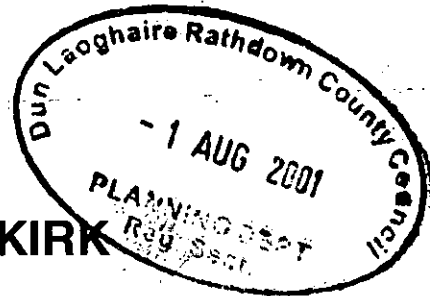


D01A/0693
1/8/01

**PROPOSED RESIDENTIAL DEVELOPMENT
ON LANDS AT WOODSIDE SANDYFORD,
COUNTY DUBLIN**

by

CANNON & KIRK



**ENVIRONMENTAL IMPACT
STATEMENT**

Prepared by



BRADY SHIPMAN MARTIN

July 2001



Comhairle Chontae Dhún Laoghaire - Ráth an Dúin

Halla an Chontae, Dun Laoghaire, Co. Átha Cliath

County Hall, Dun Laoghaire, Co. Dublin, Ireland

Tel: 00 353 1 205 4700

www.dlrccoco.ie

**Mr E. Brangan,
Inspector of Planning Research,
Department of the Environment,
Room 22,
Custom House,
Dublin 2.**

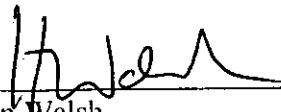
23rd August 2001.

Reg Ref: D01A/0693

Dear Sir,

Please find enclosed copy of the Environmental Impact Statement in regard to the above applications (see enclosed planning list extract). The cost to the public of the E.I.S & the non technical summary is £150 (including VAT @ 20%).

Yours faithfully


Helen Walsh.
Senior Staff Officer,
Extn 4510

Glas/sys/home/registry/Helen/jkohrs



Reg.Ref.	Date Received	Application Type
----------	------------------	---------------------

D01A/0693	01/08/01	Permission
-----------	----------	------------

LOCATION: Woodside Townland (Area 1), Sandyford, Co. Dublin.

PROPOSED DEVELOPMENT: 165 dwellings comprising of 50 houses (9 no. 4 bedroom 2 storey detached houses, 7 no. 4 bedroom 3.5 storey corner town houses, 20 no. 3 bedroom 2.5 storey terraced townhouses, 2 no. 4 bedroom 2.5 storey terraced townhouses, 4 no. 3 bedroom 2 storey terraced houses, 8 no. 4 bedroom 3.5 storey detached townhouses) and 115 apartments in 4 no. 3, 4 & 5 storey blocks comprising of (23 no. 2 bedroom ground floor apartments with communal entrance, 27 no. 2 bedroom first floor apartments with communal entrance, 24 no. 2 bedroom second floor apartments with communal entrance, 3 no. 2 bedroom second floor apartments with mezzanine and communal entrance, 22 no. 2 bedroom third floor apartments with mezzanine and communal entrance; 1 no. 2 bedroom third floor apartment with mezzanine and communal entrance, 3 no. 2 bedroom fourth floor apartments with communal entrance, 8 no. 2 bedroom fourth floor apartments with mezzanine and communal entrance, 2 no. own hall door; 1 bedroom ground floor apartments and 2 no. 2 bedroom own hall door duplex apartments with 1 bedroom in roof and roof terrace), the provision of underground and surface carparking, all associated on and off site development and ancillary works including outfall, foul and surface water sewers, landscaping, boundary treatment with 2 no. access points from the proposed Loop Distributor Road linking to the Enniskerry Road (Planning application Reg: Ref. D01A/0480) located to the south, all on site identified as Parcel 1 and part Parcel 2 (Phase 2) of the Stepside Area Action Plan. The total area of lands the subject of this application is circa 4.014 Ha (9.92 Ac.) of which circa 3.3 Ha. (8.154 Ac) is Parcel 1 (Phase 2) Residential Development and circa 0.714 Ha. (1.764 Ac.), comprising of Action Area Plan designated linear greenway open space and additional linear greenway (Part Parcel 2) linking Area 1 under proposed Loop Distributor Road to designated linear greenway open space to the south-east, all at Woodside Townland, Sandyford, Co. Dublin. An Environmental Impact Statement is being submitted to the Planning Authority with this application.

APPLICANT: Cannon and Kirk
Eden House,
Eden Quay, Dublin 1.

Reg. Ref.	Date Received	Application Type
-----------	---------------	------------------

D01A/0694	01/08/01	Permission
-----------	----------	------------

LOCATION: Existing "Foss" Site, Corrig Road, Sandyford Industrial Estate, Dublin 18.

PROPOSED DEVELOPMENT: Construction of a proposed new building and associated site works on the existing Foss site, Corrig Road, Sandyford Industrial Estate. The proposed development will comprise of 3,521 metres squared of Science and Technology and Office Based Industries, Telemarketing, Data Processing, Software development and Information Technology uses, including associated offices. The proposed development includes a new vehicular access on to Corrig Road and 71 no. car parking spaces located in the basement. Permission includes demolition of existing Foss building.

APPLICANT: Profile Properties
49 Upper Mount Street, Dublin 2.

D01A/0695	02/08/01	Permission
-----------	----------	------------

LOCATION: Rear of 52 Upper George's Street, Dun Laoghaire, Co. Dublin.

PROPOSED DEVELOPMENT: Alterations to approved planning permission (reg. ref. D00A/0817). Change of use of ground floor from office to car parking, addition of second storey office, glazed roof to courtyard and alterations to laneway facade to the rear.

APPLICANT: Peter Cashin
52 Upper George's Street,
Dun Laoghaire,
Co. Dublin.

D01A/0696	02/08/01	Permission
-----------	----------	------------

LOCATION: Rear of 52 Upper George's Street, Dun Laoghaire, Co. Dublin.

PROPOSED DEVELOPMENT: Alterations to approved planning permission (reg. ref. D00A/0817) consisting of a glazed roof to courtyard, roof lights and alterations to laneway facade to the rear.

APPLICANT: Peter Cashin
52 Upper George's Street, Dun Laoghaire, Co. Dublin.

PROPOSED DEVELOPMENT

Permission sought for the construction of a residential development consisting of 165 dwellings comprising of 50 houses: 9 no. 4 bedroom 2 storey detached houses, 7 no. 4 bedroom 3.5 storey corner townhouses, 20 no. 3 bedroom 2.5 storey terraced townhouses, 2 no. 4 bedroom 2.5 storey terraced townhouses, 4 no. 3 bedroom 2 storey terraced houses, 8 no. 4 bedroom 3.5 storey detached townhouses) and 115 apartments in 4 no. 3, 4 & 5 storey blocks comprising of :23 no. 2 bedroom ground floor apartments with communal entrance, 27 no. 2 bedroom first floor apartments with communal entrance, 24 no. 2 bedroom second floor apartments with communal entrance, 3 no. 2 bedroom second floor apartments with mezzanine and communal entrance, 22 no.2 bedroom third floor apartments with mezzanine and communal entrance, 1 no. 2 bedroom third floor apartment with mezzanine and communal entrance 3 no. 2 bedroom fourth floor apartments with communal entrance, 8 no.2 bedroom fourth floor apartments with mezzanine and communal entrance, 2 no. own hall door, 1 bedroom ground floor apartments and 2 no. 2 bedroom own hall door duplex apartments with 1 bedroom in roof and roof terrace), the provision of underground and surface carparking, all associated on and off site development and ancillary works including outfall, foul and surface water sewers, landscaping, boundary treatment with 2 no. access points from the proposed Loop Distributor Road linking to the Enniskerry Rd.(Planning application Reg. Ref. D01A/0480) located to the south, all on site identified as Parcel 1 and part Parcel 2 (Phase 2) of the Stepside Area Action Plan.

The total area of lands the subject of this application is circa 4.014 Ha. (9.92 Ac.) of which circa 3.3 Ha. (8.154 Ac) is Parcel 1 (Phase 2) Residential Development and circa 0.714 Ha. (1.764 Ac.), comprising of Action Area Plan designated linear greenway open space and additional linear greenway (Part Parcel 2) linking Area 1 under proposed Loop Distributor Road to designated linear greenway open space to the south-east, all at Woodside Townland, Sandyford, Co. Dublin.

An Environmental Impact Statement is being submitted to the Planning Authority with this application. The Environmental Impact Statement and any further information in relation to the proposed development furnished to the Planning Authority in the course of the consideration of the application by Dun Laoghaire-Rathdown Co. Co. is available for inspection at the offices of the Planning Authority, County Hall, Dun Laoghaire, Co. Dublin

For Cannon & Kirk



BRADY SHIPMAN MARTIN

July 2001

TABLE OF CONTENTS

1.	INTRODUCTION	1.1 - 1.3
2.	NON-TECHNICAL SUMMARY	2.1 - 2.6
3.	DESCRIPTION OF SCHEME	3.1 - 3.5
4.	PLANNING & DEVELOPMENT CONTEXT	4.1 - 4.6
5.1	HUMAN BEINGS	5.1.1 - 5.1.7
5.2	FLORA & FAUNA	5.2.1 - 5.2.15
5.3	SOIL	5.3.1 - 5.3.2
5.4	WATER	5.4.1 - 5.4.10
	5.4.1 Surface Water	
	5.4.2 Foul Water	
	5.4.3 Potable Water	
5.5	AIR	5.5.1 - 5.5.16
	5.5.1 Air Quality	
	5.5.2 Odour	
	5.5.3 Noise	
5.6	CLIMATE	5.6.1 - 5.6.4
5.7	LANDSCAPE	5.7.1 - 5.7.4
5.8	MATERIAL ASSETS - TRAFFIC	5.8.1 - 5.8.6
5.9	CULTURAL HERITAGE	5.9.1 - 5.9.9
6.0	INTERACTION OF THE FOREGOING	6-1

List of Illustrations, Photographs and Plates

Fig 3.1	Planning Context
Fig 3.2	Proposed Development for Parcel 1
Fig 3.3	Typical Unit Detail
Fig 3.4	Typical Unit Detail
Fig 3.5	Typical Unit Detail
Fig 5.2.1	Nature Conservation Designations
Fig 5.2.2	Habitat Assessment & Signs of Mammals
Fig 5.4.1	Site Services Schematic
Fig 5.5.3.1	Noise Measurement Locations
Fig 5.7.1	Landscape Planning Context
Fig 5.7.2	Landscape Masterplan
Photo Sheet 5.7.1	Photos 1 – 4
Photo Sheet 5.7.2	Photos 5 - 7
Fig 5.8.1	Site Location and Access
Fig 5.8.2	Peak Hour Traffic Flows
Fig 5.9.1	Extract from OS Discovery Series Sheet No. 50
Fig 5.9.2	Extract from Archaeological Constraint Map
Fig 5.9.3	Extract from 1 st Edition OS Map, Sh 22 & 25
Fig 5.9.4	Extract from Rocque's Map of Co. Dublin
Fig 5.9.5	Composite drawing showing Parcels 1 and 6
Fig 5.9.6	Reduced extract from the First Edition Ordnance Survey Map 1836 – 37 showing route of Pale Ditch
Plate 5.9.1	Aerial Photograph, 6899 OSI, 1982
Plate 5.9.2	Aerial Photograph, 8736 OSI7, 1997

1 INTRODUCTION

The Proposed Development

1.1 The applicant, Cannon & Kirk, is applying to Dun Laoghaire-Rathdown County Council for planning permission for a residential development on approximately 4.014 hectares (9.92 acres) at Woodside, Sandyford. The proposal, which represents the second phase of development within an overall holding of 25.6 hectares (63.2 acres), is located in an area indicated as 'Parcel 1' on the Dun Laoghaire-Rathdown, Stepside Action Area Plan, 2000. The application area will be accessed off the loop distributor road applied for under Parcel 6 application (See Planning Ref: D01A/0480).

1.2 The Phase 2 application to Dun Laoghaire-Rathdown County Council is for full planning permission for the construction of 165nr residential units on 3.3 hectares (8.154 acres) of the application site as follows:

50 houses and 115 apartments comprising:

- 9 no. 4 bedroom 2 storey detached houses,
- 7 no. 4 bedroom 3.5 storey corner townhouses,
- 20 no. 3 bedroom 2.5 storey terraced townhouses,
- no. 4 bedroom 2.5 storey terraced townhouses,
- no. 3 bedroom 2 storey terraced houses,
- 8 no. 4 bedroom 3.5 storey detached townhouses,
- 23 no. 2 bedroom ground floor apartments,
- 27 no. 2 bedroom first floor apartments,
- 24 no. 2 bedroom second floor apartments,
- no. 2 bedroom second floor apartments with mezzanine,
- 22 no.2 bedroom third floor apartments with mezzanine,
- 1 no. 2 bedroom third floor apartment with mezzanine
- 3 no. 2 bedroom fourth floor apartments,
- 8 no.2 bedroom fourth floor apartments with mezzanine,
- 2 no. own hall door, 1 bedroom ground floor apartments and
- 2 no. 2 bedroom own hall door duplex apartments with 1 bedroom in roof and roof terrace,
- 247 nr car parking spaces.
- Associated landscaping and site works.

A detailed description of the proposal is given in Chapter 3.

Requirement For Environmental Impact Assessment

- 1.5 Environmental Impact Assessment (EIA) involves a systematic examination of the likely effects of a proposed development or project on the environment, and the incorporation of that examination into the decision-making process. The purpose of EIA is to ensure that adequate consideration is given to environmental matters in the taking of decisions on major developments.
- 1.6 A key element of the Environmental Impact Assessment procedure is the preparation of an Environmental Impact Statement (EIS). The statement sets out the likely significant effects of the proposal on the environment. The EIS is submitted with the planning application to the 'Competent Authority', Dun Laoghaire-Rathdown County Council, for assessment and inclusion in the decision-making process.
- 1.7 The EIA procedure also allows for public participation through response to the Environmental Impact Statement, which must be made available to the public. Their responses must be taken into account, along with the EIS, when the decision on the proposal is taken.
- 1.8 Environmental Impact Assessment (EIA) procedures are required for certain types and scales of development, set out in the European Directive (85/337/EEC) amended by the Council Directive 97/11/EC and effected by the Statutory Regulations in Ireland (S.I. no's 92 and 93 of 1999 and S.I. no. 349 of 1989). Schedule 1 of the 1999 Regulations (SI No. 93 of 1999) specifies development to which EIA applies and for which an EIS is required.
- 1.9 Item 10 of Part II of the First Schedule sets out the various thresholds for infrastructural projects. Part (b) (i) of Item 10 specifies:
- 'construction of more than 500 dwelling units'*
- 1.10 The proposed development at 165 units is substantially below the threshold for an EIS however, given that the application represents the second phase of a development likely to provide in the order of 900 units it is considered appropriate to carry out an environmental impact assessment of the proposed development and the cumulative effects of the wider development of the entire land holding.

EIS Study Team

- 1.11 Brady Shipman Martin, Planning, Environmental and Landscape Consultants, were appointed to prepare and co-ordinate the Environmental Impact Statement for the proposal. Brady Shipman Martin has been assisted by a number of specialist consultants in the preparation of the EIS as follows:

EIS Contributors

Human Beings	Population, Employment, Community Aspects	Brady Shipman Martin
Flora and Fauna		K T Cullen & Co.
Soil	Soils / Geology	Burroughs Consulting Engineers
Water	Foul Water Drainage Surface Water Drainage Water Supply	Burroughs Consulting Engineers
Air	Noise & Vibration	Eanna O'Kelly & Associates
Climate	Air Quality	Don Menzies & Associates
Landscape	Landscape Character Visual Impact	Brady Shipman Martin
Material Assets	Traffic	Burroughs Consulting Engineers
Cultural Heritage	Archaeology	Archaeology Technology Ltd.
Interaction of the Foregoing		All

- 1.12 Ian Darby Partnership, Architects with Terry O'Flanagan, Engineers, have designed and laid out the proposed residential development and the loop distributor road.
- 1.13 Some of the figures and maps accompanying this Environmental Impact Statement are reproduced from and based on the Ordnance Survey by permission of the Government - Licence No. AR 0001301.

2 NON-TECHNICAL SUMMARY

Introduction

- 2.1 Cannon & Kirk is making an application to Dun Laoghaire Rathdown County Council for full planning permission for the construction of 165 residential units and associated landscaping and site works on a 4.014 hectare (9.92 acre) site at Woodside, Sandyford County Dublin.
- 2.2 The site is bounded by open agricultural land to the east, the Sandyford Stream directly to the north-west, the Enniskerry R117 Road to the west and open agricultural lands, including the Ballyogan (Kilgobbin) Stream further to the south. Excluding provision towards principal open space requirements, the proposed density for the Phase 2 application is 50 residential units per hectare (20 per acre). This figure is in accordance with Table 24.1 Proposed Development Parcels – Net Site Areas and Possible House Numbers as set out in the Stepside Action Area Plan. Continued phased development of the overall land holding is expected to provide in the order of 900 residential units. (calculated at a density of 50 units per hectare (20 per acre)).
- 2.3 The proposal is assessed in the context of the statutory planning framework for the area. This includes an evaluation of the proposal in terms of the aims, objectives and policies; land use zonings and development standards of the Dun Laoghaire Rathdown County Council Development Plan 1998, the Stepside Action Area Plan, 2000 together with various regional and national strategies. It is considered that the proposal is fully in compliance with the zoning, policies and objectives of national, regional and local planning objectives including the County Development Plan 1998 and the Stepside Action Area Plan 2000.

Impacts of the development

- 2.4 The positive and negative impacts of the proposal on human beings, flora and fauna, soil, water, air, climate, landscape, material assets and cultural heritage and any interactions are examined with reference to:
- The receiving environment;
 - An assessment of the potential impact;
 - Proposed mitigation measures;
- 2.5 A brief outline of the impacts on, and the proposed mitigation measures for the various elements of the environment are summarised in Table 2.1.

Human Beings

- 2.6 Human beings form one of the most important aspects of the environment. The proposed development will provide a variety of housing types to meet the demand for housing from all sectors of society. Such a mix of residential units will help create a balanced socio-economic profile in the area.
- 2.7 The provision of 165 residential units in the area conforms to the Strategic Planning Guidelines for the Greater Dublin Area and Dun Laoghaire Rathdown County Council policies for the area. The development will provide accommodation for approximately 545nr people (based on an average household size of 3.3 persons) and is seen as being essential to meet the future housing requirements for the area.

Flora and Fauna

- 2.8 The proposed development site is currently used as pitch and putt courses and the habitats occurring on the site reflect this ornamental use.
- 2.9 There are no rare plant or animal species on the site. Similarly there are no ecological designations pertaining to the site.
- 2.10 The proposed development will result in the replacement of an ornamental and amenity flora and fauna by an urban one. In view of the lack of ecological interest on the site this will not be significant on the county scale but will cause effects locally. Overall the proposed development will not cause any significant impact on the flora and fauna in the area.

Soil

- 2.11 Topsoil will be stripped and stored on site for re-us from all areas of likely development. Measures will be taken to ensure no run-off to watercourses. No appreciable or significant impacts are likely.

Water (Surface Foul & Potable Water)

Surface Water

- 2.12 During the construction period some adverse short-term impacts are envisaged due to increase surface water runoff before the flow control measures are implemented.
- 2.13 The overall design of the surface water system limits the proposed runoff to that of the existing greenfield site so that long-term impacts of the proposed development should be neutral to slightly adverse.

- 2.14 Dun Laoghaire/Rathdown County Councils have stipulated that flow control measures should be utilised to restrict flows to the specified limits so the run-off rates do not exceed those currently generated by agricultural lands.

Foul Water

- 2.15 Construction of the proposed foul sewerage as proposed will have minimal impacts in the short term during the construction period.
- 2.16 Adequate capacity exists in the existing drainage system, so no adverse impacts in this context are anticipated.
- 2.17 It is understood that the downstream foul sewer network (i.e. the Carrickmines Valley Main Drainage Scheme) has been designed to cater for this upstream catchment. To this end, upon completion of the entire development lands, it is envisaged that there will be no negative impacts on the existing system.

Potable Water

- 2.18 In the short term, prior to the commissioning of the Sandyford High Level Water Scheme (SHLWS), the development will increase the demand on the existing water resources within the Stepside area.
- 2.19 However, by facilitating the SHLWS the development will in the long term enhance the water supply in the area and therefore have a positive impact on water supply within the development area.

Air (Air Quality, Odour and Noise)**Air Quality**

- 2.20 The likely effects, including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative, of the proposed development on the atmospheric environment resulting from the emission of pollutants are likely to arise from traffic and heating appliances.
- 2.21 While the increase in traffic resulting from the proposed development will result in increased levels of air pollution, the resulting concentrations will be well within existing and proposed air quality standards. The opening of the South East Motorway will divert considerable traffic from Enniskerry Road, and lead to an overall reduced level of emissions of pollutants from vehicles.
- 2.22 The heating fuel will be natural gas with open fires for occasional heating. Combustion gases produced by heating appliances will not result in any detectable increase in existing levels of sulphur dioxide, nitrogen oxides or particulates, and the emissions will be far less than if other fuels were used for heating purposes.

Odour

- 2.23 The potential for odours from the proposed development is confined to kitchens in dwellings. It is not expected that any significant odour sources will arise from the operational phase of the development. Slight odours may be generated during road surfacing, from hot bitumen, but these would be confined to the immediate area.

Noise

- 2.24 Any increase in noise levels at the nearest existing houses, due to construction on site will be temporary and intermittent in nature. The impact will be slight and will be similar for any likely future phases of development.
- 2.25 Post construction, the only appreciable source of noise from the development will arise from traffic however, in relation to noise generation the traffic flow rates and traffic speed are comparatively very low. The noise due to traffic within the site will not be significant.

Climate

- 2.26 Atmospheric emissions from traffic and the various heating systems within the development will be minor and in terms of: -

- modification of atmospheric composition
- modification of heat balance
- modification of surface roughness and composition

the proposed development will have a negligible effect on the climate in their area (known as the microclimate).

Landscape

- 2.27 The application site is located within an area zoned as Objective A1 (Residential) in the 1998 Dun Laoghaire Rathdown Development Plan and conforms to the objectives and zoning of the Stepside Action Area Plan.
- 2.28 The initial construction operations of the building development will give rise to temporary or short term impacts on the landscape and character over a one to two year period, together with more lasting visual impacts through the removal of hedgerows, the excavation and mounding of soil, the erection of new built structures and loss of amenity / perceived open space.
- 2.29 The development will remove the existing two pitch and putt courses. However, numerous other courses are located within the area and a new course is nearing completion at Woodside House immediately west of the Einns Kerry Road.

- 2.30 The conversion of this amenity land is likely to be perceived in the short term as a negative 'loss' of 'perceived open space on the urban fringe, particularly by the local community in Lamb's Cross / Hillcrest. However, the lands are zoned for development and the impact will arise from any development on these lands as opposed to the nature of the proposed scheme. As such given that the lands are zoned for residential development the proposed development is not unduly impacting in the medium term and the quality of the proposed units will enhanced the urban structure of the area in the longer term.
- 2.31 In summary short term significant visual intrusion is expected from Hillcrest and the Enniskerry Road. However, no adverse long term landscape or visual impact will arise.

Material Assets

- 2.32 Construction delivery traffic is predicted to cause variable impacts, slight to moderate adverse in nature, in the short term.
- 2.33 The traffic generated by the subject development will contribute in a modest way to the traffic flows on the Enniskerry Road (prior to the SEM) being less than 8% of the total flow on the road during the morning peak and less then 9% during the evening peak. These increases will amount to less than 3 additional vehicles per minute during both morning and evening peak periods.
- 2.34 Introduction of a new development alongside an existing highway will have an impact on traffic volume and delay. As a consequence of the development traffic volumes on the adjacent roads will rise but will not be significantly noticeable. The maximum traffic flows will be comfortably within the capacity of the existing carriageways. Following the opening of the South Eastern Motorway the volume of traffic and delays on the roads will fall.

Cultural Heritage

- 2.35 The construction of the golf course has radically altered the original topography, with the positioning of the greens, bunkers and the putting green and no archaeological features were visible.
- 2.36 However, an assessment of the area to the south of this development (Parcel 6) was undertaken by in May 2001. Following the field inspection (in which a possible section of the Pale ditch was identified) and further analysis of the recorded monuments in the landscape, it was concluded that a possible section of the Pale ditch crosses the area of the golf course. This feature has been recorded in the Record of Monuments and Places in several locations close to the proposed residential development, thus it is possible that the Pale ditch crossed the proposed residential area, Parcel 1.

- 2.37 The report pertaining to Parcel 6 (included in the EIS that accompanied the Parcel 6 planning application) recommends that a programme of archaeological testing be undertaken to establish if the Pale ditch crossed the golf course. This archaeological feature, if present, extends across the entire golf course and will therefore be impacted upon. It is not deemed necessary to carry out a separate testing programme for Parcel 1 and 6 as one will be sufficient in assessing this feature within the golf course.
- 2.38 This testing programme should be carried out under archaeological license prior to the commencement of groundworks within, or in the vicinity of, the existing golf course.
- 2.39 All recommendations are subject to the approval of the relevant Archaeological Officer, Dúchas, The Heritage Service.

