the year 2004. The predicted noise levels along the R445 (N7) are given in Table 8.2.3.

Predicted Noise Levels Along R445 (N7)

Ref	Location	Baseline L10, dB(A)	2004
NV18	Ballybrittas, 2 Storey Residence	81	78
NV19	Jamestown, L'ced Premises	84	81
NV20	Monasterevin, 2 Storey Residence	80	76
NV21	<i>Bungalow</i>	71	68

Table 8.2.3

The predicted levels on the Motorway route for the year 2019 are listed in Table 8.2.4.

Predicted Noise Level Along Preferred Route

Ref	Location	L10, dB(A)	2019	With Amelioration
NV0	Bungalow	67	64	67
NV1	Bungalow	48	68	
NV1a	Bungalow		72	
NV1b	Bungalow		69	
NV2	Bungalow	50	56	
NV3	Bungalow	47	64	Acquire
NV4	Bungalow	50	65	
NV5	Bungalow	50	65	
NV6	Bungalow	53	65	
NV7	Cottage	48	79	
NV8	Bungalow	53	65	
NV9	Farm House	47	64	
NV10	Bungalow	56	67	
NV11a	Bungalow	-	66	
NV11b	Bungalow	40	66	
NV11c	Bungalow	-	66	
NV12	Grange Farm	54	61	
NV12a			69	
NV12b			67	
NV12c			66	
NV13	Bungalow	43	62	
NV14	Bungalow	50	64	
NV15	Bungalow	61	65	
NV16	House	55	61	
NV16A			68	
NV17	Cloncarlin House	49	58	
NV22	Bungalow	61	58	

Table 8.2.4

It can be seen that with the provision of appropriate amelioration measures no residences along the preferred route will be exposed to levels in excess of the criterion level of 68dB (A).

8.2.4 Predicted Vibration Environment.

The ground vibration generated from the operation of the new roads and ramps would be expected to be less than that required to cause disturbance or structural damage. The predicted vibration will be less than that caused by the existing road surfaces.

Ground vibrations during construction would not be expected to cause disturbance or structural damage.

8.3 AIR QUALITY ⁽²¹⁾

Enterprise Ireland were engaged by Kildare County Council to carry out an assessment of the impact of emissions to atmosphere from the proposed Motorway Scheme, on the air quality in the area adjacent to the route.

The study was in carried out in two phases:

- *A survey of the existing air pollution levels*
- *A computer dispersion modelling of the levels of six airborne pollutants. The prediction models used were Caline 4 and BREEZE WAY CAL3QHC. Caline 4 has an inbuilt algorithm to calculate nitrogen dioxide concentrations produced as a result of photochemical reactions of nitrogen oxides and ozone (O₃). BREEZE WAY CAL3QHC is the most recently adopted Air Pollution Dispersion Model for assessing air quality impacts near transportation facilities and intersections.*

Phase one of the survey was carried out at 21 locations in the area indicated on Figures NAA/01 to 06. Of these, 17 were along the route proposed and 4 were on the existing N7. Phase two, the dispersion modelling, was carried out at the 17 locations where residents are in close proximity to the proposed route.

The baseline measurements taken are given in Table 8.3.1. The baseline air quality along the proposed route is very good in the rural area. Higher levels of pollution, particular of the pollutants, smoke and nitrogen dioxide, were noticeable at the monitoring points on the route of the existing N7. Levels were still within appropriate quality criteria.

The dispersion model, predicting future air quality for the year 2024, was based on the worst case scenario which:

- *Assumes the wind to blow directly from the roadway towards the point in question*
- *Peak hourly flow is occurring*

The predicted levels are listed in Table 8.3.2.

Despite making such adverse assumptions, the maximum predicted hourly airborne concentrations of pollutants considered at any of the residences examined are well below the EU current and proposed Air Quality Standards and the World Health Organisation (WHO) guidelines.

In conclusion the emissions from the motorway will have no significant impact on air quality at nearby residences. It will result in an improvement in air quality along the route of the existing N7.

Results of Air Monitoring at 21 Sites
(All Units in µg/m³)

Location	Date	Weather	Smoke	Sulphur Dioxide	Lead	Nitrogen Dioxide	T.O.C.	Benzene	Carbon Monoxide
A1	06/01/95	Dry	15	25	<2	20	<40	<40	<500
A2	20/01/95	Rain	9	40	<2	20	<40	<40	<500
A3	13/01/95	Dry	<5	<5	<2	<20	<40	<40	<500
A4	05/01/95	Rain	<5	5	<2	20	<40	<40	<500
A5	03/01/95	Rain	<5	4	<2	<20	<40	<40	<500
A6	28/11/94	Dry	<5	<5	<2	20	<40	<40	<500
A7	22/11/94	Dry	<5	<5	<2	38	<40	<40	<500
A8	21/10/94	Dry	9	<5	<2	<20	<40	<40	<500
A9	08/11/94	Rain	<5	<5	<2	38	<40	<40	<500
A10	28/10/94	Dry	9	<5	<2	<20	<40	<40	<500
A11	09/11/95	Dry	<5	9	<2	<20			<500
A12	08/06/95	Dry	9	<5	<2	20	100	<40	<500
A13	08/06/95	Dry	<5	55	<2	<20	96	<40	<500
A14	06/07/95	Dry	9	<5	<2	<20	<40	<40	<500
A15	06/07/95	Rain	9	<5	<2	<20	<40	<40	<500
A16	01/06/95	Dry	9	60	<2	<20	<40	<40	<500
A17	01/06/95	Dry	<5	70	<2	<20	100	<40	<500
A18	29/11/95	Dry	46	<5	<2	96	<40	<40	<500
A19	17/10/95	Dry	29	<5	<2	134	<40	<40	<500
A20	19/10/95	Dry	38	<5	<2	134	<40	<40	<500
A21	06/07/95	Dry	38	<5	<2	20	40	<40	<500

Table 8.3.1

Maximum Predicted Peak Hour Concentrations ($\mu\text{g}/\text{m}^3$) Of The Individual Pollutants At Selected Locations Along The Proposed Route For The Year 2024

Location	CO	HC	Nox	SO ₂	SP	Lead
A1	58	18	67	5	4	<1
A2	25	5	21	4	4	<1
A3	46	16	46	5	4	<1
A4	58	18	58	5	4	<1
A5	40	16	42	4	4	<1
A6	40	16	42	4	4	<1
A7	116	40	120	12	9	<1
A8	62	21	62	5	4	<1
A9	28	9	28	4	4	<1
A10	46	16	46	5	4	<1
A11a	79	28	60	9	5	<1
A11b	74	25	74	9	5	<1
A11c	63	21	63	5	5	<1
A12	18	5	18	4	2	<1
A13	18	5	21	4	2	<1
A14	74	25	76	9	5	<1
A15	42	16	42	4	4	<1
A16	25	9	28	4	4	<1
A17	18	5	18	4	2	<1

Table 8.3.2

8.4 SOCIO ECONOMIC EFFECTS (22)

The significant effects of the proposed scheme on the community in relation to Socio-Economic aspects including population and economic activity in the vicinity of the proposed scheme are examined in this section.

The main objectives to be achieved by proposals of this kind are contained in the National Development Plan 1994-1999 and in the Operational Programme on Peripherality.

At European, National and Regional levels the proposed scheme will have a significant impact completing section of Euroroutes E20 and E201. The benefits that accrue are national and generally measured in terms of job creation or growth in GNP.

Socio-economic impacts can be categorised as follows:

- Impact on population in the vicinity of the proposed scheme*
- Impact on property*
- Community severance and relief from severance*
- Recreational facilities, schools, institutions and other community facilitation*
- Impact on local economy by reason of bypassing*

Reid Associates, Chartered Town Planners, Planning and Development Consultants were appointed to assess this aspect of the scheme.

Accessibility is a key catalyst for changes in property values. Property value is a function of the level of economic activity and is influenced, among other things, by ease of access. A decline in economic activity can result in dis-investment in business premises resulting in blight. This can give rise to adverse social and environmental consequences through the creation of an atmosphere of neglect and decay. Depending on the ease and convenience of access to a bypassed area, property values may rise or decline. Ease of access to a motorway or interchange can make an area attractive to commuters and to a wide range of commercial, industrial and other uses.

8.4.1 The Study Area.

The potential impact area was divided into three separate, though associated components. The receiving environment was spatially defined as:

a) *Mainline Motorway Route*

- *Approximately a 6.5km wide (4 miles) motorway corridor running some 12-km (7ml) from the Portlaoise Bypass to Monasterevin. Settlements located on the N7 include Jamestown, Ballybrittas and New Inn/Emo.*

b) *Monasterevin Bypass*

- *Monasterevin Town and that part of its hinterland within 5km radius of the town. This includes six District Electoral Divisions, four of which, are in County Kildare and two in County Laois.*

c) *New Inn Interchange*

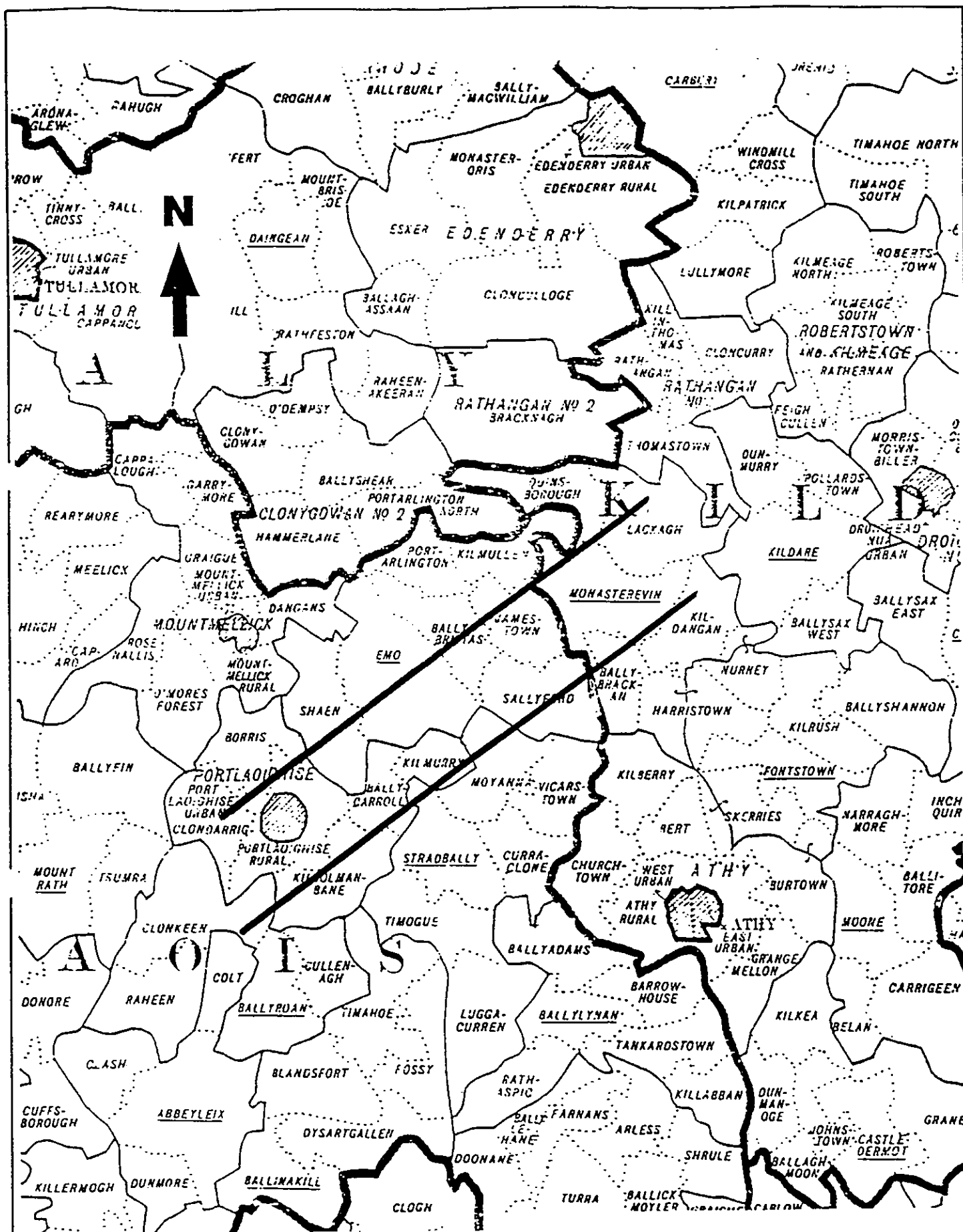
- *New Inn Interchange and its environs.*

The catchment area comprises of 55 District Electoral Divisions (DEDS). Table 8.4.1 lists all the DEDS within the catchment area. 11 DEDS lie within the motorway corridor. Figure 13 illustrates.

District Electoral Divisions

<u>Laois County</u>				
Athy No. 2 Rural	Curraclone	Moyanna	Stradbally	Vicarstown
Mountmellick Rural	Arderin Ballybrittas Ballycarroll Ballyfin Borris Brisha* Cappalough Cardtown Castlecuffe	Clonaslee Clondarig Dangans Emo Garrymore Graigue Jamestown Kilcolmanbane Kilmullen	Kilmurphy Lacka Meelick Mountmellick Rural Mountmellick Urban O'Mores Forest Portlaoighise Rural Portlaoighise Urban Portarlinton	Rearymore Rosenallis Sallyford Shaen Tinnahinch
<u>Offaly County</u>				
Birr No. 1 Rural	Kinnitty	Letter		
Roscrea No. 2 Rural	Tulla			
Tullamore Rural	Ballycommon Ballyshear Cappancur Clonygowan	Geashill Hammerlane Killeigh O'Dempsey	Portarlinton North Raheenakeeran Rathfeston Rathrobin	Scraggan Tinnycross Tullamore Rural
Tullamore Urban	Tullamore Urban			

Table 8.4.1



KILDARE COUNTY COUNCIL
National Roads Design Office
 Maudlins, Naas, Co. Kildare

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

TITLE: ROUTE CORRIDOR & DISTRICT ELECTORAL DIVISIONS

J. LYNCH BE, C.Eng, FIEI
 COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
 SENIOR DESIGN ENGINEER

Scale: N.T.S.

Date: OCT. '99.

Drawing No: FIG.13

8.4.2 Characteristics of the Proposal

a) Motorway Corridor Catchment Area

The preferred route avoids built up areas along the N7 and passes through predominantly agricultural land and small tracts of woodland, all with a low density of population. Population densities for each catchment area are detailed in Tables 8.4.2, 8.4.3 and 8.4.4.

Settlements along the N7 that are bypassed include Jamestown, Ballybrittas and New Inn. The existing N7 will remain as a local distributor road (R445) for the immediate route corridor, while performing a more strategic role in providing access to places outside the corridor such as Portarlinton and the smaller settlements and rural areas to the north.

Where road severance occurs, alternative access across the preferred route is provided in the immediate locality of the closed roads.

b) Monasterevin Bypass Catchment Area

The preferred route section bypasses the town of Monasterevin on its southern side, well beyond the development boundary demarcated in the statutory development plan for Monasterevin. The Mayfield Interchange, east of the town will provide access to and egress from Monasterevin.

There are several instances of road severance with alternative routes across the Bypass provided in the near vicinity of the closed roads.

c) New Inn Interchange Catchment Area

A "Dumbbell" grade separated interchange will be provided to the south east of New Inn, joined to the N7 and the New Inn/Vicarstown road by means of new link roads and roundabouts. A roundabout will also be provided at the intersection of the N7, the R422 and the truncated northern portion of the Vicarstown Road.

The New Inn/Vicarstown road (L-3930) and Cappakeel Road (L-3817) will be severed, to be replaced by the link roads described above.

Population Density Per Square Kilometre in the Motorway Corridor 1996

DISTRICT ELECTORAL DIVISION	PERSONS PER KM2
Moyanna	15
Ballybrittas	42
Ballycarrol	29
Borris	21
Emo	24
Jamestown	26
Kilcolmanbane	25
Kilmullen	27
Kilmurray	19
Sallyford	19
Shaen	35
Laois County	31

Source: Census of Population 1996

Table 8.4.2

Persons Per Square Kilometre in the Monasterevin Bypass Catchment Area 1996

DISTRICT ELECTORAL DIVISIONS	PERSONS PER KM2
Ballybrakan	35
Lackagh	20
Monasterevin*	103
Quinnsborough	7
Kildare County	80
Jamestown	26
Kilmullen	27
Catchment Area	43
Laois County	31

Source: Census of Population 1996

* Includes Monasterevin Town

Table 8.4.3

Persons Per Square Kilometre in the Catchment Area 1986 - 1996

Rural District	Number of DEDs	Persons Per Square Kilometre		
		1986	1991	1996
Athy No. 2 Rural	4	34	33	33
Mountmellick Rural	33	42	41	43
Birr No. 1 Rural	2	11	11	11
Roscrea No. 2 Rural	1	5	4	4
Tullamore Rural	15	27	27	27
Tullamore Urban	1	1,081	1,094	1,170
Catchment Area	56	41	41	43
Laois	-	31	31	31
Offaly	-	30	29	30
State	-	51	51	52

Source: Census of Population 1986 - 1996

Table 8.4.4

8.4.3 *Likely Effects of This Proposal*

The socio economic effects of the preferred route spring from the characteristic of the potentially affected groups. These groups are listed as follows:

- *Through Traffic*
- *Catchment Area Traffic*
- *Business Traffic*
- *Cyclists and Pedestrians*
- *Retail Commercial Industrial and other Services*
- *Community Activity.*

The motorway route section is now examined under the above headings.

a) Motorway Route

- *Through Traffic*

The proposed motorway will serve to minimise impediments to through traffic, reduce travel time, enhance driver comfort and improve travel flow patterns.

A fall in discretionary expenditure generated by through traffic will impact on businesses dependent on passing trade. Those most likely to be affected lie on or near the route of the N7. They include businesses in the three settlements, Jamestown, Ballybrittas and New Inn, serving the incidental needs of travellers. Those businesses most likely to be affected are in the food, drink, accommodation and motor service categories. Altogether some 27 establishments along the N7 are likely to be affected to varying degrees.

- *Catchment Area Traffic*

Since there will be no significant stopping off or significant diversion of existing roads, there will be no interference with local traffic flow patterns.

In the absence of significant road closures or significant diversions, the consumer hinterland should remain intact. Given unchanged catchment areas and having regard to customer loyalty/habit, improved accessibility to Portlaoise and Monasterevin is not expected to cause much change in the balance of inter-urban expenditure on convenience goods. Material changes in the spatial pattern of expenditure on convenience goods, if such should happen, is more likely to be the outcome of changes in the retail environment such as changes in customer comfort and convenience and in price competitiveness. Top-up shopping will, it is expected, remain at approximately the same level.

However, it is likely that ease and speed of access to Dublin will result in some impact on comparison goods shopping in local towns. The extent of that impact, as with the convenience goods sector, will be largely influenced by quality and marketing considerations. Since Athy is the only major shopping competitor to the south and is more distant in relation to Portlaoise and Monasterevin compared to Mountmellick and Portarlinton, little if any overlap of catchment areas is likely.

- **Business Traffic**

Since there will be no significant stopping off or significant diversion of existing roads, there will be no interference with local traffic flow patterns in either corridor.

The motorway route will benefit local business traffic and businesses by allowing immediate access to the south-west strategic road corridor linking the route corridor area with Dublin, Cork and Limerick/Shannon. When completed the national strategic route corridors are expected to allow an increased inter-urban travel speed.

- **Cyclists and Pedestrians**

In the absence of significant road closures and significant diversions, pedestrians and cyclists will not be inconvenienced. Safety levels will improve with the diversion of heavy and other non-local traffic to the motorway.

The fall in traffic flows resulting from the implementation of the motorway proposal will serve to diminish the level of potential hazard on the road networks within the route corridor area as a whole. Reduction in noise levels and exhaust emissions will improve environmental quality particularly in the settlements along the N7. This will enhance the attractiveness of walking and cycling as recreational and social activities.

- **Retail, Commercial, Industrial and Other Services Operators**

Since there will be no stopping off or significant diversion of existing roads, there will be no interference with traditional customer / client or industrial traffic flow patterns.

Little or no change in demand for convenience goods is expected in the catchment areas nor is it expected that local shopping patterns will change significantly within the route corridor. In the case of comparison goods, retail sector leakage of expenditure to Dublin and other urban centres can be expected to increase with the implementation of the proposal. The main impact will be felt by traffic-dependent businesses. The survey shows that restaurants, cafes, public houses and accommodation situated on or near the N7 are highly dependent on passing

trade. These businesses, with individual ratios ranging from 50 per cent up to 100 per cent in the case of some accommodation, will bear the brunt of the negative impacts and many are well aware of the potential impact of a motorway. The questionnaire survey of the retail sector indicates that loss of passing trade was perceived as a major, motorway-generated disadvantage.

The motorway route is not expected to have a negative impact on tourism and the number of visitors to Emo Court. Indeed the opposite is expected to be the case with an interchange strategically located at New Inn. A shorter journey time from Dublin is expected to generate an increase in the number of day trip visitors from the metropolitan region. Visitors to Emo Court are already accustomed to turning off from the N7. Their circumstances will not be materially different when using the proposed motorway. The route will not impinge on Emo Court and its environs. A further advantage of the route is that it will bring tourist attractions at Vicarstown, Stradbally and Dunamase closer to the main tourist route.

- **Community Activities**

Since there will be no significant stopping off or significant diversion of existing roads, there will be no interference with existing traffic flow patterns associated with social activities within the route corridor.

The preferred route passes through an area of low population density and as a general rule it can be assumed that the impact of severance on social activities, if it should occur, will have a lower impact in the less densely populated areas.

Provision of infrastructure for residential development within the preferred route corridor together with improved accessibility should attract immigration. The resulting growth in population should act to strengthen community and commercial activities within the corridor and the surrounding towns.

b) Monasterevin Bypass

- **Through Traffic**

There will be a minimising of impediments to through traffic, a reduction in travel time, an enhancement in driver comfort and an improvement in travel flow patterns.

There will be a fall in discretionary expenditure, which will impact on businesses that depend on passing trade.

- *Catchment Area Traffic*

Since there will be no stopping off or significant diversion of existing roads, there will be no interference with local traffic flow patterns.

Since the population density is relatively low, there should be no actual or perceived community severance.

In the absence of significant road closures and inconvenient diversions the consumer hinterland should remain intact. Local consumer loyalty might be influenced with improved accessibility to competing towns such as Portlaoise or Newbridge. On the other hand, the absence of heavy traffic flows and easier availability of parking will enhance the attractiveness of Monasterevin.

- *Business Traffic*

Since there will be no significant stopping off or inconvenient diversion of existing roads, there will be no interference with traditional traffic flow patterns.

The Bypass will benefit business traffic in the town by reducing traffic congestion and by providing faster and more convenient access to and from places beyond the town.

- *Cyclists and Pedestrians*

In the absence of significant road closures and significant diversions, cyclists and pedestrians will not be inconvenienced. Safety levels in Monasterevin will improve with the diversion of traffic to the proposed bypass.

Reduction in traffic flows, noise and exhaust emissions will improve the environmental quality of the town and consequently increase its attractiveness for cyclists and pedestrians.

- *Retail, Commercial, Industrial and Other Services Operators*

Since there will be no significant stopping off or significant diversion of existing roads, there will be no interference with traditional customer/client traffic flow patterns.

In the absence of significant road closures and significant diversions, the consumer and services hinterland should remain intact. Consumer and user loyalty might be influenced with improved accessibility to competing towns such as Portlaoise or Newbridge. The absence of heavy traffic flows and the easier availability of parking will enhance the attractiveness of Monasterevin for business and other uses.

- *Community Activities*

Since there will be no significant stopping off or significant diversion of existing roads there will be no interference with traditional traffic flow patterns associated with the social life of the town and its hinterland.

c) *New Inn Interchange*

The socio-economic effects of the New Inn interchange arise from the following considerations:

- *Linkage to the Regional Road Network*
 - *Distance between N7 and New Inn Interchange*
 - *Implications for Passing Trade*
 - *Long Term Socio-economic Impacts*
-
- *Linkage to the Regional Road Network*

The New Inn interchange provides a direct connection between the preferred route motorway and the R422 regional road, which serves Emo and Mountmellick and connects to the N80 serving Killeagh and Tullamore.

West-bound traffic originating in Portarlinton can join the motorway travelling via the R419, while south-bound traffic on the N80 with a destination in Portlaoise will be unaffected.

An interchange linked to the R422 will reduce journey time to Dublin and other cities on the national primary road system. This will facilitate and encourage the extension of the domestic tourism season through an increase in day trips and weekend breaks.

The shift of traffic from the R420 to the R422 with the provision of an interchange at New Inn, will lead to a fall in traffic volumes through Geashill, Cloneygowan, Portarlinton and Monasterevin. This will result in a decline in noise levels, a reduction in fumes and a lessening of traffic hazard. Through flows will increase in Emo, Mountmellick and Killeigh.

- *Distance between N7 and New Inn Interchange*

The New Inn interchange is very close to the N7, being situated some 500 meters from it. Access between the N7 and the M7 is direct via a grade separated intersection on the motorway, a dedicated link road and a roundabout on the N7.

- *Implications for Passing Trade*

The Heath/Mayfield Traffic Study (1999) predicts that an interchange at New Inn would attract a total of 8,986 AADT. This estimate does not include traffic which would be generated by the development of the Heritage Centre at Emo. The additional traffic drawn through the interchange should compensate for loss of current N7 passing trade.

The New Inn interchange will result in a fall of 3,450 AADT passing through Monasterevin and a consequent loss of some passing trade there.

- *Long Term Socio-economic Effects*

Improved accessibility to the national road network afforded by the New Inn interchange will enhance the attractiveness of Mountmellick as a residential and employment base and should act to reverse the demographic decline of recent times.

The socio-economic benefits of an interchange at New Inn are mainly linked to the development of the tourism potential of the area. Despite a wide range of tourism products including the Slieve Bloom Environmental Park, water recreation and amenity resources, heritage features and centers, the study area is relatively unknown as a tourist destination. The major current disadvantage is that the North Laois/South Offaly area is off the main tourist paths to the west, south-west and north-west.

The benefits of a vibrant and expanding tourism sector are:

- *An increase in employment due to the labour intensive nature of the industry and its strong growth prospects*
- *An increase in local tourism earnings*
- *The high multiplier effect on local economic activity*
- *The spatial dispersion and sectoral diffusion of benefits which make tourism a critical element in regional policy and development.*

Ease of access provided by an interchange in the R422 zone combined with the development and promotion of Emo Court will help to draw visitors off the M7 providing an opportunity to market the New Inn interchange catchment area and increase the number of stay-overs. The interchange will also provide ease and speed of access to the M7 for west-bound traffic from Mountmellick, Tullamore and areas further north. It will also serve traffic travelling from Portarlinton and other areas via the R419.

8.4.4 Conclusion

The main impacts of a proposed bypass Scheme are the effect on the local communities. These impacts can take the form of perceived community severance, affect on local recreational facilities, schools, institutions and other community facilities.

Loss of passing trade can affect income levels, employment and property values. A more positive impact, counter balancing these affects is that the bypassing of the town and villages creates a more pleasant, attractive and safer pedestrian and traffic environment within the towns and villages.

In order to lessen the impacts under consideration the design of the scheme should where practicable leave local roads open, or alternatively provide access adjacent to the existing roads. Ease of access to and from the motorway and local road networks should be addressed. The placement of the intermediate interchange should enhance and develop tourism potential in the area countervailing the impact on trade due to the reduction in passing trade.

8.5 PLANNING AND DEVELOPMENT ⁽²³⁾

Reid and Associates examined the planning and development implications of the preferred route.

8.5.1 Statutory Development Plans

There are three statutory development plans and one draft development plan that cover the catchment area of the preferred route and the New Inn interchange:

- a) Kildare County Development Plan 1999*
- b) Monasterevin Draft Development Plan 1998*
- c) Draft Laois County Development Plan 1998*
- e) Offaly County Development Plan 1995.*

Each of these development plans is now addressed in turn.

a) Kildare County Development Plan 1999

The policies and objectives contained in the Kildare County Development Plan, published in August 1998, that are relevant to the proposed Heath/Mayfield Scheme are as follows:

- To promote balanced social, physical and economic development.*
- To create conditions conducive to economic expansion, environmental enhancement and social cohesion.*
- To ensure the provision of a safe and comprehensive road system capable of satisfying the requirements of both vehicular traffic and pedestrians.*
- To promote environmentally sustainable industrial and warehousing employment-generating development in those areas of the county where the necessary infrastructure exists or can be provided.*
- To continue to implement the national programme for the provision of motorways.*
- To provide bypass routes in order to remove through traffic from towns.*
- To preserve the inherent safety and capacity of motorways and to pay particular attention to building lines, signs and external lighting near motorways.*

- *To give special protection to national primary and national secondary routes.*
- *To improve regional and main roads and to restrict access points thereon.*
- *To design and construct a motorway from Hybla to the Heath, bypassing Monasterevin.*
- *To ensure access to and conserve and develop the capacity of countryside recreation areas.*
- *To facilitate the development of tourist facilities.*

b) Monasterevin Draft Development Plan 1996

The principal relevant provision of the Monasterevin Draft Development Plan 1996 is as follows:

- *To preserve a route for the Monasterevin Bypass. (A route, objective TR1, is indicated in the Objectives Map, running to the south of the town, in the general vicinity of the preferred route).*

c) Draft Laois County Development Plan 1998

The provisions of the Draft Laois County Development Plan 1998 relevant to the preferred route and the New Inn interchange are as follows:

- *To promote and develop infrastructural programmes and interventions which reduce social inequalities, viz. investment in bypass and other initiatives.*
- *To promote the physical, social and economic development of the county.*
- *To promote the balanced consolidation and development of the county's towns and villages.*
- *To facilitate and develop the provision of a primary transportation network which does not require passage through towns and villages.*
- *To ensure that the routes of major bypasses, road realignments and new roads are kept free of development.*
- *To protect the carrying capacity of the national route system.*
- *To implement traffic management systems for the enhancement of towns and villages.*

- *To investigate and evaluate the feasibility of providing service areas adjacent to or within reasonable distance of motorways.*
- *To encourage industrial and housing development to locate in Ballybrittas, Emo, Jamestown, Mountmellick, O'Moore's Forest, Portarlinton, Rosenallis and Vicarstown.*
- *To develop the Rock of Dunamase and its environs into a major tourist attraction.*
- *To design, commence and construct the Heath-Mayfield motorway.*
- *To co-operate with adjacent county councils and the National Roads Authority in implementing specific road proposals.*
- *To seek the upgrading of the R422 regional road to Mountmellick.*

d) Offaly County Development Plan 1995

The policy and objectives of the Offaly County Development Plan relevant to the proposed Scheme are as follows:

- *To promote the development of Geashill, Killeigh, Mountbolus and Blueball.*
- *To realise fully the tourist, recreational and educational potential of the Slieve Bloom Mountains.*
- *To promote the county as a tourist destination.*
- *To recognise the critical role of the N80 national secondary route as part of the strategic corridor links through the country.*
- *To preserve the capacity of and avoid the creation of traffic hazard on the R420 regional route.*
- *To reserve land for road improvements, new roads, bypasses and relief routes.*
- *To secure the reclassification and early development to national primary route standard of the R420 Tullamore-Portarlinton-Monasterevin road.*

8.5.2 Recent Planning Permissions

Planning permissions granted in the decade 1989 – 1998 inclusive, within 200 metres of each side of the preferred route and New Inn interchange reservations are listed in Table 8.5.1. The reference numbers with extension K refer to Kildare County Council's planning register. Reference numbers with extension L refer to Laois County Council's planning register.

There are 19 permissions in total of which all but two are of a domestic nature.

8.5.3 Planning and Development

In terms of planning and development the study area is divided into three sections. These sections are:

a) Motorway Route

- Approximately, a 6.5km wide (4 miles) motorway corridor running some 12-km (7ml) from the Portlaoise Bypass to Monasterevin. Settlements located on the N7 include Jamestown, Ballybrittas and New Inn/Emo.*

b) Monasterevin Bypass

- Monasterevin Town and that part of its hinterland within 5km radius of the town. This includes six District Electoral Divisions, four of which, are in County Kildare and two in County Laois.*

c) New Inn Interchange

- New Inn Interchange and its environs.*

a) Motorway Route

The Motorway Route does not conflict with any of the provisions of the Kildare County Development Plan, nor does it conflict with any of the provisions of the Laois County Development Plan, in which latter county the majority of the route lies.

The Motorway route complies with the specific provisions of the Kildare County Development Plan, and the provisions of the Draft Laois County Development Plan, 1998.