Interactions of the Foregoing

- 2.40 Potentially significant interactions between Soils / Cultural Heritage (where disturbance may impact on un-discovered sites); Soils / Water (surface run-off to Ballyogan Stream); and Flora & Fauna / Water (also run-off to aquatic habitat) have been considered under the relevant chapters and in particular in Chapters 5.2 Flora & Fauna & 5.9 Cultural Heritage.

3 DESCRIPTION OF SCHEME

Introduction & Background

- 3.1 Dun Laoghaire-Rathdown County Council have prepared an Action Area Plan for the Stepside area. This covered a large area of 340 hectares (840 acres) centred on Kilgobbin and lying between Lamb's Cross-Hillcrest to the north-west, the Ennsikerry R117 Road the south-west, Stepside-Ballyogan to the south-east and the proposed South-Eastern Motorway Reservation to the north-east. The Action Area Plan was adopted in 2000 and within a strategic network of 'linear greenways', zoned various parcels of land for 'primarily residential' development. Sites were also identified within the plan area for a new primary school, industrial and related uses and business zones.
- 3.2 Lands within the area of the Stepside Action Area Plan in the control of the applicant, Cannon & Kirk, comprise 25.6 hectares (63.2 acres). Of this some 6.1 hectares (15 acres) or 23.8% are zoned as linear greenway open space and a further 1.5 hectares (3.7 acres) are reserved for the construction of a loop distributor road. The remaining 18.0 hectares (44.5 acres) are divided into parcels (namely 1, part of 2, 3, 4, 5 & 6) of land zoned for 'primarily residential' development. Parcel 1 is the subject lands of this application and comprises 3.3 hectares (8.154 acres), representing approximately 18.3% of the overall land zoned for primarily residential development in land holding. See Figure 3.1.
- 3.3 The applicant intends to develop the overall land holding on a phased basis, where the current application for Parcel 1 constitutes Phase 2. Phase 1 covers Parcel 6, see Planning Reg Ref: D01A/0480. It is intended that the remaining 11.47 hectares (28.34 acres) will be developed under a number of phases, which will be the subject of separate planning applications at a later stage. The current phase shows a density of 50 units per hectare (20 per acre) and it is intended that the overall holding will be developed at a similar net density (excludes principal open spaces) of 50 residential units per hectare (20 per acre). Including the principal open space, the linear greenway, the density for the overall land holding will be in the order of 35 per hectare (14 per acre).

The Site

- 3.4 Agricultural lands including those containing the Ballyogan (Kilgobbin) Stream bound the Parcel 1 development area to the south and east. The Enniskerry R117 Road, which intersects with Blackglen Road Hillcrest Road and Lambs Cross, lies immediately to the west of the site. Woodside House and a new pitch and putt course are located further west on the opposite side of the R117. The Sandyford Stream bounds the site to the north-west. There are residential properties located to the north

and north-east of the stream. The loop distributor road, an element of the Phase 1 application, will connect Parcel 1 site to the Enniskerry Road.

- 3.5 In summary the site (Parcel 1) that is the subject of the Phase 2 application comprises a total of 4.014 hectares (9.92 acres) of which 3.3 hectares (8.154 acres) is within Parcel 1 for residential development as illustrated on Figures 3.1 & 3.2. The remaining 0.714 ha. (1.764 acres) is designated for additional linear greenway.

Site Description

The Site

- 3.6 Located on the lower undulating foothills of the Dublin Mountains, the site lies on gentle south facing slopes of the Ballyogan (Kilgobbin) Stream valley. The lowest point of the site at approximately 117m OD is in the south near the Ballyogan Stream with the highest points at 125m OD at the Enniskerry Road and 128m OD towards the north-east corner. As the site is part of a north-south valley, the contours generally flow north-south along the valley. To the south the land rises gently away from the stream towards Stepside Village to over 140m OD. To the north the lands continue to rise gently to over 130m at Hillcrest.

Development Description

- 3.7 The proposed layout of 165 dwelling units comprises a wide range of dwelling types and sizes as recommended in the Action Area Plan in order to accommodate the various household types. The proposed unit mix is set out in Table 3.1, and of this total 10% will be equally divided between social and affordable housing. See Figure 3.2

Table 3.1 Make-up of Residential Units.

Nr	Height	Description	Area Sq.m.
9	2 storey	4 bed detached house	1425.1
7	3.5 storey	4 bed corner townhouse	1099
20	2.5 storey	3 bed terraced townhouse	2400
2	2.5 storey	4 bed terraced townhouse	238
4	2 storey	3 bed terraced house	364
8	3.5 storey	4 bed detached townhouse	1424
111	1 storey	2 bed apartment	9218.7
2	1 storey	1 bed apartment	92
2	2 storey	2 bed apartment (duplex dormer)	203.8
165nr			16464.60sq.m.

- 3.8 The overall site has a ratio of 30% house and 70% apartment units and provides a variety of unit types from starter units through to larger established family accommodation within an integrated courtyard layout. The proposed mix provides a ratio of:

- 14.5% 4-bed units
- 14.5% 3-bed units
- 69.8% 2-bed units, and
- 1.2% 1-bed units

- 3.9 The proposal for 165 nr dwelling units gives an overall site density of 50 dwelling units per hectare (20 per acre). This is in accordance with Table 24.1 Proposed Development Parcels – Net Site Areas and Possible House Numbers of the Stepside Action Area Plan. As stated at 3.3 above, this represents only part of an eventual wider development, which will be developed on a phased basis at a similar density of providing in the order of 900 residential units in total.

Layout and Design

- 3.10 The design and layout is set out in line with the existing contours wherever possible minimising awkward or incongruous changes in levels. Around this initial strategy every attempt has been made to create a development with a variety of scales, materials and textures, which will generate rich streetscapes and vistas punctuated by feature elevations. Consideration has been given to the treatment of the boundaries with emphasis on presenting active elevations rather than blank walls to the loop road and adjacent open green spaces. It is intended to create a strong sense of entry from the loop road through the use of feature corner blocks to increase scale and define circulation within the wider site.
- 3.11 As such, the format of the layout is determined by the provision of the required mix of unit types, the topography of the site and the orientation of the units. Where possible the units are specific to their orientation allowing for passive solar gain to living spaces. The principle of ensuring quality natural day-lighting standards to all units is exemplified in the use of generous glazing to all habitable rooms and, where possible to circulation areas.
- 3.12 The majority of the development is of two and three-storey construction with four and five storey blocks (over ground floor) located on either side of the access and along the Enniskerry Road. The taller units are removed from surrounding residential development at Hillcrest. See Figures 3.2, 3.3, 3.4 & 3.5/
- 3.13 The scheme was designed with the pedestrian in mind. The layout incorporates substantial traffic calming measures such as raised crossing points, pinch points and shared surface layouts to create informal courtyard spaces. While the development has a principally meandering north-south street, which will also act as the main cycleway/pedestrian link through the development, it is envisaged that the layout will

allow pedestrians and cyclists to circulate freely within the layout. The circulation pattern takes account of the aims of the action plan in linking in to and integrating the linear greenway open space, which lies to the east and west of the development area.

- 3.14 In the finishing of the landscape areas, a number of small play/seating areas will be provided throughout the development giving an improved community feel to the courtyard style development.
- 3.15 The loop distributor road will provide for both pedestrian footpaths and cycleways along its length and will have two accesses to the development.

Parking

- 3.16 The proposed parking provision is 2 spaces per house and 1.5 spaces per apartment or duplex unit. The total number of spaces proposed is 247, an average of 1.49 spaces per unit. A variety of methods have been employed in order to deal with the level of provision required while avoiding large clusters of parked cars and also to minimise the impact of the resulting extent of hard landscaping with planting. The parking is generally grouped, either as banked parking on the street or in parking courts provided in selected locations providing secure overlooked parking to the rear. The parking provision for apartment blocks A, B and C is provided underground (except 39 no. spaces in the case of Block A). All spaces are readily accessible to the dwellings that they serve. See Figure 3.2.

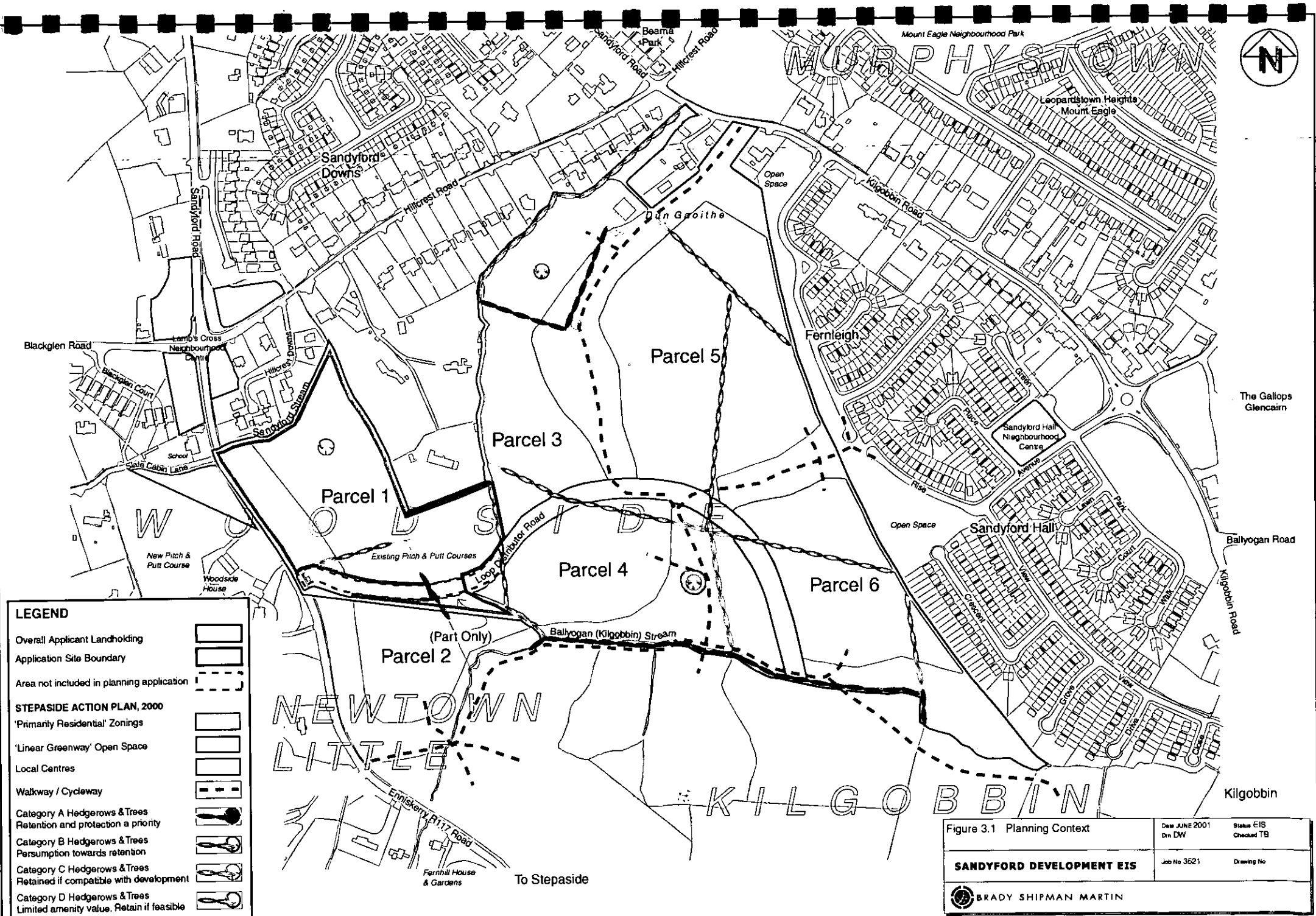
Site Access

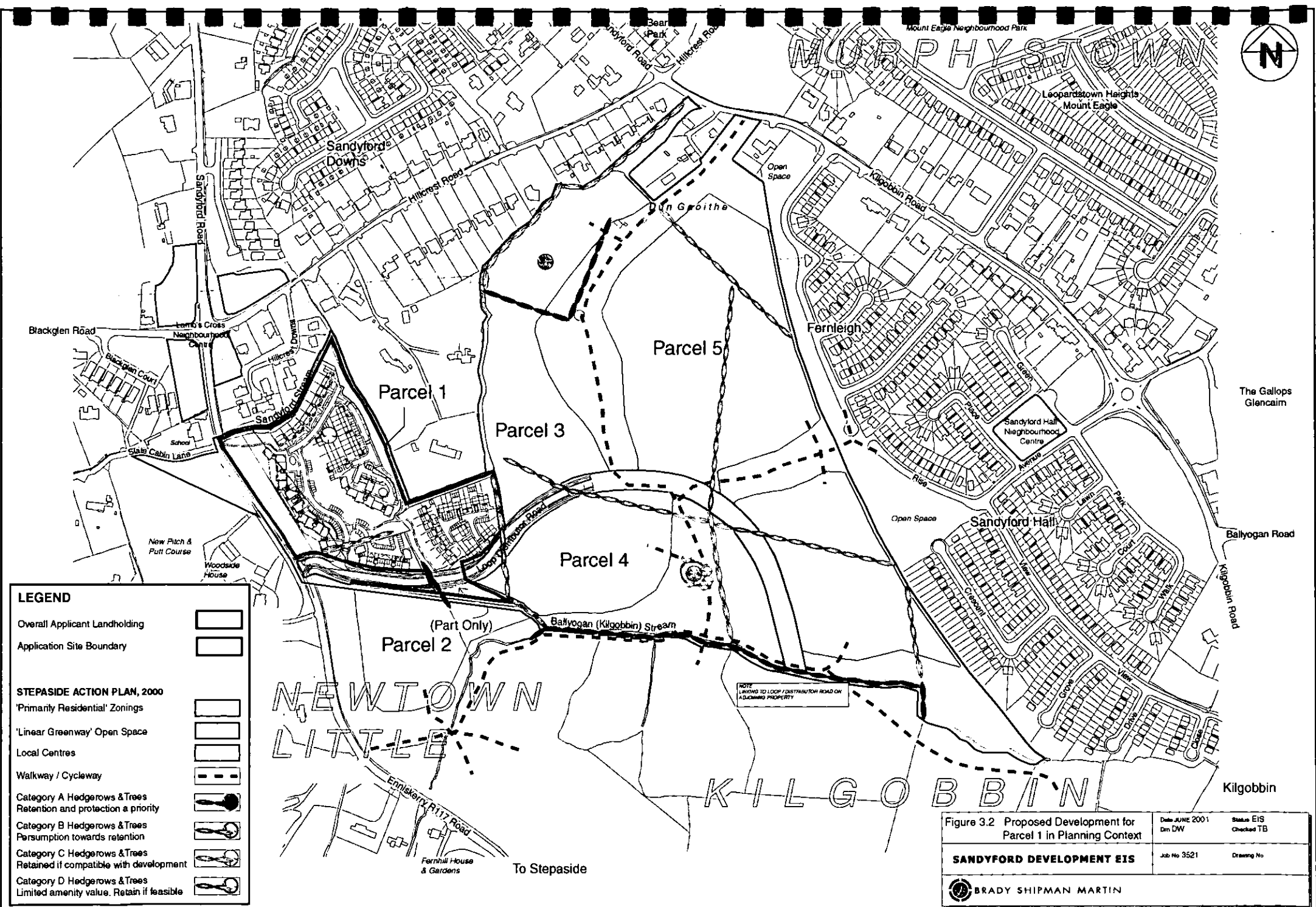
- 3.17 The development will access directly on to the proposed loop distributor road at two points on the southern boundary of Parcel 1. The loop distributor road will connect the development to the Enniskerry Road at a point south of the existing carpark associated with the Pitch & Putt Course. See Figure 3.2. The loop road proposal is in accordance with the provisions of the Stepside Action Area Plan as set out on the Action Plan (Drawing. No. PL-99-10 Rev. C) and in paragraph 21.6 (B) indicating a frontage free local distributor road generally in accordance with relevant design parameters set out in the Dun Laoghaire-Rathdown County Council's *"Development Works in Residential and Industrial Areas"* (July 1998). See Figures 3.2.

Open Space

- 3.18 The main Class 1 public open spaces have been specifically identified within the Stepside Action Area Plan, at Table 25.1 of the Plan. Within the wider area of the plan this includes the Landsdowne/Old Wesley Grounds, Glencairn Neighbourhood Park and Ballyogan Sports Ground. The other principal open space within the plan area is also specifically identified as proposed Linear Greenway (including off-shoots). The linear greenway accounts for 6.1 hectares (15 acres) of the applicant land holding and with respect to Parcel 1 bounds the entire length of the site to the west. Existing open space is also located immediately east of the site. See Figure 3.1.

- 3.19 In the event that the Old Wesley Grounds do not become available as Class 1 open space, the local authority may seek to provide additional open space within the wider area. The applicant is providing within Parcel 1, significant additional open space incorporating the retention of a local stream (northwards tributary through pitch & putt course of the Ballyogan Stream) through the existing pitch & putt area and providing for a more networked open space arrangement within the overall holding. This additional open space will extend to over 0.7 ha (approx. 1.764 acres) and provision has been made in the previous application (for Parcel 6) for the open space by means of the construction of a bridge over the aforementioned stream to allow for pedestrian and cycleway access.
- 3.20 In accordance with paragraph 25.4 of the Action Plan it is intended to provide more localised open spaces or greens within the development, which will act as seating/toddler/pre-school play areas in character with the courtyard nature of the development. The provision of a number of small pocket / green spaces together with informal tree and shrub planting to areas associated with parking and the general street is seen as a feature of the development.
- 3.21 While the linear greenway open space will be taken in charge by Dun Laoghaire-Rathdown County Council, a management company will oversee the maintenance of the smaller green spaces within the development parcels.
- 3.22 Private open space has been provided to the standard required by the 1998 Dun Laoghaire-Rathdown County Council Development Plan, i.e. 60 sq.m. per unit.





LEGEND

Overall Applicant Landholding

Application Site Boundary

STEPSIDE ACTION PLAN, 2000

'Primarily Residential' Zonings

'Linear Greenway' Open Space

Local Centres

Walkway / Cycleway

Category A Hedgerows & Trees
Retention and protection a priority

Category B Hedgerows & Trees
Presumption towards retention

Category C Hedgerows & Trees
Retained if compatible with development

Category D Hedgerows & Trees
Limited amenity value. Retain if feasible

Figure 3.2 Proposed Development for Parcel 1 in Planning Context

SANDYFORD DEVELOPMENT EIS

Date: JUNE 2001
Dm DW

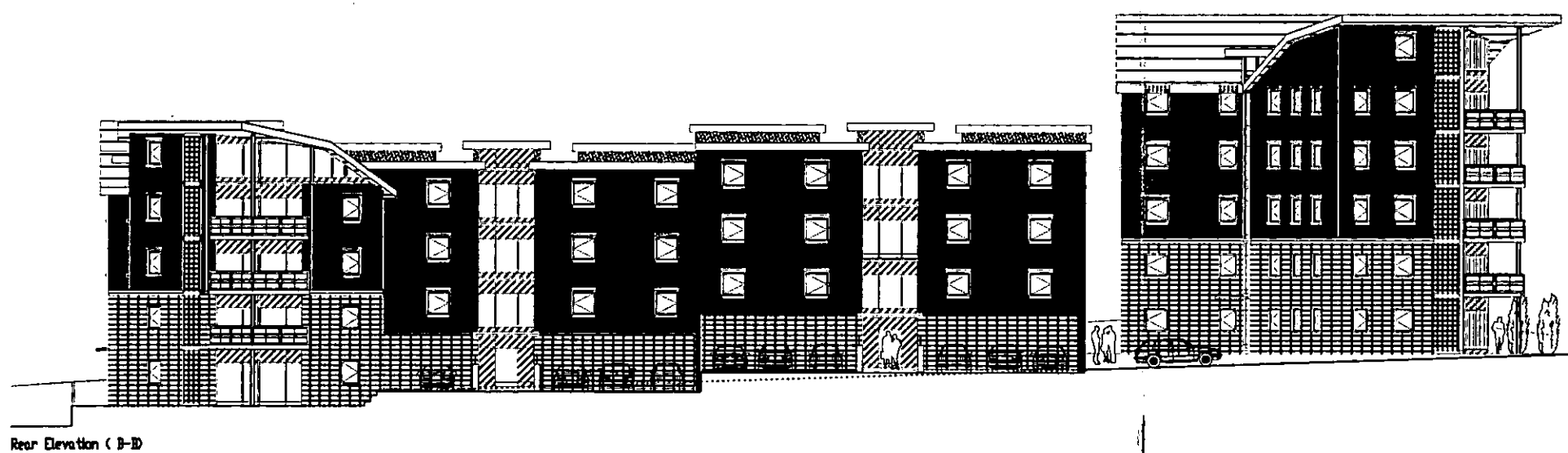
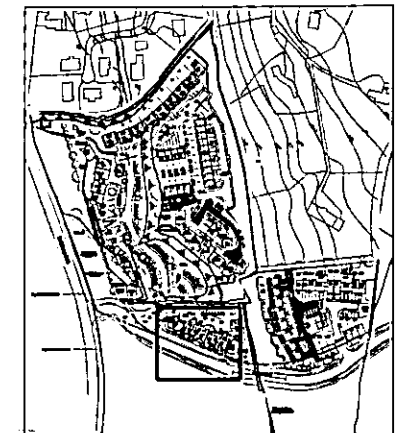
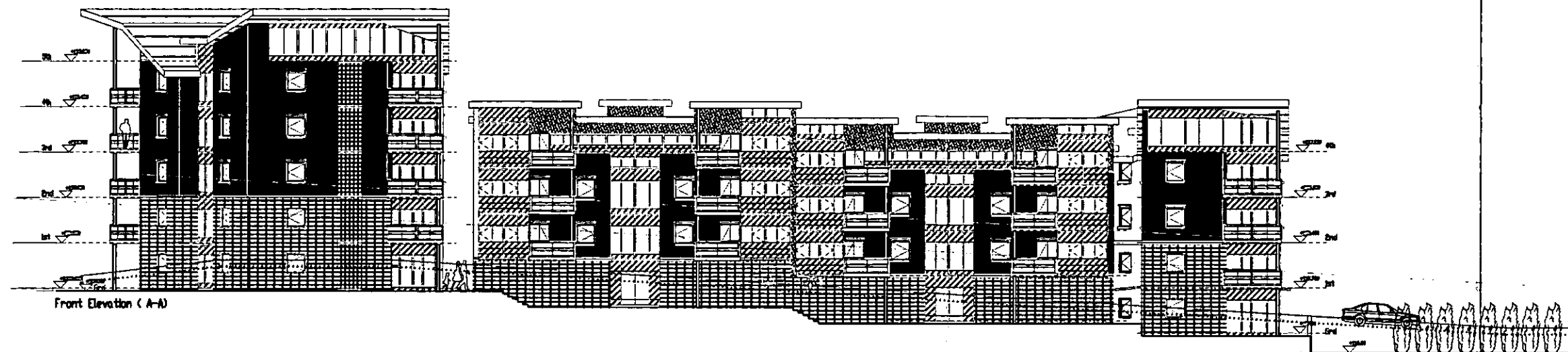
Station EIS
Checked TB

Job No 3521

Drawing No

BRADY SHIPMAN MARTIN

Stepaside - Apartment Blocks A





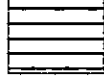
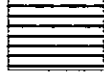


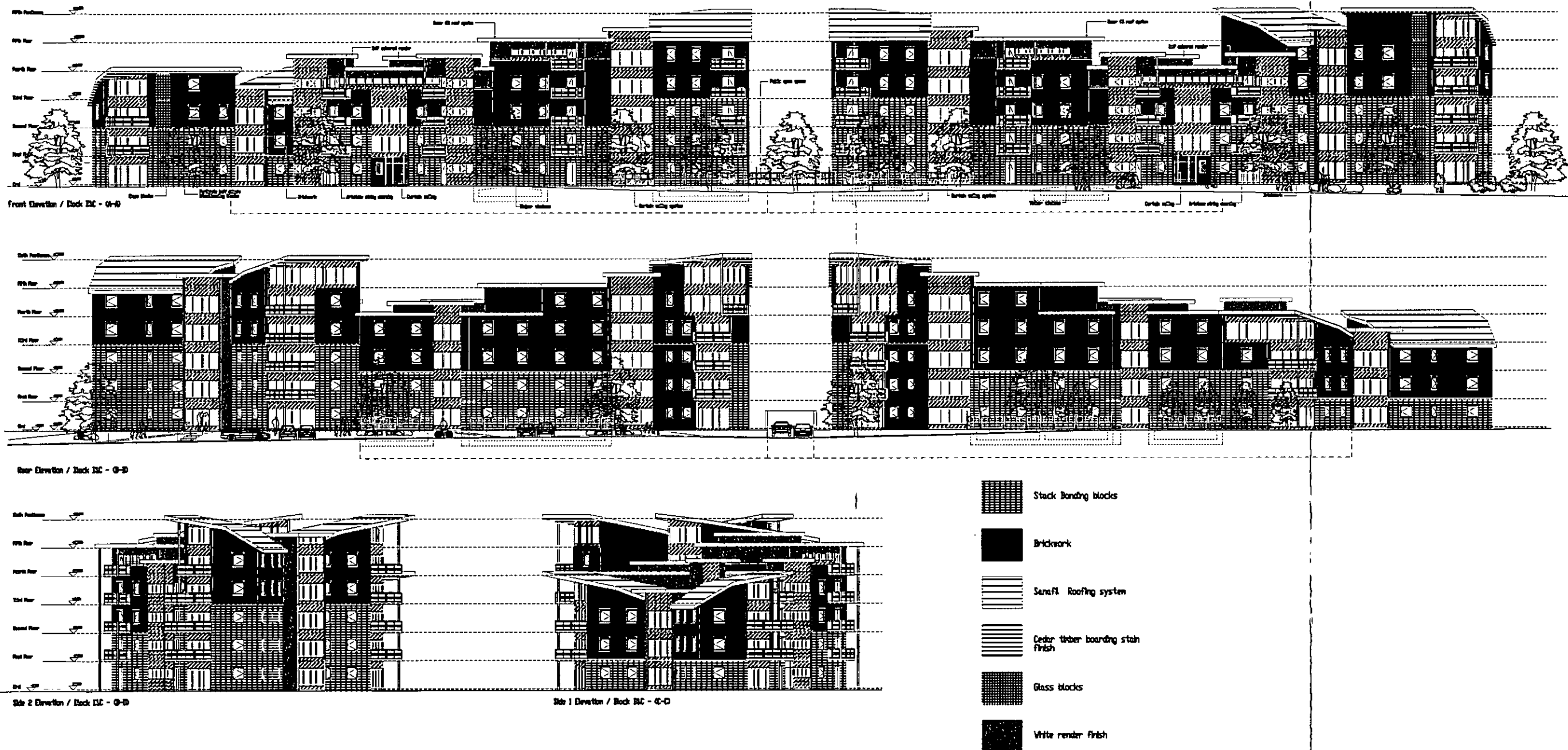
-  Stack Bonding blocks
-  Brickwork
-  Sanafl Roofing system
-  Cedar timber boarding stain finish
-  Glass blocks
-  White render finish



Figure 3.3: Typical Unit Details



BRADY SHIPMAN MARTIN



Stepaside - Apartment Blocks B and C

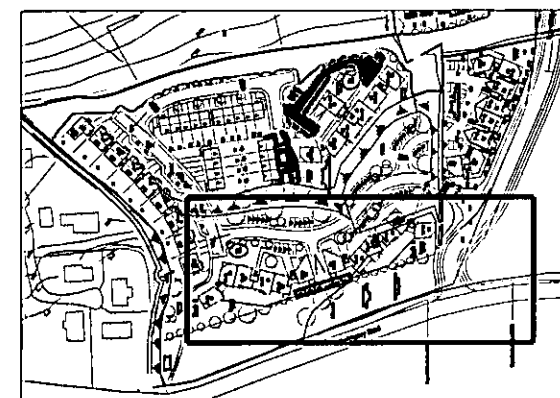


Figure 3.4: Typical Unit Details



BRADY SHIPMAN MARTIN

Typical Streetscape 87-92



Plot 87 - 1749 Sqft.

Plot 88 - 1749 Sqft.

Plot 89 - 1650 Sqft.

Plot 90 - 1749 Sqft.

Plot 91 - 1650 Sqft.

Plot 92 - 1293 Sqft.

Front Elevation - Typical Streetscape Plots 87-92



Plot 92 - 1293 Sqft.

Plot 91 - 1650 Sqft.

Plot 90 - 1749 Sqft.

Plot 89 - 1650 Sqft.

Plot 88 - 1749 Sqft.

Plot 87 - 1749 Sqft.

Rear Elevation - Typical Streetscape Plots 87-92







-  Facing brickwork
-  Interlocking concrete tiles
-  White render finish
-  Cedar boarding with stain finish

Figure 3.5: Typical Unit Details



BRADY SHIPMAN MARTIN

4 PLANNING AND DEVELOPMENT CONTEXT

Introduction

- 4.1 The planning and development section considers the proposed development with regard to the strategic and statutory planning context. It considers national, regional and local policy and in particular The National Development Plan for Ireland, 2000-2016, The Strategic Planning Guidelines for the Greater Dublin Area, The Dun Laoghaire-Rathdown County Development Plan 1998, The Stepside Action Area Plan, 2000, and other policy documents.

National Development Plan for Ireland, 2000-2016

- 4.2 The National development Plan (NDP) outlines a demand managed strategy for transport for the Dublin Area involving investment in various modes of transport including amongst others:

- Developing, extending and increasing the capacity of the bus network;
- Implementing the government approved light rail network;
- Completion of the M50, Dublin Port Access Tunnel and the national road projects.

- 4.3 With regards to housing, the NDP states that the average household size has fallen from 3.21 in 1991 to 3.04 in 1998 and is forecast to fall rapidly towards the European average of 2.63. The Plan also sets out the rapid growth in incomes and employment, the significant increase in the key household formation age groups and the high immigration, which have all combined to impact significantly on the demand for housing:

'These factors have resulted in demand for housing escalating at an unprecedented rate in recent years and it is likely that this high level of demand will continue for the period of the plan.'

The Plan also states the most significant symptom of this increase in demand and the inability of supply to meet the demand has been rapid increases in house prices and rents. One of the priorities set out in the NDP for investment in housing is to provide the necessary infrastructural investment to facilitate the overall level of housing output required to meet the current and anticipated level of demand in a planned and coherent fashion.

Sustainable Development: A Strategy for Ireland

- 4.4 The government intends to work towards ensuring that all development and growth is sustainable. The planning system has a positive role to play in the quest for sustainable development by making adequate provision for development while at the same time taking account of the need to protect the natural and built environment.
- 4.5 "Sustainable Development : A Strategy for Ireland" was published in 1997 by the Department of the Environment. The strategy recognises the need for good spatial planning and the inclusion of sustainability concerns in urban and built environment policies. The land use planning system should seek to promote orderly development through sustainable development principles that are outlined in the Strategy.
- 4.6 There is a requirement, in order to achieve sustainability, that development is located close to settlement centres, public transport nodes and access points so as to achieve social integration. The development of a significant level of new residential development in this area at higher densities requires the availability of nearby employment, shopping, transport and leisure infrastructure, if an increase in residential density is to be acceptable. There is an abundance of such uses in the wider surrounds and further sites and improvement of services is a key feature of the Action Area Plan for Stepside.
- 4.7 The scheme has been designed to exploit its location and the natural gradients, which allow views especially east and south, while also maximising the benefits of a south-facing slope. The layouts have been specifically located to achieve maximum solar penetration and passive solar gain and to minimise overshadowing insofar as possible. Internal layouts have also been designed in order to achieve the optimum layout for their orientation.
- 4.8 A more environmentally sustainable development has been achieved through an integrated design concept. The layout of the scheme has evolved from a careful study of the topographical influences and the creation of a variable series of 'places' and 'spaces' is critical to ensuring that the development is visually and environmentally stimulating. A series of interlinked streets, with independent play/seating areas create specific identity for future householders and their families. Sustainable use is made of the site and the proposed development will be linked with the adjoining community facilities and services, both existing and planned, within a layout, which facilitates both pedestrians and cyclists.
- 4.9 The scheme has been designed to provide a high quality development, which is sustainable, conservation-conscious, aesthetically pleasing and user friendly and which has high standards of amenity, safety and convenience.

Strategic Planning Guidelines for the Greater Dublin Area

- 4.10 The subject site is located in the Metropolitan Area as defined in the Strategic Planning Guidelines. Within the Metropolitan Area, the Guidelines advocate that new residential development should be at a high density with an appropriate mix of dwelling types and new residential developments should take place in the context of Action Area Plans. The proposed development is in accordance with all of these criteria.
- 4.11 The Strategic Planning Guidelines sets out the basis for such a compact urban form of development stating that higher densities and consolidation of development will facilitate the provision of a considerable enhanced public transport system which will facilitate and encourage a switch to public transport.

Transportation Strategy, 2000-2016 - A Platform for Change

- 4.12 The DTO transportation strategy includes the proposal to extend the LUAS line from Sandyford to Cherrywood between 2003 and 2006. It is envisaged that this line would be upgraded to a METRO line, which would be completely segregated along its entire length sometime between 2006 and 2010. The most likely route for such a line would bring the service along the Ballyogan Road, approximately 300 lin.m. east of the proposed development.

Guidelines for Planning Authorities on Residential Density

- 4.13 In 1999, The Department of Environment and Local Government published guidelines articulating Government policy of:

"encouraging more sustainable urban development through the avoidance of excessive suburbanisation and the promotion of higher densities in appropriate locations especially in conjunction with improved public transport systems"

For 'Outer Suburban/Greenfield' areas such as the subject lands the Guidelines indicate that:

"the greatest efficiency in land usage on such lands will be achieved by providing net residential densities in the general range of 35-50 dwellings per hectare (14-20 per acre"

However, on lands proximate to existing or proposed public transport corridors the Guidelines advocate that:

"densities in excess of 50 dwellings per hectare (20 dwellings per acre) should be permitted – subject to appropriate qualitative safeguards"

This indicates that as expressed in the Stepside Action Area Plan, the thrust should be a general presumption in favour of higher densities in the range of 35-50 units per hectare (14-20 per acre).

Dun Laoghaire-Rathdown Development Plan 1998

- 4.14 The statutory development plan for the site is the Dun Laoghaire-Rathdown County Development Plan 1998. Under this plan the site is zoned A1,

"to provide for new residential communities in accordance with approved action area plans"

Within the zone "permitted in principle uses" include residential, public house, shop local, shop-neighbourhood, crèche/nursery school and recreational facility / sports club. Therefore all the uses proposed under Phase 2 of the overall concept masterplan for the landholding are permitted in principle.

Stepside Action Area Plan, 2000

- 4.15 In accordance with the zoning objective (as above) for the site and adjoining lands, the Stepside Action Area Plan was adopted by the members of Dun Laoghaire-Rathdown County Council in July 2000. Under the action area plan, Parcel 1 is zoned 'primarily residential' with linear greenway open space bounding the site to the west and the proposed loop distributor road (part of Parcel 6 development) to the south. Similarly the route of the proposed distributor road is indicated on the Action Plan. The subject development is fully in accordance with the land use zoning of the site.

- 4.16 In section 24.0, the action area plan promotes higher residential densities, in accordance with the Residential Density Guidelines. Densities of between 35-50 dwellings per hectare (14-20 per acre) are recommended in the action area plan and possible house numbers are indicated for the various parcels of development land in Table 24.1 Proposed Development Parcels – Net Site Areas and Possible House Numbers of the Action Area Plan. The subject application conforms to this objective of increasing residential density by proposing a density of 50 dwellings to the hectare (20 units to the acre). The overall density is not excessive especially when considered that it represents a net figure restricted to designated development parcels with open space surrounding. When taken as an entire land holding, the density is in the order of 40 units per hectare (16 per acre).

- 4.17 The plan notes that the issue of sustainability has been translated in to the Stepside Action Area Plan in a number of ways including:

- higher residential densities and more compact urban form;

- permitting wider range of land uses for a better balance of housing and jobs thereby cutting travel requirements;
- actively promoting the use of public transport, including buses and IMP services to the proposed bus/Luas interchange at Blackthorn Avenue;
- facilitating the provision of facilities for pedestrian and cycle users with dedicated cycleways integrated into the design of new roads and through the linear greenways;
- preserving the quality of the landscape, open space and cultural heritage so manifest in the area;

4.18 The Plan sets out importance of house type, mix layout and form stating at paragraph 24.10:

"Variety of houses types will be a major consideration in the Planning Authority's determination of individual applications. Apartments terraces, semi-detached, detached, retirement complexes etc. should all be considered as possible elements of the mix"

"Variety of design is essential in the creation of a sense of place within a sustainable built-environment"

"it is considered that a higher built form may be acceptable in certain locations but that it should generally not rise above four storeys in height."

"the best urban design skills should inform the layouts of individual sites to ensure a clear spatial structure with variety, contrast and identity."

4.19 At paragraph 25.10, the plan sets out the importance of landscape treatment stating that, a major new residential development like Stepside requires a strong landscape framework to:

- " - improve and enhance setting
- minimise the visual impact of the development
- help unify urban form and disparate architectural styles
- provide shelter
- facilitate the phasing of the development
- create 'local' identify
- encourage the development of habitat "

4.20 The plan also makes reference to the requirement to improve the foul and surface water drainage infrastructure of the Stepside Action Plan area. All but the north-western margin of the land holding, which drains to the Sandyford Stream, drains southwards towards the Ballyogan (Kilgobbin) Stream a component of the Carrickmines/Shanganagh River system. Due to frequent flooding both at Kilgobbin Bridge but particularly downstream of Carrickmines, further significant urban

development in the Stepside Plan Area, without the introduction of appropriate remedial/attenuation measures, would only exacerbate downstream difficulties.

4.21 The plan goes on to state that the recommendation to the Carrickmines/Shanganagh catchment should be addressed not through the provision of on-line storage ponds (as originally envisaged) but primarily by addressing the areas, which are vulnerable to flooding through the provision of local engineering works designed to alleviate localised problems. At paragraph 7.5 the Plan sets out the recommended approaches of Best Management Practice, including:

- provision of bypass culverts at appropriate locations eg. Kilgobbin Road Bridge;
- provision of off-line storage ponds at appropriate locations to allow large scale developments or groups of developments;
- use of French drains and swales for roadways and infiltration basins/porous surfacing for large car parking areas;
- the exclusion of development (apart from essential access and through roads) within natural Q50 floodplain together with the maintenance of natural river channel. Together these measures will preserve 'natural storage' capacity;
- the identification of substantial riparian corridor to be retained free of development along all significant rivers and streams. Where large scale storm sewers connect to the river network this Riparian Zone will facilitate the introduction of off-line retention ponds to reduce pollution impact on the main river in addition to attenuating peak flows;.

4.22 Foul / Water Supply / Gas & Electricity Networks, etc. are considered under relevant sections.

5.1 HUMAN BEINGS

Introduction

- 5.1.1 This chapter of the environmental impact statement assesses the impact of the proposed residential development at Stepside, County Dublin, on the human beings of the area. The assessment outlines the predicted impact of the development on the socio-economic profile of the area. The structure for assessing the impact of the development is based on guidelines as prepared by the Environmental Protection Agency (EPA 1995a and 1995b).

Receiving Environment

Demography - Population

- 5.1.2 The application site is located to the east of the Sandyford Road at Woodside, Sandyford County Dublin. While the site area is 4.014 ha, the development site area is 3.3 hectares and the proposed development is for a total of 50 houses and 115 apartments. The site is located in the District Electoral Division (DED) of Glencullen and within the administrative area of Dun Laoghaire-Rathdown County Council.
- 5.1.3 The area is undergoing a number of changes that include a significant increase in its population. Current population trends are likely to continue due to regional and local housing policies as outlined in the "Strategic Planning Guidelines for the Greater Dublin Area", "Dun-Laoghaire-Rathdown Development Plan" and "Stepaside Action Area Plan". At local level, the Stepside Action Area Plan (SAAP) was published in July of 2000. Action Area Plans provide a framework to promote the proper planning and development of lands within a specified area. The plan highlighted an area of 340 hectares between Stepside and Kiltiernan, approximately 110 hectares of which are zoned with the objective "to provide for new residential communities....". This zoning and the lands eventual development will impact and alter the present demography and socio-economic structure of the entire area.
- 5.1.4 The variance in population levels in the area between 1991 and 1996 are shown in Table 5.1. Between the period 1991 and 1996 the population of Glencullen DED has increased from 5258 to 8063 persons. This is equivalent to an increase in population of 53.3%. Over the 10-year period, 1986 to 1996 the population has risen dramatically, over 135%. This is significantly higher, but reflective of the positive increases in population figures for Dun Laoghaire-Rathdown (5.2%), Dublin County and Corporation Borough (3.6%) and the State (2.4%) over the same period.

Table 5.1 Population change at Local, Regional and National Level between 1986 and 1996

Area	Year 1986	Year 1991	Year 1996	Percentage Change '86-'96
Glencullen DED	3,427	5,258	8,063	+135.3%
Dun Laoghaire- Rathdown	180,675	185,410	189,999	+ 5.2%
Dublin Co. & Co. Borough	1,021,449	1,025,304	1,058,264	+ 3.6%
Republic of Ireland	3,540,643	3,525,719	3,626,087	+ 2.4%

Source: Census of Population 1986, 1991 and 1996

5.1.5 Table 5.2 illustrates the age profile at local, regional and national level. In 1996, 26.9% of the population in Glencullen DED were within the 0-14 age group and 43.4% were in the 25-44 age group. The proportion of both groupings was appreciably higher than with the regional or national comparison. As outlined in the Strategic Planning Guidelines for the Greater Dublin Area (April 1999), the 25-44 age group is one of the primary groups for growth in household formation. The rapid level of economic growth over recent years has been attributed to a number of factors, amongst which is the extent of this highly active age group. It is consistent with the large number of young people that have typically occupied fringe settlements as well as new developments in this, and other areas of the Dublin Metropolitan Area.

5.1.6 The areas appeal to this demographic has resulted in an influx of this highly mobile age group, who have settled and are now raising young families in the area.

Table 5.2 Age profile of the Population at a Local, Regional and National Level in 1996

Area	Age 0-14	Age 15-24	Age 25-44	Age 45-64	Age 65+
Glencullen DED	26.9%	11.1%	43.4%	12.1%	6.5%
Dun Laoghaire- Rathdown	20.9%	17.4%	29.3%	21.2%	11.3%
Dublin Co. & Co. Borough	22.0%	18.6%	30.3%	19.1%	9.9%
Republic of Ireland	23.7%	17.5%	28.0%	19.4%	11.4%

Source: Census of Population 1996

5.1.7 The current age profile, combined with upward population trends are likely to influence the type of housing required in the area. The high levels of people in the working age groups is also likely to result in a need for economic and service provision in the area. The high percentage of people within the working age group in the DED has a positive impact upon the disposable income levels within the area. It is noticeable that this DED has a very low percentage of people aged 65 and over compared to Dublin and the rest of Ireland. However this is set to rise dramatically in the future given the current percentage of 25 to 44 year olds in the area.

Household size

5.1.8 The change in households and household sizes locally, regionally and at county level are shown in Tables 5.3 & 5.4.

5.1.9 The inter-census period, 1991 to 1996 has seen a dramatic rise in the number of households for all the areas analysed. Glencullen DED has seen the most dramatic of rises, 68.22%, significantly above the regional and county average.

Table 5.3: Number of Households at Local, Regional and County Level between 1991 and 1996

Area	Year 1991	Year 1996	Percentage
			Change '91-'96
Glencullen DED	1,548	2,604	68.22%
Dun Laoghaire-Rathdown	56,531	61,649	9.05%
Dublin Co. & Co. Borough	311,958	344,264	10.36%

Source: Census of Population 1991 and 1996

Table 5.4: Average Household Size at Local, Regional and County Level between 1991 and 1996

Area	Year 1991	Year 1996	Percentage
			Change '91-'96
Glencullen DED	3.4	3.1	-8.84%
Dun Laoghaire Rathdown	3.3	3.1	-6.03%
Dublin Co. & Co. Borough	3.3	3.1	-6.47%

Source: Census of Population 1991 and 1996

5.1.10 Allied to the increase in the number of households has been a reduction in the average number of persons per household. This is reflected at all levels. The Economic and Social Research Institute (ERSI) further estimates that by the year 2011, the average household size in the state will be fewer than 2.0 persons per house. This process is most pronounced in urban areas such as Dublin where modest population growth is accompanied by rapid new house provision.

5.1.11 The Strategic Planning Guidelines for the Greater Dublin Area stated that the average household size in Dun Laoighaire-Rathdown would drop to 2.8 by 2006. However, even based on an average household size of 3.0 (estimated average for the Greater Dublin Area in 2001 as outlined in the Strategic Planning Guidelines for the Greater Dublin Area) the proposed development could accommodate approximately 495nr people. This increase in the population of the area would lead to demand for additional services within the area. This has been recognised by Dun Laoghaire-

Rathdown County Council in the Action Area Plan for Stepside, which identifies sites for neighbourhood and local centres as well as school sites that will cater for the increased population generated by new residential developments in the area.

Housing Policy and Landuse

Regional Housing Policy

- 5.1.12 The Strategic Planning Guidelines for the Greater Dublin Area allocated additional population and housing units throughout the Dublin and Mid-East Region. The estimated capacity of residentially zoned land in Dun Laoighaire-Rathdown (2001-2005), as outlined in the Strategic Planning Guidelines for the Greater Dublin area is for 5,454 housing units. At an estimated household size of 2.8 persons per household in 2006, this would account for 15,271 people. The proposed development of 165 units at Sandymount will have the potential to accommodate 495 people. The proposed development, which combines high density with a mix of house types as well as apartments, conforms to the Planning Guidelines recommendations for the Dublin Metropolitan Area.

Local Housing Policy

- 5.1.13 The Dun Laoghaire-Rathdown Development Plan 1998 has zoned 110 hectares in Sandymount-Stepside to provide for new residential communities in accordance with approved local Action Area Plans. Residentially zoned lands, as highlighted in the Stepside Action Area Plan, are located on the urban fringe adjoining the foothills of the Dublin Mountains, which represent the principle natural amenity resource of this area of South Dublin.
- 5.1.14 The development of this land is to be conducted on a phased basis, having regard for the need to provide a road infrastructure capable of meeting the requirements of the new and existing inhabitants of the area.

Neighbouring land use

- 5.1.15 The proposed development site at Stepside is located in a predominantly residential area. Boundary lands are or have been developed for residential purposes and therefore the development of this land is in keeping with the form of the area and its development needs.

Socio-Economics

Economic Activity & Employment

- 5.1.16 Economic activity and employment levels have increased significantly in the area between 1991 and 1996 as indicated in Table 5.5. Allied to the substantial growth in population as outlined in Table 5.1 has been an increase in the number of people employed in the area, i.e. a 82.34% increase in employment in the DED over the 5 year period between 1991 and 1996. Correspondingly, the level of unemployment has decreased significantly from 7.17% in 1991 to 5.65% in 1996, a drop of 21.2%. Given

the economic success the State has enjoyed over recent years, it is anticipated that today's figure would indicate a further decrease on the 1996 figure.

Table 5.5 Employment levels in Glencullen DED.

	1991	1996	Percentage Change
Available workforce*	3556	5464	53.66%
Employed	2050	3738	82.34%
Unemployed**	7.17%	5.65%	-21.20%

Source: CSO 1991 and 1996

Note: * Working population between 15 and 65 years of age

** 1st job seekers plus unemployed

- 5.1.17 The principal employment sectors for residents in the Glencullen DED are commerce (35%), professional services (20%) and the manufacturing industry (14%).

Socio-Economic Profile

- 5.1.18 A socio-economic profile of the area has been drawn up based on information from the 1996 Census, obtained from the Central Statistics Office (C.S.O.), the results of which are presented in Table 5.6. The socio-economic profile of Glencullen DED has been compared to that of Dun Laoighaire-Rathdown Administrative Area. The third column highlights the differences between the two.

Table 5.6 Socio Economic Profiles

	Dun Laoighaire-Rathdown	Glencullen DED	Glencullen DED as a percentage of the Administrative Area
Economic Status			
Residents classified as retired	7.9%	4.3%	54%
Residents classified as at work	40.1%	46.4%	115%
Unemployed rate	6.1%	5.7%	92%
Socio Economic Groups			
Manager / Employer	21.7%	22.2%	102%
Skilled Manual	7.6%	10.5%	138%
Unskilled manual	3.8%	3.4%	89%
Education Attainment			
Primary/lower secondary	19.0%	18.6%	98%
Third level	25.7%	26.3%	102%
Households			
Single person h'holds	20.8%	15.5%	75%
Couples, no children	20.0%	22.6%	113%
Couples with children	43.3%	42.8%	99%

- 5.1.19 The socio-economic profile of Glencullen is somewhat different to that of Dun Laoighaire-Rathdown. The percentage of retired residents is almost half that of Dun Laoighaire-Rathdown, 4.3% compared to 7.9%. Glencullen DED has a young

population which demonstrates its appeal to that demographic. Given the current low level of retired residents it is therefore anticipated that this proportion will rise dramatically in the future. Employment rates are appreciably higher in Glencullen as compared to the rest of Dun Laoighaire-Rathdown and its unemployment rate is significantly lower.