At a more detailed level, the likely effects of the preferred route are as follows:

**Planning Permissions Granted 1989 – 1998 Within 200 Metres of S2 and New Inn
Interchange Reservations**

Year of Decision	Register Reference	Nature of Development
1989	155L	House
1990	None	-
1991	None	-
1992	1330K	2 no. Houses
1993	None	-
1994	394L	House
	886K	House Extension
	1103K	House
1995	18K	House
	114K	House Extension
	234K	Hayshed
1996	52K	House
	899K	House
	1244K	Attic Conversion
1997	424K	House Extension
	752K	House
1998	170L	Slatted Shed
	305L	House
	347K	Domestic Garage
Total Permissions	16	

Source: Kildare County Council and Laois County Council
K = County Kildare, L = Laois

Table 8.5.1

- *The bypassing of Jamestown, Ballybrittas and New Inn will facilitate environmental upgrading there.*
- *The balanced development of the bypassed villages will enhance their attractiveness for residential and employment-related uses*
- *The N7, relieved of significant traffic loading, could function as a local distributor road, affording greater levels of comfort, convenience and safety.*
- *The avoidance of significant severance of local roads will preserve the unity and cohesiveness of local communities.*
- *One outline planning permission in the County of Laois granted in 1997, a permission for a house (register reference 97/752), is affected by road realignment south of Ballybrittas. This planning permission will be subject to modification under the proposed scheme.*

b) Monasterevin Bypass

The Monasterevin Bypass does not conflict with any of the provisions of the Kildare County Development Plans or Monasterevin Development Plan, adopted or draft.

The Monasterevin Bypass complies with specific provisions of the Kildare County Council Development Plan 1999 and the Draft Monasterevin Development Plan 1996, which provisions are listed above.

At a more detailed level, the likely effects of the preferred route Bypassing Monasterevin in planning and development matters are as follows:

- *The location of an interchange at Mayfield is likely to draw development eastwards.*
- *The line of the Bypass could act as a long term development boundary for the town.*
- *The diversion of a significant volume of through traffic from the town centre should facilitate environmental upgrading there.*
- *The improved accessibility of the town by road, in synergy with improved rail facilities, is likely to generate an increased demand for housing land for the accommodation of commuters.*

- *The diversion of a significant volume of through traffic is likely to make the town more attractive for residential uses.*
- *The improved road accessibility should enhance the role of the town as a base for industrial and related uses.*
- *The routing of the Bypass to the south of the town facilitates the enhancement of the recreation and conservation related features associated with the canal zone in the north of the town.*
- *It should be noted that the S2 Bypass route does not correspond precisely with the route reservation shown in the statutory development plan.*
- *One outline planning permission in the County of Kildare granted in 1997, a permission for a house (register reference 97/801), is affected by Coillte exit requirements from Kill Plantation on Nurney Road Upper. This planning permission will be subject to modification under the proposed scheme.*

c) New Inn Interchange

The New Inn interchange does not conflict with any of the provisions of the Laois County Development Plan 1998.

The New Inn interchange complies with the specific provisions of the Laois County Development Plan, which are listed above under the heading "Statutory Development Plans".

Although not located in Counties Kildare and Offaly, the interchange furthers the objectives of the development plans for both counties which were listed above. In particular, there will be positive environmental and developmental effects on Portarlinton, Mountmellick, the villages in the area and the Slieve Blooms.

At a more detailed level, the likely effects of the New Inn interchange are as follows:

- *There are likely to be pressures for general commercial and industrial uses in New Inn, in the immediate vicinity of the interchange.*
- *The interchange is likely to generate a demand for stopover facilities in its immediate vicinity, given the ease of egress from the motorway to New Inn and the ease of re-access to the motorway for onward journeys. There should be no need for such facilities to be located directly on the motorway.*

- *The Emo Estate should benefit significantly by improved access from the main Dublin-Cork/Limerick/South West touring route, as well as daytrip traffic from the Greater Dublin area.*
- *The areas to the south of the interchange will also benefit in terms of tourism and recreation – areas such as the rock of Dunamase, Vicarstown and Stradbally.*
- *The interchange will greatly improve the accessibility to the main touring route of the Slieve Blooms Environmental Park.*
- *The development potential of Mountmellick, in all sectors including tourism, housing and industry should be significantly enhanced.*
- *No planning permissions granted in the decade 1989-1998 are affected.*

8.6 RESIDENTIAL PROPERTY

Residential Property can be directly affected by the Scheme in three different ways as follows:

1. *Dwelling to be acquired.*
2. *Part of curtilage of dwelling to be acquired.*
3. *Access to dwelling house to be altered.*

8.6.1 Dwelling Houses to Be Acquired

Tables 8.6.1 lists the 4 dwelling houses to be acquired as part of the Scheme.

Dwelling Houses to be Acquired

Map Reference	Name or Identifier of Dwelling House	Townland
P/01	House, Ballycarroll Road, Co. Laois	Ballydavis
P/03	House, New Inn/Vicarstown Road, Co. Laois	Cappakeel
P/04	Cottage, Ballybrittas Road, Co. Laois	Bellegrove
P/05	House, Grange Road Lower, Co Kildare	Moore Abbey Demesne

Table 8.6.1

Property owners, whose dwelling houses are to be acquired by the Scheme will be appropriately compensated for loss of dwelling and injurious affection.

8.6.2 Curtilage of Dwelling Houses to be Acquired

Table 8.6.2 lists the dwelling houses from which land adjoining the dwelling house is to be acquired.

Curtilage of Dwelling Houses to be Acquired

Map Reference	Road Name & Number Along Which Properties are Located	Townland
P/00	R425, 3 Properties Affected	Ballyclider
P/01	Ballycarroll Road, 4 Properties Affected	Ballydavis
P/01	Heath Road, Ballycarroll, 1 Property Affected	Ballycarroll
P/02	Heath East, South Side, 1 Property Affected	Great Heath
P/02	New Inn Cross Roads, 1 Petrol Station and 1 Furniture Factory Affected	Cappakeel
P/05	Grange Road Lower, 1 Property Affected	Moore Abbey Demesnes
P/05	Green Road, 1 Property Affected	Lughill
P/05	R417, Athy Road, 1 Property Affected	Ballyfarsoon
P/05	Nurney Road Lower, 1 Property Affected South Side	Kill

Table 8.6.2

A total of 13 dwelling houses will have some curtilage acquired. The maximum landtake is approximately 0.021 acres while the minimum landtake is approximately 0.0004 of an acre.

Property owners from which land is acquired as part of the Scheme will be appropriately compensated for loss of land and injurious affection.

8.6.3 Dwelling Houses whose Entrances will be affected by the Proposed Scheme

Table 8.6.3 lists the dwelling houses whose entrances will require regrading, reconstruction or an alternative entrance to be provided. These are as follows:

Entrance Affected By The Scheme

Map Reference	Entrance Locations	Town Lands
P/00	Along R425, 4 Entrances	Ballyclider
P/01	Along Ballycarroll Road, 5 Entrances	Ballydavis
P/01	Heath Road, South of Ballydavis Interchange, 2 Entrances	Ballycarroll
P/02	Along N7/R445, 8 Entrances	Morrett
P/02	New Inn Cross Roads, 6 Entrances	Cappakeel
P/04	Ballybrittas Road, 5 Entrances	Bellegrove
P/04	Jamestown Road, 1 Entrance	Jamestown or Ballyteigeduff
P/05	Green Road, 3 Entrances	Lughill
P/05	R417, Athy Road, 1 Entrance Regraded, 3 Dwellings North of the Motorway Require a New Access Along the Old Road to be Provided	Ballyfarsoon

Table 8.6.3

8.6.4 Dwellings Not Directly Affected By The Preferred Route.

The main impacts identified regarding dwelling houses adjacent to the preferred route but not directly affected by it are as follows:

- *Increase in Noise.*
- *Visual Impacts.*
- *Short term impacts due to construction.*

Each of these impacts are considered in Sections 8.2, 8.13 and 8.19 of this report.

8.7 BLOODSTOCK ⁽²⁴⁾.

Mr. Ralph Fitzjohn was appointed by Kildare County Council to assess the impact of the preferred route on the one bloodstock operations affected. This operation is located at chainage 366+00 and is shown on drawing number PR08.

The preferred route severs the holding in two, approximately 8.38 acres to the north and approximately 1.35 acres to the south. Approximately 0.98 acres of the land is taken to facilitate the construction of the preferred route. Access to the land cut off from the yard will be through an underpass at chainage 366+50. The design of the underpass will allow for safe passage of horse and traffic.

The reduction in land will result in the overall operation of the bloodstock operation being reduced from its present size.

8.8 AGRICULTURE (25)

Kildare County Council engaged Teagasc to assess the impact of the preferred route on agriculture in the area between east of Monasterevin and The Heath. The acquisition of land will affect a total of approximately 80 agricultural holdings. Mr. C. Watson, M.Agr.Sc., carried out an assessment to identify the affects that the proposed motorway will have on the land holdings along the motorway route based on a field inspection of all farms through which the proposed route will travel.

8.8.1 Farming Systems

Many farming systems are to be found on the 64 farms affected by the proposed Scheme, namely Beef Production, Dairying, Sheep Production, Tillage Cropping, Pig Production, Forestry, Poultry Production. These systems are operated at varying levels of intensity. The impact on these farms of the motorway varies greatly from farm to farm. The range in farm size also shows big variation. Some farms are owner operated, while others have some or all of their farms let to other farmers.

8.8.2 Land Loss

Approximately 91 ha. of land is used for motorway construction. Land take occurs on approximately 63 farms. The range in land take varies from farm to farm from an approximate maximum of 12.67acres. to an approximate minimum of 0.001acres. The affect of land take is specific to each property.

Land take has an impact on the many schemes farmers may be involved with, for example Livestock Premia, Headage, Area Aid payments on tillage crops, Rural Environment Protection Scheme (Reps), Early Retirement Scheme, Milk Quotas and eligible land for Tillage Premia.

The Department of Agriculture and Food can provide advice on the exact situation and consequences of land take in these situations and indeed in regard to all agricultural schemes that may be impacted on as a result of land take, etc.

Land take obviously leads to income loss to the farmer in question. Depending on the farm involved, income loss may be small or large, and in some cases may negatively impact on the future viability of the farm business.

The farmer will be appropriately compensated for loss of land and injurious affection.

8.8.3 Drainage

Many of the farms through which the motorway passes have artificial drainage systems in place in combination with open drainage systems. These drainage systems were expensive to install and have led to vast improvements in productivity, indeed in some cases without adequate drainage some lands could not even be farmed. It is essential that all these drainage systems be located and retained or augmented to ensure the continued productivity of these lands.

8.8.4 Severance

On 44 farms, severance of a portion of land occurs. The impact of severance depends on the area of land severed, its present use, and the long term access to the severed lands.

Severance of lands used for grazing dairy cows is critical as cows have to be moved at least twice a day to and from the grazing area during the grazing season. In this case, useable and secure access is required over the shortest distance possible to enable the farm business to continue in a viable way. The same situation applies where the area severed is used for suckler beef production, and lamb production. In these cases, animals may need to be moved quickly to housing for example spells of very poor weather. The provision of animal handling facilities on severed portions of lands is required to restrain animals for loading/unloading, routine handling for basic livestock husbandry. The movement of animals to and from severed lands will have to be by motorised means, hence proper handling facilities are a necessity. The provision of adequate water supplies for livestock on severed lands is essential and to ensure animal productivity and basic welfare

8.9 GEOTECHNICAL ASPECTS (26)

Dr. Eric R. Farrell was engaged by Kildare County Council to assess the geotechnical aspects of the preferred route.

The preferred route runs from the Heath, across relatively low lying gently rolling glacial topography as well as alluvial flats and boglands up to the Grand Canal and the River Barrow. East of the Barrow the route cuts through Hill Wood and then crosses the Kill and Monasterevin Bogs. Sections of the motorway will cut into the existing ground whilst other sections will be on embankments.

The cut sections of the route are less than 8m deep apart from a 14m deep cut in the Hill Wood area. These cuts would be in predominantly a variable glacial till overburden. Some rock would be expected in the cut between Ch 235+00 and Ch 237+50, which is on the western end, around Ch 250+00 and in the cut east of the Kill Plantation between Ch 384+00 and Ch 387+00. Normal side slopes of 2 horizontal to 1 vertical can be adopted in the glacial till, however measures will be required to control slumping of the sides of excavations and possible 'running sand' conditions during construction. This can be achieved by installing drains with appropriate filters. Permanent slope drains will be required to stabilise cut slopes where water seepage causes instability.

The proposed route crosses alluvial or boggy areas of peat and soft ground. The investigations indicate that, apart from the River Barrow flood plain, the depth of the peats and very soft clays are generally less than 2m, locally up to 3m and therefore can be excavated and replaced with suitable material where these occur under embankments. Some extra land take will be required to allow the road fill to be taken down to firm ground where soft soils are to be excavated. The glacial till is variously described as "soft" or "soft/firm" in the trial pits and boreholes put down to date. However, the till has a significant granular content which has a beneficial effect on its performance under embankments. It is considered that the glacial till overburden can support the proposed embankments with settlements within acceptable limits without requiring special geotechnical measures.

The crossing of the Barrow flood plain could involve an embankment of up to about 11m height. The exploratory holes put down in the flood plain encountered a variety of alluvial and fluvial soils with some local deposits of very soft clays. Special geotechnical measures will probably be required where these soft clays underlie the embankment. Such measures could include stage construction, possibly with vertical drains. Berms of up to 25m width may be required to enable construction of this embankment in a reasonable time period.

It is probable that most bridges will be on piled foundations as the glacial soils which would be encountered at reasonable depth are generally unsuitable as bearing strata for such structures.

The ground movements arising from excavations for cut sections and from the ground water lowering from the motorway drainage system, would generally not be expected to give rise to significant movements away from cuts in these glacial soils.

8.9.1 Earthworks Balance

Initial estimates indicate that there may be a significant shortfall of material from cuts which could be placed as embankment fill over that required for the embankment. Construction measures employed will maximise the use of excavated material in order to limit the amount of material which would have to be taken from site and to minimise imported fill.

8.9.2 Ground movements away from cuttings

During the Public Consultation Process concerns were expressed regarding ground movements in the vicinity of Rathdare Church on Local Road L-3931 (Ballybrittas Road) and in the vicinity of houses along Local Road LS07057.1 (Green Road). The preferred route is in 5m cut and a maximum of 14m cut respectively in these areas.

Ground movements close to cuts arise from elastic type movements of the ground and also from consolidation settlement over a period of time arising from ground water variations. Generally such movements in glacial till soils are small and do not give rise to structural distress, however each situation should be considered separately.

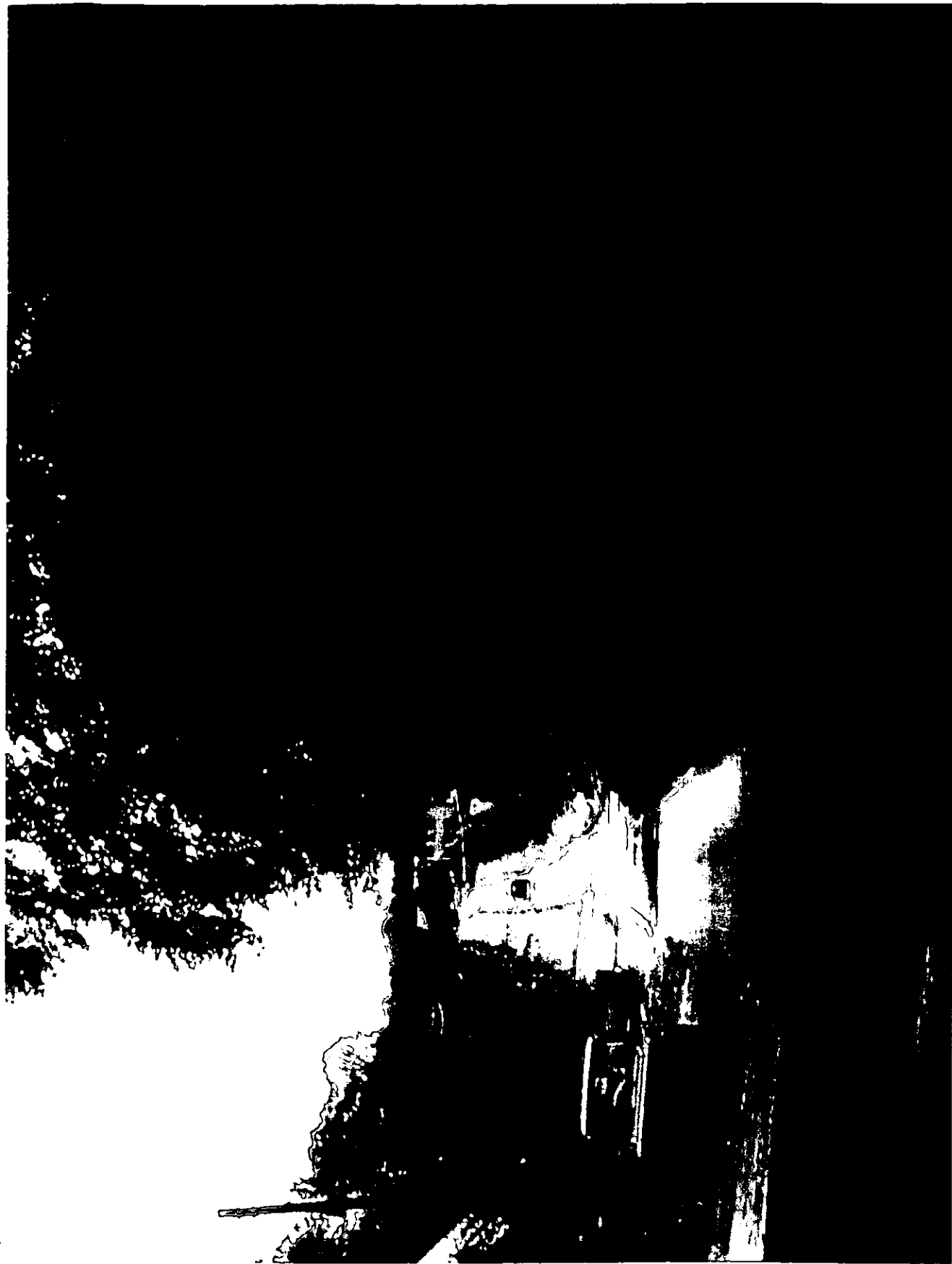
Rathdare Church is about 100m from a shallow cut and is considerably outside the zone which could be influenced by the proposed project.

The cut at Green's Road is 14m deep, however the top of the slope is over 30m from the nearest house. Stiff, sometimes firm, glacial till or by sand and gravels underlie these houses. Experience of excavations in similar ground has indicated that the movements arising from the construction of the cut and from any resulting groundwater lowering would not have a significant affect on the houses this distance from the excavation.

8.9.3 Possible effect of motorway drainage on wells

A survey of wells in the vicinity of cut areas was made to assess the impact if any that the motorway drainage might have on the viability of the wells. The results of the survey are given in Table 8.9.2. and Table 8.9.3 (27)

The difference between the water levels in the wells and the proposed road levels is relatively small. It is considered that the impact of wells due to the construction will be relatively small. Some of the wells may require to be deepened to accommodate possible drawdown resulting from the motorway drainage. Monitoring of the wells and



GREEN ROAD

Existing Well Depths In Wells Adjacent To The Preferred Route West of the River Barrow

Well No.	Landowner	m OD Malin Head	Depth of Well (m)	Depth to water (m)	Measurement Point	Comments
DW1	Matthew Hyland	94.83	6.58	6.42	Top of casing	Drilled well - not in use
DW2	Keegans	86.56	6.07	1.65	Top of casing	Drilled well
DW3	Cyril Pratt	85.05	10.54	5.27	Top of casing	Drilled well - in use
DW4	Frank Walsh	81.76	3.79	1.5	Top of casing	Dug well
DW5	C. Fletcher					No access allowed from cousin
DW6	Joseph McDermot	82.15	15.35	2.38	Top of casing	Drilled well - in use
DW7	Wilkinson	79.89	10.37	3.14	Top of casing	Drilled well - in use
DW7A	Wilkinson	78.37	7.31	3.24	Top of concrete slab	Dug well
DW8	Wilkinson	74.99	2.75	1.6	Top of concrete slab	Dug well - in use
DW9	Wm. Christiedeid	79.45	10	2.34	Top of casing	Drilled well - in use
DW10	Thomas Mulhall	78.91	5.93	1.45	Top of casing (0.52m bgl)	Drilled well - in use
DW11	Gerard Delaney					No one home - relations wouldn't allow access
DW12	Mary Gordon					House sold - no one home
DW13	McCormacks	84.66	12.28	7.47	Top of casing	Dug well
DW14	Derek Worrell					Pump house gone
DW15	William Duffy	71.92	4.53	1.45	Top of casing (0.37m bgl)	Dug well - in use
DW16	William Lalor					No one home
DW17	Mary Whelan	71.9	7.08	2.82	Top of casing	Drilled well - house unoccupied
DW18	James McLoughlin	74.37	12.47	7.2	Top of casing	Drilled well - in use
DW19	Annie McLoughlin	71.37	6.85	3.21	Top of concrete slab (bgl)	Drilled well - in use
DW20	Turkey Hatchery	73.61	13	2.2	Top of casing	Drilled well - in use?
DW21	Christy Noons	73.15	10.95	1.73	Top of casing (0.17m bgl)	Drilled well - in use
DW22	Michael Dempsey	74.64	13.98	3.95	Top of casing (below gl)	Drilled well - in use
DW23	Oliver Dempsey	74.3	0.96	0.75	Top of concrete slab	Dug well - in use

Table 8.9.2

Existing Well Depths In Wells Adjacent To Preferred Route East of the River Barrow

Well No.	Landowner	m OD Malin Head	Depth of Well (m)	Depth to water (m)	Measurement Point	Comments
1	John Carroll	89.664	33.8	25.7	Top of casing	Well Blocked 3 & 4 Share Wells
2	Leo Kelly	81.959	28.25	18.55	Top of casing(Ground Level)	
3	Kathleen Sinry	79.915				
4	Gerry Higgins					
5	Joseph Dunne	73.401	22.15	8.27	Top of casing	
6	Leo Kelly	77.346	30.2	10.78	Top of casing	
7	David McGuinness	69.726	27.56	8.3	Top of casing	
8	Cathal Coleman	71.857	14.39	7.49	Top of casing(Ground Level)	
9	Peter McDonnell	70.716	15.21	5.41	Top of casing	
10	Doyle	73.061	13.5	5.88	Top of casing	
12	Jack Byrne	75.301	12.61	7.76	Top of casing	
15	Worrell	83.108	5.45	3.19	Ground Level	
16	George Morrell					15 & 16 Share Wells
17	Gerry Callinan					Access Denied by Owner
19	Vincent Dowling				Top of casing (0.37m bgl)	Access Denied by Owner

Table 8.9.3

8.10 DRAINAGE (27)

Nicholas O' Dwyer, Consulting Engineers, were engaged by Kildare County Council to assess the catchment area into which the Scheme will be absorbed. All motorway run-off eventually discharges to the River Barrow in a number of ways:

- 5. Directly, using a surface water collector pipe.*
- 6. Directly, using the existing drainage from the Kildare Town Bypass.*
- 7. Indirectly, using existing surface water drainage channels along the route.*
- 8. Indirectly, constructing a new lined open drain, which discharges to the Glasha River and which in turn discharges to the River Barrow.*

The River Barrow rises in the Slieve Bloom Mountains and initially travels east until Monasterevin where it turns south through Athy, Carlow, New Ross and enters the Irish Sea. The total catchment area for the Barrow is estimated at 3,068km². The estimated catchment area of the Glasha River is approximately 55km² at its junction with the Derries wood drainage system.

The total area of the proposed works is less than 1km² and is contained entirely within the catchment area of the River Barrow. Given the relative size of the motorway catchment and the receiving water catchment it is not anticipated that there will be a significant impact on peak flow in the River Barrow or Glasha River as a result of the proposed motorway works.

In addition, the drainage network incorporates retention in areas where short term surcharging may occur in times of peak flow.

8.10.1 Grand Canal Feeder at Annaknock

Dúchas waterways division has expressed concerns in relation to the draw off of water from the Glasha River to the Grand Canal located at Annaknock Sluices. This feeder channel is the only source of supply for approximately 13km of the Canal from Monasterevin to Athy. It is located approximately 5.5km from the nearest motorway discharge point. The flow in the feeder channel is determined by controlling the water level in the Glasha River at the draw off location. This is achieved by an adjustable weir and a sluice gate which are located immediately upstream of a twin eyed bridge.

At low flows in the river the weir is raised to maintain an adequate depth of water to feed the Canal. At higher flows the weir can be lowered and in extremely high flows and flood conditions the sluice gate is opened. The area around the sluices has experienced some flooding in the past and is sensitive to variations in flow. Water quality in the feeder channel to the Canal would also be of concern.

As previously stated it is not anticipated that the proposed motorway runoff will have a significant effect on peak flow in the Glasha River. In addition adequate provisions are proposed, in the form of filter drains and interceptors, to retain pollutants from run-off

and accidental spillage. However, in view of the sensitive nature of the draw-off location at Annaknock, mitigation measures will be introduced to counteract any potential changes in the flow and quality characteristics of the Glasha River at the draw-off location.

8.10.2 Proposed Outfalls.

The mainline drainage can be divided into two distinct sections. Section One drains the motorway paved area, median and verge while Section Two drains the embankment side slopes.

The proposed outfalls are shown on Figures ANHD/01 to 06. Tables 8.10.1 and 8.10.2 list the relevant outfalls for each section.

To mitigate any adverse effects on the quality of the receiving waters all the run-off from the motorway to the proposed outfalls will pass through oil/grit interceptors prior to entering the surface water network.

Proposed Mainline Drainage Outfalls

Outfall	Area Drained	Peak Discharge Quantities	Retention Required
Drain 10	Ch. 235+00 - 250+00	500 l/s	No
Drain 13a	Ch. 250+00 - 307+00	1200 l/s	No
Drain 17	Ch. 307+00 - 320+00	400 l/s	No
Drain 18	Ch. 320+00 - 337+00	500 l/s	No
River Barrow	Ch. 337+00 - 368+40	1360 l/s	No
Existing M H C 130 Kildare Town By - Pass	Ch. 381+00 - 406+00	1300 l/s	No

Table 8.10.1

Proposed Drainage Outfalls From Embankments

Outfall	Area Drained	Peak Discharge Quantities	Retention Required
Drain 11	Ch. 250+00 - 306+80	150 l/s	No
Drain 12		12 l/s	No
Drain 13		12 l/s	No
Drain 14		184 l/s	Yes
Drain 15		170 l/s	No
Canal Drain	Ch. 306+80 - 336+80	185 l/s	No
Cassidy's Stream	Ch. 368+45 - 406+00	140 l/s	Yes

Table 8.10.2

8.11 AQUATIC ECOLOGY OF RECEIVING WATERS (28)

Dr. Gillian McCall, PhD and Kevin McNair, MSc., were engaged to assess the current status and likely impact of the run-off from the proposed motorway on the quality of the watercourses into which the run-off may be discharged. A total of ten watercourses were considered for this purpose of which eight are in County Laois and one is located in County Kildare. The final watercourse, being the River Barrow forms the boundary between the two counties. All of the watercourses considered for disposal of run-off are tributaries of the River Barrow. Figures ANHD/01 to 06 show the waterways sampled.

8.11.1 Existing Quality of Proposed Receiving Waters.

Chemical and biological sampling and analysis at selected sites on each watercourse were carried out. The majority of sampling and analysis was carried out between September 1993 and April 1995. Some additional sampling was undertaken in August and November 1998. The sites were selected on the basis of assessing the water quality upstream of and downstream from the preferred route for the motorway.

Water quality was assessed using the Q-Rating System as described by McGarrigle et al. (1992). Firstly the relative abundance of macroinvertebrates and fish are recorded in four frequency categories. The key invertebrates are then put into five groups, according to their tolerance of pollution: sensitive forms (A) and less sensitive forms (B) include stoneflies, most of the mayflies and some cased caddisflies, relatively tolerant forms (C) include other caddisflies, crayfish, beetles, mites and freshwater shrimps, tolerant forms (D) include leeches, snails, most non-biting midges and the water hog-louse, the most tolerant forms (E) are the midge Chironomus and tube-building worms.

The relative abundance of the five groups A-E are related to the water quality or Q-value which may range from Q1 (seriously polluted, bad quality) to Q5 (unpolluted, good quality) with seven possible intermediate values. Decision tables for both depositing sites (muddy substratum) and eroding sites (stony or gravelly substratum) allow the water quality to be assessed.

A summary of the biological results are set out in Table 8.11.1, from which it can be seen that most of the drains are classified as being doubtful quality (Q3).

Quality of Existing Drains

Drain No.	S1	S2	S3	S4	S5	S6
Drain 10	Q3	Q3	Q3	Q3/4	-	-
Drain 11	Q3	Q3/4	Q3/4	-	-	-
Drain 13	Q2/3	Q3	Q3	Q4	Q3/4	Q4
Drain 14	Q4	Q3/4	Q4	-	-	-
Drain 16	Q3	Q3	-	-	-	-
Drain 17	Q2	Q2	Q2/3	Q2/3	-	-
Drain 18	Q3	Q3	Q3	-	-	-
Drain 19	Q3	Q3	Q3	-	-	-
River Barrow	Q4	Q3	Q4	-	-	-
River Glasha	Q3/4	Q4	Q4	-	-	-

Table 8.11.1

Drains 13 and 14 support the most noteworthy communities of species in the area covered by the 1994-1995 survey. Lampreys and Crayfish were found in both drains. These species are listed in Annex II to EU Council Directive 92/43/EEC of 21.5.92 (the 'Habitats Directive'), the Bern Convention 1979 (Council of Europe) on the conservation of natural habitats and of wild flora and fauna, and in the Irish Red Data Book (Whilde 1983). Annex II lists 'Animal and Plant Species of Community Interest whose conservation requires the designation of special areas of conservation'. The crayfish is further listed in Annex V of species 'whose taking in the wild and exploitation may be subject to management measures'. Lampreys and crayfish appear to be less endangered in Ireland than in other European countries but even so reports of lost populations are becoming more frequent, especially in the midlands, and their maintenance at favourable conservation status is important both to Ireland and to Europe. Indeed their protection is obligatory.

*In August and October of 1998 drain 14 appeared to be in good condition, still unpolluted. Trout have been collected at drain 14, drain 13 and downstream towards Rossmore. Damselfly nymphs *Calopteryx virgo* are plentiful, as are nymphs of the Mayfly *Ephemera danica*. Crayfish were present in every sample taken over 120m length of drain 14 from just north of the motorway downstream. A lamprey was collected in drain 13, 1.5km south of the proposed motorway.*

Sampling was also carried out further downstream on drain 13 near the boundary of the forestry plantation and on the river Glasha into which it flows.

It should be noted that the exiting N7 runoff discharges into the same stream network as the preferred route. Samples were taken of this run-off and of the Newbridge Bypass run off for comparison purposes.

8.11.2 Characteristics of Road Run-Off

Roadway run-off contains a complex mixture of potential toxicants that are discharged, usually untreated, into receiving waters.

A number of constituents, which are present in run-off may threaten water quality. Principal among these are oils, suspended solids, chemical oxygen demand, chlorides and heavy metals.

The removal of suspended materials through sedimentation or filtration not only removes the hydrocarbons but also removes their attendant heavy metals. Suspended sediment removes a considerable amount of contamination by surface adsorption.

Very little work has been done on the composition or impact of run-off from Irish Roads. Work carried out by Hernon and McNair in 1989 concluded that run-off from the N7 was not adversely impacting on its receiving waters. Clinton (1994) carried out a study 1994 during which he sampled run-off at four outfalls and concluded that none of the discharges was having an adverse impact.

For the purpose of this study run-off was sampled at two locations. Location one is an outfall from the N7 at New Inn Cross. This discharges into Drain 11 on the downstream side of a culvert crossing beneath the N7 on the Portlaoise side of the Cross. The other outfall sampled is on the newly constructed Newbridge Bypass at the Liffey Crossing. This outfall pipe drains a section of the motorway and discharges into the River Liffey on the downstream side of the bridge on the Motorway. The results of analysis display a chemical profile which would not significantly impact on the receiving waters.

What is clear from the literature is that the vast majority of pollutants in the run-off are associated with the particulate matter. The removal of the particulate matter therefore will significantly reduce the pollution potential of the run-off. This is greatly influenced by the design of the drainage system.

It is proposed to use a french drain type of drainage system along this motorway. This type of drainage system does significantly improve the quality run-off through a combination of processes including adsorption, filtration and sedimentation. Filter drains remove up to 80% of pollutants. The retention of the run-off in the drainage system will also provide for pollutant attenuation through biological breakdown. All of these processes will reduce the pollution load discharged to the receiving waters.

8.11.3 Conclusions

Drains 13 and 14 contain a diverse community of species which include the lamprey and the whiteclawed crayfish. Both of these species are protected in law and appropriate measures must be taken to ensure that the habitats in these two drains are not adversely affected by this proposed development.

Appropriate measures should be taken to protect all of the watercourses from the discharge that will arise during the construction of the motorway and ancillaries. These discharges tend to carry large quantities of solids in suspension and therefore could adversely impact on the Rivers Glasha and Barrow if not settled prior to discharge.

The most serious threat to water quality along any main roadway is posed by the possible release of toxic or dangerous substances from road tankers following accidents involving such vehicles. The upgrading of the existing N7 to motorway standard will reduce the frequency of road accidents. The very high standards used in the design of this proposed motorway and its link roads will reduce the occurrence of such incidents to a minimum thereby reducing, to the greatest extent possible, the likelihood of such events.

8.12 BALLYDAVIS INTERCHANGE V PORTLAOSIE AQUIFER⁽²⁹⁾

The Ballydavis Interchange is located south of a swallow hole at Sluggory Cross Roads. The swallow hole is within the cross hatched red area shown on drawing number PR02. The swallow hole at Sluggory Cross Roads allows surface water to flow directly into the Portlaoise Limestone Aquifer. The well field (including the Darkin Well) supplying Portlaoise lies immediately north of the swallow hole.

The proposed construction at Ballydavis Interchange falls within the catchment of the swallow hole and as such the associated works have the potential to impact on the quality of water entering the swallow hole and also on the groundwater quality at the nearby well field and the Darkin Well.

8.12.1 Hydrogeological Conditions

The bedrock geology of the area with the swallow hole and the well field that supplies Portlaoise, occur in limestones belonging to the Allenwood Formation. This unit underlies much of the area and is classified as a regionally important aquifer.

The limestone bedrock is nearly everywhere covered by a continuous layer of glacial and post-glacial overburden consisting of a complex and variable sequence of tills and outwash deposits. The overburden is greater than 5m. deep in general and can in places be more than 10m. in thickness. At the swallow hole the limestone bedrock comes close to the surface as part of the buried bedrock topography. This rise in the bedrock explains the presence of the swallow hole at this location.

The swallow hole and some of the proposed construction works lie within the Inner Source Protection Zone associated with the Ballydavis well field. Also, the swallow hole itself and its immediate surface catchment is described as an area of 'extreme vulnerability' with respect to the underlying limestone aquifer. The surrounding areas have a 'high vulnerability' i.e a lower level of pollution risk, due to the presence of a greater thickness of glacial overburden outside the immediate catchment of the swallow hole.

The concept of vulnerability in the context of groundwater quality relates to the presence of overburden deposits to purify recharge entering an aquifer. The presence of a thick overburden cover would protect an underlying aquifer by filtering recharge either from precipitation or surface run-off. Where the overburden cover is thin or absent the vulnerability of the aquifer to pollution by surface water is increased due to the absence of the filtering layer. This vulnerability or potential risk of pollution is described as 'extreme' where the overburden is very thin or absent as in the case of the swallow hole found at Sluggory Cross. Away from the swallow hole the vulnerability is described as 'high' due to the presence here of 5m. of overburden.

The location of the swallow hole within the Inner Protection Zone of the Ballydavis well field and it's designation as an area of 'extreme vulnerability' recognises the importance

of this feature to the quality of groundwater within the Portlaoise limestone aquifer. Any interference with the established surface water regime within or flowing into the area of 'extreme vulnerability' has the potential to impact on the groundwater flowing to the well field and the Darkin well.

8.12.2 Surface Drainage

Construction works associated with the Portlaoise Bypass motorway resulted in the toe drainage along the motorway here draining to the swallow hole, with the road surface drainage being removed from the catchment area that flows to the swallow hole. Also, as part of the Portlaoise Bypass motorway construction the drains flowing directly into the swallow hole were widened and deepened.

8.12.3 Mitigation Measures

The upgrading of Ballydavis Interchange to a full interchange and the associated construction works have the potential to pollute the surface water entering the Portlaoise Limestone Aquifer at the swallow hole. Clearly, any such ingress of pollution waters must be avoided and measures implemented to allow for an adequate response in the event that some pollution does in fact take place. The remedial measures proposed relate to:

- (i) construction activities and*
- (iii) monitoring and response measures.*

8.13 THE LANDSCAPE ⁽³⁰⁾

Kildare County Council appointed Murray & Associates, Landscape Architects to assess the impact of the preferred route on the surrounding landscape.

Impacts of the preferred route were considered before landscape mitigation measures were proposed. Following on from the preliminary design of the preferred route, recommendations have been made for inclusion in the detailed design stage, which will ensure that any adverse impacts on the landscape resulting from the construction of the route will be kept to a minimum. Drawings Numbered PR01 to 10 refer.

8.13.1 Ch 240+00 to Ch 255+00

Between Ch 240+00 and 250+00 the proposed route is in fill of 2.6m average height. The existing N7 and dwellings to the north are at a slightly higher position to the location of the proposed route. The route will be visible to residents and motorists travelling along this road.

The route from Ch 250+00 to Ch 255+00 is in deep cut. The average cut depth is 4.7m. A minor degree of visual impact will arise.

Structure 2, known as Castle Road Structure (L-7815), crosses the proposed route at Ch 253+50. This structure will cater for the realignment of Castle Road and is located over an area of motorway cut, resulting in a low visual impact in the landscape.

8.13.2 Ch 255+00 to 270+00

The proposed route is in fill of approximately 1.5 to 2.8 m within these chainages. The construction of embankments will impact on the landscape, as the embankments will be slightly higher than the surrounding area. At Ch 262+00 the route penetrates a copse of deciduous trees, resulting in loss of visual amenity.

8.13.3 Ch 270+00 to Ch 280+00

Ch 270+00 to Ch 273+00 the proposed route is situated in minor fill and will have a low visual impact in the surrounding landscape.

Structure 3 to cater for the New Inn Interchange is located at Ch 275+00. The bridge is to be constructed where the motorway is in an area of 2.5m cut. The Interchange and associated ramps will be constructed in fill, which vary from 1m to 5m in height. The Interchange will have a relatively high visibility in the local landscape, resulting in moderate visual impacts occurring in the area. To the areas west of the Interchange the embankments will be visible and will alter the landscape character of the surrounding local area. Some natural screening of the structure from areas to the east occurs due to a large coniferous forestry block at Ch 280+00.

8.13.4 Ch 280+00 to Ch 300+00

This section of the route passes through an area of commercial forestry at Derries Wood. From Ch 280+00 to Ch 299+00 the route carries on under cover of trees and is not visible in the wider landscape.

8.13.5 Ch 300+00 to Ch 310+00

The proposed route is in deep cut to an average depth of 7m along this section. The depth of cutting significantly reduces any potential visual impact within this area.

Structure 4, Ballybrittas Road (L-3932) is located at Ch 310+00. This structure and associated road alignment embankments will be visible locally resulting in a visual change for residents and visitors to Rathdare Church. The fill depth at this location is minor and will reduce any potential negative visual impact.

8.13.6 Ch 310+00 to Ch 325+00

The area of fill from Ch 315+00 to Ch 320+00 will be locally visible as it contrasts with the very low-lying landscape here.

8.13.7 Ch 325+00 to Ch 340+00

The route from Ch 325+00 to 332+00 is in cut, which varies from 6m to 1m in depth. This section of the route will not be visible in the landscape.

Structure 5, Jamestown Road (L-3932) will overpass the mainline route at grade and no visual change will result.

The route passes in proximity of Jamestown House at Ch 333+00. Within the natural environs of Jamestown House, a Georgian Farmhouse, the route will generate moderate short term visual impact along the front of the house and moderate long-term visual impact to the east of the house due to the area of fill from Ch 332+00 to Ch 335+00. The existing trees and hedgerows will provide a degree of screening to the route.

8.13.8 Ch 340+00 to Ch 355+00

This area is in the vicinity of the Grand Canal and the River Barrow. In order to cross these waterways the route is in fill of up to a maximum height of 10m resulting in a significant visual impact over a wide area. The continuity of the view along the banks of the canal will be changed, affecting amblers, anglers and residents of the area. The bridge and embankments will be highly visible on the skyline. Two houses will be

affected by the construction of the embankments. A short-term adverse visual effect will result during the embankment construction.

At Ch 347+00 the route enters a section of Dangan Wood on the eastern side of the River Barrow. Still in large fill, the route embankments through this area will result in a significant loss of local visual amenity. The existing trees however will screen the embankments from view in the surrounding landscape.

8.13.9 Ch 355+00 to Ch375+00

This section of the route remains in fill gradually reducing to ground level prior to entering Hill Wood at Ch 370+00. The route will visually impact on several residences along Grange Road and Green Road. Residences located at Ch 353+00 and 360+00 will suffer significant deterioration in visual quality due to the construction of embankments in close proximity. There is little existing vegetation of any significant height or depth to provide natural screening. A ridgeline running parallel to Grange Road will provide some measure of screening for residents on the western end of this road.

The route penetrates the southern tip of Hill Wood at Ch 370+00 resulting in a moderate local visual impact. The mature trees along the Demesne wall will be retained where possible and the demesne wall repointed or rebuilt where necessary. A moderate short-term visual impact will result.

The route is in deep cut through Hill Wood and will be visible locally and within the wider landscape in the short term. Natural screening is provided to the north by the existing wood. The removal of mature trees and the demesne wall will result in a loss of enclosure along the eastern end of Grange Road. At Ch 374+00 the route severs walking tracks through the woods used by local people. A minor short term loss of recreational amenity for local people will result. The walking tracks affected will not severe the walkways system of Hill Wood and all areas will be accessible following completion of the scheme. The relocation of the entrance to the amenity area to the north will fully integrate the loss of access point to the wood at the Green Road/Athy Road junction.

Structure 10 caters for the realignment of the Athy Road (R417) and is at grade resulting in a moderate short-term impact on existing residences along the Athy Road.

8.13.10 Ch 375+00 to Ch 391+00

From Ch 375+00 to Ch 377+00 the route is in fill and this will appear artificial in the context of the existing gently undulating topography. The route enters Kill Plantation at Ch 377+00, which screens it from the surrounding landscape. There will be a degree of slight visual impact to a dwelling at Ch 377+00 in the short term.

A slight local visual impact for residences on the Kill Road results from the route, which passes through in deep cut. Structure 10 at Ch 386+00 to cater for the realigned Nurney

Roads (LS 07056 and LS 07055.1) will result in slight short term visual impact, with the majority of the route crossing located in minor cut.

At Ch 387+00 the proposed route enters an area of fill. There will be moderate short-term visual impacts to dwelling houses on the Nurney Road in the short term. The route enters an area of fill over flat landscape at Ch 391+00. The visual impact will be localised due to enclosure provided by existing vegetation and the flat topography in the area.

8.13.11 Ch 391+00 to 410+00

The route is in fill of 1m along this final section. Some local visual impact will result. The route will be clearly visible from areas to the north and west. A recently planted forestry and the elevated topography around Cloncarlin will reduce visibility to the south.

8.14 FLORA & FAUNA ⁽³²⁾

Dr. John Feehan was engaged by Kildare County Council to assess the impact of the preferred route on the Flora and Fauna of the area.

8.14.1 Natural Heritage

The preferred route will have a low negative impact on the natural diversity of the area traversed. The land is occupied for the most part by open agricultural fields-pasture and arable- divided by hedgerows of relatively recent origin. Every tree lost and every length of hedge removed represents a loss in terms of natural diversity, both in terms of the loss of species of flora and the habitat it provided by the connection pattern of boundary features.

It is anticipated that the proposed landscape design in connection with the construction can more than compensate for any loss. Every opportunity should be taken during landscape design to increase the natural diversity and provide habitat for wildlife in the area of generally low natural value.

This can be done by the planting of species of native trees in small groups or strips within the overall landscape design, connected where possible by lines of hedge. The most important trees in this regard would be oak and ash. When fences and other new boundaries are being constructed, every attempt will be made to match the character and composition of the hedgerows, which have been traditional to the area for some centuries.

Cutting slopes and banks associated with construction offer scope for the creation of new grassland habitats of considerable wildlife value. If there is some planting of natural grassland species, mixes appropriate to soil and other local ecological constraints in patches where considerations of management allow, it will enhance not only the species composition of the local flora, but also of the invertebrate fauna: providing food for Lepidoptera and other insects, habitat for native Hymenoptera etc.

8.14.2 Woodlands

The proposed route traverses six wooded areas. These areas are shown on Figures ANHD/03 and 05 and are as follows:

a) Derries Wood.

The Derries wood is bounded on the east by a very attractive track, now overgrown and neglected. It has the usual overgrown hedgerow trees at the side. There is a line of "hedge" with fine hawthorn, blackthorn, ash, hazel and crab which will be removed by the construction of the preferred route. There is also a group of four maples at this location, one of them exceptionally fine. These will be noted and

carefully avoided if at all possible. There is a group of several fine crab trees further up this lane, in the direction of the N7.

The Derries Wood itself is a proposed National Heritage Area (NHA) (No. 416). Mr. Richard Nairns of Natural Environment Consultants Ltd. was engaged by Kildare County Council to assess the current legal status of a proposed National Heritage Area⁽³⁹⁾. The proposed NHA at Derries Wood is presently a non-statutory designation and there is thus no formal legal protection for the site. (This will change if the Wildlife (Amendment) Bill, 1999 is passed by the Oireachtas).

The invertibrate species for which the site is primarily listed as an NHA are not legally protected in Ireland and the habitats with which they are associated are mainly in other parts of the site which will not be adversely impacted by the proposed road alignment.

Conifer plantations dominate the Derries Wood, and the area through which the road will run has now been largely clear felled and the flora has little of special interest. The wood contains a considerable population of fallow deer, which may pose a problem. However, the proposed road will run directly alongside the existing N7, which will minimise the difficulty. The presence of the fallow deer will be taken into account when deciding fence type through the wooded area.

b) Black Lough.

The piece of woodland beside Black Lough is important and attractive. The wood is surrounded by an ancient woodbank, and there are some fine trees: sweet chestnut, sycamore, oak, hazel, beech, but stumps show how many trees were taken out. The understory includes a great abundance of primrose and pignut, with bluebell, cuckoo pint, alexanders, tutsan and wood violet.

c) Dangan Wood.

This is a spruce wood. There are elements of the original vegetation, some oak, ash and hazel along with such broadleaved woodland species as *Hypericum perforatum*, *Bromus ramosus* and *Deschampsia caespitosa*. The invertibrate fauna includes the molluscs *Limax maculatus*, *Limax maximus*, *Carychium minnum*, *Vitreaa crystallina*, *Lauria cylindracea* and a number of woodlouse species. Buckthorn (*Rhamnus catharticus*), spindle and wild apple are frequent in hedgerows in the area south of the wood.

The wood is fringed on the south side with a venerable tree-covered woodbank with parallel ditch, now considerably eroded on the field side. One good oak stands directly in line of the route. The bank is lined with beech, ash, grey willow, alder, blackthorn. Further along the bank are wood sanicle, wood sedge, slender, slender false brome and turfted hair grass. The wood itself is mainly Norway spruce at this point, becoming wet northwards as the river is approached. There is the usual diversity of conifer woods, but nothing out of the ordinary. Hazel and grey willow are prominent along the breaks.

d) *Green Wood.*

The proposed route clips the northern tip of green wood. The wood itself has some fairly uncommon invertebrates, including the woodlouse characteristic of the River Barrow.

e) *Hill Wood.*

The preferred route cuts through the southern edge of Hill Wood, immediately inside the bounding demesne wall. The main compartments here are Norway spruce and beech, with some ash. A fringe of young beech and ash extends along the fringe of the wood near the wall, with hazel and occasional young oak, with an occasional Spanish chestnut. Immediately inside the demesne wall at the southwest end there are three or four mature beech trees and one Spanish chestnut. There is another group of large trees in the south west corner and a number of more mature beech in the wood itself merge into this group.

Along the inside of the western boundary wall at the southern end there are several more beech trees and two tall sycamore. Some of the young beech at this end of the wood itself are substantial. The woodland floor, especially under the beech at the southern end, is carpeted in places with bluebells and many primroses are visible along the bank parallel to the fringe. Honeysuckle and privet are frequent, along with among others herb robert, cuckoo pint, and bugle.

On the outside of the demesne wall at the western side there are several less common grasses, and a number of common sedges; these however are found in many places along the wall. The wall itself has well-developed growth of polypody, along with wall rue, fern grass, hard fern. Red squirrels are present. There are several old sawpits here, as there are in other parts of the wood.

The proposed route will cut directly through the present entrance to the wood from the Monasterevin-Athy Road (R419). At this point there has been some amenity planting of broadleaves. A young sycamore is prominent in the hedge immediately across the road from the entrance. All of these will be lost, but this is essentially amenity planting and can be replaced.

The scrub vegetation inside the entrance at the south-east corner of the wood is predominantly blackthorn, with some hazel and a bit of guelder rose. There is also a fringe of planted birch.

The location of the route along the southern edge of the wood minimises the disruption that might have been occasioned by dividing it into two compartments if the route had been further to the north. There is still the moderate loss of the cover provided by this added corner. However, there is nothing in this fringe of wood that is not commonly seen elsewhere in the woods.

A tree survey was undertaken within Hill Wood₍₃₁₎ to determine the quantity and quality of existing trees in the area of cut, to establish the extent of mature trees which will be affected by the proposed route and to propose any mitigation measures which would be appropriate.

The existing mature trees within the site are located along the western portion of the forestry area and are situated adjacent to the stone wall which runs along Green Road and Grange Road. Of the twenty mature trees surveyed 5 were classified as in poor condition, 8 were classified as good condition and the remaining 7 were classified as in fair condition.

The construction of the cutting will result in the removal of areas of woodland and exiting mature trees. The areas of woodland which will be removed are forestry plantations. These areas would be harvested in any event for commercial purposes. The loss of amenity is therefore significantly reduced.

A total of six mature trees will be removed as a result of the proposed scheme. A number of these trees are in poor condition and are in decline. The remaining trees to be retained would require to be overhauled in terms of deadwooding and crown thinning.

f) Kill-Ballyfarsoon

*This wood is of substantial interest and diversity. The wood has been planted on drained bog. The trees are mainly Norway spruce and Scots pine, which is fairly unusual. The plantation has something of the characteristic of semi-natural heath woodland in certain respects. The mycoflora is of interest, with *Amanita fulva* (tawney grisette) and several *Russula* species among those fruiting at the time of inspection. There is much bracken in places and buckler fern is locally dominant in the ground flora.*

Most of the wood will remain after construction of the motorway and there is unlikely to be a reduction in overall biodiversity.

8.14.3 Waterways.

The proposed route traverses two main waterways, The River Barrow and The Grand Canal. Land use between the canal and the river is dominated by cereal and Grass/Grass-clover reseeded pasture, often wet and dependent on deep drainage.

a) River Barrow

*The vegetation is of considerable interest along the river in some places, but its character and quality vary greatly between different stretches, depending on land use and river management history. Among species of note in this stretch are the pondweed *Potamogeton perfoliatus*, arrowhead (*Sagittaria sagittifolia*) and bulrush (*Scirpus lacustris*). The soils along the Barrow are heavy and generally poached. Deep drains are necessary to make it possible to put animals on the land. There is dense rush growth, both of soft and hard rush. The most unusual of the bank species is the strawberry headed clover (*Trifolium fragiferum*).*

Where the route reaches the river there are some tall, planted black poplar trees. Most of this visually attractive group lies to the south, at the corner of the plantation and will hardly suffer any interference.

The new bridge will cause very local and temporary disruption to the river corridor ecology.

b) Grand Canal

Stretches of the Canal bank are National Heritage Areas (NHA No. 2104). The overgrown canal itself includes some stretches where recolonization has resulted in a rich aquatic flora and fauna, with small stretches of species-rich grassland and well developed hawthorn and ash scrub on the banks.

*In the area traversed by the proposed route the main species are hedge woundwort, wild iris, soft rush, meadowsweet, and weedy species among which creeping bent, white clover, red clover, silverweed, glaucous sedge, redshank and other annual weeds are prominent. Dry south-facing banks have a flora of considerable diversity (including burnet saxifrage and rough hawkbit (*Leontodon hispidus*), but there is little of special interest in the short stretch traversed by the proposed route.*

On the edge of the tow path, on the eastern side, the vegetation is dominated by a line of ash, hawthorn, hazel, grey willow scrub, some young beech, a bit of white willow.

c) Toberkine Pond

Toberkine is an oasis of biological diversity in a desert of improved grassland. It is an artificial pond apparently constructed at the site of an ancient well (tobar caoin, the beautiful well). This is one of the headwaters of the Glasha River. There is a strong flow

of water where it leaves the pond at the north-east side to flow over a small boulder fall and disappears underground.

Apart from its ecological interest there is an archaeological dimension to Toberkine. The pond is in the nature of a millpond and may well be one of the oldest features of industrial archaeological interest in the county of Laois.

The pond also serves as a source for the Emo Lake via drain 12. The preferred route does not interfere with Toberkine pond but does traverse drain 12 in three separate locations.

8.14.4 The Fauna

Throughout the area of the preferred route common birds of field and hedgerow occur. It is anticipated that there will be some temporary disturbance to bird life as a consequence of the new motorway. This disturbance should not result in any reduction in diversity or numbers.

In the area Red Squirrel are common. Temporary disturbance is anticipated. There are badgers throughout the area but significant badger activity was noted in only one location only close to the propose route.

A considerable population of Fallow deer resides in the Derries Wood, which may pose difficulties. However the proximity of the proposed route to the existing N7 should minimise the problem. Special fencing will be required throughout the Wood to protect the fallow deer. The other mammals recorded were rabbit, hare and wood mice, which are not affected in any significant way.

The invertebrate fauna in the area is common fauna associated with the species of plant and the communities they constitute. All the usual groups and common species associated with these are found in the area. There should be no significant diminution in invertebrate diversity or frequency associated with the construction of the motorway.

8.15 ARCHITECTURAL, CULTURAL AND HERITAGE (15)

Dr. John Feehan examined the impact of the preferred route on the exiting architectural, cultural and heritage of the area. The preferred route interferes with no buildings of significance.

8.15.1 Architecture.

The locations of the main architectural features in the area are indicated on Figures ANHD/01 to 06. The more significant classical buildings adjacent to the proposed scheme are commented on below.

8.15.1.1 Georgian Houses

a) New Inn House

This is prominently situated on the main road near New Inn Cross and is the "New Inn" from which the Cross takes its name. It is an important building, attributed to James Gandon.

b) The Derries (SMR LA009-015)

The Derries was demolished some 50 years ago, and has been overplanted with Norway Spruce.

c) Jamestown House.

The preferred route passes within 120m of Jamestown House. Dr. J. W. Carter⁽³²⁾, an architectural historian, was engaged to prepare a report on Jamestown House and the impact of the proposed motorway on it from a heritage perspective. Dr. Carter an active member of the Georgian Society is one of the leading authorities on the houses of Laois. His conclusions in relation to the impact of the proposed motorway on Jamestown House were as follows:

Jamestown house and its associated buildings are of modest architectural merit. They are located in a relatively quiet rural area off a minor road. The proposed motorway will be clearly visible from the front of the original residence and is unlikely to be welcomed by residents.

Immediate access to the house and its farmyard will not be impaired. The present unexceptional entrance will remain.

Noise from the motorway should not be too intrusive. Habitation is largely in the extensions behind the original house and stretching away from the motorway.



JAMESTOWN HOUSE

The motorway route comfortably skirts the trees alongside the neglected pond, and moves diagonally across a presently cultivated field of winter corn, not across any sort of formal landscaping or “front lawn”.

8.15.1.2 Churches

a) Rathdaire Church

Perhaps the most noteworthy building in the area is the extraordinary church of Rathdaire, built around 1885 by J.F.Fuller for Mrs. Adair. The main inspiration for the elaborate west front was the Romanesque doorway of Saint Cronan’s in Roscrea. Early Christian metalwork and manuscripts art provide further ideas. Maurice Craig’s enthusiastic account of Rathdaire is perhaps worth quoting:

“ What an extraordinary sight it is, appearing without warning among the lush pastures of Leix. It is full-size replica of the West front of Roscrea, but improved upon by the application of much more detail and the addition, to the right of a tower of “Lombardic” origin. Most startling of all is the enrichment of the door gable with large-scale zoomorphic interlace surrounding a large “high cross” without a shaft. Immediately above this – the fact touching its apex – is a wheel-window not related to either of the Irish examples but rather of French or English derivation.”

8.15.1.3 Vernacular Architecture

The most distinctive features of the architecture of the area are its thatched mud-walled farm buildings. The preferred route does not impact directly on any of these buildings but there is one in close proximity to the route. This is shown on Figure ANHD/04.

8.15.2 Cultural Heritage

Part of the fabric of cultural landscape is the characteristic field patterns. Inevitably disruption of existing patterns will occur but it is anticipated that such disruption will be modest and can be alleviated by matching the composition and character of the traditional hedgerows of the district where the opportunity arises in connection with the construction of the motorway.

8.16 ARCHAEOLOGY ⁽³⁴⁾

Valerie J. Keeley Ltd., Archaeological Consultancy was retained by Kildare County Council to assess the archaeological impact of the preferred route. The assessment was divided into two phases, a paper survey and a field inspection of the entire length of the route.

8.16.1 Preferred Route Mainline

The Heath/Mayfield Motorway Scheme will affect the archaeology of the area through which it will pass. Eleven sites of archaeological interest have been identified within a 300m band (north and south) of the proposed route. The sites identified are listed in Table 8.16.1 and their location shown on Figures ANHD/01 to 06.

The preferred route directly impacts sites numbered 1,6 and 9. Sites numbered 3 and 7, while away from the preferred route landtake, may extend from the site into the take of the road. Sites numbered 2,4,5,8,10 and 11 while adjacent to the preferred route are not impacted directly by it.

8.16.2 Ballydavis Interchange ⁽³³⁾

The construction of the West facing ramps and associated link road to the R445 at Ballydavis Interchange on the Portlaoise Bypass will directly impact on one archaeological monument.

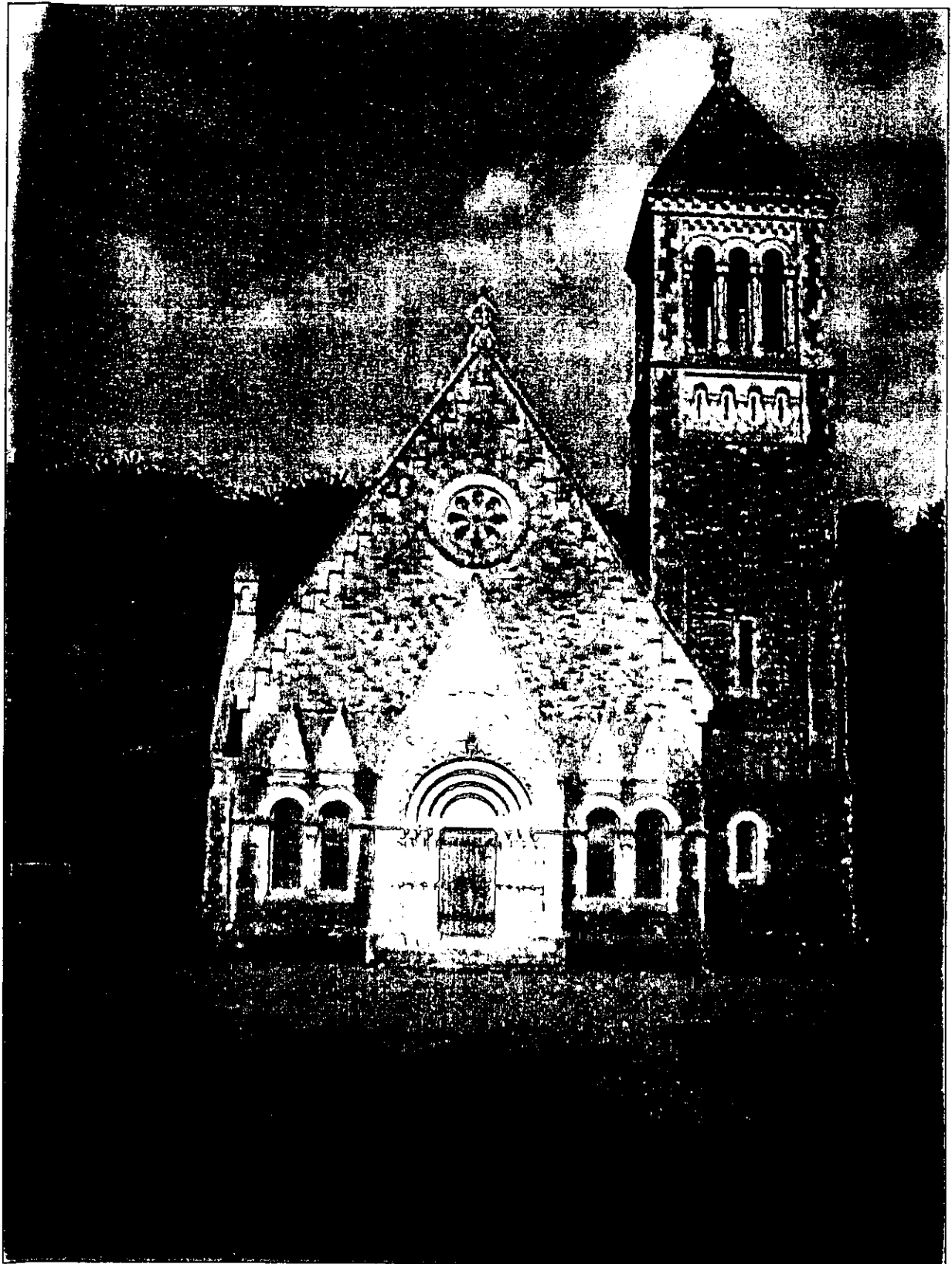
The proposed works will also run adjacent to three further sites and the Iron Age burial complex uncovered during the construction of the Portlaoise Bypass. Four further sites occur within this study area, however the works will not affect these sites.

The sites are shown on figure ANHD/01 and listed in Table 8.16.2.

It is recommended that at sites 12,13,14, and 18 a series of machine assisted investigation trenches be excavated. The results of such investigation should indicate the presence or otherwise of a significant archaeological site.

8.16.3 General Recommendations

- a) Archaeological Monitoring is recommended during topsoil stripping for all elements of the proposed route, with the provision for full excavation of any significant archaeological material uncovered at this time.*
- b) Intensive Monitoring is recommended where the route is adjacent to an archaeological site and where associated material may extend from the site into the land requirement area of the route. This also applies to areas identified as having archaeological potential.*



RATHDAIRE CHURCH

- c) Monitoring during any testing and probing on the route prior to or during construction is also recommended.*
- d) A programme of Archaeological Investigation within the pertinent areas to quantify the impact of the road scheme on the archaeological environment is recommended at Ballydavis Interchange and associated Link Road.*

Sites of Archaeological Interest

Site No.	Location	Type	Recommendation
1	Morett	Roadway, Ancient (site of)	Investigative Excavation
2	Morett	Well	No Specific Amelioration Measures
3	Morett	Castle, Earthworks, Holy Well, Church	Geophysical/Topographical Survey
4	Ballyshaneduff Or the Derries	House/Castle (site of)	No Specific Amelioration Measures
5	Ballyshaneduff Or the Derries	Earthworks (site of)	No Specific Amelioration Measures
6	Ballyshaneduff Or the Derries	Possible Earthworks	Investigative Excavation
7	Lughill	Graveyard	Geophysical Survey Trial Trenching
8	Ballyfarsoon	Crop Marks; Possible Earthworks	No Specific Amelioration Measures
9	Kill	Children's Burial Ground	Trial Trenching
10	Monasterevin Bog	Crop Marks; Possible Earthworks	No Specific Amelioration Measures
11	Morett	Earthworks	No Specific Amelioration Measures

Table 8.16.1

Sites of Archaeological Interest at Ballydavis Interchange

Site No.	Location	Type	Impact of the Development
12	Ballydavis	Sub-rectangular Enclosure	It will not be directly affected by the proposed route.
13	Ballydavis	Earthwork	The proposed scheme will require that the land surface be cut away at this point, thus removing any buried remains on site.
14	Ballydavis	Iron Age Complex	The proposed interchange will construct an exit ramp from the existing bypass at a point that is adjacent to and north of this site. The ramp will be an area of cut. Existing ground will be removed.
15	Rathbrennan	Ringfort	It will not be directly affected by the proposed works.
16	Rathbrennan	Barrow	It will not be directly affected by the proposed route.
17	Rathbrennan	Barrow	It will not be directly affected by the proposed route.
18	Earthworks	Ballydavis	It will not be directly affected by the proposed works but the fenceline passes very close to the site. The ground slopes noticeably northwards along a N/S scarp to the north of the site.