- 5.1.20 Comparable proportions of the workforce are employed at manager/employer level. There are considerable differences in the proportions of skilled manual and unskilled manual workers resident within the DED. Glencullen have a higher proportion of skilled manual workers than in Dun Laoighaire-Rathdown as a whole but has an appreciably lower proportion of unskilled manual workers.
- 5.1.21 There is some slight variance in the level of education attainment but both primary/secondary and third level attainment is comparable between the Glencullen DED and Dun Laoighaire-Rathdown Administrative Area.
- 5.1.22 While the figure for couple with children is uniform for both the DED and Administrative Area, the percentages of single person households and couples with no children is most striking. Single person households are well below the Administrative Area average, while couples with no children is above the Administrative Area average. The aforementioned suggests that the area is one which is ideally suited and indeed highly appealing to young couples and in particular those who are raising children.

Impact of the Development

- 5.1.23 The current proposal will continue the change that is occurring in the socio-economic profile of the area and will provide further employment in the area, not only through construction, but also from retail and ancillary services required due to the increase in population. The provision of 165 new housing units in the area is in keeping with the Strategic Planning Guidelines for the Greater Dublin Area and Dun Laoighaire-Rathdown County Councils policies for the area. This development will provide accommodation for approximately 495 people and is therefore seen essential to meet the housing requirements of the area. Construction of the development is expected to last between 18-24 months, employing on average some 50 people and possibly up to 100+ at various stages of the development. The above elements will not only provide appropriate employment but also services that will facilitate economic, demographic and social improvement in the area.
- 5.1.24 Direct effects of the construction of the development on the human population will be primarily through matters such as road traffic, noise and landscape quality. Indirect effects pertain to matters such as flora, fauna and existing retailing and property values which are dealt with in the following sections.
- 5.1.25 It is recognised that there is a need to provide housing for a wide cross section of the community and this proposal will provide housing to cater for all sectors of the

community. This type of housing will not only provide for the growth of the area but also maintain the level of vibrancy within the community.

Mitigation Measures

- 5.1.26 The topic of human beings is addressed in the proceeding sections of the Statement by means of an appraisal of the effects of the development on the environment in general, including human beings. Where appropriate mitigation measures to reduce adverse impacts are identified and incorporated into the proposal.

5.2 FLORA AND FAUNA

Introduction

- 5.2.1 At the request of Brady Shipman Martin, K.T.Cullen & Co. Ltd. have conducted the flora and fauna aspects of an Environmental Impact Statement for a residential development at Sandyford, Dublin. The location of the proposed site is illustrated on Figure 5.2.1.

Scope and Methodology

- 5.2.2 The assessment was conducted in general accordance with the *Guidelines for Baseline Ecological Assessment* prepared by the Institute of Environmental Assessment, UK (IEI, 1995). It follows the *Draft Guidelines on the Information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 1995).
- 5.2.3 The ecological assessment comprised a desk study and field survey. The desk study comprised the following elements:
- i. A review of the Duchas, National Parks and Wildlife, database of existing and proposed designated sites,
 - ii. A review of Ordnance Survey maps,
 - iii. A review of relevant literature and reports,
 - iv. Consultation with Duchas, National Parks and Wildlife and the Eastern Regional Fisheries Board.
- 5.2.4 The site was surveyed in general accordance with Phase 1 Habitat Survey methodology (JNCC 1993). Hedgerows were described and evaluated using the *Hedgerow Evaluation and Grading System* (Clements, D.K, Tofts, R.J. 1992). An assessment of vertebrate fauna was conducted by means of a field survey. Land use directly adjacent to the site was mapped by means of a field survey.
- 5.2.5 A site visit was conducted on 8th and 9th of November 2000.

Constraints

- 5.2.6 It is possible that some early flowering herbaceous plants would not be in flower during the time of survey and thus may be under-recorded. However, a comprehensive assessment of habitats can be made.

5.2 FLORA AND FAUNA

Introduction

- 5.2.1 At the request of Brady Shipman Martin, K.T.Cullen & Co. Ltd. have conducted the flora and fauna aspects of an Environmental Impact Statement for a residential development at Sandyford, Dublin. The location of the proposed site is illustrated on Figure 5.2.1.

Scope and Methodology

- 5.2.2 The assessment was conducted in general accordance with the *Guidelines for Baseline Ecological Assessment* prepared by the Institute of Environmental Assessment, UK (IEI, 1995). It follows the *Draft Guidelines on the Information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 1995).
- 5.2.3 The ecological assessment comprised a desk study and field survey. The desk study comprised the following elements:
- i. A review of the Duchas, National Parks and Wildlife, database of existing and proposed designated sites,
 - ii. A review of Ordnance Survey maps,
 - iii. A review of relevant literature and reports,
 - iv. Consultation with Duchas, National Parks and Wildlife and the Eastern Regional Fisheries Board.
- 5.2.4 The site was surveyed in general accordance with Phase 1 Habitat Survey methodology (JNCC 1993). Hedgerows were described and evaluated using the *Hedgerow Evaluation and Grading System* (Clements, D.K, Tofts, R.J. 1992). An assessment of vertebrate fauna was conducted by means of a field survey. Land use directly adjacent to the site was mapped by means of a field survey.
- 5.2.5 A site visit was conducted on 8th and 9th of November 2000.

Constraints

- 5.2.6 It is possible that some early flowering herbaceous plants would not be in flower during the time of survey and thus may be under-recorded. However, a comprehensive assessment of habitats can be made.

- 5.2.7 November is outside the breeding season for all bird species. It can be assumed, however, that most of the species recorded on the site which are considered as 'resident' species would nest in the immediate area.

Designated Areas

- 5.2.8 A review of the Duchas datasets of existing and proposed designations indicates that the site itself is not covered by any designations of nature conservation interest. There are three proposed Natural Heritage Areas and one Special Area of Conservation, also a National Park, within 5 km of the site. See Figure 5.2.1 and Table 5.2.1 below.

Table 5.2.1: Nature Conservation Designations within 5km of the proposed site

Site	Site Code	Description	Designation	Distance from Proposed Site
Fitzsimon's Wood	001573	Semi-natural woodland	pNHA	0.4km
Dingle Glen	001207	Semi-natural woodland	pNHA	3.75km
Ballybetagh Bog	001202	Marshland	pNHA	4.5km
Wicklow Mountains	002122	Upland heath & blanket bog	cSAC/NP	4.9km

Source: www.heritagedata.ie

Explanation of terms: pNHA = proposed Natural Heritage Area;
cSAC = candidate Special Area of Conservation;
NP = National Park

Fitzsimon's Wood

- 5.2.9 This woodland is dominated by downy birch (*Betula pubescens*). Young trees of pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*) are plentiful, with lesser quantities of sycamore (*Acer pseudoplatanus*), beech (*Fagus sylvatica*), and wild cherry (*Prunus avium*). There is a well-developed understory of holly (*Ilex aquifolium*). The woodland exhibits all stages in a natural succession from grassland and heath through spin scrub to woodland. The prevalence of pedunculate oak instead of the acid loving sessile oak is a quirk of nature. (Doogue *et al.* 1998).

Dingle Glen

- 5.2.10 This site is a dry valley formed as a glacial lake overflow channel. Formerly cleared of vegetation, a woodland cover is now regenerating with pioneer species of holly (*Ilex aquifolium*), blackthorn (*Prunus spinosa*) and willow (*Salix* spp.). A heathy vegetation is found on the slopes of the valley. (Duchas, www.heritage data.ie).

Ballybetagh Bog

- 5.2.11 This site includes 3 separate areas of marshland situated approximately 5 km north-west of Enniskerry. Its main interest lies in its historical value as it is renowned for the number of skeletons of the extinct Giant Irish Deer (*Megaloceros giganteus*) which have been excavated from the site. (Duchas, www.heritage data.ie).

Wicklow Mountains National Park

- 5.2.12 This site is important as a complex, extensive upland site. It has great geomorphological and topographical diversity and incorporates the typical habitats of upland ecosystems. The vegetation consists largely of heath, blanket bog and upland grassland. Several rare, protected plant species occur. The site is also home to the otter, listed on Annex 2 of the EU Habitats Directive and also Merlin (*Falco columbarius*) and Peregrine Falcon (*Falco peregrinus*), listed on Annex 1 of the EU Birds Directive. (Duchas, www.heritage data.ie).

Consultation

- 5.2.13 Duchas, National Parks and Wildlife, and the Eastern Regional Fisheries Board (ERFB) were consulted with respect to the proposed development. Duchas stated that it had no objections to the proposed development. (Personal communication, Dec. 2000). The ERFB highlighted the presence of Ballyogan Stream and the Sandyford Stream in the vicinity of the proposed development. A copy of the ERFB correspondence is contained in Appendix 5.2.1.

Proposed Site and Land Use

- 5.2.14 The proposed development comprises a residential development. The development is located within a development parcel, referred to as Area 1 in the Stepside Action Plan. (Dun Laoghaire Rathdown County Council, 2000).
- 5.2.15 The proposed site is located in Sandyford, Dublin. It is approximately 4.0ha in extent and its existing use is as part of the Sandyford Pitch and Putt Course. The site is composed of part of a larger pitch and putt course, including greens, fairways and tees, and the associated car parking and visitor facilities. See Figure 5.2.2.
- 5.2.16 The site is located within approximately 120m of the junction of the Regional Routes R113 and R117. The R117 Enniskerry Road runs along the western boundary of the site.
- 5.2.17 The site is undulating in character. The predominant slope is an easterly direction. However, a small area at the north east of the site slopes in a south westerly direction.
- 5.2.18 To the east, the site is bounded by residential dwellings and gardens, an area of scrub/ woodland and improved grassland. To the north are a number of residential dwellings and gardens. To the south is a continuation of the pitch and putt course. To the west is the Regional Road R117.

Phase 1 Habitat Assessment

5.2.19 An assessment of the habitats on the site was conducted according to Phase 1 Habitat Methodology. This is a standard method of habitat classification developed by the Joint Nature Conservancy Council, U.K. This classification system is based principally on vegetation, where data from vegetation studies provide an effective means of classifying and surveying habitats. (JNCC, 1993).

5.2.20 The site is composed predominantly of man-modified habitats. Using the Phase 1 Survey methodology, 5 No. habitat types were identified on the site. Figure 5.2.2 illustrates the extent and locations of these habitats. The habitats are as follows:

- i. Amenity grassland
- ii. Scattered broad-leaved and coniferous trees
- iii. Introduced shrub
- iv. Watercourses
- v. Hedgerows

Amenity Grassland

5.2.21 Amenity grassland is the predominant habitat type on the site, comprising fairways and greens. This is an intensively managed habitat with very poor species diversity. Perennial ryegrass (*Lolium perenne*) is the predominant species in the grass sward. Slender speedwell (*Veronica filiformis*), daisy (*Bellis perennis*), and white clover (*Trifolium repens*) are common.

5.2.22 There are a few small pockets of grassland adjacent to some of the fairways which are not as intensively managed as the fairways and greens. These areas are dominated by species such as nettles (*Urtica dioica*), willowherb (*Epilobium hirsutum*) and creeping buttercup (*Ranunculus repens*).

Scattered Broad-Leaved and Coniferous Trees

5.2.23 There are many small, scattered groups of mature trees throughout the site. The most common tree is the non-native, evergreen Cedar (*Cedrus deodara*). Ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and rowan (*Sorbus* sp.) are common. Also included in these areas are ornamental shrubs. See Section 1.7.3 below.

Introduced Shrub

5.2.24 Introduced shrub is common throughout the site, both as scattered groups and as mass planting. The predominant species recorded include the following: *Fuschia* sp., *Pittosporum* sp., *Weigelia* sp., *Buddleja* sp., *Griselinia* sp. and *Olearia* sp.

Watercourses

- 5.2.25 A ditch runs in a west to east direction adjacent to hedgerow No. 9. See Figure 5.2.2. This ditch is known to dry up during the summer months.
- 5.2.26 A second ditch flows in a north south direction, adjacent hedgerow No. 8 at the south of the site. The ditch is mainly fed by groundwater rising as a spring at its northern end. This ditch is a tributary of the Ballyogan stream. It is approximately 0.5m in width and drains into the Ballyogan stream approximately 100m south of the site. Species recorded in and adjacent to this ditch include fools watercress (*Apium nodiflorum*), cuckoo-flower (*Cardamine pratensis*) and wavy bittercress (*Cardamine flexuosa*).

Hedgerows

- 5.2.27 Hedgerows form the site boundaries at the north, east and west of the site. Stone walls are associated with most of the hedgerows. There is a significant variation in hedgerow type and composition throughout the site. A number of hedgerows are composed predominantly of non-native ornamental species, the remainder are a mix of native and non-native species.
- 5.2.28 The hedgerows were surveyed and evaluated, using a quantitative methodology devised by Clements and Tofts (1992). This gives weighted scores to various ecological attributes such as structure, diversity, connectivity (links with other hedges) and associated features (such as banks, drains and grass verges). Each hedge surveyed was assigned a Grade of 1 to 4, signifying the following levels of local ecological value: Grade 1= High to Very High; Grade 2= Moderately High to High; Grade 3= Moderate Value; Grade 4= Low Value.
- 5.2.29 Each of the grades is further subdivided into three categories, with the use of + or - symbols (i.e 1+, 1, 1-, etc.). Each hedgerow on the site is numbered individually. See Figure 5.2.2. The evaluations are given in Table 5.2.2, below.
- 5.2.30 Mature/semi-mature trees are occasional in the hedgerows. The predominant tree species are ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*). Willow (*Salix* sp.) is occasional along the Sandyford stream and ditches on the site. The non-native black italian poplar (*Populus x canadensis*) is common along Sandyford stream.
- 5.2.31 The predominant native hedgerow canopy species are holly (*Ilex aquifolium*), blackthorn (*Prunus spinosa*) and elder (*Sambucus nigra*). Gorse (*Ulex europaeus*), privet (*Ligustrum vulgare*) and hazel (*Corylus avellana*) are locally common. Hawthorn (*Crataegus monogyna*), snowberry (*Symphoricarpos alba*), spindle tree (*Euonymus europaeus*), and *Rosa* sp. are occasional. Brambles (*Rubus fruticosus* agg.) are common throughout.
- 5.2.32 The ground flora associated with the hedgerows is generally species-poor. Species recorded as common include; ivy (*Hedera helix*), creeping buttercup (*Ranunculus repens*), nettles (*Urtica dioica*), cleavers (*Gallium aparine*), common vetch (*Vicia*

cracca), bush vetch (*Vicia sepium*), herb robert (*Geranium robertianum*), ribwort plantain (*Plantago lanceolata*), groundsel (*Senecio vulgaris*), wild angelica (*Angelica sylvestris*), ground ivy (*Glechoma hederacea*) and dandelion (*Taraxacum* sp.). Species recorded as occasional include coltsfoot (*Tussilago farfara*) and pennywort (*Umbilicus rupestris*). Horsetail (*Equisetum* sp.) is occasional in damp areas. The non-native invasive species japanese knotweed (*Reynoutria japonica*) is recorded in hedgerow No.s 3 and 4 at the north west of the site.

Table 5.2.2: Hedgerow Evaluation Grading

Hedge No.	Grade	Length (m)	Local Ecological Value	Description
1	3	75	Moderate	Trimmed roadside hedge. Poor species diversity.
2	4	55	Low	Trimmed. Ornamental species only.
3	4	80	Low	Roadside hedge. Predominantly non-native species. Japanese knotweed recorded.
4	2-	190	Moderately high to high	Sandyford stream adjacent. Many mature trees. Good species diversity. Ornamental species common. Japanese knotweed recorded.
5*	1-	210	High to Very High	Adjacent to woodland/scrub. Very good diversity
6	4	100	Low	Leyland cypress hedge
7**	2	60	Moderately High to High	Very good species diversity
8**	3+	50	Moderate	Poor species diversity. Drain adjacent.
9	2+	125	Moderately High to High	Good species diversity. Drain adjacent.

* This hedgerow is located predominantly outside the site boundary wall. The species recorded relate predominantly to species in the adjacent woodland/scrub area.

** Part of a longer hedgerow.

- 5.2.33 Hedgerow No. 5 achieved a rating of *high to very high local ecological value*. However, as mentioned in Table 2 above, this hedgerow is located predominantly outside the site boundary wall. Therefore the species recorded relate predominantly to species in the adjacent woodland/scrub area. Hedgerow No.s 4, 7 and 9 achieved a rating of *moderately high to high local ecological value*. The remainder of the hedgerows are of moderate to low ecological value.

Adjacent Habitats

- 5.2.34 Habitats adjacent to the proposed site were identified and assessed. These habitats are illustrated on Figure 5.2.2 and include the following:

Amenity grassland

- 5.2.35 The land adjacent to the southern boundary of the site is a continuation of the pitch and putt course.

Gardens/Domestic Residences

- 5.2.36 There are a number of domestic residences and associated gardens adjacent to the north and north east of the site.

Semi-Natural Woodland/Scrub

- 5.2.37 Adjacent to the eastern boundary of the site is a small strip of woodland/scrub, at the rear of domestic dwellings, sloping steeply down to the site. The tree canopy is composed predominantly of oak (*Quercus robur*) and ash (*Fraxinus excelsior*). Understory vegetation is dense, with holly (*Ilex aquifolium*) as the predominant understory species. Blackthorn (*Prunus spinosa*), hazel (*Corylus avellana*) and elder (*Sambucus nigra*) are common. The ground flora includes ivy (*Hedera helix*), wood avens (*Geum urbanum*), foxglove (*Digitalis purpurea*), wild strawberry (*Fragaria vesca*), wood sorrel (*Oxalis acetosella*), soft shield fern (*Polystichum setiferum*) and harts tongue (*Asplenium scolopendrium*).

Improved Grassland

- 5.2.38 An area of improved grassland is located adjacent to the south east boundary of the proposed site. Typical species associated with improved grassland include perennial ryegrass (*Lolium perenne*).

Watercourses

- 5.2.39 The Sandyford Stream is located adjacent to the northern boundary of the site. The stream is approximately 0.5m to 1m in width. The stream is culverted upstream of the site and also along its lower section adjacent to the western site boundary. The banks of the stream are steep. The western bank is predominantly a continuation of the adjacent gardens with ornamental species including *Chaemacyparis* sp., *Bergenia* sp. and golden privet (*Ligustrum ovalifolium*). The eastern bank is vegetated with brambles and ivy. Hedgerow No. 4 runs adjacent to the southern boundary of the stream.
- 5.2.40 As mentioned, the ditch which is located at the south of the site drains into the Ballyogan stream approximately 100m south of the site boundary. The Ballyogan stream is a tributary of the Loughlinstown stream. Further details on the water quality and fisheries potential of the Ballyogan stream are outlined in Section 5.2.9 below.

Fauna

- 5.2.41 An assessment of the vertebrate fauna was conducted by means of a field survey. Reference was also made to previous surveys conducted in the vicinity of the proposed site including surveys for proposed developments in Area 4 and Area 6, Stepside (Smal, C., 2001), proposals for Waste Recycling and Treatment Facilities at Ballyogan Landfill (Biosphere Environmental Services, 1997) and the EIS for the South Eastern Motorway (Dun Laoghaire-Rathdown County Council, 1997).

- 5.2.42 A limited vertebrate fauna was recorded on the site. Such an intensively managed site would typically support a poor faunal diversity, with common and ubiquitous species recorded.
- 5.2.43 A bat survey was not conducted due to the fact that bats would be in hibernation at this time of year. However, studies conducted for adjacent developments in the area, during the appropriate season, indicate the presence of two bat species, in low numbers, in the area of the pitch and putt course. These are the common pipistrelle (*Pipistrellus pipistrellus*) and the soprano pipistrelle (*Pipistrellus pygmaeus*). The absence of suitable buildings, caves or bridges indicate that any bat roosts, if present, would be located in mature deciduous trees. (Smal, C., 2001).
- 5.2.44 Bats are protected under the Wildlife Act (1976) and the EU Habitats Directive (92/43/EEC).
- 5.2.45 An active badger (*Meles meles*) set was recorded in the small woodland/scrub area outside the eastern boundary of the site. The set is located at the base of a wooded slope which grades upwards away from the site. It appears to be a relatively small set. The set is approximately 5m from the eastern boundary of the site. See Figure 5.2.2. The badger set does not appear to be a main breeding set. No other set entrances were recorded in the woodland. Some limited evidence of badger foraging activity was recorded at the eastern edge of the existing site, adjacent to the area of improved grassland. See Figure 5.2.2. No other ancillary sets were located within the vicinity of the site. No other sign of badger activity was recorded at the site. Given the location of the badger set at the base of a slope, it is most likely that the badger set is dug into the base of the slope, i.e away from the flat ground of the proposed site. Badgers will typically dig into the side of a slope to create their set, rather than utilising flat ground. (RSPCA, no date).
- 5.2.46 Studies conducted for developments adjacent to the proposed site indicate additional badger setts adjacent to the Ballyogan stream and significant foraging activity in the area. (Smal, C., 2001).
- 5.2.47 The badger is protected under the Wildlife Act (1976).
- 5.2.48 Four species of common birds were recorded at the site. These include magpie (*Pica pica*), blackbird (*Turdus merula*), robin (*Erithacus rubecula*) and crow (*Corvus corone corone*). Studies conducted for developments adjacent to the proposed site indicate the presence of other common bird species associated with woodland and amenity grasslands, including wren (*Troglodytes troglodytes*), chaffinch (*Fringela coelebs*), house sparrow (*Passer domesticus*), wood pigeon (*Columba palumbus*), jackdaw (*Corvus moedula*), song thrush (*Turdus philomelos*), dunnoek (*Prunella modularis*), blue tit (*Parus caeruleus*) and great tit (*Parus major*). (Smal, C., 2001).
- 5.2.49 Most bird species are protected under the Wildlife Act (1976). Under Section 46 of the Wildlife (Amendment) Act, 2000, it is an offence to disturb vegetation during the period

1st March to 31st August, with exemptions for road construction and developments works.

5.2.50 The common frog (*Rana temporaria*) is more than likely present at the site. The drainage ditches and stream would serve as potential breeding sites. However, it was not recorded at the time of survey due to seasonal constraints. The common frog is protected under the Wildlife Act (1976) and is listed as a Red Data Book species. It is common and ubiquitous in Ireland.

5.2.51 Evidence of rat (*Rattus norvegicus*) runs were observed along the northern boundary of the site.

Water Quality and Fisheries

5.2.52 For the purposes of this report a desk study assessment of the fisheries potential and water quality of the Ballyogan stream and the Sandyford stream was undertaken.

Water Quality

5.2.53 Water quality on the Ballyogan stream ranges from moderately polluted along its upper reaches, upstream of Kilgobbin Road, to seriously polluted at the confluence with the Racecourse stream. (Biosphere Environmental Services, 1998).

5.2.54 Previous studies conducted on the Sandyford Stream indicate moderate to serious pollution. Using the standard Biotic Index (Q Values) developed by the Environmental Protection Agency, values of 2 to 3 were recorded, where Q2—3=Moderately polluted and Q2=Seriously polluted. (Clabby et al. 1992).

Fisheries Potential

5.2.55 An assessment of the habitats along the Ballyogan stream indicate poor to fair potential habitat for adult trout, fair to good potential nursery habitat for juvenile trout and poor to fair potential spawning habitat. (Biosphere Environmental Services, 1998).

5.2.56 Previous fisheries surveys conducted on the Ballyogan stream indicate the presence of a trout population in the upper reaches of the stream at Woodside. The survey indicates that the stream has significant sections of good trout nursery habitat and areas of spawning potential, particularly upstream of Kilgobbin Road. In addition, the stream has potential to support a small population of adult trout. (Dun Laoghaire-Rathdown County Council, 1997).

5.2.57 A habitat assessment of the stretch of the Ballyogan stream from the Pitch and Putt course at the Ennsikerry Road to the culvert upstream of Kilgobbin Road, indicates that this section of the stream is too small to provide good habitat for adult trout;

however, it does have good nursery trout habitat and some fair to good spawning grounds. (Biosphere Environmental Services, 1998).

5.2.58 A fish survey (electrofishing) conducted on the Ballyogan stream in 1998 reports that the existence of a trout population in the upper reaches of the Ballyogan stream, approximately 7km from the nearest substantial trout population in the system, may result from trout migrating from the main Shanganagh population to spawn in this section. However, given the polluted state of the intervening waters and presence of culverts, it is thought more likely that the upper Ballyogan population is an isolated one, with fish reaching maturity at smaller sizes than normal and completing their life cycle in the small stream. Furthermore, it is suggested that the existence of this isolated population allows for the possibility that the Ballyogan stream could be repopulated by natural spread of fish native to that stream, if conditions downstream were improved. (Biosphere Environmental Services, 1998).

5.2.59 Previous fish studies on the Sandyford Stream revealed no records of fish. The absence of fish may be attributed to the small size of the stream, the serious pollution and the extensive culverts. The stream is not regarded as having significant potential as a trout habitat. (Dun Laoghaire-Rathdown County Council, 1997).

5.2.60 As mentioned, the ERFB was consulted with respect to the proposed development. According to the ERFB, Ballyogan Stream is the significant watercourse in relation to this development, as it is a salmonid catchment. The Sandyford stream is extensively culverted, and is unlikely to contain salmonids. It would however, contain macroinvertebrates. The ERFB has made a number of recommendations regarding the proposed development. Details of the recommendations are contained in Appendix 5.2.1.