Table 8.16.2

8.17 ROAD LIGHTING ⁽³⁵⁾

It is proposed to provide lighting to traffic route standard at the following locations:

- ***Ballydavis Interchange:*** *existing lighting installation will be extended to cover the entire interchange, as far as the merging area of the ramps, the two roundabouts and all roads linking to these roundabouts to a distance of approximately 140 meters away from the roundabouts. Lighting along the Ballycarroll road and the link road to the R445/N7 will extend further to allow for lighting of the tight curvature of these roads.*
- ***New Inn Interchange:*** *lighting will be provided at the interchange between the north-east and south-west ramp merging zones, including the two roundabouts linking the on and off ramps and the three outlying roundabouts on ancillary roads. The southern link road and roundabout at the Vicarstown's road and the northern link road and roundabout junction with the R445/N7 will also be lit. The roundabout at New Inn cross road and associated roads for a distance of approximately 140m will be lit, as will all roads leading to the proposed roundabouts along the Vicarstown road and the junction of the northern link road with the R445/N7.*
- ***Mayfield Interchange:*** *provision has been made under the proposed Kildare Town Bypass Scheme to install lighting for this interchange. The lighting scheme proposed will have to be extended to cover the entire interchange between the ramp merging zones.*

8.18 BRIDGES AND STRUCTURES (36)

Roughan & O' Donovan Consulting Engineers, were engaged by Kildare County Council to prepare a preliminary structures report. The proposed structures can be sub divided into three distinct areas as follows:

- 1. Barrow River Crossing*
- 2. Grand Canal Crossing*
- 3. Motorway Structures*

The impacts of the construction of the structures is discussed separately in Section 8.19.

8.18.1 Barrow River Crossing

The bridge is located at Ch. 346+80. The motorway is on an embankment of 9 metres. The possible impacts of the structure identified were visual impact, impact on water quality and the effects on river hydrology, e.g. flooding.

8.18.1.1 Visual Impact

The location of the proposed Barrow Bridge is not a prominent one. Views, both from the east and west of the proposed crossing are restricted. The Dangan Wood which flanks the river along its eastern bank ensures that the view of the bridge will be screened from the Kildare Side. Although Grange Farm is on a slightly elevated site, it is unlikely that there will be any view through the trees of the bridge.

On the western side of the river, the dwelling houses of Mr. D. O' Connell and Ms. M Ging are 500m and 750m respectively from the bridge site. The bridge will not be a prominent feature in either case. The major visual impact will arise due to the 10m high embankment running between the canal and the river.

8.18.1.2 Water Quality

The construction of the bridge supports, both in the river channel and on the banks of the river, will have a potentially damaging impact on the water quality.

8.18.1.3 Hydrology

a) Preliminary Hydrological Studies

As part of the Barrow Bridge Feasibility Study, which was undertaken as part of the Route Selection Process in 1995, a Preliminary Study was undertaken by Professor Con Cunnanne of the Engineering Hydrology Department at NUI Galway, so as to assess the

likely impact on the River Bridge and adjacent embankments on the flow regime in the river during periods of high flow.

During extreme high flows, the flood extends over the flood plain of the river. In this situation, significant proportion of the total flow will be overland, amounting to perhaps 20% of the total flow. In the presence of a road embankment constructed across the flood plain, all of the flow has to pass through the bridge opening, a situation which will lead to some build up of water upstream of the bridge.

An assessment was undertaken for the 10, 20, 50, 100 and 200 year return period floods, for two notional span arrangements, single span and two span. The analysis indicated that the afflux arising from the 10 year and 100 year floods were approximately 100mm and 200mm respectively. The predictions were calibrated against the actual flood levels encountered.

Inspection of the ground contours in the flood plain between the river and the canal shows that for a 1 in 10 year flood, the effect of a 100mm rise in water level upstream of the embankment would not result in a significant additional area of land being flooded. In reality, the rise in ground level along the western side of the flood plain, coinciding with the line of the canal, acts to limit the extent of flooding.

b) Current Studies

On identification of the preferred route and the proposed River Barrow crossing location, two flow monitoring devices were installed in the river, upstream and downstream of the proposed crossing point. To date, approximately one and a half years of hydrometric data is available. The Department of Engineering Hydrology at NUI Galway have been engaged to undertake a detailed analysis of the flood characteristics of the river, based on the recorded information.

It is of interest that preliminary assessment by the Department of Engineering Hydrology of the data from the recorders, indicates that flood levels upstream of the bridge site are unlikely to reach even the moderate levels of afflux which were estimated in the earlier Preliminary Hydrological Report.

8.18.2 Grand Canal Crossing

The most significant impacts of the Grand Canal Crossing were identified as being on the amenity value of the canal, water quality, visual impact and ground borne vibrations.

8.18.2.1 Amenity

The greatest impact on the amenity value of the Grand Canal will occur during construction, when there may be possible restrictions on navigation.

8.18.2.2 Water Quality

The greatest impact on water quality may occur during construction.

8.18.2.3 Visual

The canal bridge carries the motorway over the local road, the Grand Canal and the canal towpaths. The motorway embankment is the dominant visual feature. The bridge will appear as an opening in the embankment. The visual intrusion of the bridge on the dwelling houses of Mr. D. O'Connell and Ms. M. Ging will be slight, although the visual intrusion of the motorway embankment will be severe.

8.18.2.4 Ground-borne Vibrations

The bridge foundations will have to be piled at this location. The effects of ground-borne vibration caused by piling of the foundations is predicted to be less than 2mm/s, which is less than the level associated with building damage or other disturbance.

8.18.3 Motorway Structures

The significant impacts of the motorway structures are assessed in Table 8.18.1. The main impacts are the visual impact and impacts due to foundation type.

Motorway Bridges

Structure	Visual Impact	Ground Borne Vibrations
Castle Road	Visual intrusion of the bridge on the surrounding area is slight. The dwelling home of Mr. P. Keegan will have a view of about 80% of the length of the structure. The level of visual impact is moderate on this dwelling house.	Piled foundations. Predicted vibration is less than 2mm/s, which is less than the level associated with building damage or other disturbances. Closest dwelling house 80m.
New Inn	Visual obstruction due to bridge is slight. Approach ramps and minor road embankment will cause moderate visual obstruction. Impact on surrounding dwelling houses is slight.	Piled foundations. Predicted vibration is less than 2mm/s, which is less than the level associated with building damage or other disturbances. Closest dwelling house 130m.
Ballybrittas	Visual intrusion of the bridge on the surrounding area is slight. Rathdaire Church and dwelling house of Mr. Joe Flynn have line of sight to the bridge. As line of sight is end on visual intrusion is slight.	N/A
Jamestown	Visual intrusion of the bridge is slight. The bridge will be visible from the second storey of Jamestown House resulting in moderate visual intrusion.	Piled foundations. Predicted vibration is less than 1mm/s. The Jamestown Turkey Hatchery is closest to the structure at a distance of 125m. The resultant vibrations, less than that of people walking or doors closing is not expected to impact on the operation of the Turkey Hatchery.
Grange Road Link	Bridge carries motorway over this road. Structure appears as an opening in the embankment. The dwelling house of Mr. V. Foxton is 150m from the bridge. The front of the house faces directly onto the bridge. The bridge causes severe visual obstruction to this dwelling house.	N/A
Athy Road	Visual intrusion is slight. The embankments to the Athy Road realignments will cause severe visual intrusion to the dwelling houses of Mr. C. Murray and Mrs. Imelda Murray.	Piled foundations are required. Predicted vibration is less than 2mm/s, which is less than the level associated with building damage or other disturbances. Closest dwelling house 100m.
Nurney Road	Visual intrusion of the bridge in the surrounding area is slight.	Piled foundations are required. Predicted vibration is less than 2mm/s which is less than the level associated with building damage or other disturbances. Closest dwelling house 110m.

Table 8.18.1

8.19 CONSTRUCTION

The construction time for this scheme is placed between two and a half and three years. During this time residents living adjacent to the proposed scheme and local to access routes will be subject to some disruption resulting from construction activities.

8.19.1 Impact on Traffic During Construction

The preferred route is primarily built through a green field site. The main impact on traffic will be in relation to traffic using the regional and county roads directly affected by the scheme. Greatest disturbance will occur during the construction of bridges to facilitate the realignment of the existing minor roads. While the construction period for the entire scheme is three years, the effects on road users at individual locations will be for much shorter periods.

The overbridge and realignment of Castle Road are off the line of the existing road and therefore there will be no need for a road closure. The construction of the New Inn Interchange is also off line and no road closures or diversions will be involved.

The overbridge and realignment of Ballybrittas road is constructed on the line of the existing road. A traffic diversion is therefore required. This is also the case with the construction of the Jamestown overbridge and the canal bridge.

Grange Road link underpass is constructed off line and no road closure will be involved. This is also the case for the Nurney Road. The Athy Road overbridge and realignment is on the line of the existing Athy Road. A traffic diversion will be required.

Traffic diversions will, where possible, take the form of temporary roads linking either side of the existing road around the site of the works, thereby eliminating the need for road closures. Periods of traffic restrictions and road closures, should they arise, will be minimised as far as is practicable.

All temporary diversions will be in accordance with the Department for the Environment "Traffic Signs Manual" and "Guidelines for Traffic Control at Rural Roadworks" prepared jointly by An Foras Forbatha and the County and City Engineers' Association.

8.19.2 Traffic Management During Construction.

The necessity to import considerable volumes of fill material for the construction of the motorway and in particular the construction of the embankment in the flood plain between the River Barrow and the canal will result in considerable volumes of construction traffic using local roads.

In order to comply with the Safety, Health and Welfare at Work (Construction) Regulations, 1995, the contractor will be conditioned to prepare (i) a detailed traffic

management proposal in order to minimise the traffic disruption and (ii) method statements in relation to the construction of all structures.

8.19.3 Noise, Vibration and Dust Emissions

It is anticipated that piling of bridge foundations may cause some noise pollution during the period of foundations being laid for the structures. These activities are usually of a short duration. No rock excavation is expected and therefore no blasting or rock hammering should be required.

Dust emissions and noise pollution are dependent on meteorological conditions, type of construction plant used, distance from the source of the disruption and the source of the raw material being imported. People living within 300m of the proposed site will be subjected to varying degrees of disruption, inversely proportional to the distance from the proposed works.

Vibration due to piling for bridge structures etc. will be controlled where necessary. Ground vibration from construction works would not be expected to cause undue disturbance or structural damage.

In order to mitigate against the impact of noise pollution from construction plant the works specification will specify hours outside which certain noise levels may not operate. The Specification for the works will further require the contractor to take adequate measures to limit dust.

8.19.4 Disposal Sites

It is anticipated that large quantities of unsuitable material will be removed offsite. The contractor will be conditioned to reinstate, to a satisfactory standard, areas used for such disposal.

9. COST BENEFIT ANALYSIS

9.1 COST BENEFIT ANALYSIS ⁽³⁷⁾

The cost benefit report was prepared by McMahon Design & Management Ltd and based on the cost estimate prepared by Kildare County Council in June 1999.

Economic analysis was carried out to establish the Internal Rate of Return (I R R) for the proposed project. A scheme is considered worthwhile if they exhibit an I.I.R. of 10% or more measured by standard cost benefit analysis.

In order to establish the I.R.R. for the scheme we must first establish the following:

- a) Overall Project Cost*
- b) Value of Time Saving*
- c) Costs Saving due to Accident Reduction and Increased Safety.*
- d) Vehicle Operation Costs.*

To estimate the Internal Rate of Return for the scheme the quantifiable benefits (b, c, & d above) which accrue to the road user over the design life of the project are set against the capital costs of the scheme.

9.1.1 Project Costs

The estimated project costs excluding VAT prepared by Kildare County Council in June 1999 are as follows:

<i>Preliminaries</i>	<i>IR£</i>	<i>2,562,295.45</i>
<i>Site Clearance</i>	<i>IR£</i>	<i>24,236.50</i>
<i>Hedges</i>	<i>IR£</i>	<i>1,655,030.50</i>
<i>Fencing</i>	<i>IR£</i>	<i>1,655,030.50</i>
<i>Drainage & Service Ducts</i>	<i>IR£</i>	<i>4,775,065.00</i>
<i>Earthworks</i>	<i>IR£</i>	<i>26,518,521.22</i>
<i>Sub-Base & Road-Base</i>	<i>IR£</i>	<i>7,518,009.50</i>
<i>Flexible Pavement</i>	<i>IR£</i>	<i>4,720,873.20</i>
<i>Works for Statutory Undertaker & Accommodation Works</i>	<i>IR£</i>	<i>3,848,660.00</i>
<i>Structures</i>	<i>IR£</i>	<i>8,350,000.00</i>
<i>Dayworks 1%</i>	<i>IR£</i>	<i>607,711.37</i>
<i>Design & Supervision Costs Including Land Acquisition</i>	<i>IR£</i>	<i>15,994,624.15</i>
Total Excluding VAT	IR£	77,373,509.10

9.1.2 Traffic

The 1998 Traffic Survey for Heath/Mayfield indicates the present AAAD to be of the order of 14,335 at the Heath and 15,530 at Mayfield.

The projected annual figures are listed in Table 9.1.1.

Projected AADT Figures to the Year 2024

	The Heath	Mayfield
1998	14,335	15,330
2003	19,185	20,514
2008	23,343	24,962
2024	32,040	34,264

Table 9.1.1

It is anticipated that 80% of the traffic will utilise the new motorway network.

9.1.3 Value of Time Saving

The National Road Needs Study, Technical Appendix, National Roads Authority 1998 (38), gives data in relation to the cost of working time and non-working time based on 1994 prices. These costs have been factored to bring them to 1996 prices and the prices are then increased at the rate of 2% per annum in real terms to 2024, the project design year.

The relevant figures are as follows:

<i>Working Time (1994 prices)</i>	<i>£ 9.20 /Hour</i>
<i>Non-working Time (1994 prices)</i>	<i>£ 3.70 /Hour</i>
<i>Working Time (1996 prices)</i>	<i>£ 9.85843 /Hour</i>
<i>Non-working Time (1996 prices)</i>	<i>£ 3.96481 /Hour</i>
<i>Working Time (2024 prices)</i>	<i>£ 17.16377 /Hour</i>
<i>Non-working Time (2024 prices)</i>	<i>£ 6.090282/Hour</i>

Kildare County Council carried out a survey of current journey times on the existing N7 excluding Bank holiday weekends, when journey times are greatly increase. The distance travelled was 16.6km. The average journey time was 13mins and 40 secs. The average speed was 72.87km per hour.

The length of the proposed scheme is 17.3km. The journey time on the proposed bypass was calculated based on an average speed of 97km/hour.

It should be noted that the removal of motorway traffic from the existing network would result in considerable savings from increased safety conditions reduced maintenance costs and enhanced speed/flow conditions. These savings are not included in the analysis of costs and benefits.

Based on the above the value of working time saved from the year of opening 2005 to 2024 is estimated at £245,285,040.15. The estimated value of non-working time saved for the same period is estimated at £126,628,179.56.

9.1.4 Costs Saving due to Accident Reduction and Increased Safety.

Statistics on accident occurrences and cost of personal injuries/fatalities have been taken from the National Road Needs Study (17). The data covers both the existing network and the proposed motorway conditions.

Table 9.1.2, extracted from "Heath/Mayfield, Accident Analysis 1994" report (3) illustrates two main points. The rate of accidents on a typical motorway is lower than on the existing N7 and that the portion of the N7 between the Heath and Mayfield has a fatal accident rate which is almost 3 times as high as the average rate along this route.

Accident Rates

Road Type	Fatal (/10⁶ Veh. km)	Serious Injury (/10⁶ Veh. km)	All Injuries (/10⁶ Veh. Km)
N7(Heath-Mayfield)	0.035	0.05	0.13
N7(Total Length)	0.012	0.036	0.15
Naas Bypass	0.00888	0.059	-
Motorways	0.008	-	0.26

Table 9.1.2

The estimated cost in savings from reduction in accidents from the year of opening to design year is £105,808,771.10.

9.1.5 Vehicle Operation Costs.

Data on vehicle operating costs was obtained from the National Road Needs Study, Technical Appendix(39). The costs are associated with both fuel and non-fuel elements.

Tax in any form is excluded and the real price of fuel is assumed not to change from 15p per litre in 1996 prices.

It is estimated that vehicle operation costs will increase when the motorway scheme is in use. The costs associated with that increase from the year of opening to design year is £10,880,487.95.

9.1.6 Conclusion

The Internal Rate of Return Function (IRR) in the Microsoft Excel programme was used to carry out the economic evaluations in Table 9.1.3. This gives a summary of the data used to establish the Internal Rate of Return for the scheme.

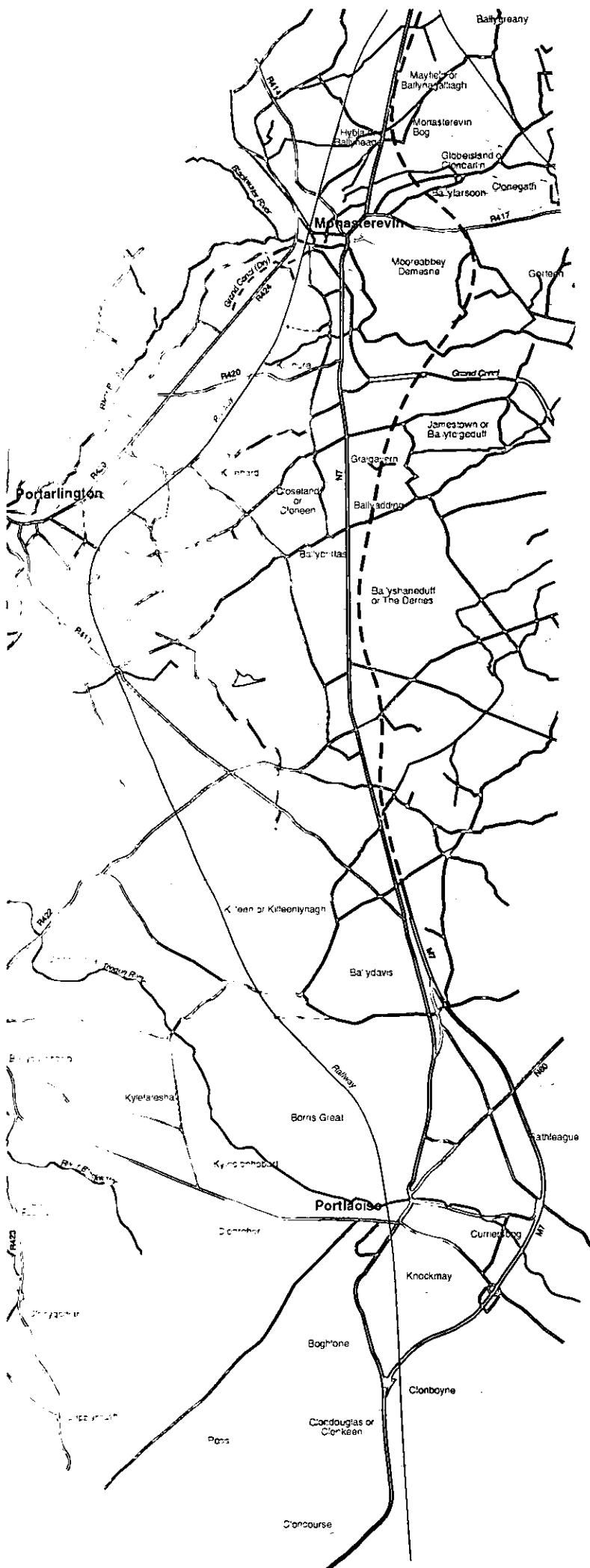
The costs and benefits associated with the operation and construction of the proposed scheme are discounted to the base year (2005) and then summed to give net product value. The total discount saving is £271,577,888.64. The total discounted costs are calculated as £89,728,000.

These figures give an Internal Rate of Return of 15.13% per annum. This rate of return indicates that the motorway scheme represents good value for money. The rate of return is sufficiently high that any variations, which may occur in the input parameters, are most unlikely to have any significant negative impact.

Cost Benefit Summary Table

Year	AADT	Value of Work Time Saved per Year 1997 Values	Value of Non-Work Time Saved per Year 1997 Values	Accident Savings 1997 Values	VOC Changes 1997 Values	Total Savings/Yr 1997 Values	Discounted Savings/Yr Discounted to 2005 1997 Values	Discounted Costs/Yr Discounted to 2005
1993								IR£555,810.00
1994								IR£529,340.00
1995								IR£504,130.00
1996								IR£120,030.00
1997								IR£228,630.00
1998	14,833							IR£217,740.00
1999	15,723							IR£829,500.00
2000	16,666							IR£6,320,020.00
2001	17,666							IR£18,151,260.00
2002	18,726							IR£28,483,100.00
2003	19,850							IR£27,126,770.00
2004	20,644							IR£6,661,860.00
2005	21,470	4,749,632.35	2,447,932.45	3,351,267.59	-431,397.04	10,117,435.35	IR£10,117,435.35	
2006	22,328	5,341,204.11	2,753,490.29	3,555,024.66	-452,578.60	11,197,140.46	IR£10,663,943.30	
2007	23,222	6,016,563.08	3,102,377.26	3,771,170.16	-473,987.52	12,416,122.98	IR£11,261,789.55	
2008	24,150	6,790,164.20	3,502,072.84	4,000,457.31	-495,392.88	13,797,301.46	IR£11,918,627.76	
2009	24,633	7,294,743.58	3,762,735.77	4,162,075.78	-506,103.85	14,713,451.28	IR£12,104,792.78	
2010	25,126	7,841,460.80	4,045,188.67	4,330,422.59	-516,685.52	15,700,386.55	IR£12,301,663.69	
2011	25,629	8,434,554.04	4,351,624.39	4,505,371.66	-527,078.80	16,764,471.29	IR£12,509,906.59	
2012	26,141	9,078,831.92	4,684,530.98	4,687,388.68	-537,214.08	17,913,537.50	IR£12,730,816.66	
2013	26,664	9,779,787.49	5,046,750.78	4,876,759.18	-547,008.80	19,156,288.65	IR£12,965,730.19	
2014	27,197	10,543,746.69	5,441,557.13	5,073,780.25	-556,364.40	20,502,719.67	IR£13,216,235.91	
2015	27,741	11,378,065.77	5,872,756.66	5,278,760.98	-565,162.02	21,964,421.39	IR£13,484,249.40	
2016	28,296	12,291,400.66	6,344,828.69	5,492,022.92	-573,256.68	23,554,995.58	IR£13,772,118.07	
2017	28,862	13,294,084.65	6,863,120.67	5,713,900.65	-580,468.96	25,290,637.00	IR£14,082,773.01	
2018	29,439	14,398,674.87	7,434,131.08	5,944,742.23	-586,572.73	27,190,975.45	IR£14,419,954.82	
2019	30,028	15,620,771.61	8,065,933.53	6,184,909.82	-591,276.65	29,280,338.31	IR£14,788,560.53	
2020	30,629	16,980,297.94	8,768,839.03	6,434,780.17	-594,194.92	31,589,722.23	IR£15,195,196.51	
2021	31,241	18,503,593.35	9,556,479.74	6,694,745.29	-594,799.03	34,160,019.35	IR£15,649,098.46	
2022	31,866	20,227,032.54	10,447,681.99	6,965,213.00	-592,333.77	37,047,593.76	IR£16,163,742.44	
2023	32,503	22,203,700.76	11,469,921.51	7,246,607.61	-585,661.54	40,334,568.33	IR£16,759,846.25	
2024	33,153	24,516,729.74	12,666,226.13	7,539,370.56	-572,950.16	44,149,376.27	IR£17,471,407.37	
		245,285,040.15	126,628,179.59	105,808,771.09	-10,880,487.95	466,841,502.86	IR£271,577,888.64	IR£89,728,190.00

Table 9.1.3



CHAPTER TEN

Interactions

10. INTERACTIONS

10.1 INTERACTION MATRIX

Kildare County Council in association with a variety of specialist consultants worked together to identify the preferred route for this Scheme and assess the impact of that preferred route on the Environment.

While it was obviously required that Kildare County Council interact with each consultant it was further required that where necessary consultants should interact with each other on specific issues.

In addition the consultants meet collectively with the Technical Steering Committee, consisting of Senior Technical Roads personnel from Laois and Kildare County Council, members of the National Roads Authority and members of the design team. The County Manager of Laois County Council chairs the Technical Steering Committee.

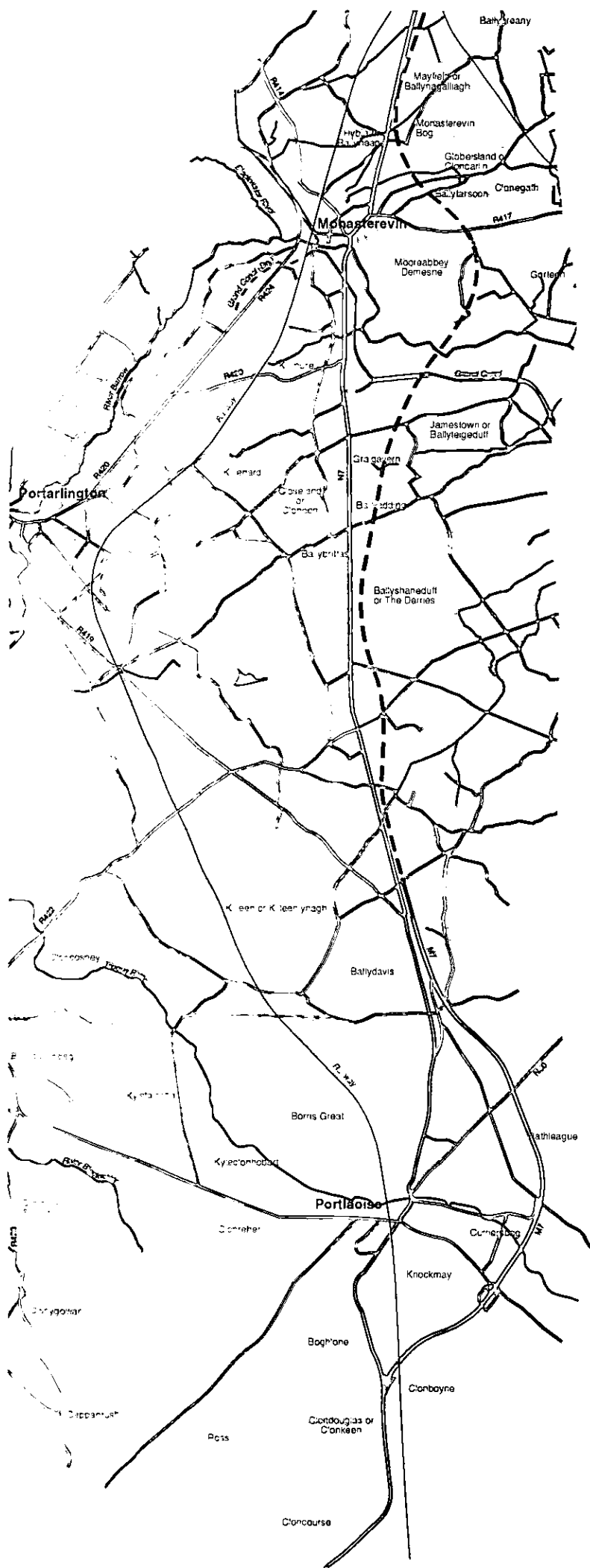
These meetings allowed the consultants to meet collectively and listen to the issues arising from other consultant's studies.

Table 10.1.1 indicates the interactions between each subject studied as part of the preparation of this Environmental Impact Statement.

Interactive Matrix

	Traffic	Socio-Economic	Architectural, Cultural & Heritage	Noise & Vibrations	Flora & Fauna	Geotechnical Aspects	Aquatic Ecology of Receiving Waters	Air Quality	Bloodstock	Landscape	Planning & Development	Property	Agriculture	Archaeology	Drainage	Bridges & Structures	Construction
Traffic		*						*									*
Socio-Economic	*												*				*
Architectural, Cultural & Heritage					*											*	
Noise & Vibrations						*											
Flora & Fauna			*			*				*			*				*
Geotechnical Aspects				*		*							*				*
Aquatic Ecology of Receiving Waters							*			*							*
Air Quality				*				*									*
Bloodstock									*								*
Landscape					*					*							*
Planning & Development		*						*			*						*
Property				*				*		*		*					*
Agriculture		*				*				*			*				*
Archaeology							*							*			*
Drainage								*							*		*
Bridges & Structures	*	*		*				*		*			*		*	*	*
Construction	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 10.1.1



CHAPTER ELEVEN

Proposed Environmental Measures

11. PROPOSED ENVIRONMENTAL MITIGATION MEASURES

11.0 PROPOSED ENVIRONMENTAL MEASURES

Chapter 8 of this report describes in detail the environmental impact of the preferred route on the surrounding environment into which it is to be absorbed. This chapter deals with the environmental measures, which will be put in place to combat any adverse impacts of the scheme.

11.1 TRAFFIC ⁽¹⁹⁾

- *The proposed scheme provides an element of infrastructure, which will cater for the future traffic growth on the route up to a design year of 2024.*

11.2 NOISE, VIBRATION AND CONSTRUCTION ⁽²⁰⁾

- *A barrier constructed between the source and the receiver is the principle method of noise control for road traffic. Noise attenuation measures will be incorporated into the scheme where necessary.*
- *The siting of temporary site compounds will be given careful consideration.*
- *The hours, during which activities which generate short term noise nuisance, will be restricted.*
- *The contractor will be conditioned to take adequate measures to eliminate dust.*
- *Vibration due to piling will be controlled where necessary.*

11.3 AIR QUALITY ⁽²¹⁾

- *No significant adverse impacts identified.*

11.4 SOCIO ECONOMIC ⁽²²⁾

- *The proposed scheme removes heavy traffic from the settlements along the existing N7, Monasterevin, Jamestown, Ballybrittas, New Inn, returning the streets to the community.*
- *Advance notice signage on the motorway will be put in place to enable travellers to avail of the rest and other facilities available in these settlements.*
- *All local roads will be replaced by way of bridges or alternatively will be replaced by other routes in the immediate vicinity.*
- *The provision of three interchanges will allow for ease of interaction between the local road network and the motorway.*
- *New Inn interchange strategically located will enhance and develop tourism in the region.*
- *Provision will be made for the reinstatement of recreational facilities at Hill Wood.*
- *Existing walkways severed within Hill Wood will be reinstated.*
- *Provision of alternative access to all wooded areas severed by the proposed scheme will be provided.*
- *Boundaries to affected properties will be reinstated on foot of discussions between the local authority and the landowners involved.*

11.5 PLANNING AND DEVELOPMENT ⁽²²⁾

- *The Scheme is in accordance with the current aspirations of both Kildare and Laois County Council Development Plans.*

11.6 RESIDENTIAL PROPERTY ⁽²³⁾

- *All properties directly affected by the Scheme will be appropriately compensated for loss of land and/or dwelling house and injurious affection.*
- *Appropriate landscape measures will be taken to lessen the impact on dwelling houses located closest to the Scheme.*
- *Noise barriers will be erected where a need has been identified to protect dwelling houses from the impact of noise generated by the Scheme.*
- *While it is anticipated that the Scheme will not adversely impact on existing private wells adjacent to the motorway, wells which may suffer a short term impact will be deepened or an alternative water supply will be provided.*

11.7 BLOODSTOCK ⁽²⁴⁾

- *The local authority will work with the Bloodstock owner on how best to protect the Bloodstock during construction.*

11.8 AGRICULTURE ⁽²⁵⁾

- *Landowners will be appropriately compensated for loss of land and injurious affection.*
- *Severed lands where practicable will be provided with alternative access.*
- *Existing land drainage networks will be catered for within the scheme.*
- *Existing Surface water drains in fill areas will be culverted across the motorway.*
- *Existing Surface water drains in cut areas will be catered for in the design of the mainline drainage.*
- *Existing water supplies will where possible be maintained. Should any water supplies be interfered with an alternative supply will be provided.*
- *Access to lands during construction will, where practicable, be maintained.*

11.9 GEOTECHNICAL ASPECTS ⁽²⁶⁾

- *Conservation of topsoil.*
- *To avoid polluting hazards and habitat damage, disposal of excess volumes will be in accordance with relevant legislation.*
- *To reuse the maximum amount of material available on site to reduce the amount of imported material required.*

11.10 DRAINAGE ⁽²⁷⁾

- *Oil and Grit interceptors are to be provided at motorway outfalls.*
- *Retention tanks are to be provided where required, to mitigate any adverse impacts on existing streams at proposed discharge locations.*
- *Drain 12, which serves Emo Court Lake from Toberkine Pond, will be re-routed to allow for the continued flow of water to the Lake. All works carried out in relation to this stream will be done in consultation with Dúchas.*
- *An open drain will be provided at the top of the embankment at Hill Wood, separate to the mainline drainage, to cater for the surface water runoff from Hill Wood, which at present discharges through Kill Bog into Cassidy's Stream.*
- *Retention tanks will be provided in Kill Bog north of the proposed motorway to regulate the flow into Cassidy's Stream.*
- *The flow capacity of the draw-off location at Annaknock to the Grand Canal will be increased to transfer more water downstream of the bridge in times of high flow, so as to minimise flooding. This will be achieved by providing an extra*

“eye” (culvert) in the existing bridge, which is immediately downstream of the sluices.

- *It would be the intention to provide automatic sluices and weirs controlled by upstream water levels. This system would be linked to a dial out alarm system which would notify the Canal Foreman of significant changes in water level.*
- *Water quality monitoring will be established on the Glasha River at the closest motorway discharge location to the Grand Canal. Appropriate water treatment will be provided to ensure the quality of water discharging from the motorway to the Glasha River.*

11.11 AQUATIC ECOLOGY OF RECEIVING WATERS ⁽²⁸⁾

- *Oil interceptors will be provided where motorway drainage is discharging to the local drain network.*
- *Oil interceptors will be provided where toe drainage discharges to sensitive drains i.e. drain 12 which discharges to Emo Lake, Drain 13 and 14 where a diverse community of species which include lamprey and whiteclawed crayfish reside.*
- *No motorway drainage will discharge into Drains 13 and 14.*
- *A new drainage outfall will be provided, known as Drain 13a, from the vicinity of drain 13 and 14 directly to the Glasha River.*
- *Retention areas will be provided along drains where it is deemed necessary to offset any adverse impact of discharges.*
- *Water quality monitoring points will be established on the Glasha River at the closest motorway discharge location, Drain 13a, and at the canal draw-off location, to ensure that water quality in the Glasha River is not affected by run-off from the proposed motorway.*
- *The most serious threat to water quality along any main road is posed by the possible release of toxic or dangerous substances from road tankers following an accident. The upgrading of the existing N7 to motorway standard will reduce the occurrence of such accidents to a minimum thereby reducing, to the greatest extent possible, the likelihood of such events.*

11.12 BALLYDAVIS INTERCHANGE V PORTLAOISE AQUIFER ⁽²⁹⁾

- *A Method Statement will be prepared in conjunction with the contractor that limits to a minimum the level of construction activity that can be carried out within the catchment of the swallow hole.*
- *Where soil disturbance is necessary the Method Statement will include for the required level of bunding to prevent any silt laden waters accessing the drainage network flowing to the swallow hole.*
- *The Method Statement will be in place prior to any construction works taking place within the swallow hole catchment.*
- *Monitoring of the implementation of the Method Statement would be an integral part of the duties of the supervising engineering team.*
- *A suitably secure response measure will be put in place to protect the Ballydavis well field and the Darkin well in the event that the motorway construction works compromises the water quality entering the swallow hole.*
- *The guiding principles of the proposed mitigation measures allow for:*
 - (i) an early warning system,*
 - (ii) an automatic and immediate isolation response mechanism and*
 - (iii) a capacity to cater for long duration storm events.*
- *The proposed mitigation measures that incorporate the above objectives include for:*
 - (i) the purchase of the land take required for the protection of the swallow hole (Drawing PR02 – red hatched area).*
 - (ii) the construction 2 No. pump sumps on the drainage channels flowing into the swallow hole.*
 - (iii) the provision of a water quality monitoring link between the pump sumps and Kilminchy Reservoir.*
 - (iv) the provision of suitably sized pump(s) duty and stand-by to allow for the pumping of poor quality surface water to the existing motorway drainage network.*
 - (v) the provision of on-line water quality monitoring and information relay equipment at the proposed pump sumps.*
 - (vi) The inclusion of the daily inspection of the water discharging into the swallow hole by the Kilminchy Reservoir staff.*
- *The combination of a pollution prevention Method Statement, the proposed response structures together with the daily monitoring of the water quality entering the Sluggory by the Kilmichy Reservoir personal should ensure the necessary level of monitoring and protection of the swallow hole drainage during the motorway construction phase.*

11.13 THE LANDSCAPE ⁽³⁰⁾

- *The loss of trees and hedgerows during construction of the scheme will be more than compensated for by the planting of new trees and shrubs.*
- *A three-year monitoring period will be put in place for all structural landscape elements. During this period all defects will be identified and corrected as necessary. The monitoring will also provide for the establishment of wildflower areas on the margins and median of the proposed route.*
- *Existing mature trees in Hill Wood and at other locations will, where possible, be retained.*
- *Remedial work to the retained trees in Hill Wood will be carried out. All deadwood will be removed to ensure stability.*
- *It is proposed that Beech woodland would be established on the sideslopes of the motorway in the Hill Wood cutting. This would allow the development of Beech woodland in the area which would be permanent rather than the present condition of commercial forestry.*
- *The proposed scheme will, where possible, be screened from local roads, adjacent lands, public areas and residential areas by means of planting and mounding.*
- *Additional land at appropriate locations has been acquired for this purpose.*

11.14 FLORA AND FAUNA ⁽³²⁾

- *Landscape design will incorporate the need to increase the natural diversity of the surrounding area and to provide habitats for wildlife in the area.*
- *Planting of native tree species in small groups within the overall landscape design will be done where practicable.*
- *Fences and other boundaries will attempt to match the character and composition of the existing hedgerow.*
- *Slopes and embankments will be planted, where practicable, with natural grassland species mixes, which will enhance not only the species composition of the local flora, but also the invertebrate fauna.*
- *Deer fencing will be provided throughout the Derries Wood to protect the Fallow Deer population which resides there.*
- *Topsoil in Hill Wood, which is rich in ground flora, will be carefully stripped during the course of construction, protected and reused to topsoil the sideslopes of the cutting within Hill Wood.*
- *Existing mature trees in Hill Wood and at other locations will, where possible, be retained.*

11.15 ARCHITECTURE, CULTURE & HERITAGE ⁽³³⁾

- *Additional land has been identified to provide a suitable landscape environment for Jamestown House.*

11.16 ARCHAEOLOGY ^(33, 34)

- *Archaeological monitoring will be carried out during topsoil stripping for the length of the route. Archaeologically significant material uncovered at this time shall be fully excavated.*
- *Prior to construction, initial site investigations will be carried out at the following locations:*

Archaeological Sites to be Investigated

Site Number	Location	Description
Site 3	Morett	Castle, Earthworks, Holy Well, Church
Site 7	Lughill	Graveyard
Site 9	Kill	Child's Burial Ground
Site 12	Ballydavis	Earthwork
Site 13	Ballydavis	Earthwork
Site 14	Ballydavis	Iron Age Complex
Site 18	Ballydavis	Sub-rectangular Enclosure

Table 11.16.1

- *Where initial investigation has yielded evidence of archaeologically significant material or structure, full archaeological investigation will be undertaken.*

11.17 PUBLIC LIGHTING ⁽³⁵⁾

- *Consideration will be given to the appearance of the lighting installation by day as affected by the :*
 - (a) location of the lighting columns with respect to views of scenic value*
 - (b) design of supporting elements*
 - (c) complexity of the lighting arrangement*
 - (d) design of luminaires.*
- *In environmentally sensitive areas the use of a light source, which allows colour discrimination, will be used.*
- *The number of lighting columns will be kept to a minimum consistent with an effective lighting installation.*
- *Good quality high pressure sodium lanterns, which concentrate their light output on the road surface, will be used to minimise light spillage beyond the road boundary.*
- *In order to minimise light pollution and “sky glow” SON lanterns will be used. SON lanterns are more easily directed and it is usually possible to light effectively from one side only using this lantern type.*
- *All cabling will be underground.*

11.18 BRIDGES AND STRUCTURES ⁽³⁶⁾

Barrow River Crossing

- *A detailed method statement for construction will be submitted by the contractor prior to work commencing. Details will include method of access to and from bridge sites.*
- *The construction of an aesthetically pleasing structure will lessen the visual impact on the recreational users of the river.*
- *Permanent supports, and associated construction activities within the river channel will be avoided to reduce the impact on the water quality of the river.*
- *Geotextile screens enclosing the works on the river bank will be provided to minimise the impact on aquatic life.*
- *The river bank will be replanted where necessary on completion of the works.*

Canal Crossing

- *Geotextile screens enclosing the works on the canal bank will be provided to minimise the impact on aquatic life.*
- *An impermeable bund will be provided around the works adjacent to the canal.*
- *Water monitoring is recommended during construction and for a period of approximately 6 months after completion of the works.*
- *A traffic diversion will be put in place to allow the existing Local Road to remain open during construction.*



MORET CASTLE

- *A temporary footway will be required to be provided on the east bank for the Barrow Way during certain construction times.*

Castle Road

- *The times during which piling can take place will be limited.*
- *Additional land is being acquired for landscaping purposes to screen the bridge structure from a local dwelling house.*

New Inn Interchange

- *The times during which piling can take place will be limited.*

Ballybrittas Road

- *The times during which piling can take place will be limited.*
- *A traffic diversion will be put in place to allow the Ballybrittas road to remain open during construction.*

Jamestown Road

- *In order to limit ground-borne vibrations due to piling at the Turkey Hatchery it is intended to use augered or bored piles for the bridge foundation.*
- *The times during which piling can take place will be limited.*
- *A traffic diversion will be put in place to allow the Jamestown road to remain open during construction.*

Grange Road Link

- *No amelioration measures required.*

Athy Road

- *The times during which piling can take place will be limited.*
- *A traffic diversion will be put in place to allow the Athy road to remain open during construction.*

Nurney Road

- *The times during which piling can take place will be limited.*

11.19 CONSTRUCTION

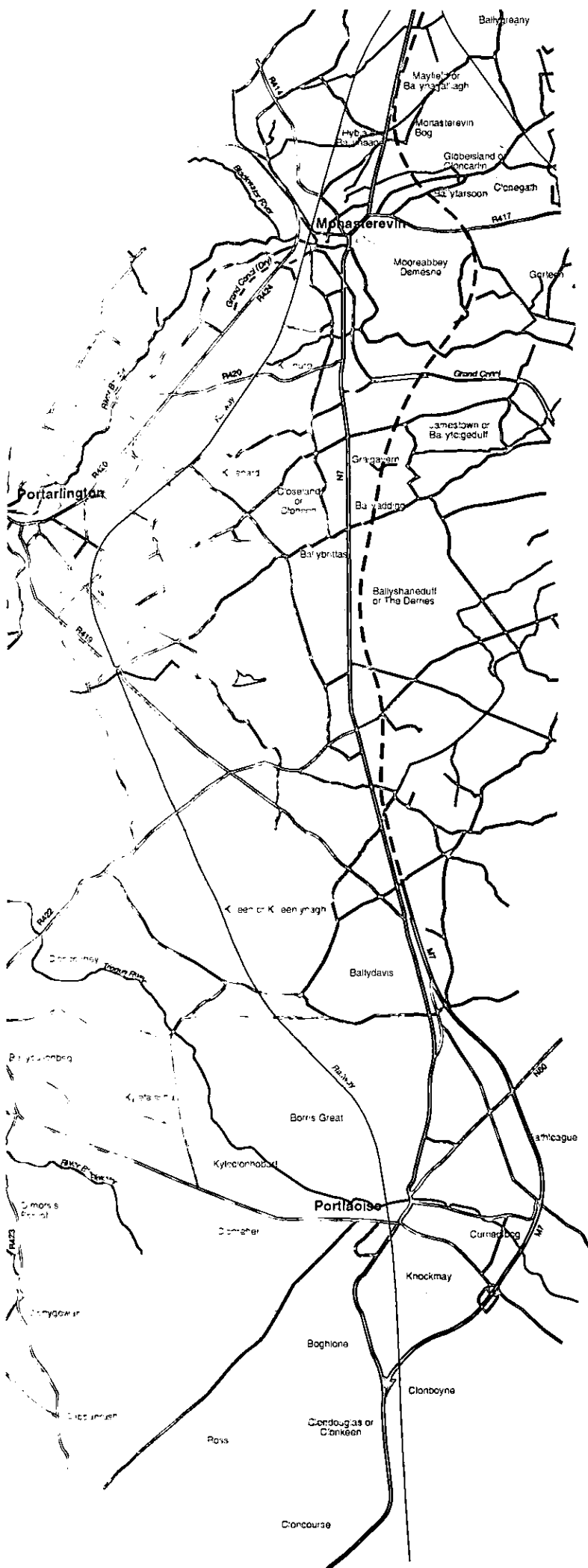
- *The sighting of temporary site compounds will be given careful consideration.*
- *The hours during which activities generating short term noise disruption occur will be restricted.*
- *The contractor will be conditioned to take adequate measures to eliminate dust.*
- *Vibration due to piling will be controlled where necessary.*
- *The contractor will be conditioned to reinstate in a satisfactory manner, borrow pits and areas for disposal of unsuitable material.*
- *Individuals whose land is cited in the Scheme will be compensated for temporary disturbance caused during the construction of the Motorway.*
- *In order to comply with the Safety, Health and Welfare at Work (Construction) Regulations, 1995, the Contractor will be conditioned to prepare the following:*
 - a) *A detailed traffic management proposal in order to minimise traffic disruption.*
 - b) *Method statement in relation to the construction of each of the ten structures to be constructed.*
- *The sequencing of work will be such as to minimise the disruption of access to lands.*

11.20 GEOMETRIC DESIGN ⁽³⁸⁾

The EIS and public consultation processes identified several adverse impacts of the proposed scheme, which could be mitigated against by appropriate consideration during the design stage. The main ameliorative measures taken were:

- The provision of a full interchange at Ballydavis and the removal of the west facing ramps at Heath West thus eliminating weaving movements and increasing safety on the motorway.*
- The provision of a "Dumbell" type interchange at Ballydavis, improving safety at the junction of the off ramps and the local road.*
- The provision of the Ballydavis link road, allowing ease of access from the motorway to the local road network.*
- Signage will be provided to attract heavy good vehicles bound for the N80 to the interchange at Ballydavis, thus improving the environment and safety of Portlaoise town.*
- The R425 will be upgraded to cater for the increase of traffic from Ballydavis to the N80.*
- The Bloomfield cross roads will be replaced by a roundabout increasing safety at this junction.*
- Provision of landscape area between the motorway and the N7 opposite residents at Morett.*
- The relocation of Castle Road to an area of cut on the motorway, thus removing the necessity to demolish a dwelling house and reducing its visual impact in the landscape.*
- The provision of a staggered junction at Sugar Loaf Cross Roads enhances safety at this junction, the second highest accident location on the existing N7 between the Heath and Mayfield.*
- The provision of a roundabout at New Inn Cross Roads, the highest accident location between the Heath and Mayfield, which will regularise traffic movement at this junction.*
- The relocation of New Inn Interchange to cater for both local roads L-3930 and L-3817 and the removal of the proposed overbridge at L-3817 lessens the impact on residential properties in the area and the impact of the interchange on the surrounding landscape environment.*
- The introduction of two compound curves on the main line between Ballybrittas and the River Barrow moved the Horizontal alignment further north. This lessens the impact of the scheme on residential properties along Jamestown Road and the Canal.*
- Providing a bridge design for the Canal in keeping with the requirements of Dúchas for the area.*
- Providing a bridge design for the River Barrow in keeping with the requirements of the Barrow Drainage Board.*
- The existing demesne wall which will be removed during construction will be relocated to the north of the scheme along the lands of Grange Farm.*

- *The vertical alignment between the Barrow and Hill Wood was raised slightly to provide an underpass at Grange Road. This requirement was to reduce local severance and retain a local amenity walkway in the area. It further provided access to severed lands negating the need to upgrade Lughill Lane and interfere with several residential properties along this Lane.*
- *The horizontal alignment through Hill Wood was moved North by approximately 20m at its widest, thus allowing the retention of mature trees within the wood along by the demesne wall.*
- *The vertical alignment through Hill Wood was lowered thereby reducing the impact of the realigned Athy Road on residents along this road and Green Road.*



CHAPTER TWELVE

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LISTS OF TABLES & DRAWINGS**

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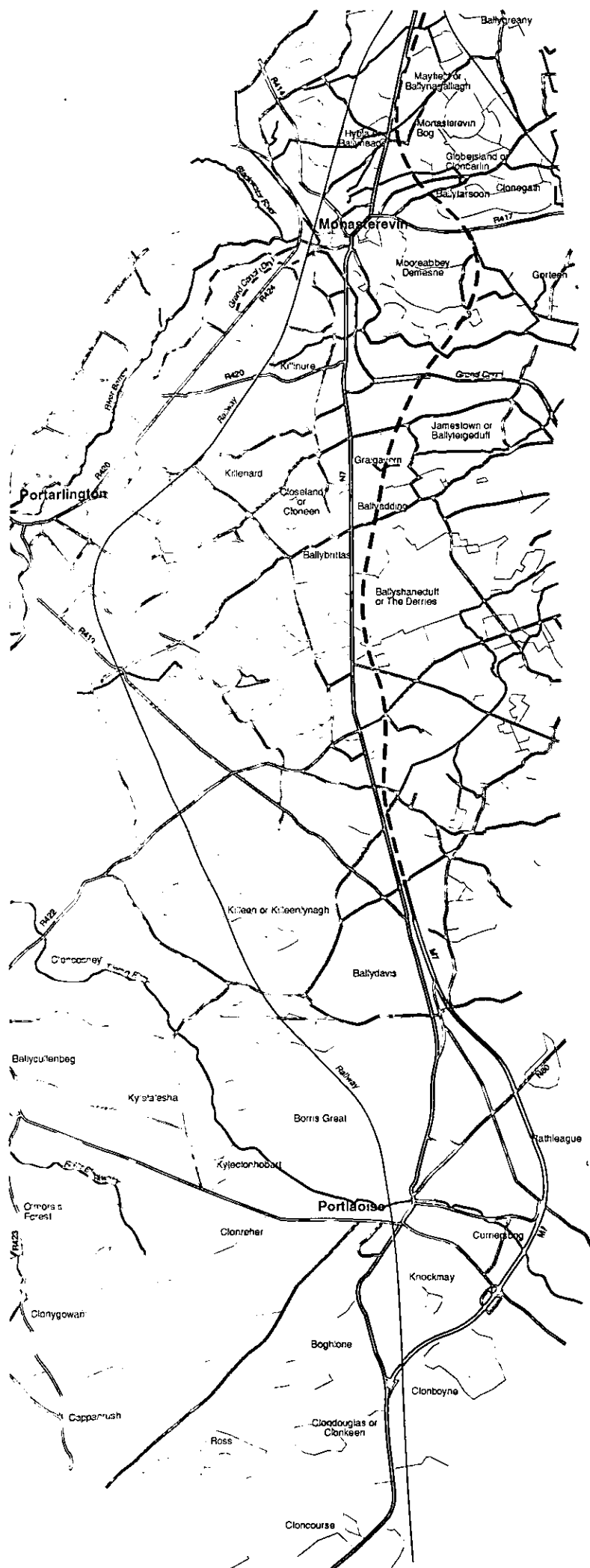
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	<i>Outfalls</i>

Kildare

County Council



National Roads Design Office



HEATH MAYFIELD MOTORWAY

Environmental Impact Statement

Volume 3

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January 2000

PREFACE

Kildare County Council has prepared a scheme for a proposed motorway, known as the "Heath/Mayfield Motorway", to connect the 30km Naas, Newbridge, Kildare Motorway with the 13km of Portlaoise Motorway already constructed.

This document forms part of the Heath/Mayfield Motorway Scheme Environmental Impact Statement.

The structure of the statement is as follows:

- **Volume 1**
Non-Technical Summary
- **Volume 2**
Environmental Impact Statement (including a repeat of the Non-Technical Summary)
- **Volume 3**
Environmental Impact Statement Drawings
- **Volume 4a, 4b, 4c, 4d, 4e**
Reference reports and data used in the compilation of the statement. The reference reports contained in these Volumes are as follows:
- **Volume 4a and 4b** **Preliminary Route Selection Reports**
 - Volume 4a* *Reports on Route Selection, Traffic, Accident Analysis, Socio-Economic.*
 - Volume 4b* *Reports on, Heritage, Flora and Fauna, Noise, Soils, Receiving Waters, Landscape, Soils & Agriculture, Archaeology, River Barrow Crossing.*
- **Volume 4c, 4d and 4e** **Preferred Route Reports**
 - Volume 4c* *Reports on Traffic, Noise, Air Quality, Socio Economic, Planning & Development, and Bloodstock.*
 - Volume 4d* *Reports on Agriculture, Geotechnics, Water and Human Beings, Receiving Waters, Portlaoise Aquifer*
 - Volume 4e* *Reports on Landscape, Tree and Wood Survey, Flora & Fauna, Archaeology, Public Lighting, Bridges and Structures and Cost Benefit.*

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The writer wishes to express appreciation to the Heath/Mayfield Technical Steering Committee Members,

<i>Michael Malone</i>	<i>Chairman, County Manager</i>	<i>Laois County Council</i>
<i>Jimmy Lynch</i>	<i>County Engineer</i>	<i>Kildare County Council</i>
<i>Gerry McGlinchey</i>	<i>County Engineer</i>	<i>Laois County Council</i>
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<i>Pascal Griffin</i>	<i>Engineering Inspector</i>	<i>National Roads Authority</i>

for their technical advice and support during the compilation of this document.

I would like to express appreciation to all the Consultants who contributed to the Environmental Impact Statement for their time and expertise.

I wish to acknowledge the assistance of both Kildare and Laois County Council's roads administration staff and in particular Irene Delaney, Senior Staff Officer, Laois County Council and Liam Dunne, Senior Staff Officer, Kildare County Council for their help and co-operation in compiling data.

I would also like to acknowledge the work carried out by the previous design teams of Kildare and Laois County Councils who produced the "Preliminary Route Selection Report".

I would like, in particular, to express my gratitude to the Heath/Mayfield Design Team Members,

*John Lahart
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Karen McCafferty
Alan Dunney
Liam Carroll
Padge Kehoe
Ollie Hennessey
Seamus Doherty
Elaine Keogh
Brian McCarthy
Damian O' Brien
Paul McDonald*

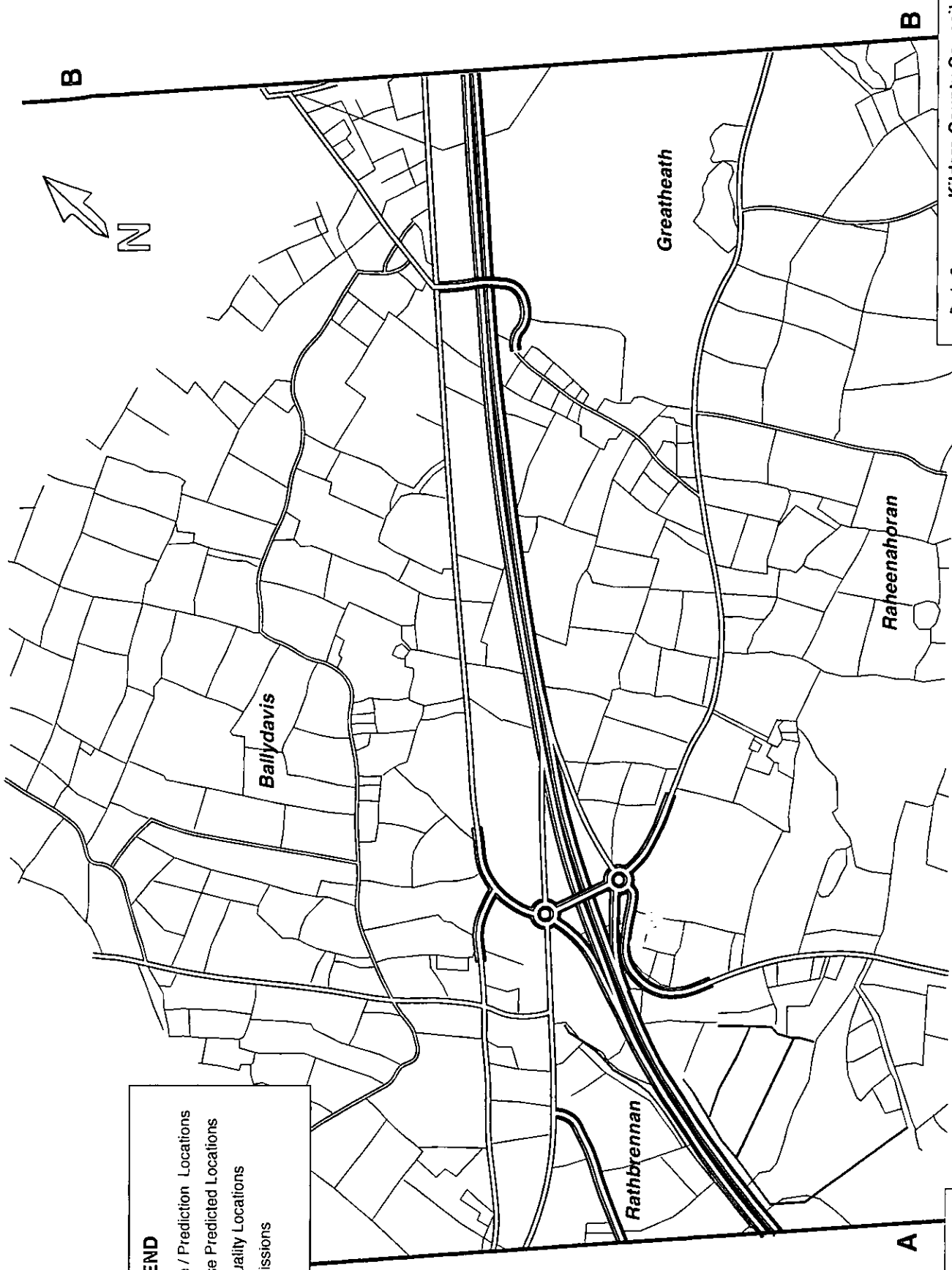
*Senior Engineer
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Executive Engineer
Executive Engineer
Executive Engineer
Assistant Engineer
Graduate Engineer
Chief Technician
Technician Grade 1
Technician Grade 1
Technician Grade 1
Technician Grade 2
Technician Grade 2
Technician Grade 2
Technician Grade 2*

for their tireless work, patience and assistance which was invaluable during the preparation of this document.

In conclusion I wish to thank Mr. Niall Bradley, County Manager, Kildare County Council, Mr. Michael Malone, County Manager, Laois County Council and the Members of both Kildare and Laois County Council for their kind consideration during the preparation of this document.

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December 1999



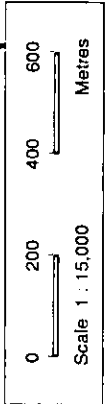
LEGEND

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- Additional Noise Predicted Locations
- Baseline Air Quality Locations
- Planning Permissions

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Kildare County Council
 Noise, Air and Planning Sites
 Job No 2126
 Date Nov 1999
 Figure NAA/01

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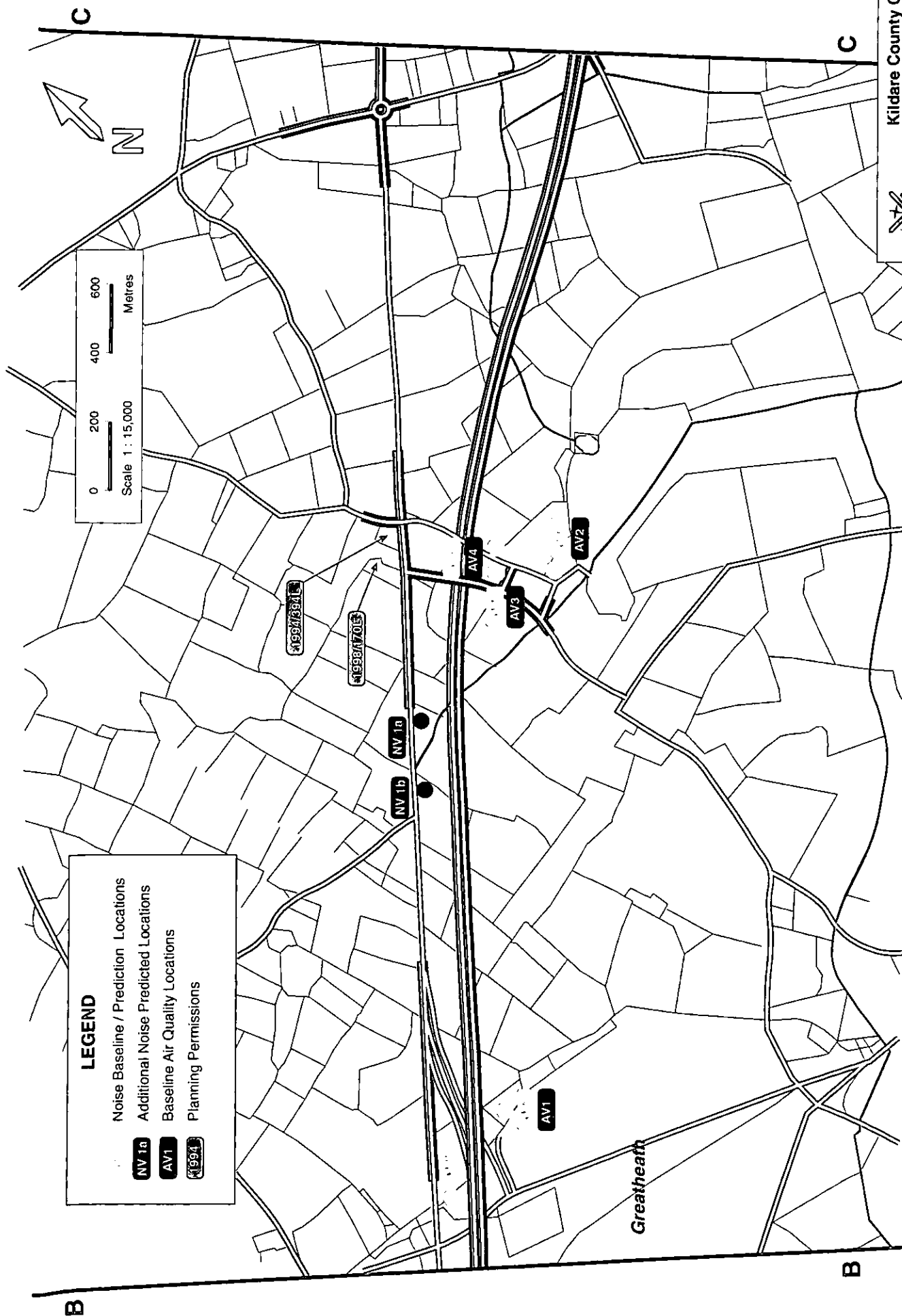
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- Planning Permissions



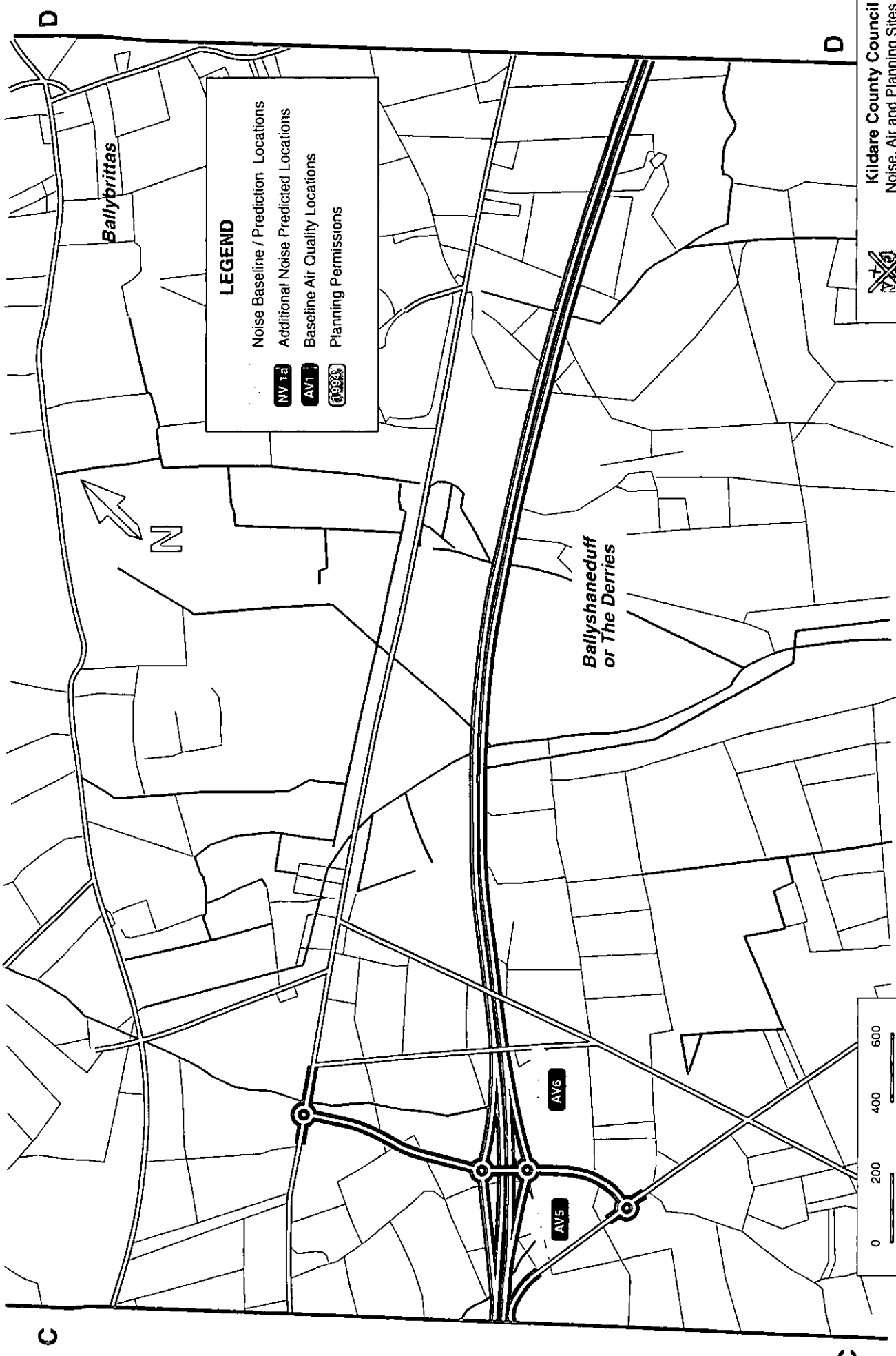
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Figure NAA/02