Overall assessment of the scientific interest of site

- 5.2.61 The proposed site is not covered by any designations of nature conservation interest. The closest designated site is Fitsimons Wood, a proposed Natural Heritage Area, located 400m north west of the site.
- 5.2.62 The existing site is part of a larger pitch and putt course. It is an intensively managed area with a predominance of man-modified habitats and a high proportion of introduced/ornamental species. The habitats on the site are widespread and common.
- 5.2.63 No rare or protected species of plant was recorded at the site.
- 5.2.64 Three of the hedgerows on the site are of moderately high to high local ecological value. The remainder are of moderate to low ecological value.
- 5.2.65 The area of woodland/scrub adjacent to the north east boundary of the site is of high local ecological importance.

- 5.2.66 No rare species of bird or vertebrate fauna was recorded, or is known to be located, in the vicinity of the site.
- 5.2.67 Bird species recorded at the site are common and widespread. No rare species of bird, or species protected under the EU Birds Directive Annex 1 were recorded.
- 5.2.68 An active badger set was recorded in an area of woodland/scrub outside the eastern boundary of the site. Signs of foraging were recorded on the eastern boundary of the site. No additional signs of foraging were recorded in any other locations on the site.
- 5.2.69 Two common species of bat, the common pipistrelle and the soprano pipistrelle, are known to occur in low numbers in the vicinity of the site.
- 5.2.70 The site has potential breeding sites for the common frog.
- 5.2.71 The Sandyford stream, which runs adjacent to the northern boundary of the site, is of low ecological interest. It is extensively culverted and has no published records of fish.
- 5.2.72 The ditch adjacent to hedgerow No.8 at the south of the site, flows into the Ballyogan stream approximately 100m south of the site. The Ballyogan stream has stretches of trout habitat and spawning grounds upstream of Kilgobbin Road.

Potential Impacts

General

- 5.2.73 The proposed development will not have a direct impact on any of the designated sites within 5km of the proposed development.
- 5.2.74 The development has the potential to impact, via downstream pollution, the pNHA at Loughlinstown, approximately 8km downstream of the site. This is due to the fact that the Ballyogan stream, approximately 100m south of the site, could potentially act as a route for pollution incidents.

Flora

- 5.2.75 The proposed development will involve the removal of amenity grassland and introduced shrub. These habitats are intensively managed and composed of predominantly non-native species and are of low ecological value. Their removal is not of significant ecological significance.
- 5.2.76 Where possible, the scattered groups of trees are retained as part of the overall site development.

- 5.2.77 The removal of the hedgerows, excluding Hedgerow No. 5, will be of no more than local ecological significance. Hedgerow No. 5 will be retained as part of the overall development.
- 5.2.78 The development has the potential to impact on the woodland/scrub adjacent to the north east boundary by virtue of isolating it from surrounding habitats and also resulting from potential disturbance due to construction works. Mitigation measures will be out in place to reduce/avoid these potential impacts.

Fauna

- 5.2.79 The badger set recorded in the area of woodland/scrub lies outside the eastern boundary of the proposed site. However, it is possible that the development of the north east portion of the site could result in some disturbance to badgers using this sett. In addition, the development will result in the loss of some small areas of habitat used for foraging by the badgers. The development may involve the fragmentation of access routes to adjacent feeding sites. It is possible that the group may not persist in the area.
- 5.2.80 The removal the hedgerows and groups of trees may, potentially, result in the loss of summer bat roosts in mature deciduous trees. However, it is expected that only low numbers of common species would be potentially affected.
- 5.2.81 The removal the hedgerows and groups of trees will result in the reduction of the available nesting and foraging habitat for the common and ubiquitous bird species on site.

Water Quality/Fisheries

- 5.2.82 The drain adjacent to Hedgerow no. 8 will be retained as part of the development.
- 5.2.83 The ditch adjacent to Hedgerow No. 9 will be culverted as part of the development. This section of ditch dries up during the summer months and is not of significant ecological value. The loss of this section of stream is not considered to be of significant ecological importance. However, works associated with its culverting, and the development in general, have the potential to impact on the adjacent watercourse. Mitigation measures will be out in place to reduce/avoid these potential impacts.
- 5.2.84 The culverting of the section of drain will involve the loss of some potential breeding site for the common frog.
- 5.2.85 The replacement of the on-site vegetation with significant areas of buildings and concreted surface will alter the existing surface water run-off regime on the site. This

has the potential to impact on the volumes of water entering the watercourses on site and consequently on the aquatic ecology and vegetation. Mitigation measures will be put in place to reduce/avoid any negative impacts.

Mitigation Measures

- 5.2.86 It is recommended that standard mitigation measures, as would apply to any large scale development, be adopted in the construction of this development. These include habitat retention where feasible, limiting season of disturbance to trees and vegetation so as to reduce impacts on breeding species, to provide for habitat replacement and enhancement, and measures to reduce pollution and sedimentation into watercourses during construction and operation phases.

Flora

- 5.2.87 In order to avoid damage to trees and hedgerows which will be retained as part of the development, it is recommended that the areas around these trees and hedges be left undisturbed. These areas should be fenced off prior to commencement of construction work.
- 5.2.88 An area of open space will be retained along the eastern boundary of the proposed site, adjacent to the woodland/scrub and to the drain which is to be retained. This will act as a wildlife corridor. Additional planting with native species, similar to those recorded in adjacent hedgerows, is recommended. This corridor will also act as an effective buffer zone for the badger sett to the east of the site.
- 5.2.89 The removal and disposal of Japanese knotweed (*Reynoutria japonica*) found in Hedgerows 3 and 4 should be undertaken with care. This is a very invasive species which occurs in a variety of man-made habitats such as road verges, railway embankments, stream, rivers and canal banks. It is recommended that this plant should be destroyed in-situ prior to development of the site.

Fauna

- 5.2.90 Measures to mitigate for potential impacts to the badger set located outside the proposed site will be undertaken. These include the creation of a buffer zone of approximately 20m adjacent to badger set. This buffer zone will form part of the larger area of open space to be retained/created as part of the development. The buffer zone will be identified and fenced off prior to construction and protected from development. This area will be planted with native tree and shrub species, which reflect the species composition of the adjacent area of scrub/woodland.

- 5.2.91 In addition, it is recommended that site storage areas, machinery depots etc should not be located adjacent to the area where the sett is located.
- 5.2.92 Where possible, the timing of construction should be chosen so as to limit disturbance and impacts on breeding species. The removal of trees and hedgerows should, where possible, take place outside the bird nesting season of March to June.
- 5.2.93 Where mature trees require removal, the recommended period for felling of trees, to limit damage to potential bat roosts, is Autumn (September – November) or Spring (April – May). (However, attention should also be paid to the recommended dates for protection of bird nesting sites. See above.)

Water Quality/Fisheries

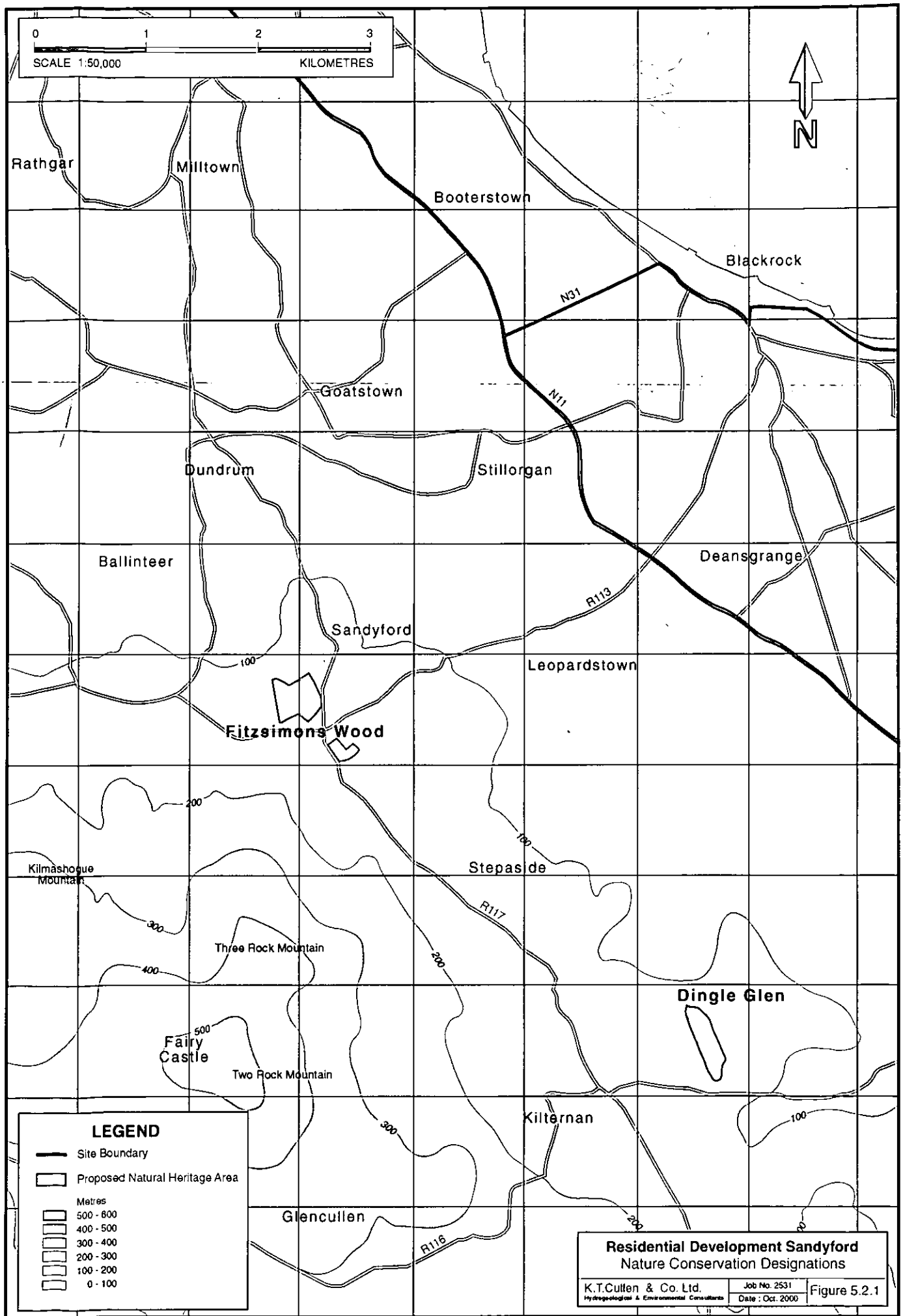
- 5.2.94 Measures to reduce and prevent pollution and sedimentation to watercourses during site development will be adopted. These include constructing interceptor ditches and sediment control structures as appropriate.
- 5.2.95 It is recommended that a method statement detailing any proposed in-stream works be drawn up in consultation with the ERFB, in advance of proposed works. Where possible instream works will be conducted during the period May-September.
- 5.2.96 Construction, storage areas, temporary access roads and spoil disposal areas will be located as far as practicable from watercourses on the site. In general, sites at least 50-75m from watercourses should be chosen.
- 5.2.97 Construction works should limit entry of sediments, and avoid entry of pollutants, into the drainage system and watercourses in the area. Prior to commencement of construction work, streams on site should be fenced off behind the existing zone of bankside vegetation or at a minimum distance of 5m from the stream edge.
- 5.2.98 All sewage effluent associated with the proposed development will be discharged to foul sewer. Surface water run-off from paved areas of the development will be directed to an attenuation pond, silt trap and oil interceptor prior to discharge.

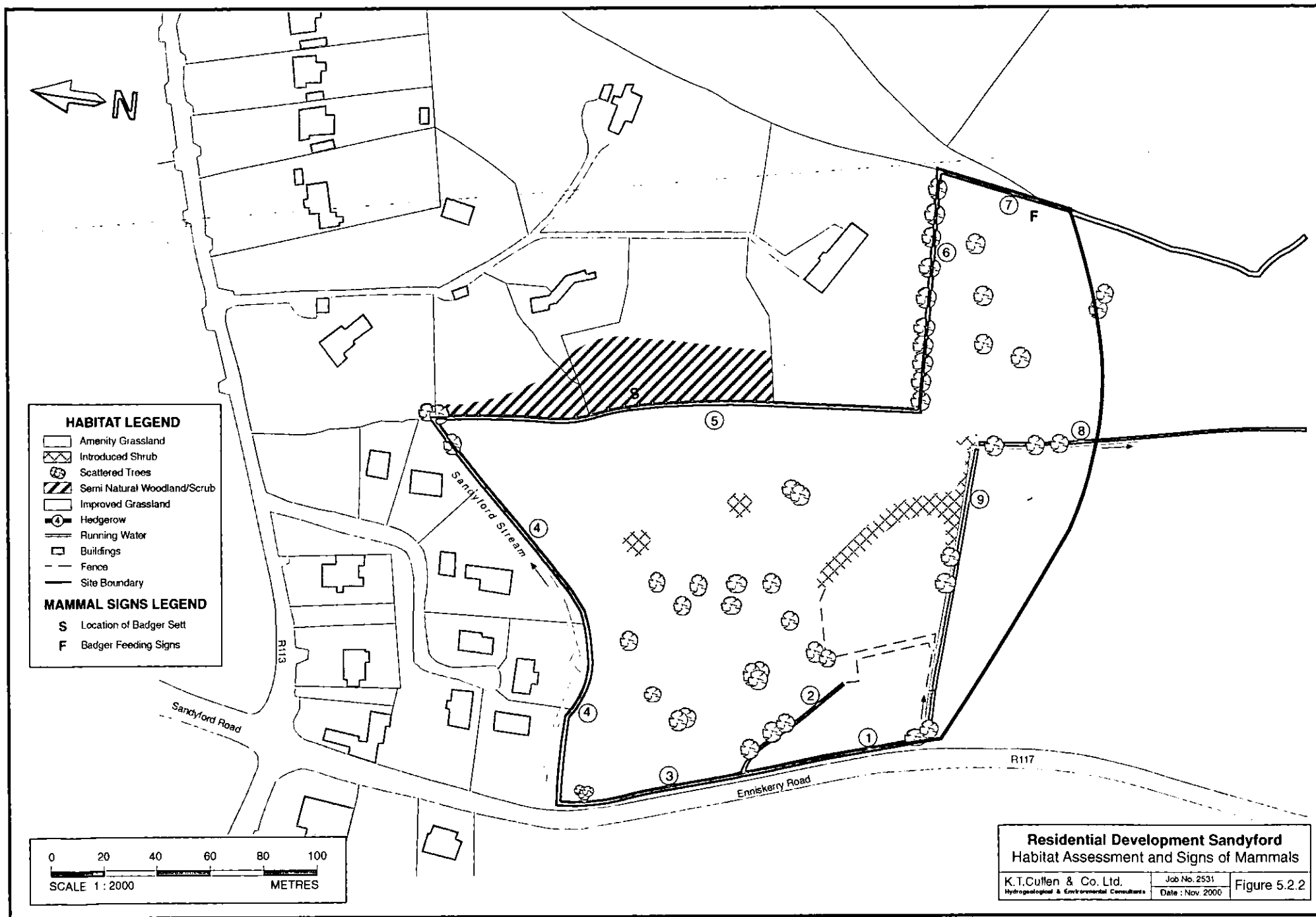
Predicted Impact of the proposal

- 5.2.99 With the mitigation measures in place, the overall impact of the proposed development is not considered to be of high ecological significance.

REFERENCES

- Anon. (1993). Handbook for Phase 1 Habitat Survey. Joint Nature Conservation Committee.
- An Foras Forbartha. 1981. National Heritage Inventory. Areas of Scientific Interest in Ireland.
- Biosphere Environmental Services. 1998. Ballyogan Waste Management Centre. EIS and EPA Waste Licence Application, Ecological Study (Aquatic Ecology and Terrestrial Fauna). Dun Laoghaire Rathdown County Council.
- Clabby, K.J. *et al.* 1992. *Water Quality in Ireland. 1987 - 1990. Part One -General Assessment.* Environmental Research Unit.
- Clements, D.K., Tofts, R.J. 1992. *Hedgerow Evaluation and Grading System.* Countryside Planning and Management.
- Dempsey, E. and O'Clery, M. 1995. *Pocket Guide to the Common Birds of Ireland.* Gill & Macmillan Ltd., Dublin.
- Doogue, D., Nash, D., Parnell, J., Reynolds, S. and Wyse-Jackson, P. (eds) 1998. *Flora of County Dublin.* The Dublin Naturalists' Field Club, Dublin.
- Dun Laoghaire-Rathdown County Council. 1997. South Eastern Motorway. Environmental Impact Statement.
- Dun Laoghaire-Rathdown County Council. 2000. Stepside Action Area Plan.
- Harris *et al.* Problems with badgers? Royal Society for the Protection of Cruelty to Animals.
- Heritage Service, National Parks and Wildlife Service "Proposed Natural Heritage Areas (pNHA) and proposed Candidate Special Areas of Conservation (pCSAC)". Sheet No.40, 03/06/97.
- Hickie, D. 1997. Evaluation of Environmental Designations in Ireland. The Heritage Council.
- Mitchell, A. 1974. *Trees of Britain and Northern Europe.* Harper Collins. London.
- Smal, C. 2001. Proposed Housing and Commercial Development at Sandyford/Stepaside. Terrestrial Fauna.
- Webb, D.A., Parnell, J. and Doogue, D. 1996. *An Irish Flora.* Dundalgan Press (W. Tempest) Ltd, Dundalk.
- www.heritagedata.ie (Duchas Datasets)





5.3 SOILS

Receiving Environment

- 5.3.1 The soils of the wider area are generally dominated by boulder clays containing limestone cobbles and some boulders deposited by glacial progression over limestone terrain pushing up towards the Dublin Mountains.
- 5.3.2 The soils vary from 'soft brown clayey gravelly sands' to stiff black, slightly sandy and gravelly clay. In places, there are traces of totally weathered granite (loose to medium dense residual granite sand).
- 5.3.3 The Leinster Granite Northern Pluton forms the bedrock below all soils on the development lands. This strong granite varies in depth from surface to approximately 3.5m below ground level across the site. The surface granite is most evident through the eastern part of the existing pitch and putt course.

Characteristics of the Proposal

- 5.3.4 In general the proposed residential development is not invasive in terms of soils and will follow the general topography of the site. However, the development will involve the excavation and movement of existing soils, and the storage of stripped soil on site for re-use.

Impact of Development

- 5.3.5 All topsoil on the development lands will be stripped in accordance with the phasing of the development. The total works will involve the stripping of between 6,000 and 8,000 cu.m of topsoil. This range takes account of the varying depths of existing topsoil on the site where bedrock is close to the surface.
- 5.3.6 Stripped topsoil will be stored during the construction phase for re-use in landscape works within the development. Therefore, although the impact on soils will be slightly negative during the construction stage, the impact in the long term will be negligible.
- 5.3.7 Construction of roads and footpaths and underground parking will involve some local excavation into the subsoil and bedrock. However, this form of excavation will be limited as the development is designed to generally follow the topography of the site.

No significant quantities of material will be generated during these excavations and it is anticipated that all material excavated will be re-used during the construction phase. Therefore, the impact of any excavations additional to stripping of topsoil will be only slightly negative.

- 5.3.8 Development of remaining parcels of appropriately zoned lands within the wider land holding will similarly have little adverse impact on soils of any significance.

Mitigation

- 5.3.8 - Topsoil stripped from the development lands will be stored on site in temporary mounds. These mounds will be located away from construction traffic, watercourses and retained tree and hedgerows. The stockpiles will be protected during the construction phase. All topsoil will be re-instated into the open space and garden areas. In general topsoil will be exported off site.

5.4 WATER

Introduction

- 5.4.1 A detailed assessment of the proposed water and drainage infrastructure on site, and the potential impacts of the proposed development and associated mitigation measures has been undertaken by Burroughs Consulting Engineers, in consultation with Terry & O'Flanagan Consulting Engineers.

Surface Water

Receiving Environment

- 5.4.2 The largely undeveloped greenfield area south of Ballyogan Road/Kilgobbin Road, including the subject site is bisected by and drains to the Kilgobbin Stream. It flows eastwards towards Carrickmines and connects into the Ballyogan stream south of the Sandyford Hall estate. A number of tributary streams feed the Ballyogan Stream, one of which is located within, and drains the subject site shown in Fig. 5.4.1. below. There have been some recorded instances of localised flooding on the Ballyogan Stream in the vicinity of the Kilgobbin Road Bridge. The lands to the North of the Kilgobbin Stream, within the subject site, have an average natural grade of approximately 1:34, towards the outfall tributary stream.
- 5.4.3 The Sandyford stream is located to the northwest of the subject site outside the site's catchment area. There have been instances of secondary flooding from this stream onto the subject lands.

Characteristics of the Proposal

- 5.4.4 The proposal consists of the construction of an urban development on agricultural lands which gives rise to a different surface water run-off character. Existing ditches traversing the site will be filled in and replaced with land drains where appropriate.
- 5.4.5 It is proposed to provide a positive surface water outfall for the subject lands by constructing a new surface water pipe discharging to the Kilgobbin Stream, via the tributary stream as indicated schematically on Fig. 5.4.1 below. The existing channel

of this stream will also be deepened and widened so as to provide an outfall for secondary flooding from the Sandyford stream. Any existing ditches within the site will be replaced with a new piped system, which will be sized to accommodate external flows entering the site.

- 5.4.6 Dun Laoghaire/Rathdown County Council has indicated the requirement to provide attenuation and flow control. On-line retention by means of storage tanks and a hydro-brake flow control device will be utilised to restrict flows to the specified limits so the run-off rates do not exceed those currently generated by agricultural lands. The storage tanks will be located to the east of the site (See Figure 5.4.1). Retention volumes to accommodate 1 in 30 year return period will be provided.

Potential Impact of the Proposal

Construction Stage

- 5.4.7 Chemicals/materials if spilled during construction could have a detrimental effect on the surface water within the catchment area.

Operational Stage

- 5.4.8 Accidental connections of the foul sewer to the surface water system may lead to contamination of the Kilgobbin stream.
- 5.4.9 Blockage of the Hydro-Brake flow control device could lead to flooding.
- 5.4.10 Road and car parking areas may give rise to a potential contamination of run-off due to oil and other materials which be deposited on their surfaces.
- 5.4.11 The proposed development would give rise to a significantly increased impermeable area, which in turn increases the run-off rate and the quantity of rainwater.

Remedial or Reductive Measures

Construction Stage

- 5.4.12 Run off water from the construction areas of the site will be discharged to ponds to intercept and settle highly coloured run-off prior to discharge to the Kilgobbin Stream. All storage areas for oils construction chemicals etc will be located to prevent the washing of any spilled materials to the surface water system and the stream.

Operational Stage

- 5.4.13 To prevent on-site flooding, an emergency overflow device will be incorporated in the event of the Hydro-Brake device malfunctioning.
- 5.4.14 The provision of bypass interceptors on the outfall sewer will ensure collection of any oils or other contaminants prior to discharge to the Kilgobbin stream.
- 5.4.15 The provision of fully plumbed dwellings and buildings making provisions for the connection of all devices in bathrooms and kitchens at the construction stage significantly reduces the likelihood of any misconnection to the surface water system.

Predicted Impact of the Development

- 5.4.16 During the construction period some adverse short-term impacts are envisaged due to increase surface water runoff before the flow control measures are implemented.
- 5.4.17 The overall design of the surface water system limits the proposed runoff to that of the existing greenfield site so that long-term impacts of the proposed development should be neutral to slightly adverse.

Monitoring**Construction Stage**

- 5.4.18 The construction stage of the development will require monitoring to ensure that the reductive measures proposed are implemented and
- 5.4.19 operational.

Operational stage

- 5.4.20 The by-pass interceptors will require monitoring in accordance with manufacturers recommendations to ensure that such materials, which are separated and stored, are removed for disposal.
- 5.4.21 Silt traps associated with the storage facilities will require monitoring to ensure that the efficacy of the system is not compromised and the desilting is carried out as required.

Reinstatement

- 5.4.22 Where pipelines discharge to the Kilgobbin stream, or its tributaries, the streams banks will be reinstated in the vicinity of the pipe and its associated head
- 5.4.23 wall.
- 5.4.24 Normal post-construction reinstatement of sewer trenches will take place after pipe laying, jointing and testing.

Cumulative Effects

- 5.4.25 Dun Laoghaire/Rathdown County Councils have stipulated that flow control measures should be utilised to restrict flows to the specified limits so the run-off rates do not exceed those currently generated by agricultural lands. This criteria is applicable to the entire development area so that no negative long term impacts are anticipated.

Forecasting Methods

- 5.4.26 Normal engineering methods, i.e. the Modified Rational Method, were employed to forecast the effects of proposed surface water runoff and storage requirements.

Difficulty in compiling information

- 5.4.27 No particular difficulties were encountered.

Interactions

- 5.4.28 No interactions are noted.