Greatheath



LEGEND

- Noise Baseline / Prediction Locations
- Additional Noise Predicted Locations
- Baseline Air Quality Locations
- Planning Permissions

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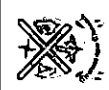
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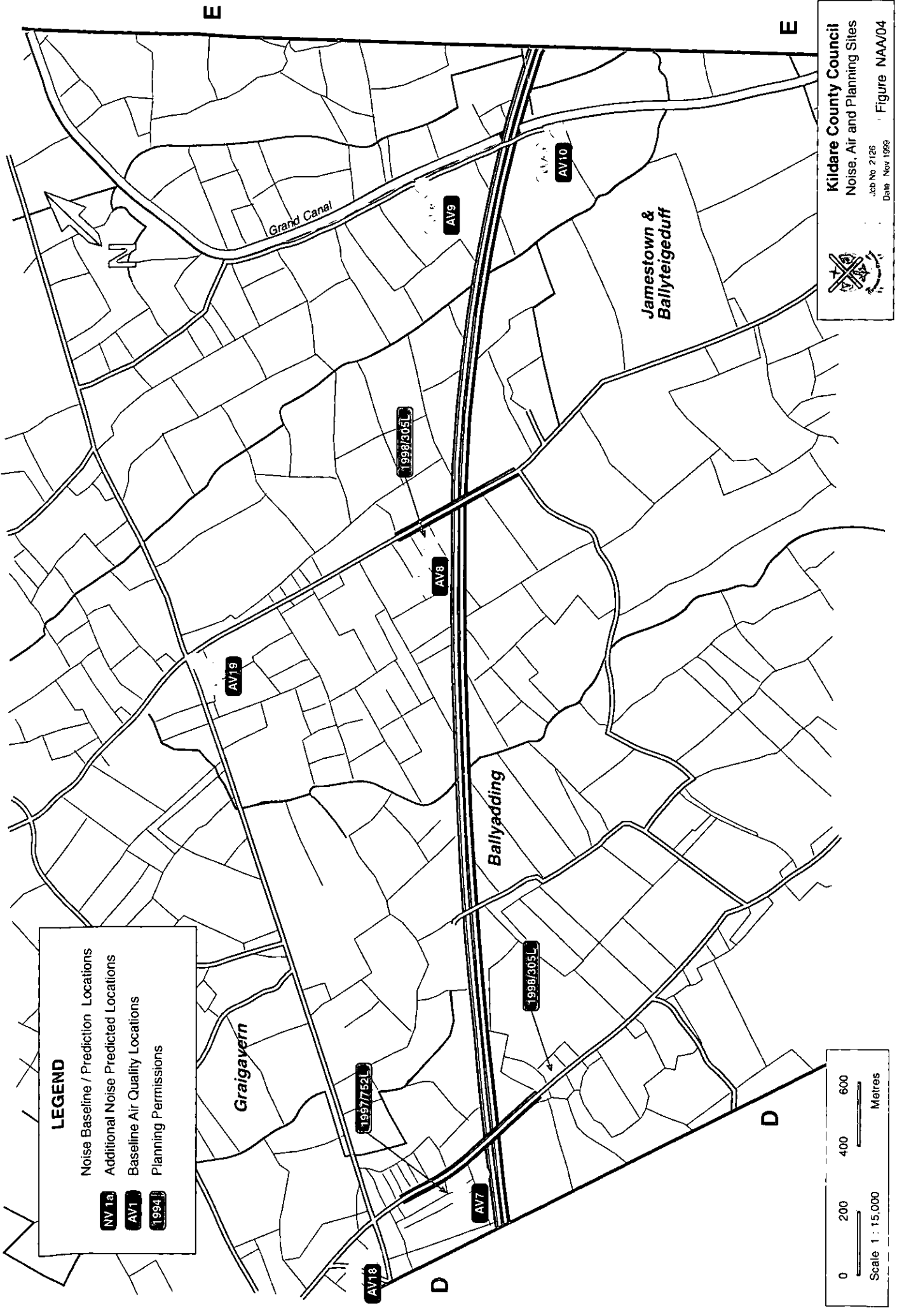


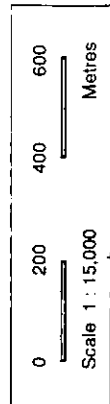
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Noise Baseline / Prediction Locations
Additional Noise Predicted Locations
Baseline Air Quality Locations
Planning Permissions

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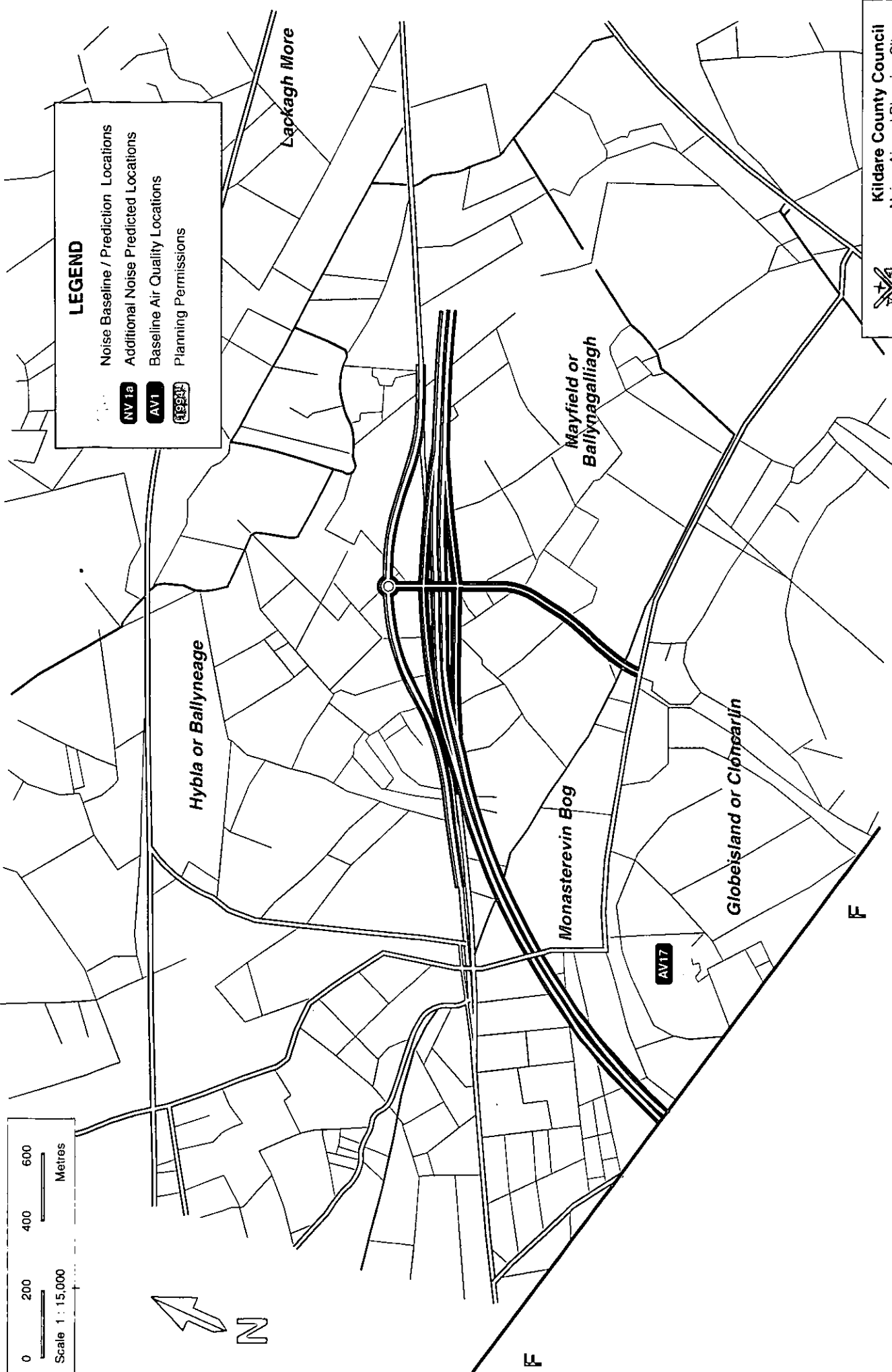




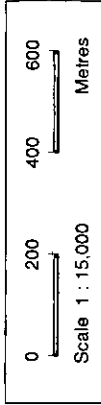
LEGEND

- Noise Baseline / Prediction Locations
- Additional Noise Predicted Locations
- Baseline Air Quality Locations
- Planning Permissions

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AV1
AV17



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Figure NAA/06



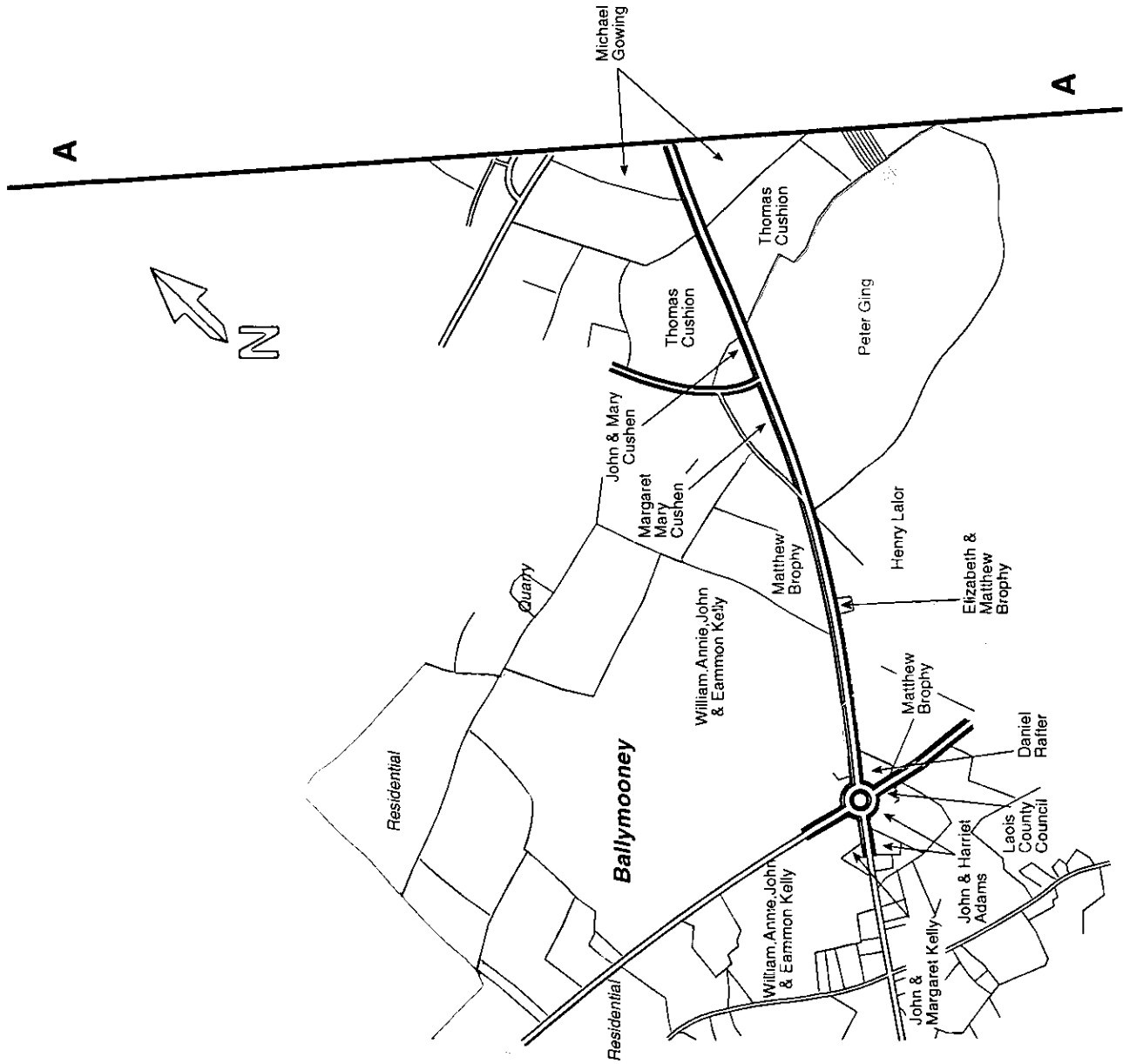
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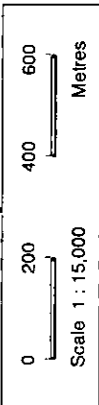
Peter Ging Land Owner Name
Field Boundary

Kildare County Council
Properties

Job No 2126
Date Nov 1999

Figure P/00





LEGEND

Patrick Ging Land Owner Name
 — Field Boundary

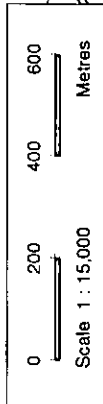


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Properties

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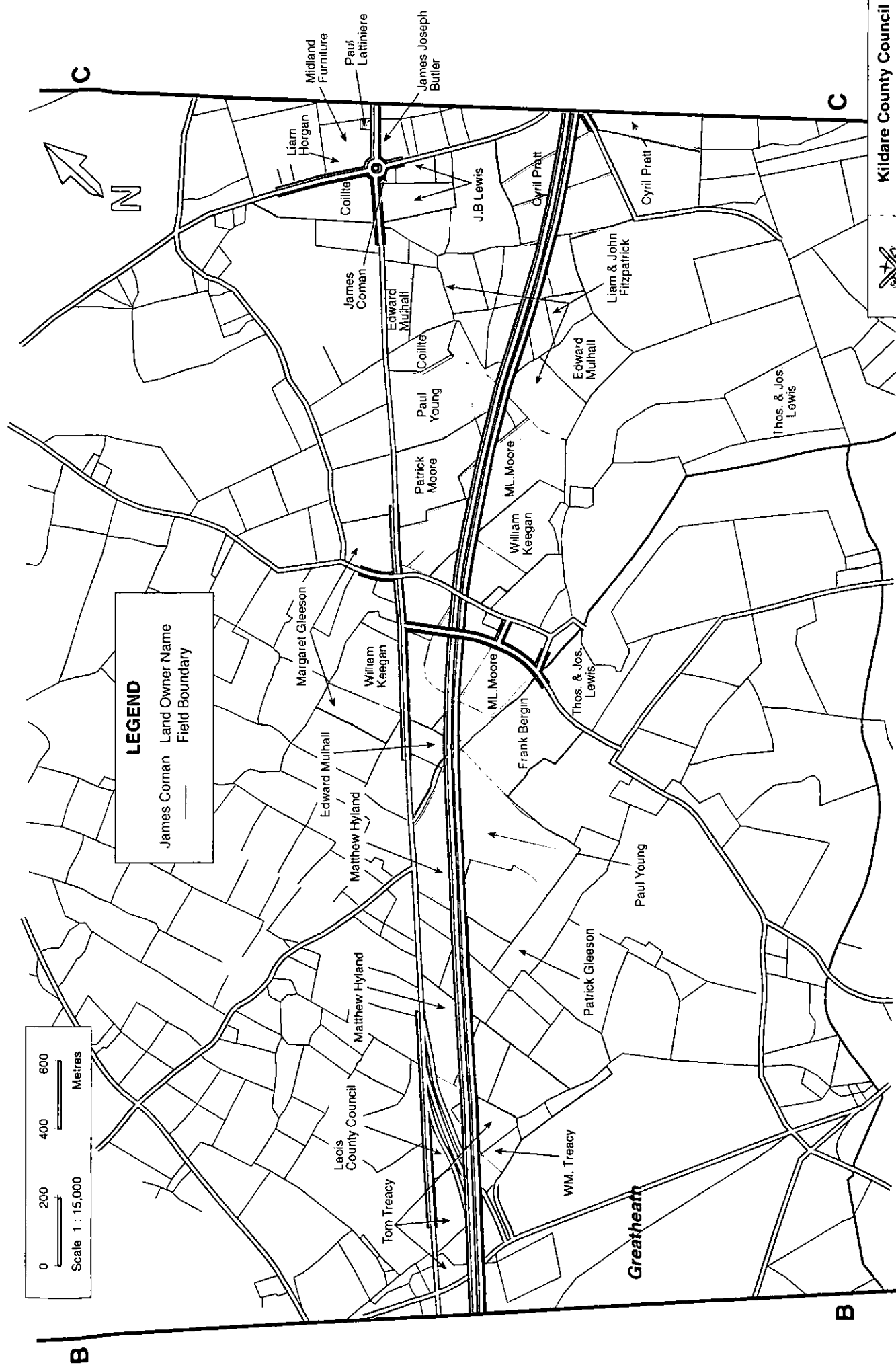
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Figure P/01



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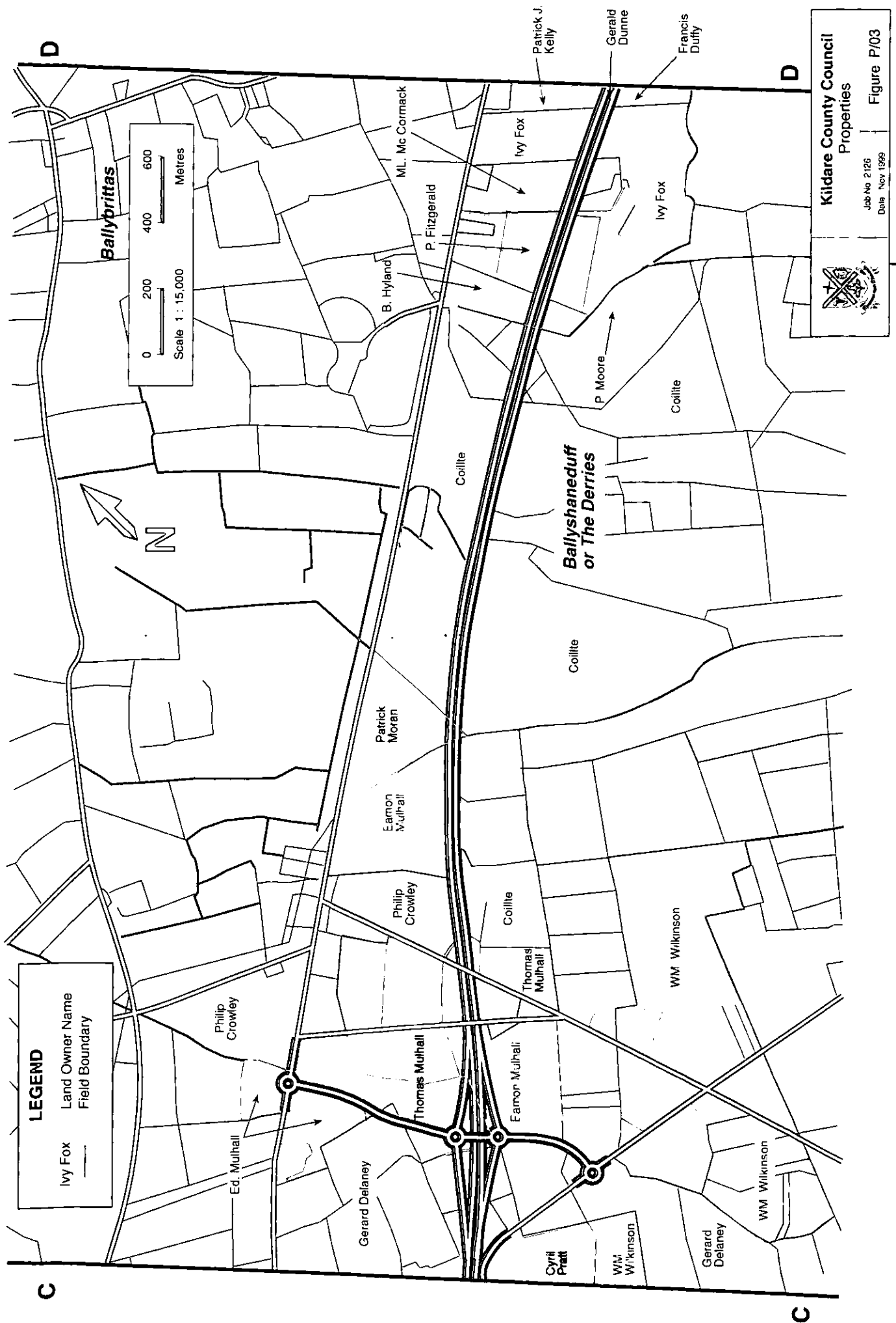
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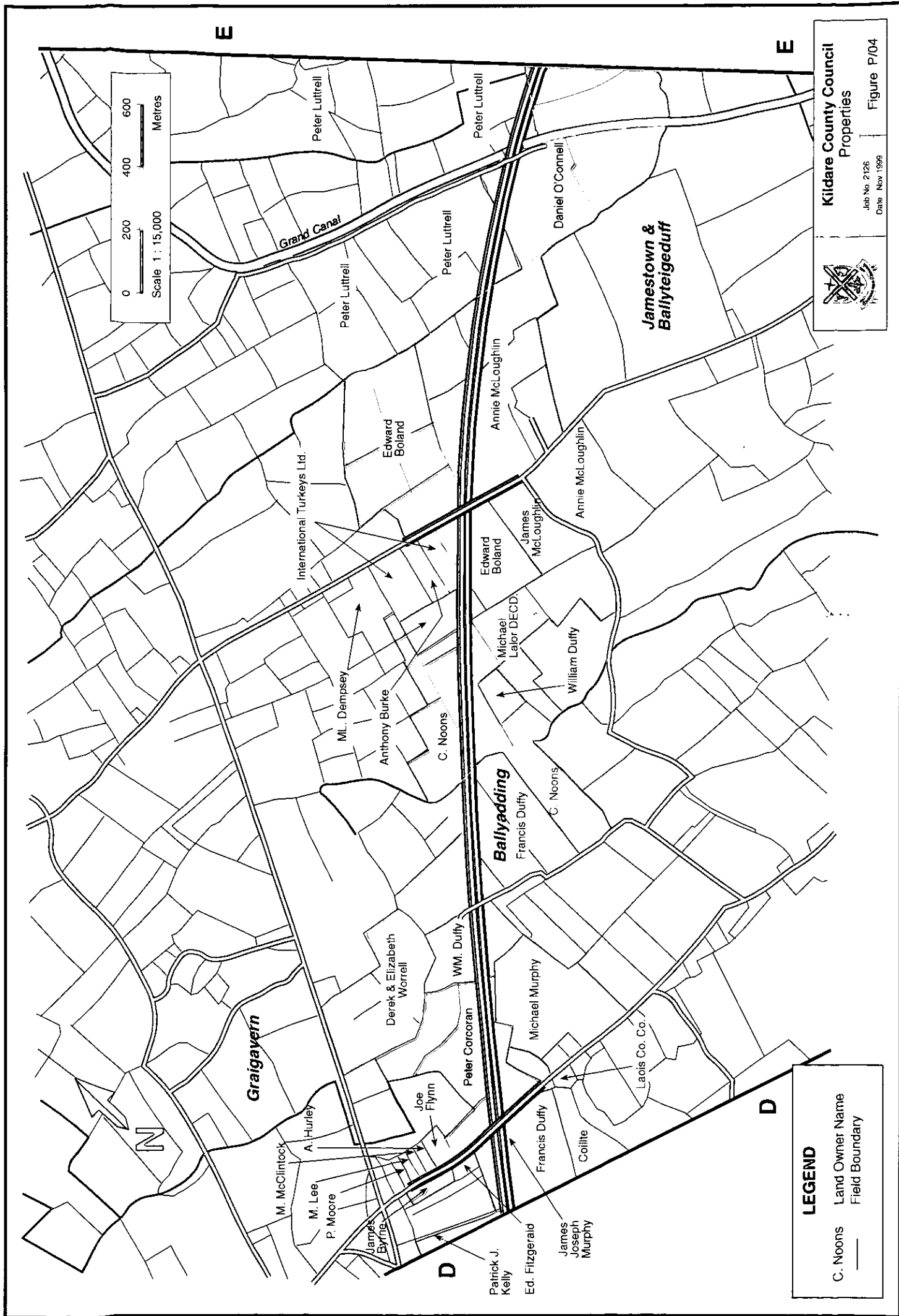


Kildare County Council
Properties

Job No 2126
Date Nov 1999

Figure P/02





Kildare County Council
Properties

Job No. 2126
Date Nov 1999

Figure P/04

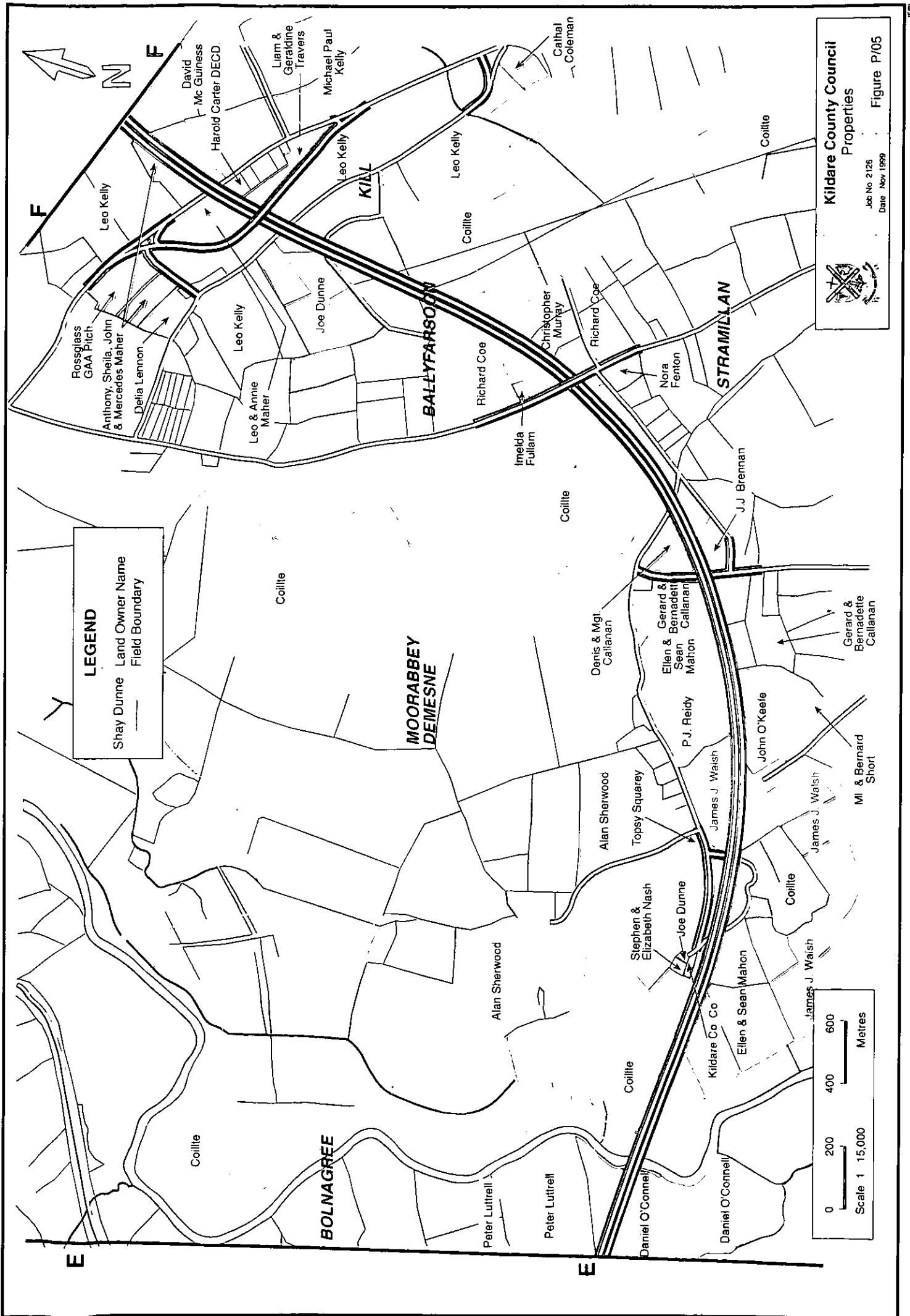
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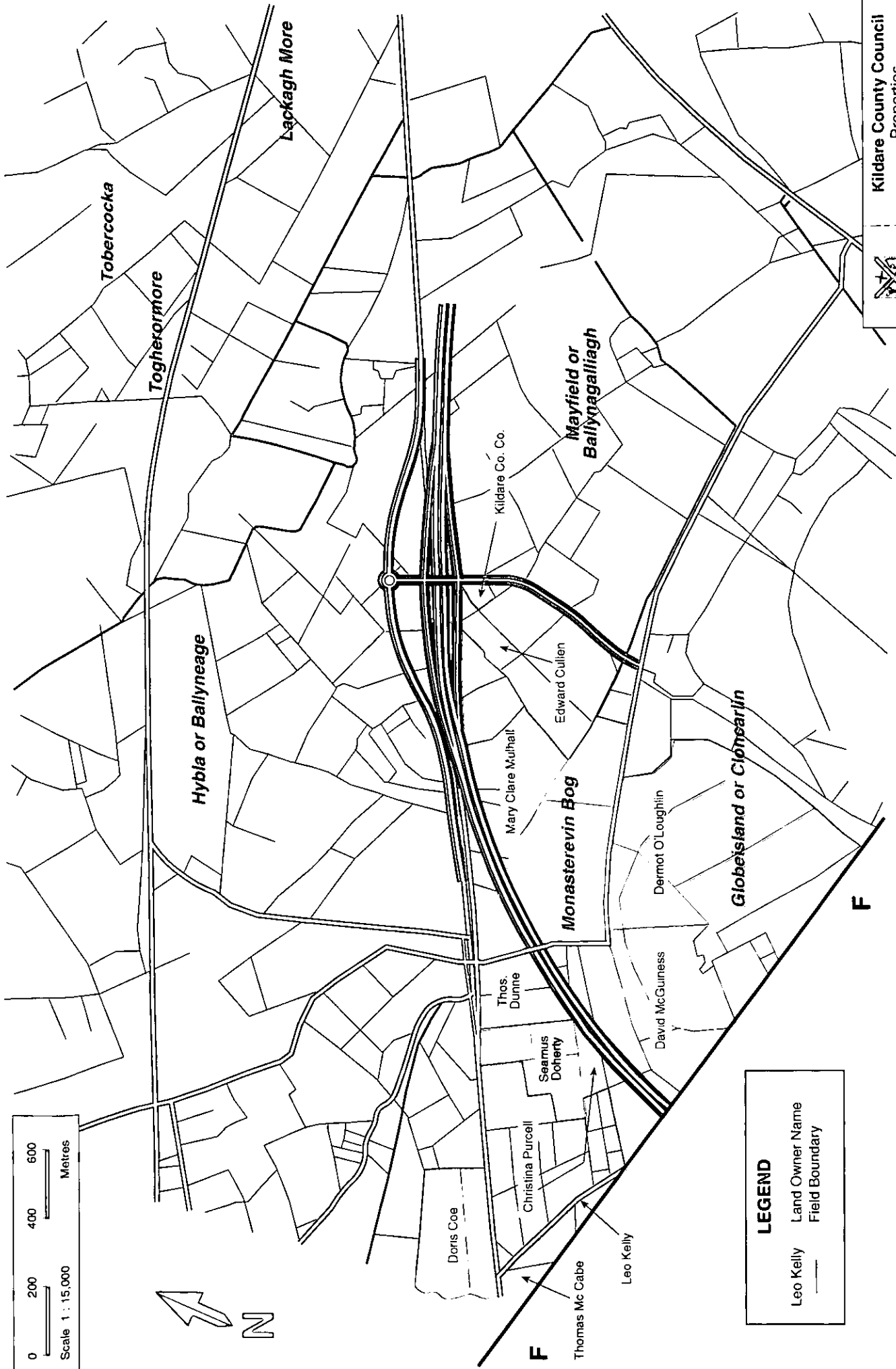
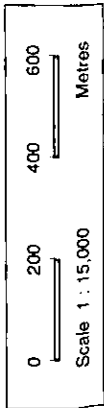
C. Noons

Land Owner Name

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Field Boundary



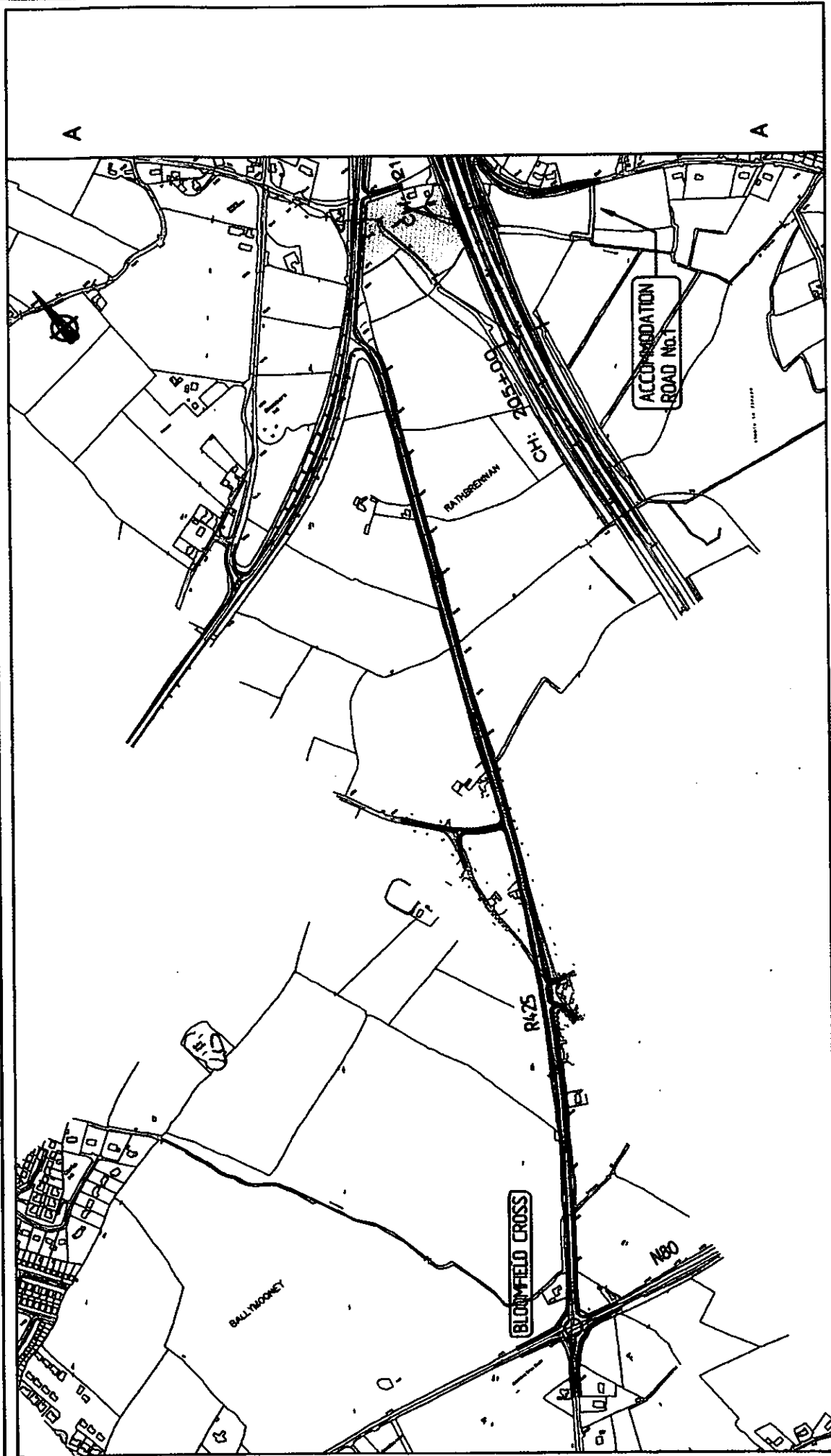



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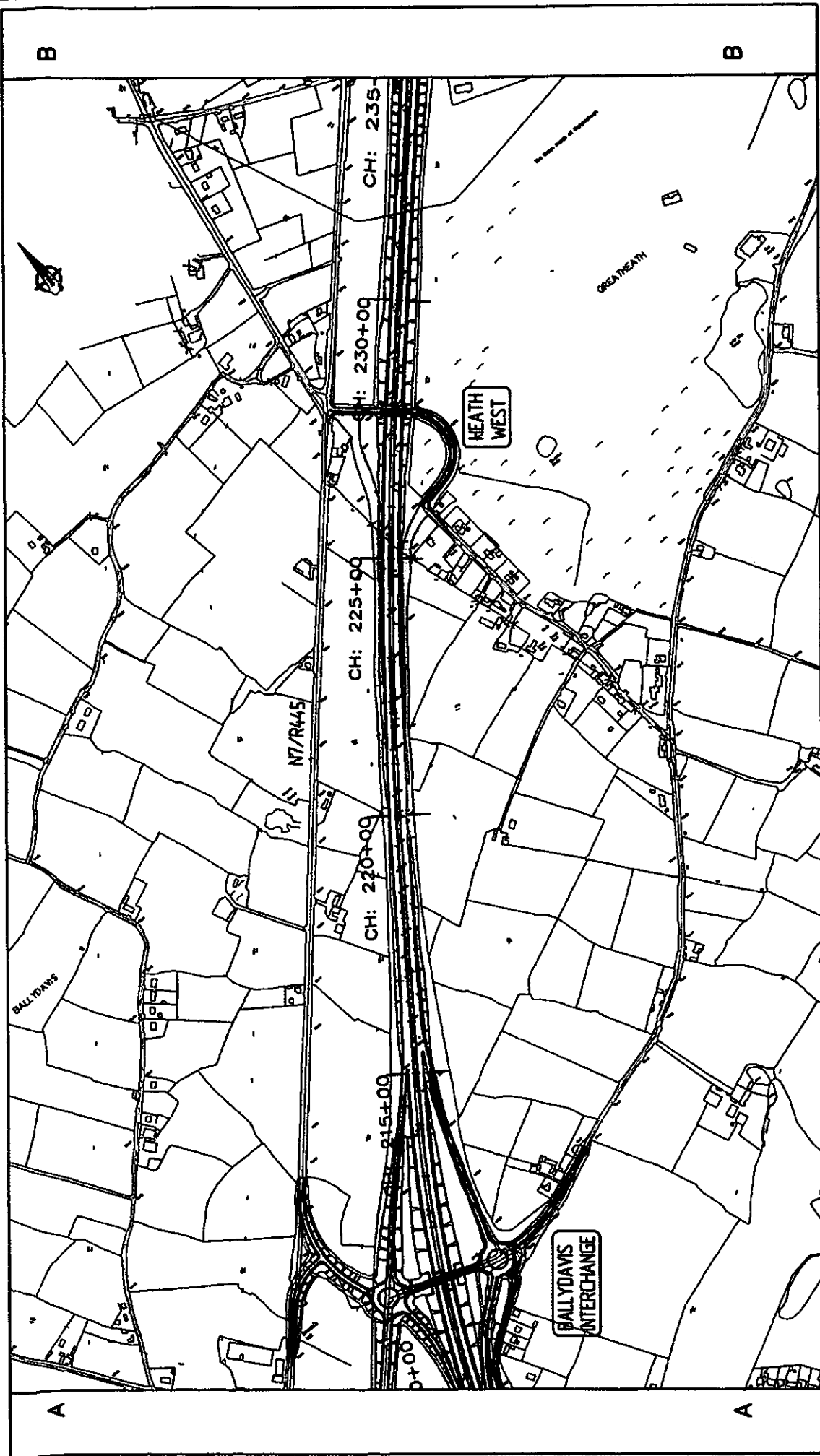
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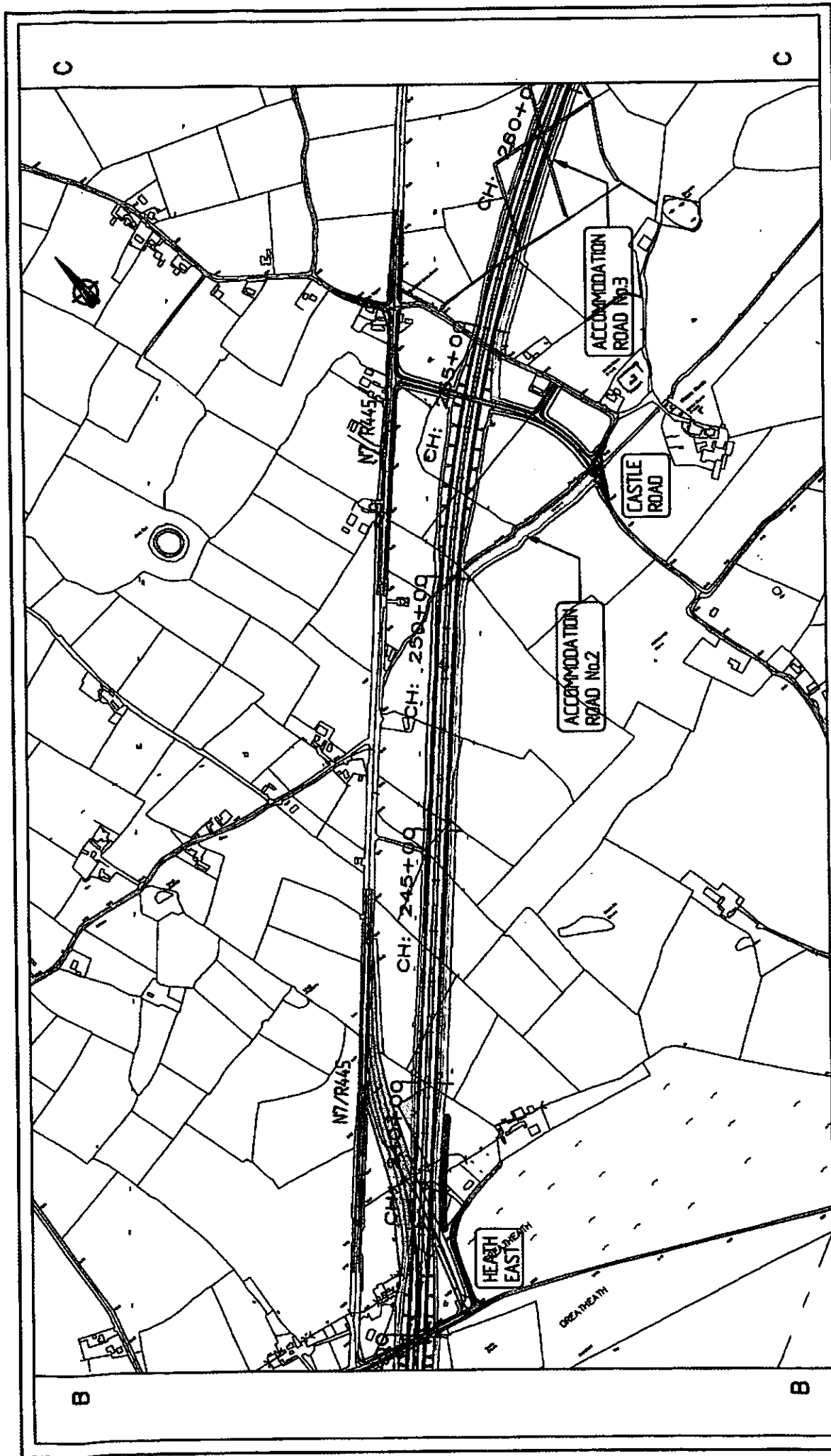
Kildare County Council
Properties
Job No 2126
Date Nov 1999
Figure P/06




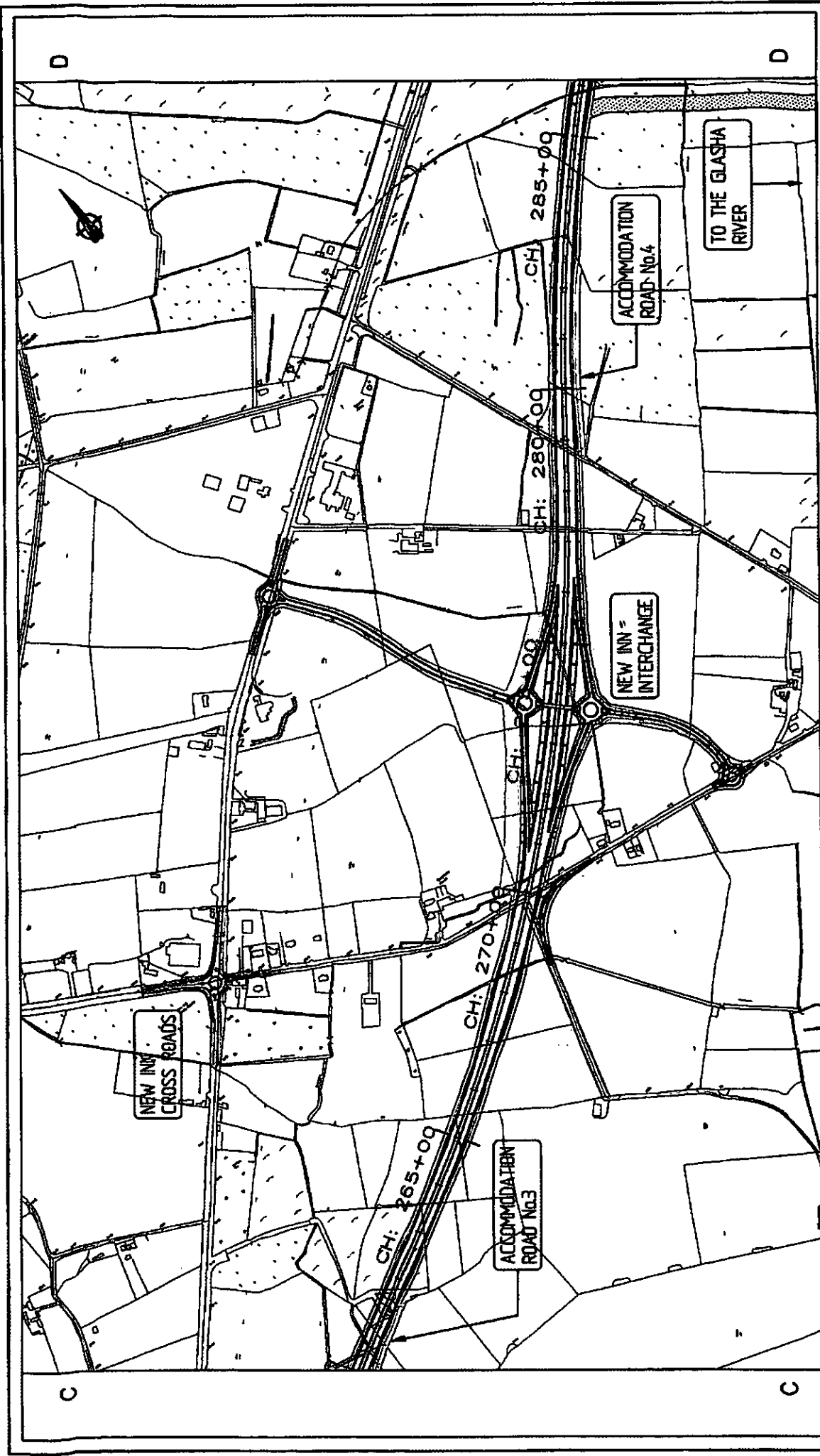
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		J. LYNCH BE, C.Eng, FIEI COUNTY ENGINEER	R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT SENIOR DESIGN ENGINEER		




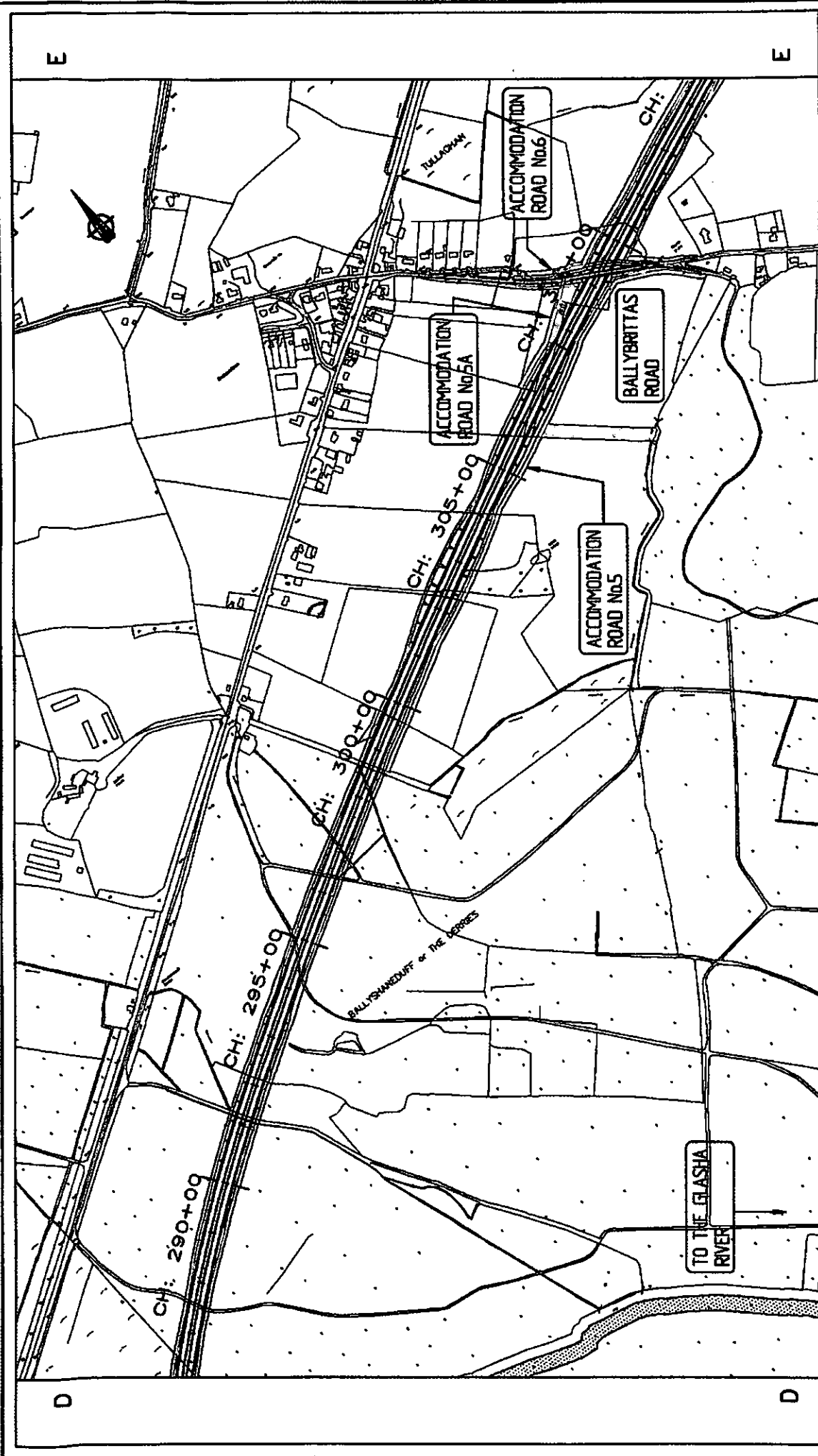
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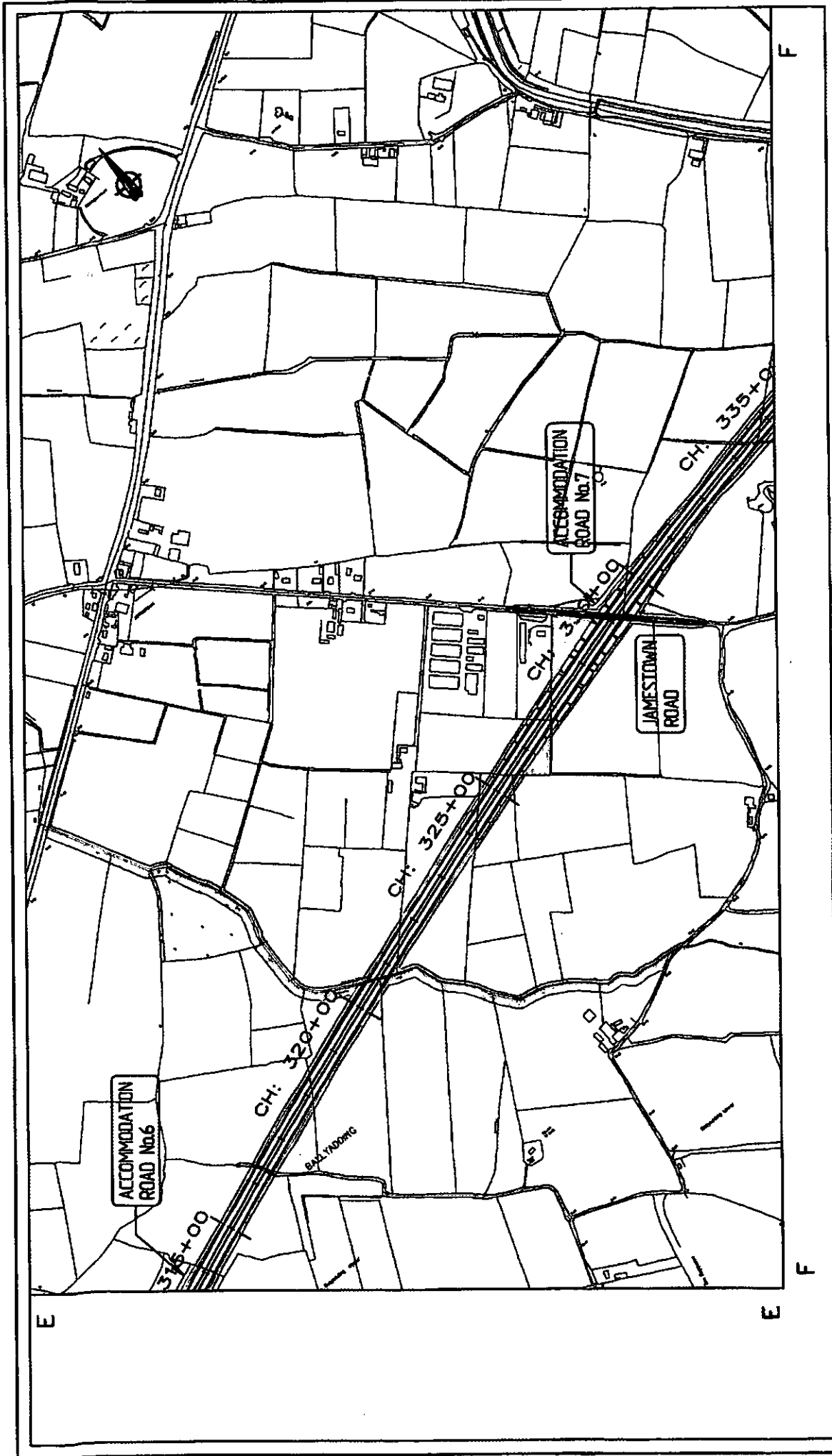
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	J. LYNCH BE, C.Eng, FIEI COUNTY ENGINEER	R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT SENIOR DESIGN ENGINEER		



	KILDARE COUNTY COUNCIL National Roads Design Office Maudlins, Neas, Co. Kildare		PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME		Drawing No.
	J. LYNCH BE, C.Eng, FIEI COUNTY ENGINEER		TITLE: PREFERRED ROUTE		PR04
	R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT SENIOR DESIGN ENGINEER		Scale: 1:10,000		Date: NOV. '99.



	KILDARE COUNTY COUNCIL National Roads Design Office Maudlins, Naas, Co. Kildare		PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME TITLE: PREFERRED ROUTE Scale: 1:10,000 Date: NOV. '99.	Drawing No. PR05
	J. LYNCH BE, C.Eng, FIEI COUNTY ENGINEER		R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT SENIOR DESIGN ENGINEER	



KILDARE COUNTY COUNCIL
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Maudlins, Naas, Co. Kildare

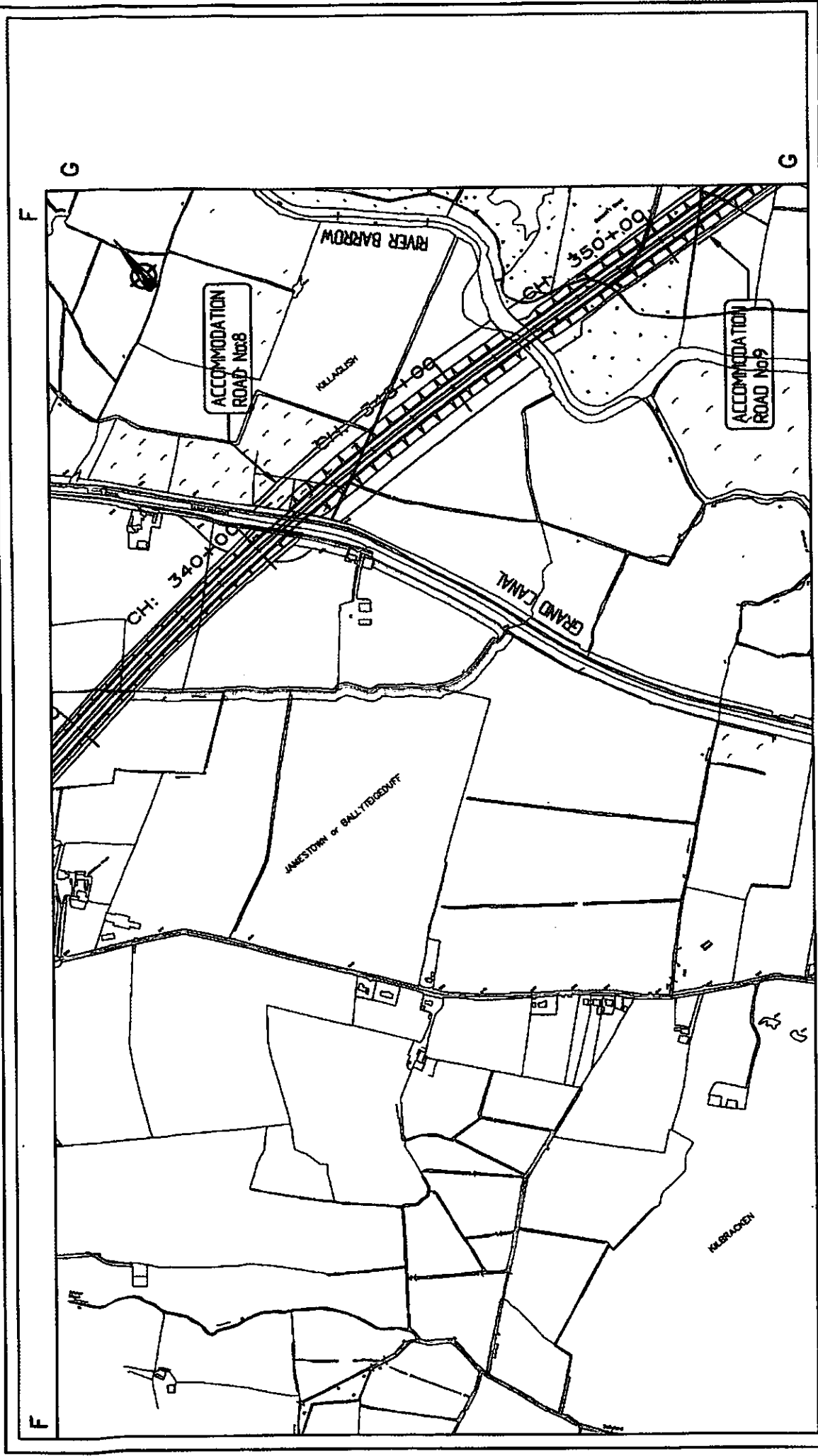
J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER


R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

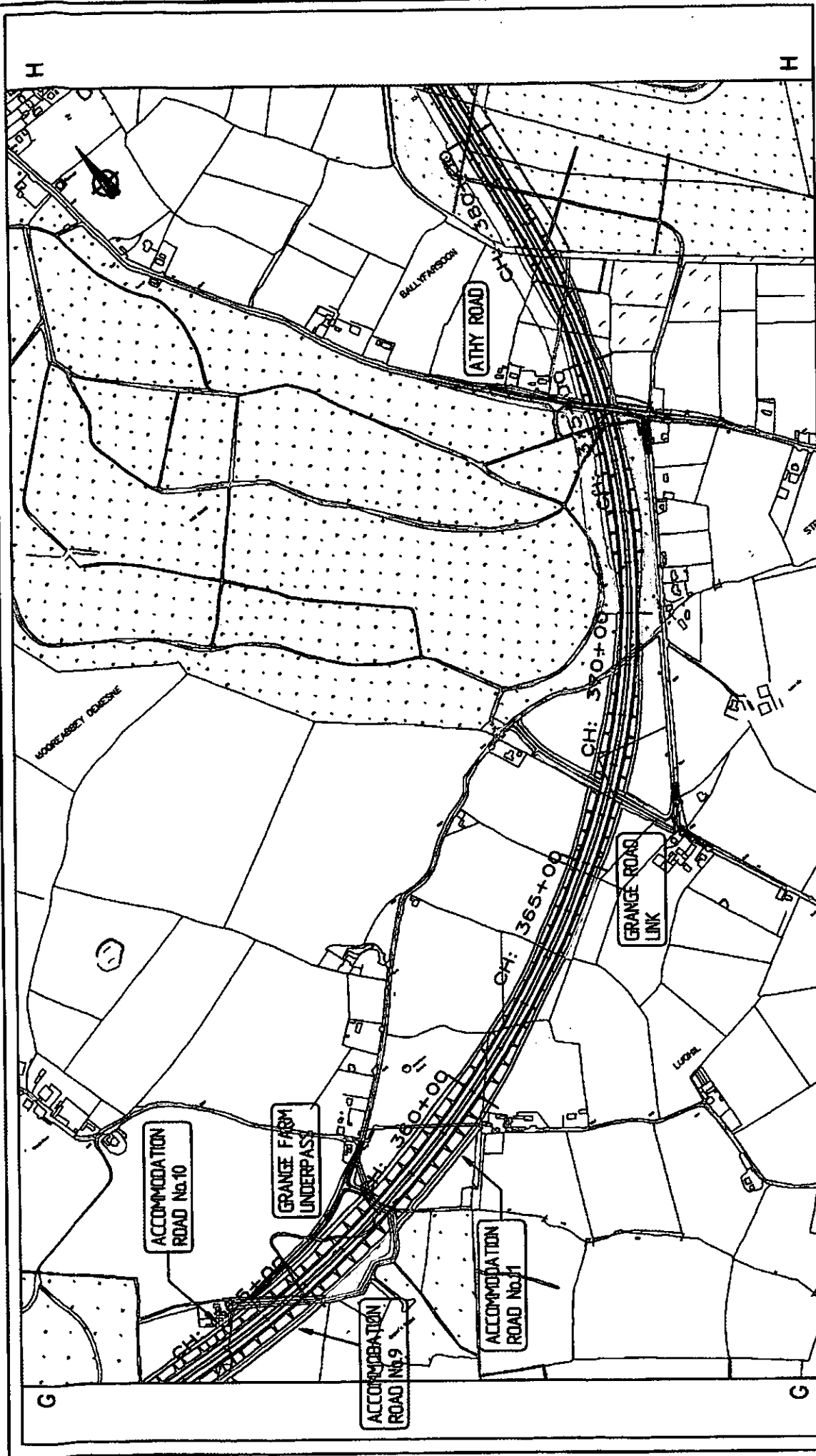
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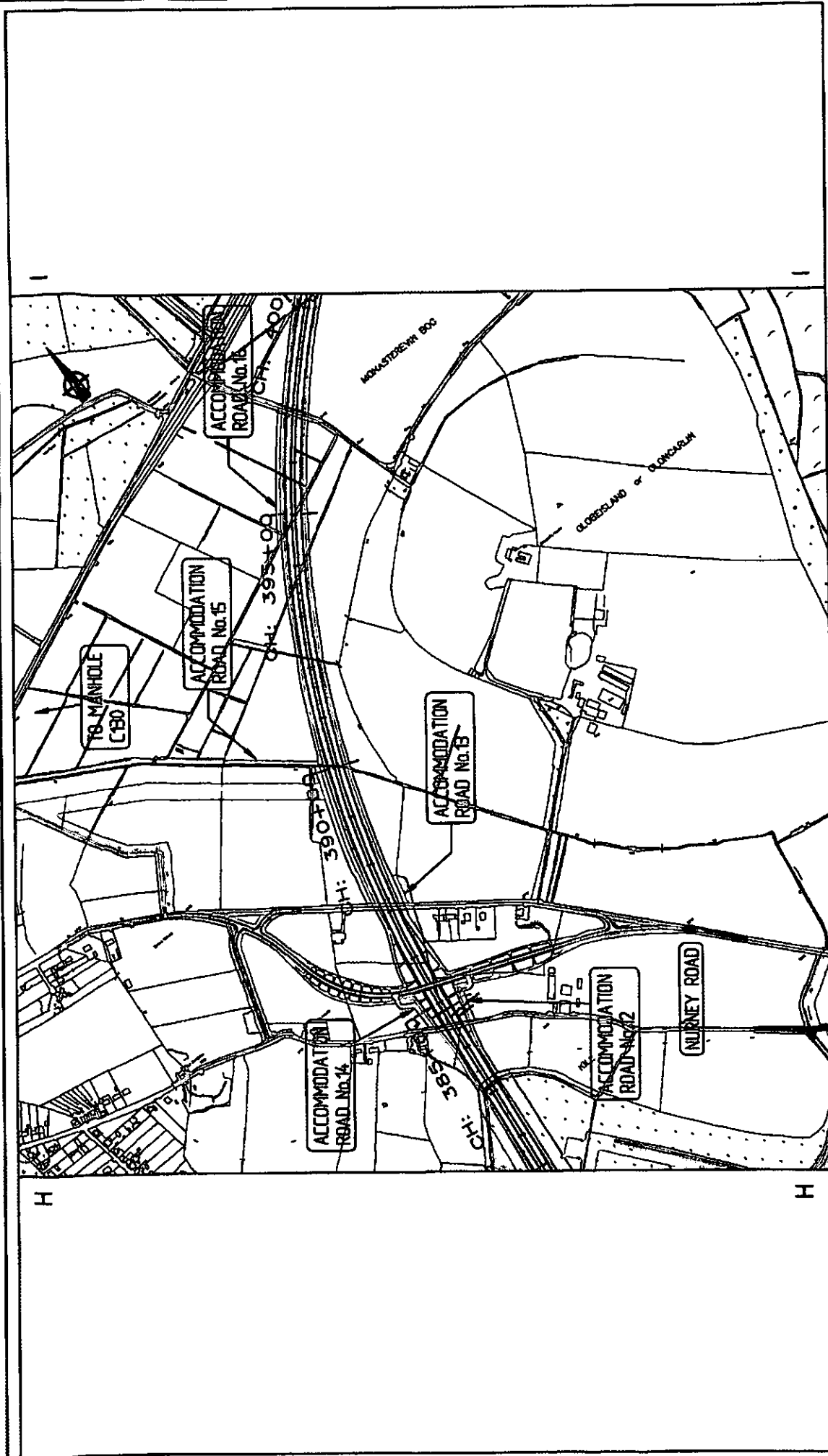
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PR06



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	J. LYNCH BE, C.Eng, FIEI COUNTY ENGINEER		R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT SENIOR DESIGN ENGINEER		



	KILDARE COUNTY COUNCIL National Roads Design Office Maudlin, Neas, Co. Kildare		PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME TITLE: PREFERRED ROUTE		Drawing No. PR08
	J. LYNCH BE, C.Eng. FIEI COUNTY ENGINEER	R.J. BURKE BE, MS, C.Eng. FIEI, MICE, MIHT SENIOR DESIGN ENGINEER	Scale: 1:10,000	Date: NOV. '99.	