Foul Water

Receiving Environment

5.4.29 There are no foul sewers within the curtilage of the subject site. The nearest suitable foul sewer, within the Stepside AAP area, is approximately 550 metres from the subject site in the Sandyford Hall residential development. It is understood that capacity provisions have been made within this system for upstream developments.

5.4.30 The foul system within Sandyford Hall currently drains by gravity in the first instance to a pumping station located at the southeastern corner of the estate. The sewage is then pumped into a rising main to connect to the gravity sewer on Murphystown Road that serves the Mount Eagle Estate. It is understood that Dun Laoghaire Rathdown County Council will be replacing the rising main with a gravity sewer to be connected directly to the Carrickmines Valley Main Drainage Scheme. The Scheme, which is currently being extended in stages along the Ballyogan Stream Valley, flows to the treatment works at Shanganagh.

Characteristics of the Proposal

5.4.31 The proposed development will be constructed using 'separate system' methods, i.e. separate foul drainage and surface water drainage systems.

5.4.32 It is proposed to construct a foul outfall sewer of approximately 675 metres from the subject site to an existing foul sewer network in the Sandyford Hall residential development on Sandyford Hall Grove, as illustrated in Figure 5.4.1 below. The proposed sewer outfall shall generally follow the direction of the Ballyogan Stream with a minimum setback of 10 metres observed at all stages.

Potential Impact of the Proposal **Construction Stage**

5.4.33 The construction of the outfall sewer and connection to the existing foul sewer on Sandyford Hall Grove may have a slight impact on cul de sac residents in the short term.

- 5.4.34 The excavation and construction of the foul sewer outfall may have slight adverse effects on the Kilgobbin stream should poor on-site earthworks management practices be used.

Operational Stage

- 5.4.35 Possible effects include an increased demand on the resources of the receiving drainage network and wastewater treatment facilities.

Remedial or reductive measures

Construction Stage

- 5.4.36 The proposed foul sewer network and outfall will be designed and constructed in accordance with Dun Laoghaire/Rathdown County Council guidelines and good engineering practice.
- 5.4.37 Construction of the outfall sewer alongside the Kilgobbin stream shall be completed in accordance with a strict method statement so as to minimise disruption.

Operational Stage

- 5.4.38 The receiving wastewater treatment facilities in Shanganagh are estimated by Dun Laoghaire/Rathdown County Council to have sufficient capacity for this and other planned developments in the long term.

Predicted impact of the development

Construction Stage

- 5.4.39 Construction of the proposed foul sewerage as proposed will have minimal impacts in the short term during the construction period.

Operational Stage

- 5.4.40 Adequate capacity exists in the existing drainage system, so no adverse impacts in this context are anticipated.

**Monitoring
Construction Stage**

- 5.4.41 The construction stage of the development will require monitoring to ensure that the reductive measures proposed are implemented and operational.

Operational Stage

- 5.4.42 The foul sewer system will be monitored by way of a proper sewer maintenance programme.

Reinstatement

- 5.4.43 Any works on public roads, such as the connection to the existing sewer, will be carried out with the minimum of inconvenience to the public and shall be reinstated in accordance with the requirements of Dun Laoghaire/Rathdown County Council's Roads Department.
- 5.4.44 Normal post-construction reinstatement of sewer trenches will take place after pipe laying, jointing and testing.

Cumulative Effects

- 5.4.45 It is understood that the downstream foul sewer network (i.e. the Carrickmines Valley Main Drainage Scheme) has been designed to cater for this upstream catchment. To this end, upon completion of the entire development lands, it is envisaged that there will be no negative impacts on the existing system.

Forecasting Method

- 5.4.46 Normal engineering methods were employed to forecast the effects of proposed foul water drainage in accordance with Dun Laoghaire/Rathdown County Council guidelines.

Difficulty in Compiling Information

- 5.4.47 No particular difficulties were encountered

Interactions

- 5.4.48 There is an obvious and directly proportional interaction between foul drainage and water supply in that the former will replicate the latter closely in volumetric terms.

Potable Water

Receiving Environment

- 5.4.49 The subject lands are situated within the supply area of the Sandyford High Level Water Scheme (SHLWS). There is a recently constructed 300mm diameter rising main running along the Enniskerry road, which is served by the Stillorgan Reservoir. It is understood that the commissioning of the intelligent pumping systems at the Stillorgan Reservoir has recently enhanced water supply in this area. It is anticipated that the practical completion of the SHLWS will be by 2003.

Characteristics of the proposal

- 5.4.50 It is proposed, in the short term, to service the site by a connection to the existing 300mm diameter watermain in the Enniskerry Road, as indicated in figure 5.4.1 below.

Potential Impact of the Proposal

- 5.4.51 Pending the completion of the SHLWS the construction of the proposed development would potentially lead to an increased demand on water resources in the short term.

Remedial or Reductive Measures

- 5.4.52 Where possible, water saving devices will be utilised within the development so as to optimise usage.
- 5.4.53 Dun Laoghaire/Rathdown County Council in the Area Action Plan have identified upgrade "intelligent pumping systems" which can be installed to optimise the residual capacities of Sandyford reservoir.

Predicted Impact of the development

- 5.4.54 In the short, prior to the commissioning of the SHLWS, the development will increase the demand on the existing water resources within the Stepside area.
- 5.4.55 By facilitating the SHLWS the development will in the long term enhance the water supply in the area and therefore have a positive impact on water supply within the development area.

Monitoring

- 5.4.56 Water flow meters as required will monitor ongoing water usage. The proposed reservoirs as part of the SHLWS will be consistent with good water conservation practices.

Reinstatement

- 5.4.57 Any works on public roads, such as the connection to the existing watermain on the Enniskerry road, will be carried out with the minimum of inconvenience to the public and shall be reinstated in accordance with the requirements of Dun Laoghaire/Rathdown County Council's Sanitary Department.

Cumulative Effects

- 5.4.58 Upon completion of the entire development lands there are no significant impacts envisaged should development be phased in parallel with the implementation of the Sandyford High Level Supply Scheme.

Forecasting Method

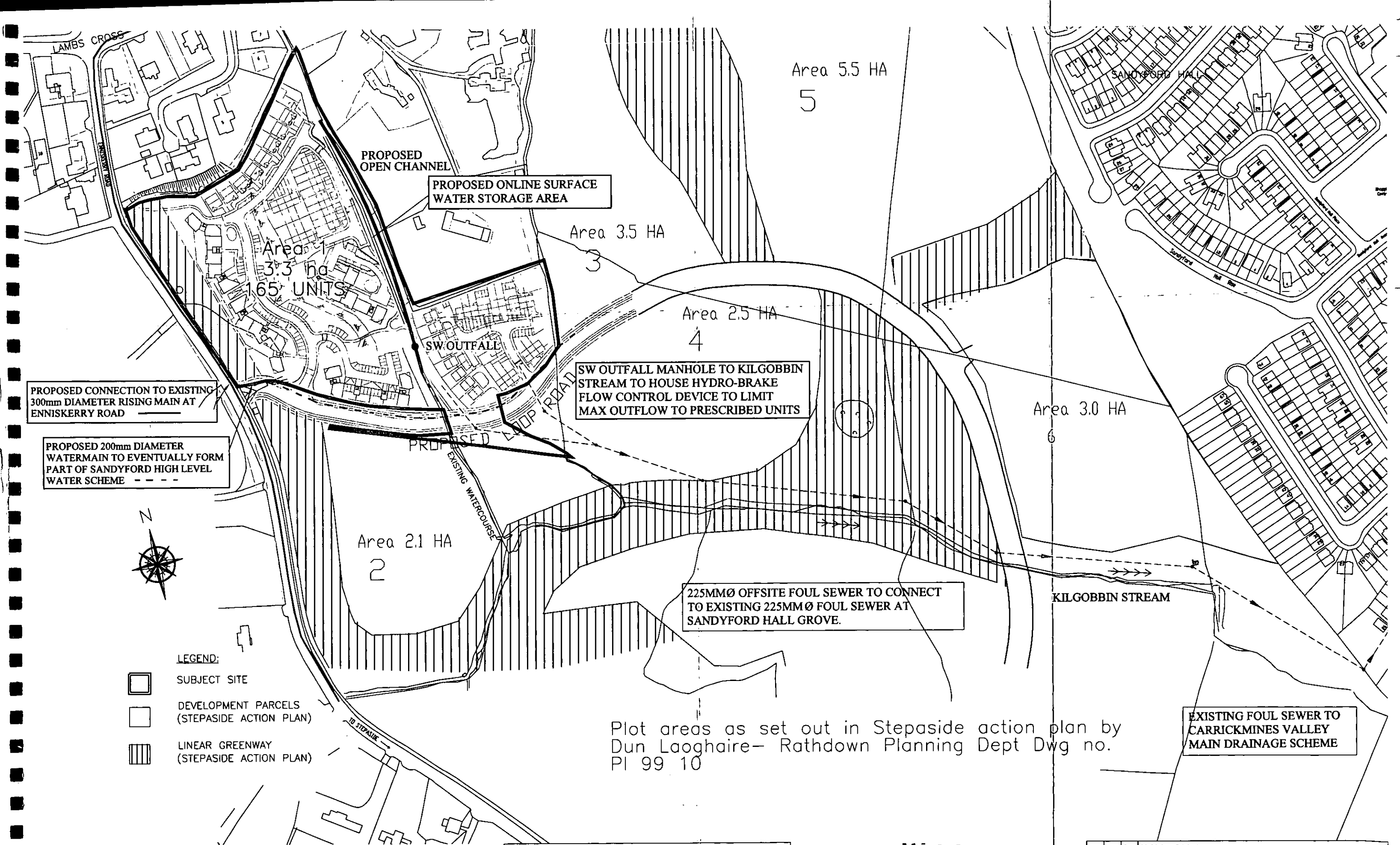
- 5.4.59 Normal engineering methods based on typical water usage patterns were used to forecast effects of water supply.

Difficulty in compiling information

5.4.60 No particular difficulties were encountered.

Interactions

5.4.61 There is an obvious and directly proportional interaction between foul drainage and water supply in that the former will replicate the latter closely in volumetric terms.



Scales: 1:2500	Drawn: GE	Checked: ES	Authorised: ES
Job Title: Stepaside EIS Area 1			
Drawing Status: EIS			

consulting
Burroughs
civil & structural

Dartmouth Terrace
Ranelagh
Dublin 6

Tel: 01 491 4862
Fax: 01 491 4866

e-mail: admin@burroughs.ie

Rev.	Dm.	Ckd.	28/06/01 - Original
Drawing Title: FIGURE 5.4.1 SITE SERVICES SCHEMATIC			
Job No: 3015_1		Drawing No: 3015_1-802	
		Rev: 	

5.5 AIR

5.5.1 Air Quality

Receiving Environment

- 5.5.1.1 The site is located on lands bounded by Enniskerry Road (R117), Hillcrest Road (R113) and Kilgobbin Road. Access will be provided from the Enniskerry Road. The proposed development adjoins existing developments at Sandyford Hall Rise and Sandyford Hall Crescent.
- 5.5.1.2 The area would be expected to have good air quality.
- 5.5.1.3 Dún Laoghaire-Rathdown County Council has been monitoring the air quality at a number of stations throughout the county for many years. The nearest monitoring station to the proposed site is at Mount Anville, Goatstown Road, Dublin 14.
- 5.5.1.4 The Dún Laoghaire-Rathdown County Council monitoring results for the year ending 31 March 2000 are summarised in the following table:

Smoke

	Air Quality Standard ($\mu\text{g}/\text{m}^3$)	Measured at Mount Anville
98 percentile of daily averages for the year	250	26
Median of daily averages for the year	80	5
Median of daily average concentrations in winter (1 October -31 March)	130	6

Sulphur Dioxide

	Air Quality Standard ($\mu\text{g}/\text{m}^3$)	Measured at Mount Anville
98 percentile of daily averages for the year	250	27
Median of daily averages for the year	80	14
Median of daily average concentrations in winter (1 October -31 March)	130	13

5.5.1.5 The air quality is good and complies with all Irish air quality standards.

5.5.1.6 The quality of air in Dublin has improved considerably in recent years as a result of:

- the ban on the sale of smoky coal,
- the widespread use of natural gas for space heating in new housing developments,
- the large scale conversion of existing heating systems to natural gas, and
- accelerated replacement of the car population with new vehicles, more efficient, less polluting engine systems
- abolition of leaded gasoline

5.5.1.7 No monitoring of concentrations of nitrogen oxides has been carried out in the vicinity of the proposed development.

5.5.1.8 In 1999, monitoring of concentrations of nitrogen oxides was carried out in Rathmines and in College Green. The 98 percentile of 1-hour average concentrations of nitrogen dioxide was $42 \mu\text{g}/\text{m}^3$ for Rathmines. This value is within the EC standard, $200 \mu\text{g}/\text{m}^3$. The 98 percentile of 1-hour average concentrations of nitrogen dioxide was $211 \mu\text{g}/\text{m}^3$ for College Green. This value marginally exceeded the EC standard, $200 \mu\text{g}/\text{m}^3$. It would be expected that concentrations of nitrogen oxides in areas outside the city centre would be lower than those measured in Rathmines and College Green.

Characteristics of the Proposal

5.5.1.9 No monitoring of concentrations of nitrogen oxides has been carried out in the vicinity of the proposed development.

5.5.1.10 The proposed development will consist of the construction on a site of approximately 8 acres (3.3 ha) of 50 houses and 115 apartments, a total of 165 units. The total gross floor area will be approximately $16,500 \text{ m}^2$.

5.5.1.11 Approximately 247 parking spaces will be provided.

5.5.1.12 During the construction phase, emissions to atmosphere will arise from:

- construction activities

5.5.1.13 During the operational phase, emissions to atmosphere will arise from:

- combustion of fuel for heating purposes
- motor vehicles used by residents, visitors and services

Potential Impact of the Proposal

5.5.1.14 The likely significant effects, including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative, of the proposed development on the atmospheric environment resulting from the emission of pollutants are set out below. No difficulties, either technical deficiencies or lack of know-how, were encountered in compiling the information.

Heating Appliances

5.5.1.15 The heating fuel will be natural gas with open fires for occasional heating.

- Natural gas supplied by Bord Gáis Éireann is a very pure fuel, with minimal sulphur content. Therefore there will be virtually no sulphur dioxide generated, as the only sulphur present is the odorant, which is added to assist detection of leaks by smell.
- Burning of peat, wood and other solid fuels in open fires will result in greater quantities of pollutants per unit of heat generated, because of the nature of the fuel, and also because of the much lower efficiency of open fires in comparison with enclosed boilers, etc. However, such use of fires is likely to be occasional only, and hence the total quantity of pollutants will be small.

5.5.1.16 Some nitrogen oxide will be generated during combustion in boilers. The quantity will depend on the type of burner installed. No detectable particulates will be generated.

5.5.1.17 The total gross floor area of the 165 housing units will be approximately 16,500 m². The total emissions per annum from heating appliances serving this development are estimated to be:

Material	Quantity (kg per annum)
Particulates (dust, soot)	4
Sulphur oxides	2
Nitrogen oxides	440
Carbon Monoxide	90
Methane	10
Non-methane volatile organic compounds	25

5.5.1.18 The combustion gases produced will not result in any detectable increase in existing levels of sulphur dioxide, nitrogen oxides or particulates, and the emissions will be far less than if other fuels were used for heating purposes.

5.5.1.19 The impact of combustion gases on national or international climate will be immeasurable.

Road Traffic

5.5.1.20 Vehicles using the estate will be mainly cars driven by residents and visitors, with occasional service vehicles (deliveries, maintenance, etc). Approximately 247 car park spaces will be provided.

5.5.1.21 Exhaust gases from motor vehicles will arise when vehicles are being driven to and from the car parking areas. Exhaust gases will also arise from service vehicles. The exhaust gases from motor vehicles will be discharged directly to atmosphere.

5.5.1.22 Exhaust gases from motor vehicles contain carbon monoxide, nitrogen oxides, hydrocarbons and particulate matter. Gasoline does not now contain any lead.

Total Annual Emissions

5.5.1.23 It is estimated that the following emissions will be generated within the development boundary:

Material	Quantity (kg per annum)
Carbon monoxide	9,000
Hydrocarbons	1,400
Nitrogen oxides	750

5.5.1.24 The fact that the quantities of atmospheric emissions from the movement of cars in the car parks are much greater than those from heating appliances reflects national emission inventories prepared in other European Countries.

5.5.1.25 When vehicles are arriving at, parking at, or departing from the site, emissions from motor vehicles will have an impact only on the immediate area. The impact will be highest during morning and evening peak hours.

Kerbside Concentrations of Pollutants

5.5.1.26 Estimates were made of the maximum ambient levels of carbon monoxide (CO), nitrogen dioxide (NO₂), non-methane hydrocarbons (NMHC or HC) and particular matter (PM) along several roads adjoining the proposed development.

5.5.1.27 These estimates were made using the calculation procedures developed by The Highways Agency et al (UK), and set out in the *Design Manual for Roads and Bridges* Vol 11, 3rd Edition, 2000.

5.5.1.28 This model is widely used in Ireland and the U.K. for assessing the impact on air quality resulting from traffic flow changes and road developments. The model predicts the increase in concentrations of pollutants that occur at various distances from the centre of a road.

5.5.1.29 The concentration is a function of several variables:

- the total traffic flow (vehicles per hour)
- the proportion of heavy vehicles
- the speed of the traffic
- the year for which calculations are made
- the distance from the road

5.5.1.30 The rate of dispersion of pollutants from road vehicles is rapid. The concentration at a distance of 10 m from the centre of the road is 86% of that at 5 m. At 20 m the concentration drops to 64%, and at 50 m to 27%.

5.5.1.31 The concentrations of CO, NO₂, HC and PM was estimated at distances of 15, 30 and 40 m from the centre of the following roads:

- Enniskerry Road, at its junction with Hillcrest Road
- Enniskerry Road, at its junction with Kilgobbin Road
- Proposed Loop Road, at its junction with Enniskerry Road

5.5.1.32 The calculations assumed an average vehicle speed of 50 km/hr on the Loop Road and 65 km/h on the Enniskerry Road, and a HGV proportion of 10% on all roads.

5.5.1.33 Traffic volume data were obtained from the Stepside Action Area Plan Traffic. The following scenarios were modelled:

- Existing (2001) without the development
- Existing (2001) with the development completed, but without the SE Motorway
- Projected (2010) on completion of the development of the entire site, with the South East Motorway in operation

5.5.1.34 Peak traffic flow occurs during morning and evening peak periods. The average hourly flow in these periods was taken to represent 10% of the total daily flow. The average daily flow was calculated from this. The total volume of traffic on each road was calculated (i.e. flow in both directions).

5.5.1.35 The results are summarised in the following tables.

Road Section	Annual average concentration of CO (ppm): no standard			Maximum 8-hour average concentration of CO (ppm): standard = 10 ppm			Annual average concentration of NO2 (ppb): standard is 21 ppb			98 percentile of hourly average concentrations of NO2 (ppb): standard is 105 ppb			Maximum hourly concentration of NO2 (ppb): standard is 150 ppb		
Distance from centre of road (m)	15	30	40	15	30	40	15	30	40	15	30	40	15	30	40
Existing (2001)															
Enniskerry Road	0.048	0.033	0.024	0.48	0.33	0.24	14.22	9.61	7.15	35.5	24.0	17.9	71	48	36
Proposed (2001)															
Proposed Loop Road	0.010	0.007	0.005	0.10	0.07	0.05	2.53	1.71	1.27	6.3	4.3	3.2	13	9	6
Enniskerry Road at its junction with Hillcrest Road	0.055	0.037	0.028	0.55	0.37	0.28	16.27	10.99	8.18	40.7	27.5	20.5	81	55	41
Enniskerry Road, at its junction with Kilgobbin Road	0.049	0.033	0.025	0.49	0.33	0.25	14.52	9.81	7.30	36.3	24.5	18.3	73	49	37
Projected (2010 - Full Development with Completion of South East Motorway)															
Proposed Loop Road	0.024	0.016	0.012	0.24	0.16	0.12	7.43	5.02	3.74	18.6	12.5	9.3	37	25	19
Enniskerry Road at its junction with Hillcrest Road	0.026	0.018	0.013	0.26	0.18	0.13	9.15	6.19	4.61	22.9	15.5	11.5	46	31	23
Enniskerry Road, at its junction with Kilgobbin Road	0.012	0.008	0.006	0.12	0.08	0.06	4.14	2.80	2.08	10.4	7.0	5.2	21	14	10

Road Section	Annual average concentration of NMHC (ppb): No standard			Annual average concentration of benzene (ppb): Standard = 5 ppb			Annual average concentration of 1,3-butadiene (ppb): Standard = 1 ppb			Annual average PM ($\mu\text{g}/\text{m}^3$): No standard			99 percentile of running 24-hour mean concentration ($\mu\text{g}/\text{m}^3$): Standard = 50 $\mu\text{g}/\text{m}^3$		
	15	30	40	15	30	40	15	30	40	15	30	40	15	30	40
Existing (2001)															
Enniskerry Road	11.5	7.8	5.8	0.092	0.062	0.046	0.0184	0.0124	0.0093	1.28	0.86	0.64	3.8	2.6	1.9
Projected (2001)															
Proposed Loop Road	3.3	2.2	1.7	0.027	0.018	0.013	0.0053	0.0036	0.0027	0.24	0.16	0.12	0.7	0.5	0.4
Enniskerry Road at its junction with Hillcrest Road	17.8	12.0	9.0	0.143	0.096	0.072	0.0285	0.0193	0.0143	1.46	0.99	0.73	4.4	3.0	2.2
Enniskerry Road, at its junction with Kilgobbin Road	15.9	10.7	8.0	0.127	0.086	0.064	0.0254	0.0172	0.0128	1.30	0.88	0.66	3.9	2.6	2.0
Projected (2010 - Full Development with Completion of South East Motorway)															
Proposed Loop Road	4.0	2.7	2.0	0.032	0.022	0.016	0.0065	0.0044	0.0033	0.54	0.37	0.27	1.6	1.1	0.8
Enniskerry Road at its junction with Hillcrest Road	4.3	2.9	2.2	0.035	0.023	0.018	0.0070	0.0047	0.0035	0.66	0.45	0.33	2.0	1.3	1.0
Enniskerry Road, at its junction with Kilgobbin Road	2.0	1.3	1.0	0.016	0.011	0.008	0.0031	0.0021	0.0016	0.30	0.20	0.15	0.9	0.6	0.5

5.5.1.36 The results are summarised in the following tables.

5.5.1.37 These tables show that roadside air pollution from traffic will not result in air quality standards being exceeded. The following table shows the highest predicted concentration as a percentage of the air quality standard, where such a standard exists.

Pollutant	Parameter	Units	Air Quality Standard	Highest Predicted Value	Highest Predicted Value as % of Air Quality Standard
CO	Annual average concentration	ppm	None	0.055	N.A.
CO	Maximum 8-hour average concentration	ppm	10	0.55	6%
NO2	Annual average concentration	ppb	21	16.3	77%
NO2	98 percentile of hourly average concentrations	ppb	105	41	39%
NO2	Maximum hourly concentration	ppb	150	81	54%
NMHC	Annual average concentration	ppb	None	17.8	N.A.
Benzene	Annual average concentration	ppb	5	0.143	3%
1,3-butadiene	Annual average concentration	ppb	1	0.029	3%
PM	Annual average concentration	µg/m ³	None	1.46	N.A.
PM	99 percentile of running 24-hour mean concentration	µg/m ³	50	4.4	9%

5.5.1.38 While the increase in traffic resulting from the proposed development will result in increased levels of air pollution, the resulting concentrations will be well within existing and proposed air quality standards. The opening of the South East Motorway will divert considerable traffic from Enniskerry Road, and lead to reduced emissions of pollutants from vehicles.

Construction Activities

5.5.1.39 The construction phase of the development may have a short term impact on air quality in the immediate vicinity of the site. This would be due to activities including:

- Erection of offices, stores, site fencing, compounds, etc

- Strip and stockpile topsoil
- Cut and fill subsoil
- Haul surplus material off site
- Delivery of materials to the site
- Excavate for and construct roads within the site
- Excavate for and pour house foundations
- Construct superstructure of houses, apartment blocks, boundaries
- Finish road and footpath construction
- Clear site of offices, stores, etc

5.5.1.40 The potential for significant dust emissions only arises during site clearance and excavation in dry weather, and during such activities levels of dust are likely to be small. Dust may be raised by wind from dry surfaces and stockpiles.

5.5.1.41 Air emissions from the exhausts of the plant construction machinery and haul trucks will be mainly nitrogen oxides and particulate emissions from the diesel engine exhausts.

Remedial or Reductive Measures

Heating Appliances

5.5.1.42 Emissions of nitrogen oxides and carbon monoxide will be minimised by the use of modern efficient heating appliances. Because of the low impact, other remedial measures will not be required.

Car Parks

5.5.1.43 Because the car parking spaces are open to the atmosphere, no remedial measures are practicable.

Construction Activities

5.5.1.44 The following avoidance, remedial or reductive measures will be implemented as part of this development proposal:

- Limiting vehicle speeds in the construction site
- During very dry periods, dust emissions from heavily trafficked locations will be controlled by spraying surfaces with water.

- Re-suspension of spillages of material from trucks entering or leaving the site could be prevented by limiting the speed of vehicles within the site and by use of a mechanical road sweeper.
 - Trucks removing topsoil and other dusty material will be transported in covered trucks, and during dry weather conditions the area of removal will be sprayed with a mobile tanker on a regular basis to control dust emissions.
 - Exhausts emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by proper engine maintenance.
-
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, which may be a significant local source of fine particulate emissions, in particular particles less than 10 μ m (PM₁₀), measures to control emissions should be used to prevent a nuisance within the locality.
 - If cement is stored in a silo on site, a filter will be fitted to the silo. Alternatively, ready-mix concrete might be supplied by truck.

Predicted Impact of the Proposal

- 5.5.1.45 The actual impact will be the same as the potential impact, i.e. negligible impact.

Monitoring

- 5.5.1.46 No monitoring will be required.

Reinstatement

- 5.5.1.47 No reinstatement will be required.

Difficulties Encountered in Compiling the Information

- 5.5.1.48 No difficulties were encountered in compiling the information.

5.5.2 Odour

Receiving Environment

5.5.2.1 An odour can be described as a physiological response to activation of the sense of smell. It can be caused by a chemical compound or by a mixture of compounds. Generally, if an odour is objectionable, any perceived concentration greater than the odour threshold will be cause for complaint. Odorous substances are generally detectable by the human nose in very small concentrations.

5.5.2.2 Whereas odours may be a nuisance, they are not a danger to health unless the substance is inherently toxic. However, nuisance odours may cause nausea and other minor complaints.

5.5.2.3 Odour threshold values have been established for industrial chemicals as low as 0.0005 mg/m³. Odour thresholds for mixtures are not generally available. It is however possible to determine the number of times an odorous mixture has to be diluted in order to reduce its concentration below the detectable level.

5.5.2.4 Existing odour sources include vehicular traffic, food outlets and domestic cooking.

Characteristics of the Proposal

5.5.2.5 The potential for odours from the proposed development is confined to kitchens in dwellings. It is not expected that any significant odour sources will arise from the operational phase of the development. Slight odours may be generated during road surfacing, from hot bitumen, but these would be confined to the immediate area..

Potential Impact of the Proposal

5.5.2.6 Odours from the development will be those associated with cooking.

5.5.2.7 Odours from cooking are not inherently unpleasant odours, but any odour can be regarded as unpleasant or a nuisance if it is:

- in the wrong place
- at the wrong time
- prolonged
- in high concentrations

5.5.2.8 It is not expected that any odour nuisance will occur.

Remedial or Reductive Measures

5.5.2.9 No remedial or reductive measures will be required.

Predicted Impact of the Proposal

5.5.2.10 There should be no odour nuisance from the proposed development.

Monitoring

5.5.2.11 No monitoring will be required.

Reinstatement

5.5.2.12 No reinstatement will be required.

Difficulties Encountered in Compiling the Information

5.5.2.13 No difficulties were encountered in compiling the information.

5.5.3 Noise

Receiving Environment

5.5.3.1 The existing noise environment was monitored at two locations in the vicinity of the site.

- Location A – Hillcrest Downs
- Location B – off Hillcrest Road

5.5.3.2 These locations are shown in Figure 5.5.3.1.

5.5.3.3 Noise measurements were made over the time interval 10:00 hours to 18:00 hours on the 20/06/2001 and 21/06/2001. Eight measurements of the following noise parameters were made at each location.

- $L_{(Aeq, 15 \text{ min})}$ The equivalent continuous noise level in dBA over a 15 minute measuring interval.
- $L_{(A90, 15 \text{ min})}$ The noise level in dBA equalled or exceeded over 90% of the measuring interval of 15 minutes.

5.5.3.4 The instrumentation consisted of a Bruel & Kjaer Precision Integrating Sound Level Meter Type 2236, and Bruel & Kjaer Sound Level Calibrator Type 4231. The measuring microphone was located 1.5 metres above ground level. The results are given in table 5.5.3.1.

Table 5.5.3.1. - Ambient Noise Measurements - dBA**Measurements taken between 10:00 hours and 18:00 hours**

	Date		L _(Aeq, 15 min)	L _(A90, 15 min)	Comment
Location A	20/06/2001		49.8	45.0	Distant Traffic
			50.7	45.5	
			50.4	46.0	
			47.4	45.4	
	21/06/2001		47.6	44.0	Distant traffic and Aircraft
			52.4	47.6	
			53.4	47.2	
			<u>49.7</u>	<u>44.7</u>	
		Mean Value	50.2	45.7	
		standard deviation.	2.1	1.2	
Location B	20/06/2001		51.0	45.5	Distant Traffic
			49.3	45.0	
			49.7	46.6	
			51.6	47.5	
	21/06/2001		49.6	45.7	Distant traffic
			51.1	47.6	
			52.3	47.3	
			<u>49.8</u>	<u>46.5</u>	
		Mean Value	50.6	46.5	
		standard deviation.	1.1	1.0	

Characteristics of the Proposal

- 5.5.3.5 The proposed development entails the construction of 165 housing units and 115 apartments.

Potential Impact of the Proposal**Construction Phase**

- 5.5.3.6 Noise will arise during the construction phase of the development and has the potential to cause disturbance to residents in adjoining housing estates.

Operational Phase

- 5.5.3.7 Noise arising from the road traffic along the loop distributor road has the potential to cause disturbance at the nearest noise sensitive location.

Remedial or Reductive Measures**Construction Phase**

- 5.5.3.8 All construction equipment will be required to comply with EC Directives relating to noise emission from construction plant and equipment as set out in Statutory Instrument 320 of 1988 European Communities (Construction Plant and Equipment)(Permissible Noise Levels) Regulations 1988.

Operational Phase

- 5.5.3.9 None required.

Predicted Impact of the Proposal**Construction Phase**

- 5.5.3.10 The predicted noise levels at the nearest existing houses, due to construction on site are likely to be up to $L_{(Aeq, 1 \text{ hour})}$ level of 60 dBA. This will be temporary and intermittent in nature. The impact will be slight.

Operational Phase

- 5.5.3.11 The trip generation rates for the subject site are 42 inbound and 168 outbound for the AM peak and 168 inbound and 84 outbound for the PM peak. In relation to noise generation these traffic flow rates and traffic speed are comparatively very low. The noise due to traffic within the site will not be significant.

Monitoring

- 5.5.3.12 There is no requirement for noise monitoring.

Reinstatement

- 5.5.3.13 No reinstatement measures are required in respect of noise.

Vibration

- 5.5.3.14 There are no significant sources of vibration associated with this development.

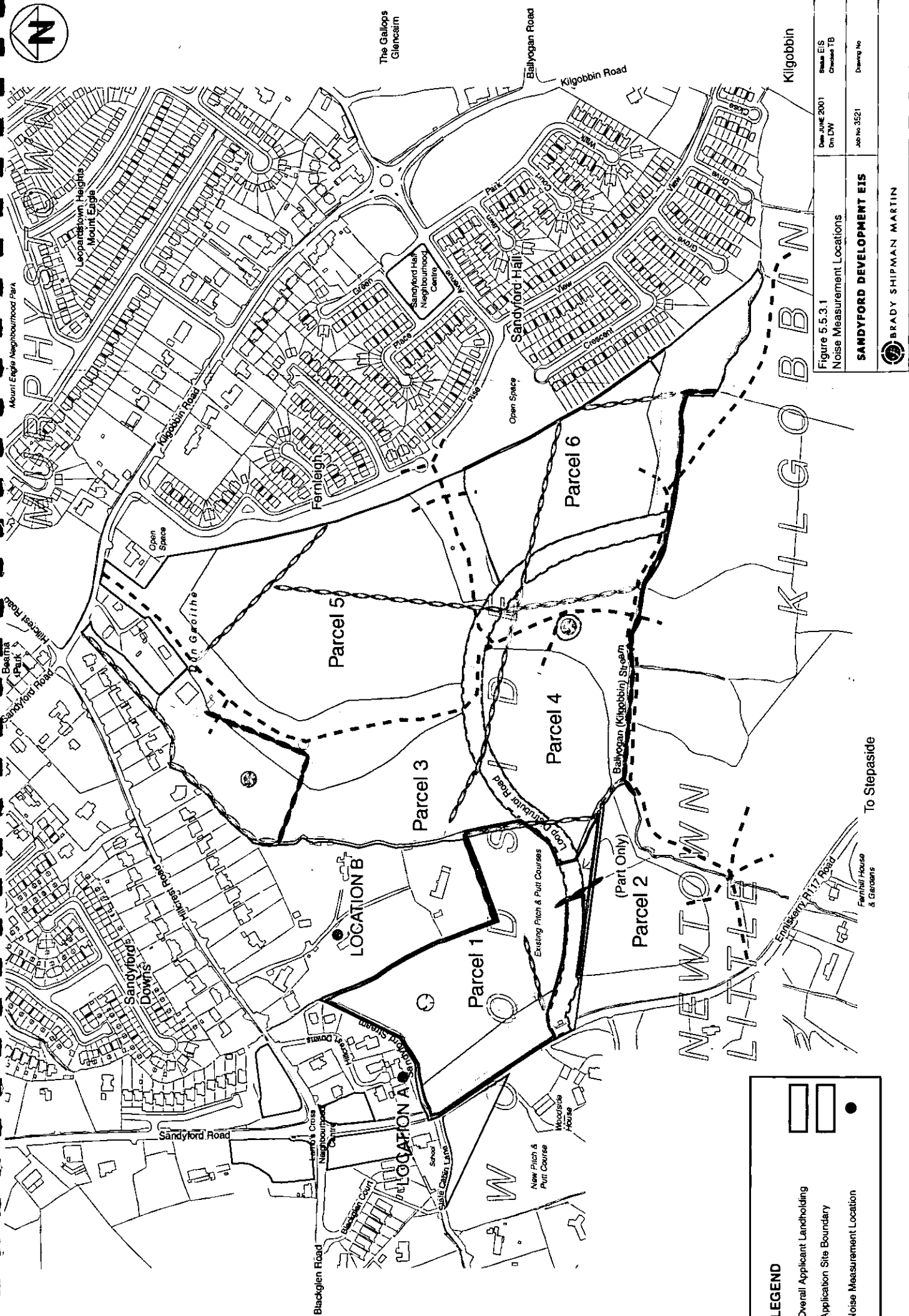


Figure 5.5.3.1
Noise Measurement Locations

Date: JUNE 2001	Scale: EIS
Dr: DW	Checked: TB
Job No: 3521	Drawing No:

SANDFORD DEVELOPMENT EIS

BRADY SHIPMAN MARTIN

5.6 CLIMATE

Receiving Environment

Temperature

- 5.6.1 According to the Met Éireann, the mean daily air temperature in Dublin is about 5.5°C in January and 16°C in July, a year-round average of about 10°C. The mean daily temperature range is about 6°C.

Rainfall

- 5.6.2 The mean annual rainfall is about 800 mm, and on 140 days in the year the rainfall is more than 1 mm. The maximum 15 minute rainfall is 20.5 mm.

Wind

- 5.6.3 The mean annual wind speed for the Dublin area is 5-6 m/s (Force 4 on the Beaufort Scale - "Moderate Breeze"). The prevailing wind comes from the southwest and west. Winds from the north and east are less frequent. Calms account for about 6% of all wind conditions in the Dublin area.

Sunshine

- 5.6.4 The annual average sunshine amounts to about 1,400 hours.

Characteristics of the Site

- 5.6.5 The site is located on lands bounded by Enniskerry Road (R117), Hillcrest Road (R113) and Kilgobbin Road. Access will be provided from the Enniskerry Road. The proposed development adjoins existing developments at Sandyford Hall Rise and Sandyford Hall Crescent.

Characteristics of the Proposal

- 5.6.6 The area of the site is 3.3 ha, and it is located in an area that is being developed rapidly for housing. The site elevation rises from 115 m OD on the southern boundary to 127 m OD on the eastern boundary and 126 m, at the northwest corner.
- 5.6.7 The parameters of the proposed development of relevance to local climate or microclimate are:

- dimensions of the building (length, breadth and height)
- heat losses

5.6.8 About 24 blocks or structures will be provided on the site, ranging from detached houses to terraces.

5.6.9 Structures will range from 10 m to 66 m in length, and from 8.5 to 12.5 m in width. The height of blocks will range from 8.2 m in the case of 2 storey houses at the north of the site, to 17 m in the case of house/apartment blocks at the west of the site.

Potential Impact of the Proposal

5.6.10 The effects of urban structures on the climate in their area (known as the *microclimate*) can be considered under three headings:

- modification of atmospheric composition
- modification of heat balance
- modification of surface roughness and composition

Modification of Atmospheric Composition

5.6.11 Apart from increasing ground level concentrations of pollutants (see section on air emissions), the modification of atmospheric composition by the emission of pollutants may reduce visibility (photochemical smog).

5.6.12 However, as stated above, the use of natural gas for heating purposes will minimise the production of sulphur dioxide and particulates. Emissions of nitrogen oxides and carbon monoxide will be minimised by the use of modern efficient heating appliances.

5.6.13 Locally, short-term elevated concentrations of nitrogen oxides, carbon monoxide, hydrocarbons and particulates may occur during periods of high traffic, i.e. in the morning and evening peak times.

Modification of Heat Balance

5.6.14 The impact on heat balance, and hence on micro-climate, by urban buildings can be divided into:

- changes in thermal radiation balance due to changes in atmospheric composition
- changes in thermal balance due to albedo (the ratio of the energy received to the energy given up), heat conductivity and thermal capacity of urban surface materials
- the production of heat by human activities - increased heat generation from the waste heat from heating systems, and heat lost through the thermal fabric of buildings, as well as heat from the exhausts and engines of motor vehicles

5.6.15 The net effect of urban thermal processes is to make city temperatures generally higher than those in surrounding rural areas. Met Éireann data show that the outdoor temperature in the inner Dublin area is some 1-1.5°C higher than in County Dublin. This is mainly due to the turbulent diffusion of sensible heat from warm buildings and the absorption of long wave radiation emitted by the city surface and its pollution blanket. This is known as the **heat island** effect, and can in extreme cases raise city temperatures by as much as 6-8°C in the early hours of calm, clear nights in large cities.

5.6.16 However, the scale of the proposed development is such that no measurable impact on the heat balance in the area will occur.

Modification of Surface Roughness and Composition

5.6.17 Modifications of surface roughness and composition can be considered with respect to:

- airflow
- moisture

Airflow

5.6.18 On average, city wind speeds are lower than those recorded in the surrounding open country, due to the sheltering effect of the buildings. However, the urban effect on air motion varies greatly depending on the time of day and the season. During the day, city wind speeds are considerably less than those in surrounding areas, but during the night the greater mechanical turbulence over the city means that the higher wind speeds aloft are transferred to the air at lower levels by turbulent mixing.

5.6.19 Urban structures have considerable effects on the movement of air, both by producing turbulence as a result of their roughening of the surface, and by the

channelling effects of the urban canyons. Vortices may occur, as well as eddies in the lee of buildings, and there may be reverse flows.

5.6.20 However, the height and mass of the proposed buildings is relatively small. Some funnelling may occur in the gaps between structures, but only when the wind direction favours this. The three long blocks to the west and south of the site will provide screening from west and southwest winds. Some screening from wind will be provided also by planting.

5.6.21 The presence of buildings will increase the macro-roughness of the area, which will increase air turbulence, but not to any noticeable extent. There will be some sheltering in the lee of the buildings. However the impact will be barely detectable outside the immediate vicinity of the buildings.

5.6.22 It is not expected that the new buildings will have any detectable influence on neighbouring houses in terms of exaggerating local wind conditions.

Moisture

5.6.23 The rapid removal of surface water run-off through drains reduces local evaporation. However, as about 50% of the site will not be built upon, the reduction in evaporation will not be significant in the context of the area.

Remedial or Reductive Measures

5.6.24 Because of the low impact, remedial measures will not be required.

Predicted Impact of the Proposal

5.6.25 The actual impact will be the same as the potential impact, i.e. negligible impact.

Monitoring

5.6.26 No monitoring will be required.

Reinstatement

5.6.27 No reinstatement will be required.

Difficulties Encountered in Compiling the Information

5.6.28 No difficulties were encountered in compiling the information.

5.7 LANDSCAPE

Receiving Environment

5.7.1 The visual assessment was carried out during November 2000 and with the lack of foliage cover, there were clear views within the site and beyond. Information regarding the site and surrounds was gathered from Ordnance Survey maps, a site topographical survey and from on-site observations.

5.7.2 The methodology used to assess the impacts of the development on the landscape is based on the guidelines of the Environmental Protection Agency. The terminology used throughout the assessment can be defined as follows;

- *Imperceptible/No Impact* arises where the development proposal is adequately screened by existing landform, vegetation or built environment.
- *Slight Impact* arises where views affected by the proposal form only a small element in the overall panorama.
- *Moderate Impact* arises where an appreciable segment of the panorama is affected or where there is an intrusion in the foreground.
- *Significant Impact* arises where the views are affected, obstructed or dominated to such a degree that the proposal becomes the focus of the viewer's attention.
- *Significant/Profound Impact* arises where a view of significance is completely obscured or altered.

Note:- Moderate Impacts are not included in the EPA Glossary of impacts. We have included them in our scale of impacts to cover the substantial gap between slight and significant impacts as they will relate to landscape assessments.

Location

5.7.3 The development site is located on the lower foothills of the Dublin Mountains and is 10kms to the south of Dublin City centre and 7kms to the south west of Dun Laoghaire. The historical settlement of Kilgobbin is located to the south of the site. The R117, Dundrum - Enniskerry Road, runs along the south-western boundary of the site.

Topography

5.7.4 Located on the lower undulating foothills of the Dublin Mountains, the site lies on gentle south facing slopes of the Ballyogan (Kilgobbin) Stream valley. The site itself is set on either side of the north – south valley of a tributary of the Ballyogan Stream.

The lowest point of the site at approximately 117m OD is in the southern end of the valley near the Ballyogan Stream with the lands rising on the eastern valley side to approximately 128m OD and on the western valley side to 125m OD at the Enniskerry Road. As the site is set across a noticeable valley, the contours generally flow north to south across the site. To the south the land falls initially to the Ballyogan Stream before rising gently away from the stream towards Stepside Village at over 140m OD. To the north the lands continue to rise gently to over 130m at Hillcrest.

Character

- 5.7.5 The site is located immediately south of the urban/village character of Lamb's Cross and is laid out in managed amenity as pitch & putt golf courses. There is documentary evidence indicating that Kilgobbin was an important settlement in the previous times, being located on a principal regional road, which skirted the Dublin Mountains. All that remains of this settlement today are Kilgobbin Castle (now in ruins) and Kilgobbin Church and graveyard, which are important local landmarks. Woodside was similarly an important area and more detailed discussion is given under Cultural heritage. Locally quarried granite is found in many of the local buildings and walls. The quarries at nearby Barnacullia have been in operation for a long time and there is still a tradition of stone quarrying and sculpting in this area.

- 5.7.6 Undeveloped lands in the area are typically laid out in fields separated by primarily blackthorn/hawthorn hedgerows. There are significant stands of specimen trees in the Fernhill Gardens and there are large tracts of forestry on the slopes of the Three Rock Mountain. (See Photoviews 2 & 3)

Views

- 5.7.7 The DLRCC 1998 Development Plan identifies listed views northwards from the Burrow Road and from the Ballyedmonduff Road. The DLRCC Action Area Plan identifies listed views northwards towards Dublin Bay from elevated sections of the Burrow Road, however, these views are largely over lands to the south of the site.
- 5.7.8 The site is most visually open from the Enniskerry Road Hall (See Photoview 1) where the old road-side boundary was partly lowered and partly removed in developing the pitch and putt course facility. See Photoview 1. Views into the site from the R117 are open for approximately 170m south of existing development at Lamb's Cross otherwise views are limited by intervening hedgerows allowing only glimpsed viewing.
- 5.7.9 Views to the north views run up towards the strong tree planting associated with houses off the Hillcrest road (See Photoview 2,3 & 5). Views west, east and south are more extensive and panoramic over Stepside Village, the elevated ground surrounding the village and mid and upper slopes of Two/Three Rock Mountains see Photoview Nr 4.

Tree And Hedgerows

- 5.7.10 Results of a preliminary survey by DLRCC in the Stepside Area Action Plan categorised trees and hedgerows of the action area into classes of importance. See Fig. 5.7.1. The visually prominent evergreens (*Cupressus marcocarpa*) are classed as

'Category C – retain if compatible with development. However, there are few hedgerows within the site with one segment classed as 'Category B – presumption towards retention'. Part of the northern boundary hedgerow surrounding housing at Hillcrest Road is 'Category A – retention and protection a priority', as is part of the hedgerow along the northern tributary of the Ballyogan Stream.

Predicted Impact Of The Proposal

Construction Phase

5.7.11 The initial construction operations of the building development will give rise to temporary or short term impacts on the landscape and character over a one to two year period, together with more lasting visual impacts through the removal of hedgerows the excavation and mounding of soil, the erection of new built structures, the loss of amenity lands and the perceived loss of open space at the rear off properties off Hillcrest Road.

5.7.12 While the development will remove the two pitch and putt courses, numerous other courses are located within the area and a new course is nearing completion at Woodside House immediately west of the Enniskerry Road.

Operational Phase

5.7.13 The application lands are currently zoned for residential development. The residential density will be higher than adjacent residential developments and are comprised of two and three storey units with feature three, four and five (over ground) floor blocks. From the west, (i.e. Enniskerry road etc.) the development will be most evident at the taller units frame the corridor from a setback position. The impact during initial years will be significant arising from the alteration over the existing situation. In this respect a similar scale of impact would be expected with any built development in this area.

5.7.14 The conversion of this amenity land is likely to be perceived in the short term as a negative 'loss' of 'perceived open space on the urban fringe, particularly by the local community in Lamb's Cross / Hillcrest. However, the lands are zoned for development and the impact will arise from any development on these lands as opposed to the nature of the proposed scheme. As such given that the lands are zoned for residential development the proposed development is not unduly impacting in the medium term and the quality of the proposed units will enhanced the urban structure of the area in the longer term.

5.7.15 The impact on Hillcrest is appreciably lessened by the buffering presence of intervening Hedgerows and woodland surrounding the existing developments.

5.7.16 The application site is located within an area zoned as Objective A1 (Residential) in the 1998 Dun Laoghaire Rathdown Development Plan and conforms to the objectives and zoning of the Stepside Action Area Plan. Visually the development will be seen as part of a southwards extension of the existing development at Lamb's Cross.

Mitigation Measures

- 5.7.17 Apart from aspects of the design and layout, which has taken account of landscape aspects, minimising ground level disturbance and retaining where possible the existing trees and hedgerows, the following measures will be used for mitigation purposes.

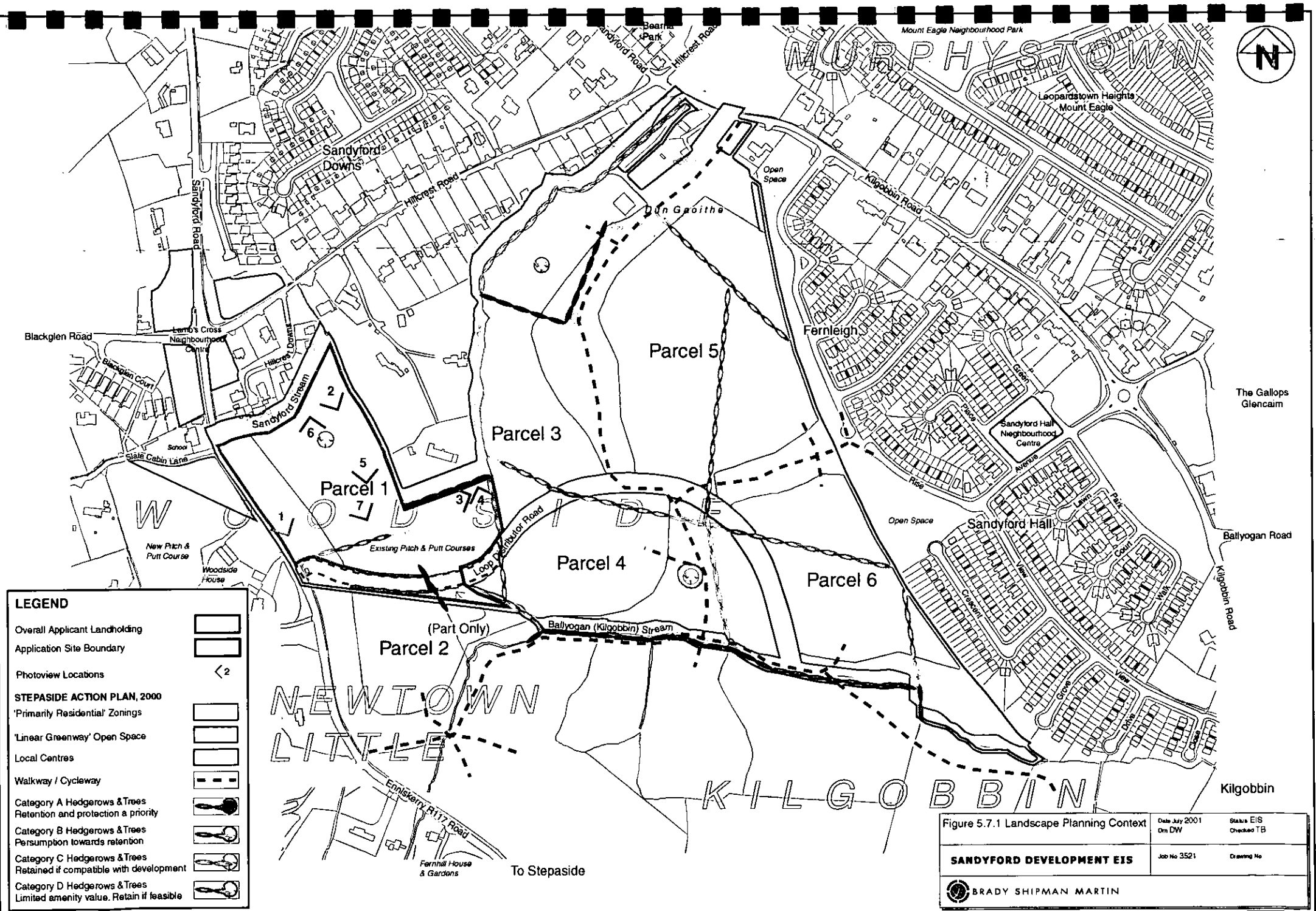
Construction Phase

- 5.7.18 Prior to commencement of works on the site, all trees and hedgerows to be retained along the boundaries and within the site will be fenced off.