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J. LYNCH BE, C.Eng, FIEI
COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

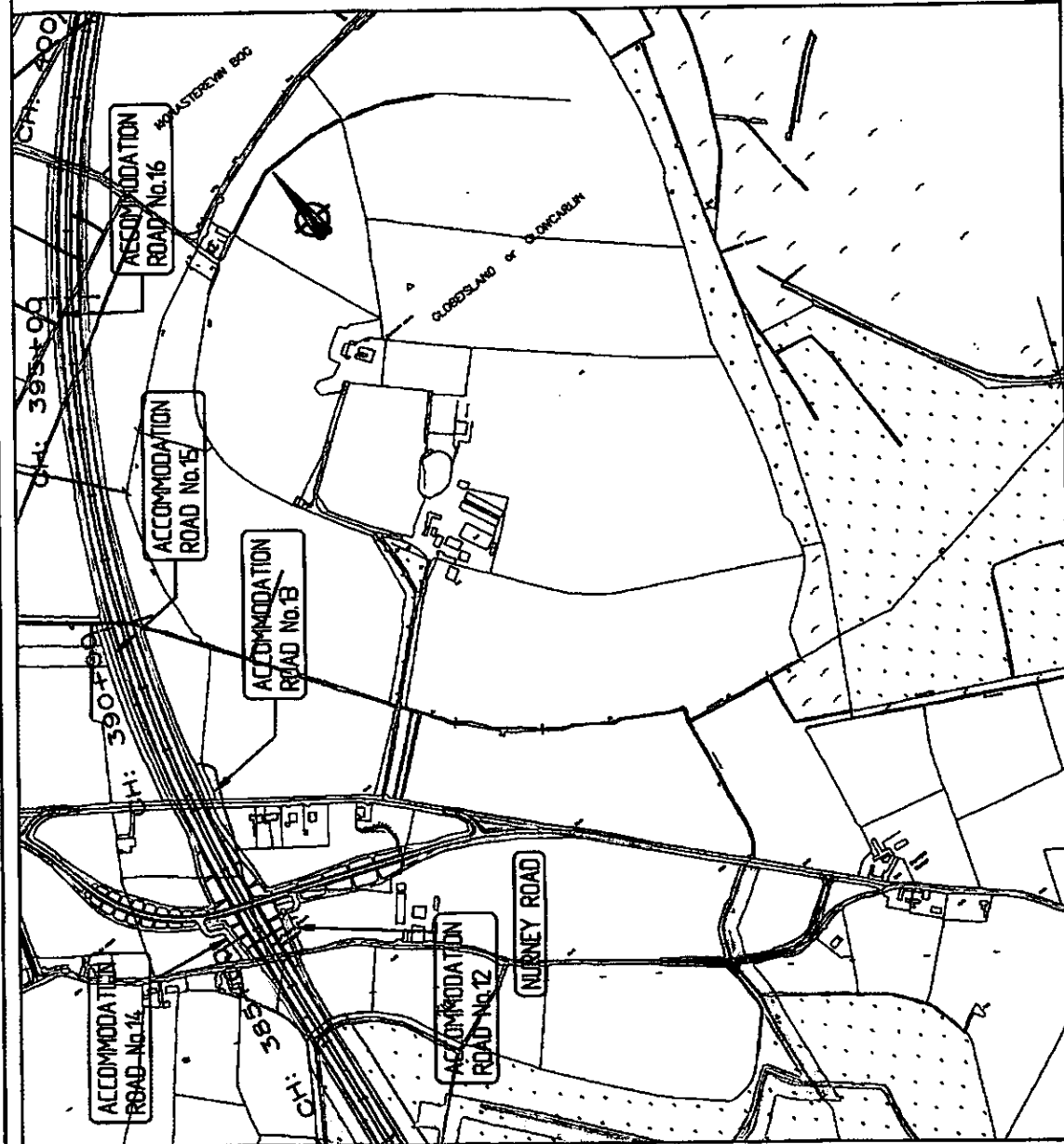
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Date: NOV. '99.

Drawing No.

PR09



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Maudlins, Naas, Co. Kildare

J. LYNCH BE, C.Eng, FIEI
 COUNTY ENGINEER

R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT
 SENIOR DESIGN ENGINEER

PROJECT: HEATH-MAYFIELD MOTORWAY SCHEME

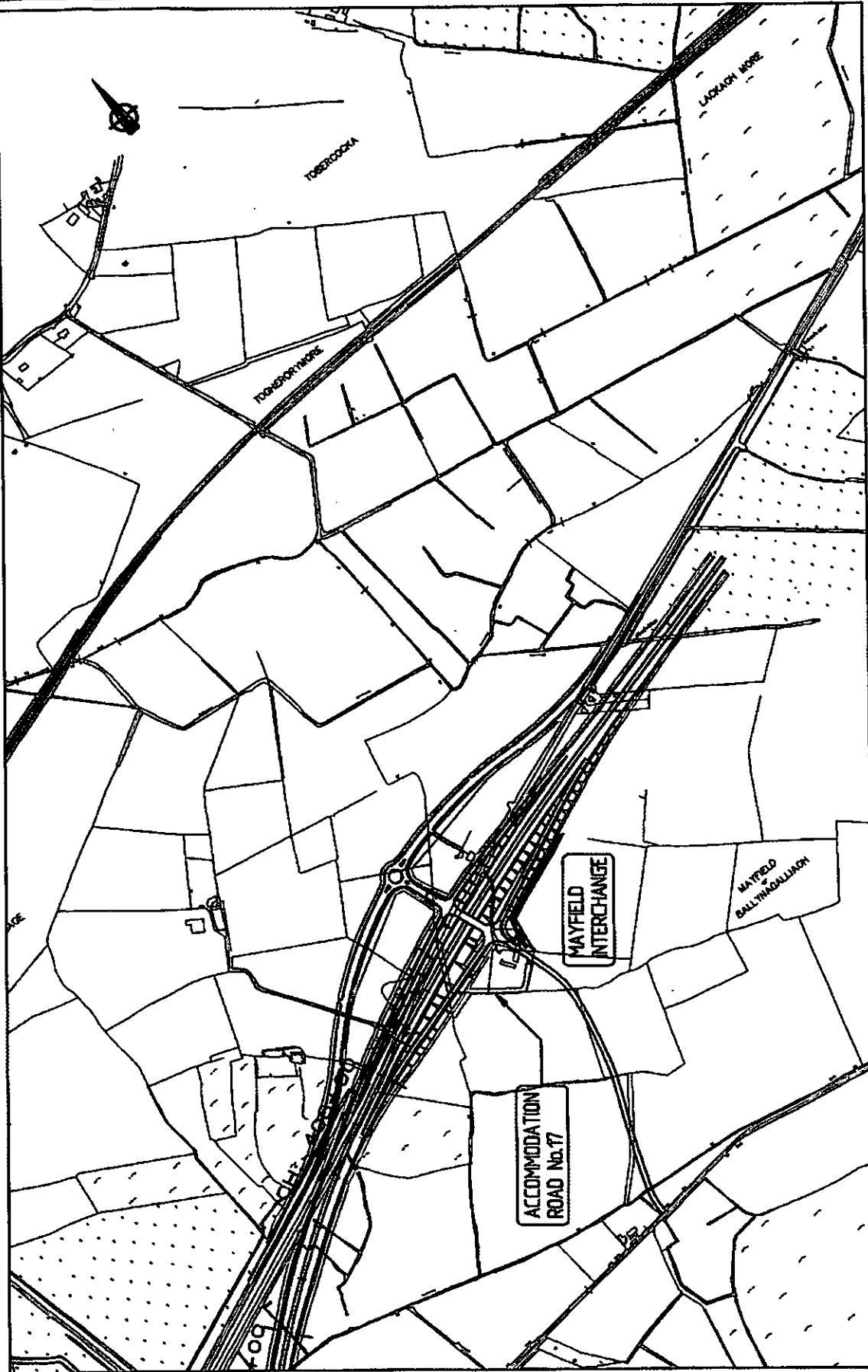
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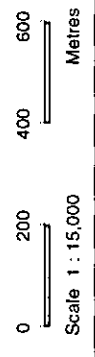



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J. LYNCH BE, C.Eng, FIEI		R.J. BURKE BE, MS, C.Eng, FIEI, MICE, MIHT		Date: NOV. '99.	
COUNTY ENGINEER		SENIOR DESIGN ENGINEER		Scale: 1:10,000	



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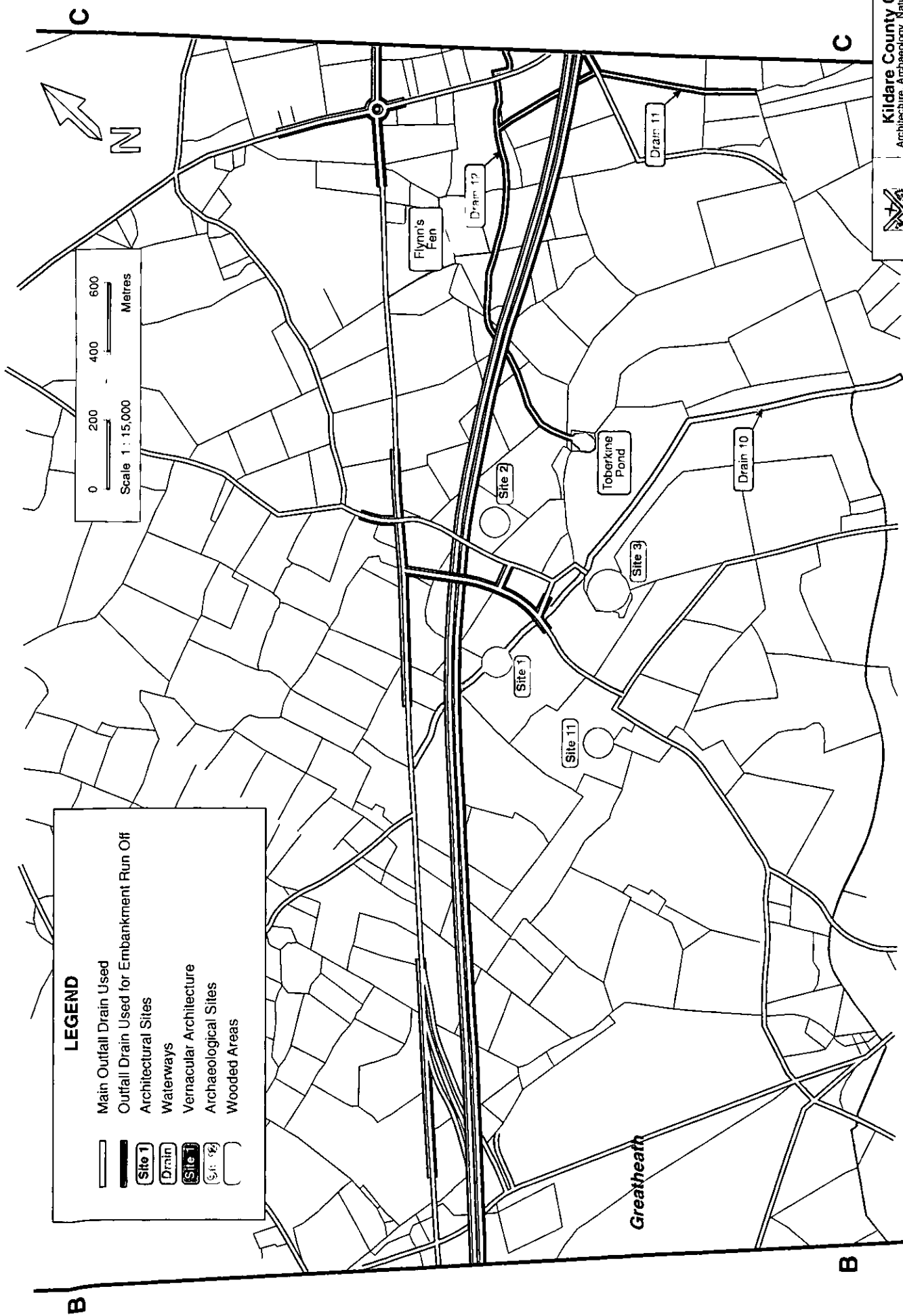
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- Outfall Drain Used for Embankment Run Off
- Architectural Sites
- Waterways
- Vernacular Architecture
- Archaeological Sites
- Wooded Areas



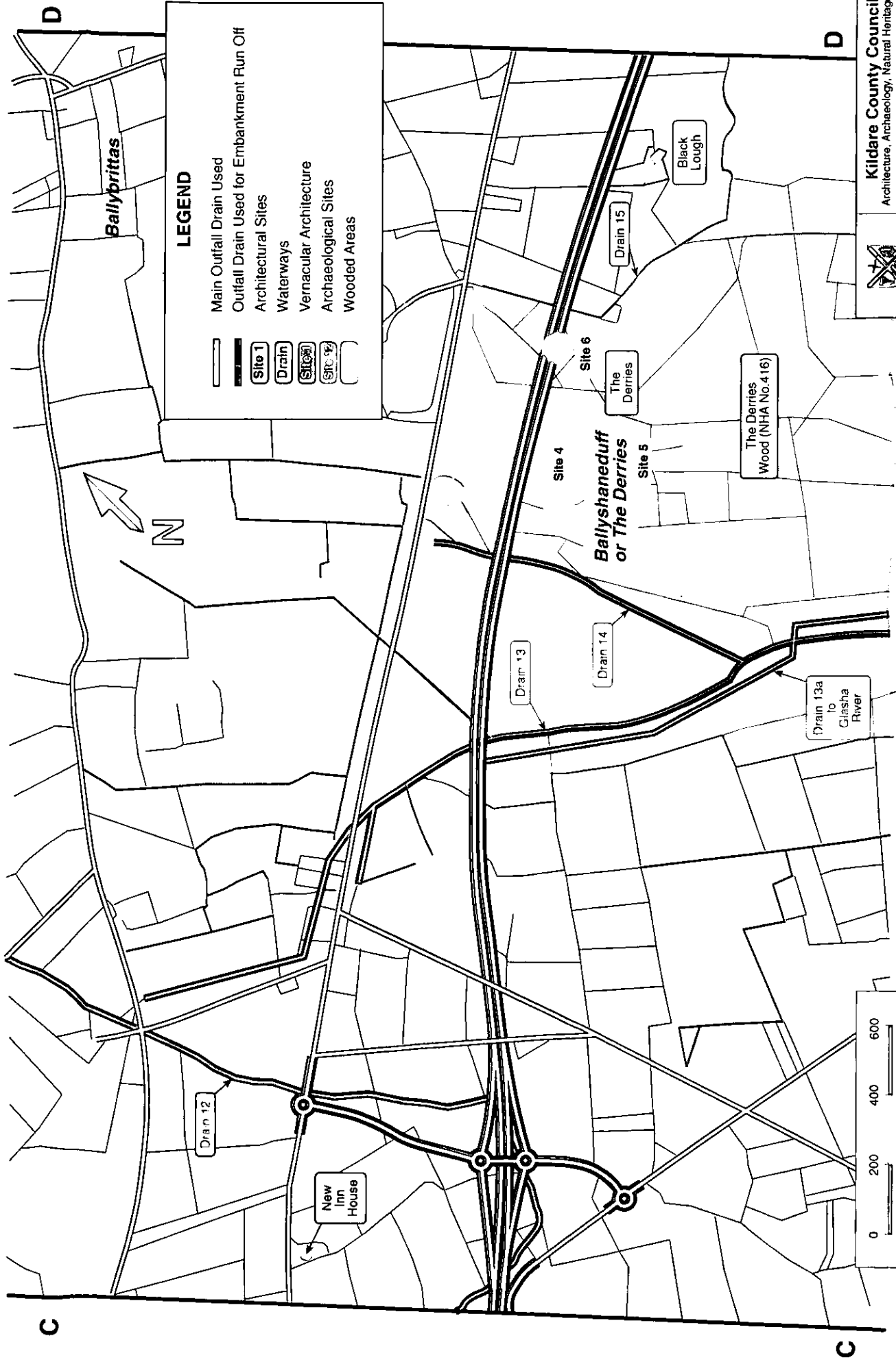


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Drainage Outfalls

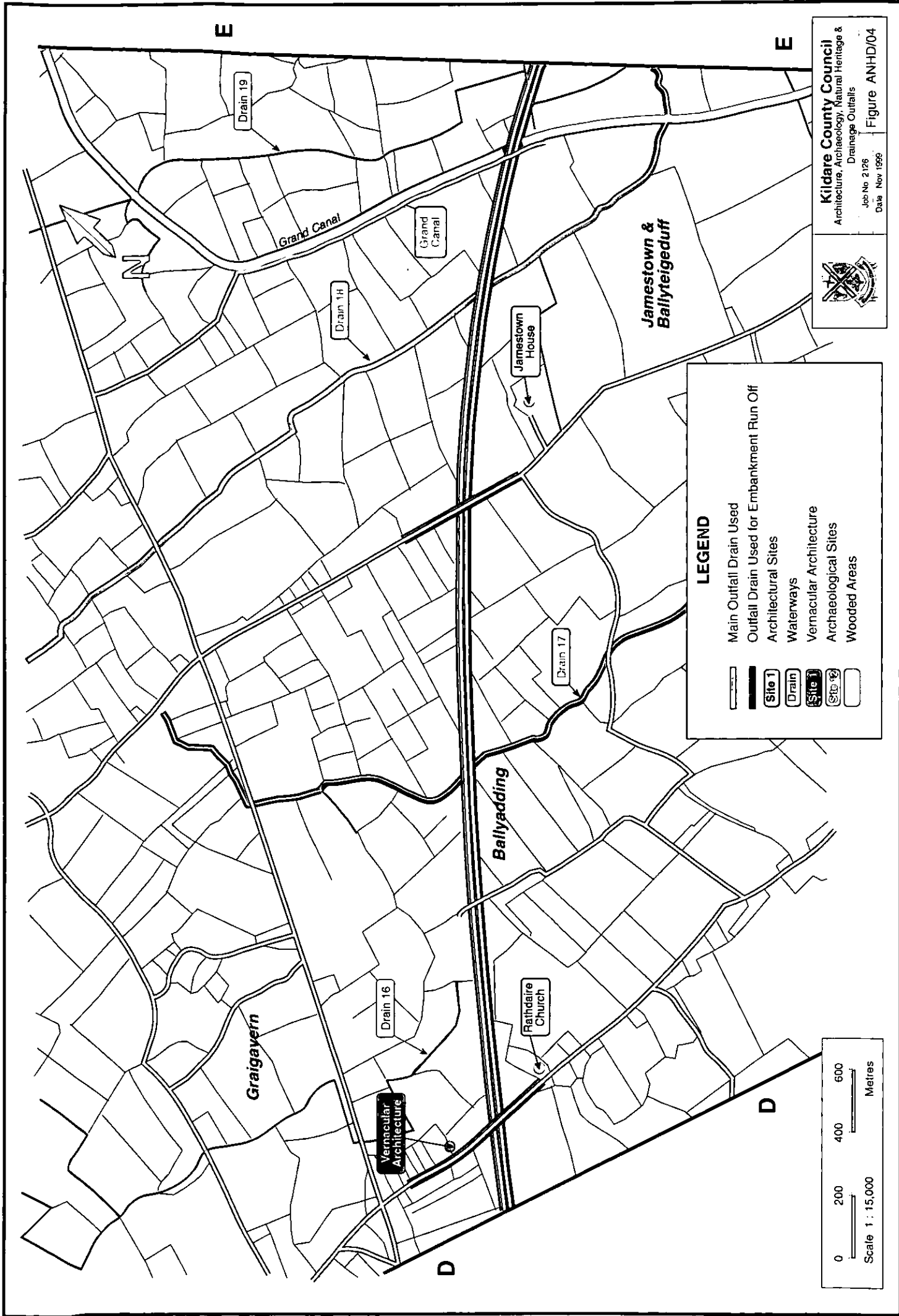
Job No 2126
Date Nov 1999
Figure ANHD/01



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 Drainage Outfalls
 Job No. 2126
 Date: Nov 1999
 Figure ANHD/02

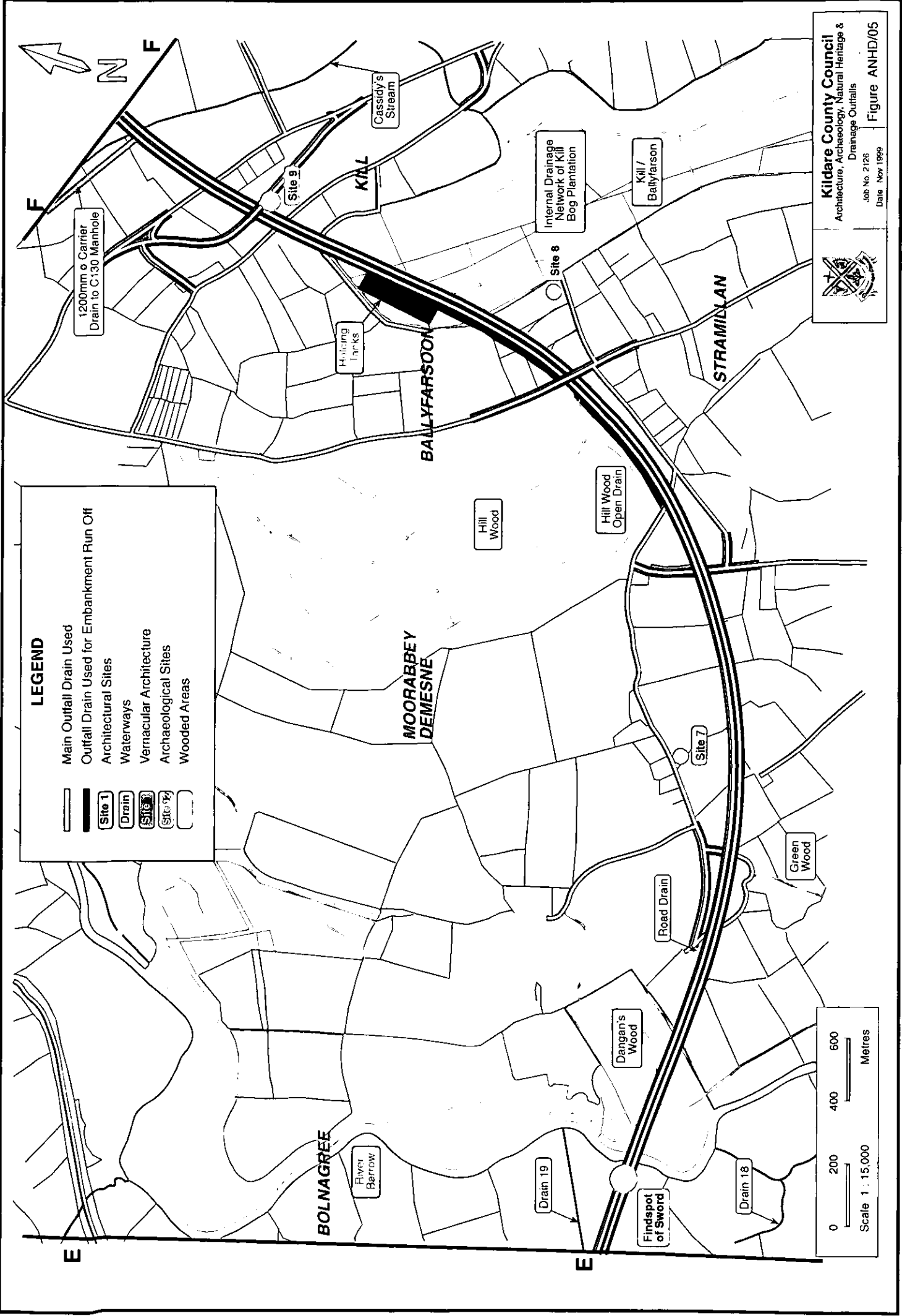


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 Job No. 2/26
 Date Nov 1999
 Figure ANHD/03



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 Drainage Outfalls
 Job No 2126
 Date Nov 1999
Figure ANHD/04






LEGEND

- Main Outfall Drain Used
- Outfall Drain Used for Embankment Run Off
- Architectural Sites
- Waterways
- Vernacular Architecture
- Archaeological Sites
- Wooded Areas

- Site 1
- Drain
- Site 2
- Site 3
- Site 4



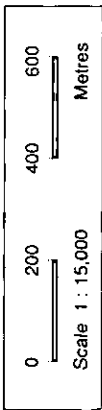
Kildare County Council
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Job No 2126
Date Nov 1999

Figure ANHD/05

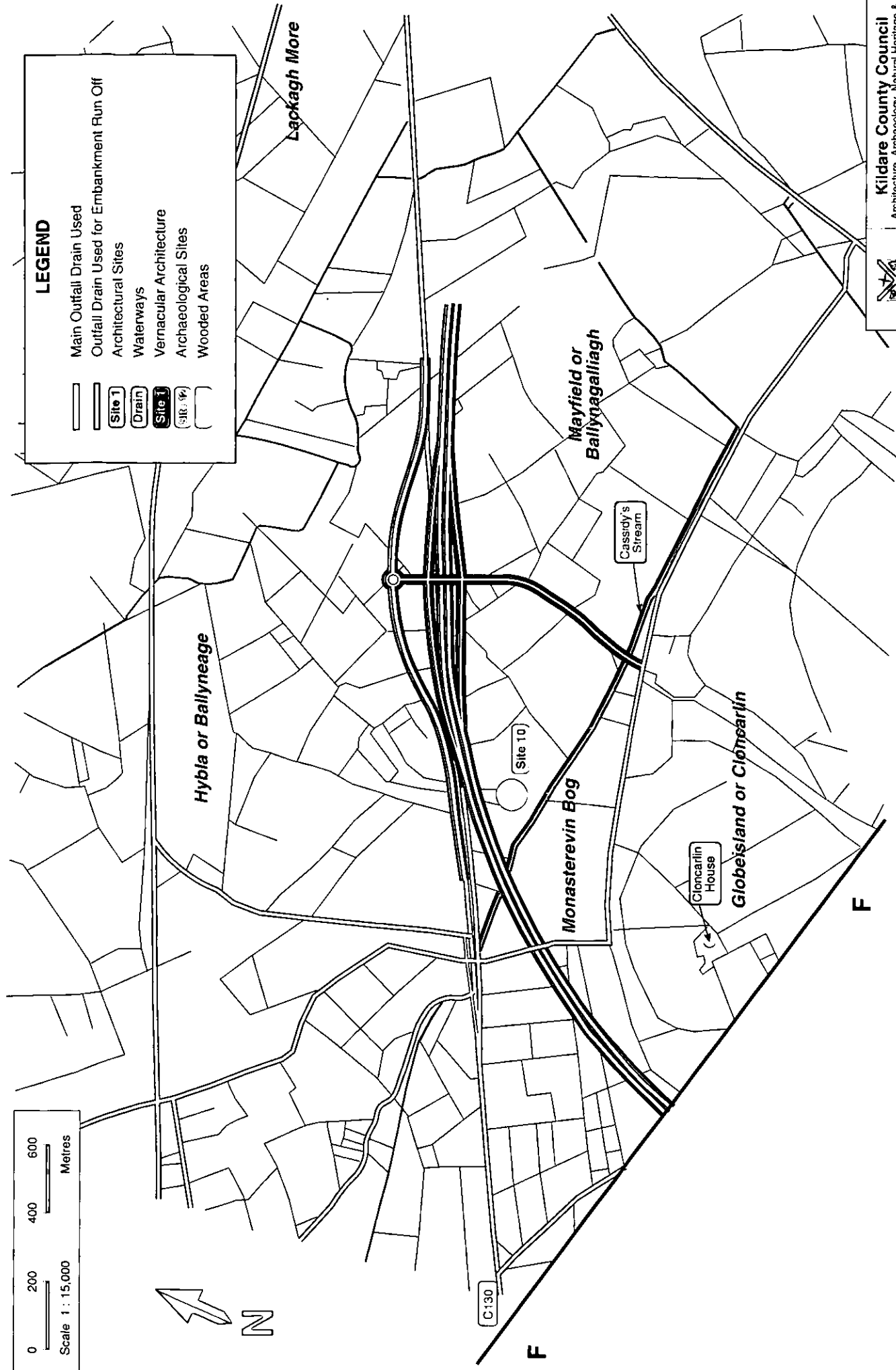
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LEGEND

- Main Outfall Drain Used
- Outfall Drain Used for Embankment Run Off
- Architectural Sites
- Waterways
- Vernacular Architecture
- Archaeological Sites
- Wooded Areas



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Date Nov 1999

Figure ANHD/06