Operational Phase

- 5.7.19 The following landscape works will be carried out on a phased basis as each section of development is completed: -

- Provision of tree and shrub planting along the loop distributor and Enniskerry Roads.
 - Comprehensive landscape proposals will be prepared for the development area.
 - Provision of internal site landscape structure to enhance the internal road corridors and hence reduce the impact of the built form from outside the site.
 - Development of additional linear greenway incorporating an existing stream and passing under the loop road thereby integrating the proposed site with the overall greenway structure.
- 5.7.20 Comprehensive landscape proposals will be prepared for the development area, See Figure 5.7.2. Due to the rising nature of the land there will be particular emphasis on the provision of an internal landscape structure. It is proposed that this landscaping approach will enhance the internal road corridors and their associated spaces and that this will reduce the impact of the built environment when viewed from outside the site.



LEGEND

Overall Applicant Landholding

Application Site Boundary

Photoview Locations

STEPSIDE ACTION PLAN, 2000

'Primarily Residential' Zonings

'Linear Greenway' Open Space

Local Centres

Walkway / Cycleway

Category A Hedgerows & Trees

Retention and protection a priority

Category B Hedgerows & Trees

Persumption towards retention

Category C Hedgerows & Trees

Retained if compatible with development

Category D Hedgerows & Trees

Limited amenity value. Retain if feasible

Figure 5.7.1 Landscape Planning Context

Date July 2001

On DW

Status EIS

Checked TB

SANDYFORD DEVELOPMENT EIS

Job No 3521

Drawing No



BRADY SHIPMAN MARTIN



L E G E N D			
Select extra heavy standard trees		Path	
Grass to specification		Cycle Track	
Shrub Planting		Roadway	
Play Area- with hedge boundary		Parking Area	
Proposed earth mounding		Retained Trees	
Woodland Planting		Retained Cypress Hedge	

STRUCTURE PLANTING PROPOSALS

All landscape works to be carried out in accordance with the specification documents.

The primary landscape structure to be composed of tree planting and grass. Shrub planting to be positioned to create spaces of a more intimate scale as necessary.

Shrub Planting
Ground cover and medium height shrubs to be used extensively. Deciduous shrubs to be mixed with evergreen shrubs to provide year round interest.
High shrubs not to be planted close to footpaths where their large spreads might inhibit access.
Small areas of grass and large areas of shrub planting to be avoided.

Tree Planting
Large trees to be planted along the main road and in the larger spaces where the tree roots and canopy will have room to spread.

All planting to take account of location of services, cables, ducts, pipes. Planting to have regard to engineering drawings for the location of services.

Planting Species

Planting to be selected to take account of the location of the development site. Care to be taken in the selection of plants to ensure that they comply with the specifications. Protection to be provided to planting in exposed locations.

Typical Tree Species

Acer pseudoplatanus
Fraxinus excelsior
Sorbus intermedia
Sorbus aria
Sorbus aucuparia
Tilia euchlora
Prunus sargentii
Prunus padus Watereri
Prunus avium

Typical shrub planting

Buxus sempervirens
Berberis spp.
Ceanothus Thymifolius repens
Cotoneaster spp.
Elaeagnus spp.
Escallonia spp.
Genista spp.
Lonicera spp.
Phormium tenax
Rubus 'Betty Ashburner'
Hedge Planting
Fagus sylvatica

Stepaside Residential Parcel 1
for Cannon & Kirk
Landscape masterplan

BRADY SHIPMAN MARTIN

Scales	1/500	Status	Planning
Date	July 2001	Dm.	DOS
Job No.	3521/1	Chd.	Passed
		Drawing No.	310
		Rev.	

CONSULTANTS PLANNERS ARCHITECTS LANDSCAPE ARCHITECTS
26 TEMPLE ROAD DARTRY DUBLIN 6
Tel: +353 (0)1 4979651 Fax: +353 (0)1 4966651 e-mail: mail@bsmconsult.com



Photoview Nr 1



Photoview Nr 2



Photoview Nr 3



Photoview Nr 4



Photoview Nr 5



Photoview Nr 6



Photoview Nr 7

5.8 MATERIAL ASSETS

Traffic

Introduction

- 5.8.1 A detailed traffic impact assessment has been undertaken by Burroughs Consulting Engineers.

Receiving Environment

- 5.8.2 The development site forms part of the larger Dun Laoghaire/Rathdown County Council's Stepside Action Area Plan and is identified as Parcel 1 throughout this plan. The plan area is bounded by R113 Hillcrest Road, Enniskerry Road and Kilgobbin Lane. The derestricted (60mph) Enniskerry Road is approximately 7.3m wide providing two traffic lanes one in each direction with a footpath on the east side and no street lighting. Enniskerry Road currently carries a high volume of traffic. Much of this traffic is caused by 'rat-running' through the area, which will be severely reduced with the opening of the South Eastern Motorway.
- 5.8.3 The flows on the existing roads network have been obtained from the Stepside Action Area Plan. These figures, for both with and without the proposed South Eastern Motorway are given in average annual daily totals (AADTs). For analysis purposes it has been assumed that the peak hour flows will be 10% of the AADT and that traffic distribution in the AM peak is split 90:10 (northbound: southbound). This is reversed during the PM peak. As no directional flows are available this split has been assumed to create a worst case for the analysis of the proposed junction with the Enniskerry Road. The predicted flows on the existing road network are shown in Table 5.8.1 below.
- 5.8.4 There are currently no designated cycle routes in the vicinity of the proposed development.
- 5.8.5 There are currently no public transport services using Enniskerry Road. Currently bus route 44 passes along Hillcrest Road and Kilgobbin Road.

Table No. 5.8.1: Predicted flows on existing network

Time	Direction	Enniskerry Road		Hillcrest Road	
		Do min 2001	With SEM 2001	Do Min 2001	With SEM 2001
AM (08:00-09:00)	Northbound	1215	405	—	—
	Southbound	135	45	—	—
	Total	1350	450	350	100
PM (17:00-18:00)	Northbound	135	45	—	—
	Southbound	1215	405	—	—
	Total	1350	450	350	100
Daily	Northbound	—	—	—	—
	Southbound	—	—	—	—
	Total	13500	4500	3500	1000

Source: Stepside Action Area Plan/Table 5.8.1.1

Characteristics of the Proposal

- 5.8.6 The proposed scheme is for the construction of an access from the Enniskerry road, a section of local distributor road approximately 240 meters in length and 165 no. Dwellings comprising one, two and three bedroom dwellings in two and three storey accommodation. The general layout is further illustrated in Figure 5.8.1 below.
- 5.8.7 The proposed residential area will be laid out to follow the principles of sustainability adopting the plan framework from the Dun Laoghaire / Rathdown County Councils 'Stepside Action Plan' – July 2001.
- 5.8.8 In keeping with the County Development Plan – July 1998 car parking allowances have been made for 1.25 spaces per 1 bed unit, 1.5 spaces per 2 bed unit and 1.75 spaces per 3 bed unit.

- 5.8.9 The site layout will include appropriate traffic calming measures by way of speed attenuation curves and speed ramps in accordance with the Dun Laoghaire / Rathdown County Councils 'Developments Works in Residential and Industrial Areas' – Guidance Document – July 1998.
- 5.8.10 It is proposed that the development shall be phased in accordance with Section 33.0 of the DLRCC – Stepside Action Plan.

Potential Impact of the Proposal

- 5.8.11 In order to establish the trip generation from the proposed development, the trip rate information computer system (TRICS) was used. This system provides information on the trip generation characteristics for this type of development.
- 5.8.12 The future development of the surrounding lands is not included in this application. However, in the interest of producing a comprehensive traffic impact assessment, accounting for the development lands as a whole, two scenarios are considered. In the first case with the subject site fully developed and in operation prior to the construction of the South Eastern Motorway and the second with the entire development lands in operation with the SEM complete. Note traffic growth has been calculated for a compound annual growth of 5% until 2010.
- 5.8.13 Table 5.8.1.2 below shows the total levels of forecast traffic attraction at the development site to and from the surrounding local road network and the total levels at full operation of the entire development lands. Note that 45 units per hectare are assumed for the density of the future developments for the TRICS calculations.

Table 5.8.2

Trip Generation Rates	AM Peak (08:00 – 10:00)		PM Peak (17:00 – 19:00)	
	Inbound	Outbound	Inbound	Outbound
Trips with subject site in full operation (165 units) Scenario 1				
	42	168	168	84
Trips with entire development lands in operation (1,125 units)* Scenario 2- Cumulative Effects				
	286	1148	1148	572

* Assuming Parcels 1 to 8 (ref. Stepside Action Plan) use the proposed entrance onto the Enniskerry Road.

- 5.8.14 It is considered that car ownership figures are unlikely to increase dramatically from those assumed by TRICS at the proposed development site. Therefore growth in the estimated levels of traffic to and from the development site over time has not been considered. In contrast it is accepted that commuter traffic on the surrounding road network will increase significantly over the construction period of the proposed residential scheme. It is assumed that for the most part, this increase will result from development in the area.
- 5.8.15 Figure 5.8.2 below illustrates the peak hour traffic flows at the proposed junction for both the above-mentioned scenarios for the years 2001 and 2010. It is clear from the flows that the development lands would have a significant impact on the Enniskerry Road should the SEM not be implemented, and although the Enniskerry Road may have capacity for the subject development in the short term, the long term effects are dependent on the SEM being in operation.
- 5.8.16 Further potential traffic or transportation impacts of the proposed residential development are as follows:
- A. Congestion effects on the surrounding road network of junctions arising from increased traffic flows generated by the development both during and after the construction period.
 - B. Change in risk or hazard arising from increased traffic, road geometry alterations, new junctions, or from a new form of junction control.
 - C. Diversion effects or inconvenience arising on a temporary or permanent basis to existing local traffic as a result of new construction and/or an alteration of access arrangements.
 - D. Effects on pedestrians using the area.
 - E. Increased traffic noise and/or air pollution arising from generated traffic.
 - F. Visual effects of new road construction or access improvements.

Remedial or Reductive Measures

- 5.8.17 The Stepside Action Plan includes in Appendix 1 a road "sterilisation corridor" pending the outcome of the Hillcrest Road Study. The implementation of a road through this corridor would significantly change the traffic patterns and would reduce the traffic volumes on adjacent roads most notably the Enniskerry and Hillcrest Roads.
- 5.8.18 During the construction phase every possible effort will be made to keep the Enniskerry Road clear from blockages and excessive congestion as a result of site machinery and vehicles.

Predicted Impact of the Proposal

- 5.8.19 Construction delivery traffic is predicted to cause variable impacts, slight to moderate adverse in nature, in the short term.
- 5.8.20 The construction of a new link onto the Enniskerry Road at the proposal junction will allow the safe access into and egress from the development. The impact of the priority intersection in the short term (prior to the opening of the South Eastern Motorway) is predicted to be slight to moderate at the junction and slight on adjacent roads.
- 5.8.21 The traffic generated by the subject development will contribute in a modest way to the traffic flows on the Enniskerry Road (prior to the SEM) being less than 8% of the total flow on the road during the morning peak and less than 9% during the evening peak. These increases will amount to less than 3 additional vehicles per minute during both morning and evening peak periods.
- 5.8.22 Introduction of a new development alongside an existing highway will have an impact on traffic volume and delay. As a consequence of the development traffic volumes on the adjacent roads will rise but will not be significantly noticeable. The maximum traffic flows will be comfortably within the capacity of the existing carriageways. Following the opening of the South Eastern Motorway the volume of traffic and delays on the roads will fall. The development of the entire lands will utilise additional capacity freed-up by the opening of the motorway.

Monitoring

- 5.8.23 It is recommended that the traffic growth on the Enniskerry Road be monitored in tandem with the development of the Stepside Lands and the South Eastern Motorway.

Reinstatement

- 5.8.24 Any works necessary to construct the accesses to the development including any alterations to the existing roadway, verge and footpath will be carried out to a standard satisfactory to Dun Laoghaire/Rathdown County Council.

Forecasting Methods

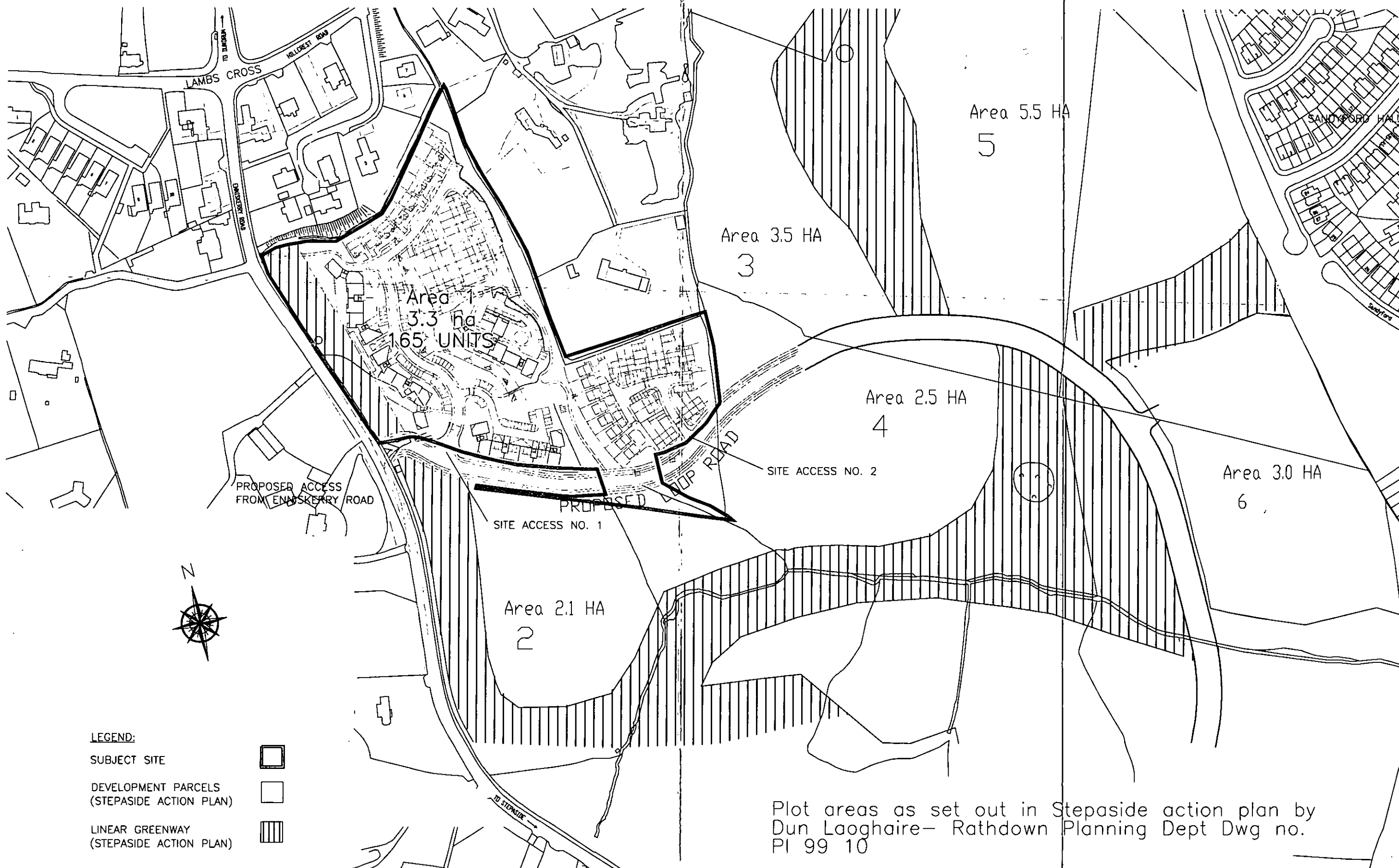
- 5.8.25 The industry standard Trip Rate Information Computer System (TRICS) was used to generate the predicted flows from the proposed development.
- 5.8.26 An annual growth rate of 5% per annum was used to for the surrounding road networks within the TRICS program.

Difficulty in compiling information

- 5.8.27 The assessment was carried out using such information as was available regarding the existing flows on the surrounding road network. The information was limited in extent being based on annual average daily totals from the South Eastern Motorway's EIS. No peak hour or directional flows were available. The final roads configuration for Hillcrest Road is subject to a separate study that was not available at the time of this assessment.
- 5.8.28 For the analysis of the cumulative effects a density of 45 residential units per hectare is considered to be conservative and may yield dwelling totals in excess of what might be constructed in the future.
- 5.8.29 Some future plans for public transport within the area are still unknown. If full implementation of all proposed plans were to materialise this would further affect the above results. However if such services did exist they could only have a positive impact on the vehicle traffic within the area as a modal split in favour of public transport is anticipated.

Interactions

- 5.8.30 There is an obvious and directly proportional interaction between traffic and noise and air quality in that the former will increase the latter closely in volumetric terms.



LEGEND:

SUBJECT SITE

DEVELOPMENT PARCELS
(STEPASIDE ACTION PLAN)

LINEAR GREENWAY
(STEPASIDE ACTION PLAN)



Plot areas as set out in Stepside action plan by
Dun Laoghaire- Rathdown Planning Dept Dwg no.
PI 99 10

Scales: 1:2500	Drawn: GE	Checked: ES	Authorised: ES
Job Title: Stepaside EIS Area 1			
Drawing Status: EIS			

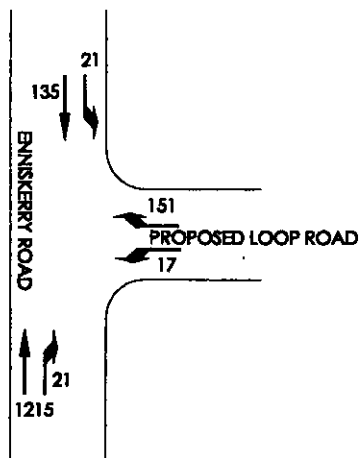
consulting
Burroughs
civil & structural

Dartmouth Terrace
Ranelagh
Dublin 6

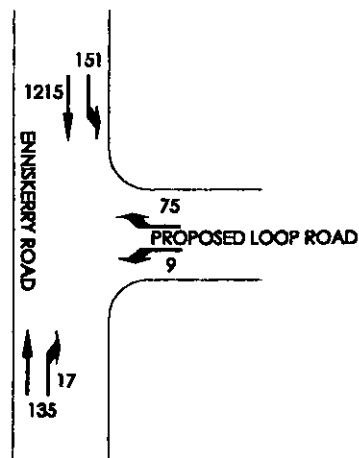
Tel: 01 491 4862
Fax: 01 491 4866

e-mail: admin@burroughs.ie

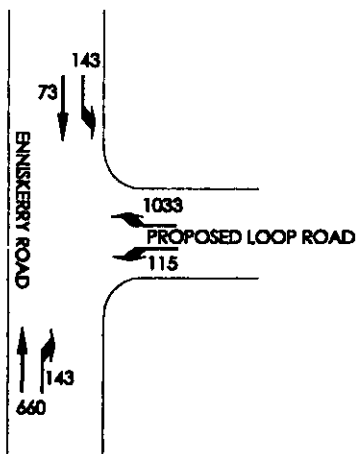
Rev.	Dm.	Ckd.	28/08/01 - Original
Drawing Title: FIGURE 5.8.1 SITE LOCATION AND ACCESS			
Job No: 3015_1		Drawing No: 3015_1-800	
		Rev: 	



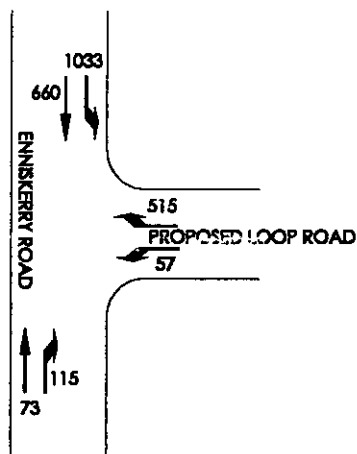
PROPOSED JUNCTION
AM PEAK TRAFFIC MOVEMENTS
SUBJECT SITE ONLY
SEM NOT IN OPERATION (Year 2001)



PROPOSED JUNCTION
PM PEAK TRAFFIC MOVEMENTS
SUBJECT SITE ONLY
SEM NOT IN OPERATION (Year 2001)



PROPOSED JUNCTION
AM PEAK TRAFFIC MOVEMENTS
ENTIRE DEVELOPMENT LANDS
SEM IN OPERATION (Year 2010)



PROPOSED JUNCTION
PM PEAK TRAFFIC MOVEMENTS
ENTIRE DEVELOPMENT LANDS
SEM IN OPERATION (Year 2010)

5.9 CULTURAL HERITAGE

Introduction

5.9.1 Cultural Heritage is the term used to bring together the disciplines of archaeology, architecture and urban design, together with monuments and decorative features. Recently archaeology and the history of human settlement have begun to see the surviving monuments and ruins as existing in unique relationships to their setting, which forms the landscape.

5.9.2 The following study will identify the known archaeology and the potential archaeology in the defined area which is liable to be affected by the proposed development, together with the architecture of the area and any other elements of the Cultural Heritage.

5.9.3 The relevant legislation and the current statutory requirements are considered. The historical context of the landscape is outlined and as far as possible, its evolution and its development is traced from the early historic period until recent times.

The Study

5.9.4 The study is based on an examination of Ordnance Survey maps, records and publications of the Archaeological Survey of Ireland, documentation and archive material from the various institutions including:

- Dúchas, The Heritage Service, 51, St. Stephens Green, Dublin 2.
- National Museum of Ireland, Kildare Street, Dublin 2.
- National Library of Ireland, Kildare Street, Dublin 2.
- Irish Architectural Archive, 73, Merrion Square, Dublin 2.
- Royal Society of Antiquaries of Ireland, 63, Merrion Square, Dublin 2.
- Folklore Library, University College Dublin, Belfield, Dublin 4.
- Ordnance Survey Office, Phoenix Park, Dublin 8.
- Dun Laoghaire - Rathdown County Council, County Hall, Marine Road, Dun Laoghaire, Co. Dublin.

5.9.5 A detailed analysis of the available aerial photographs and field inspection of the site has been undertaken.

5.9.6 The standard publications which relate to the area under consideration have been consulted.

5.9.7 The proximity of the development area to known and identifiable archaeological monuments has also been considered.

Archaeology

5.9.8 Archaeology is defined as the study of the past through the examination and analysis of material cultural remains. These include buildings, structures, features, artefacts and the landscape itself.

5.9.9 Thus for modern developments which involve earth-moving or disturbance in areas of known archaeological remains or in areas of high archaeological potential, mitigation of impacts and of possible impacts will be required.

5.9.10 All archaeological sites and monuments are protected under the National Monuments Act 1930 and subsequent Amendment Acts, 1954, 1987, 1994, the Heritage Act, 1995 and 'The Valletta Convention'.

5.9.11 The European Convention on the Protection of the Archaeological Heritage (revised), dated 16/1/92, (commonly known as 'The Valletta Convention'), European Treaty Series no. 143 entered into force for Ireland on 19th September 1997.

Planning Legislation

5.9.12 It should be noted that under the Local Government (Planning and Development) Act, No. 17 of 1999, (subsequent to the publication of the Dun Laoghaire-Rathdown County Development Plan), the listing classification (i.e. List 1 or List 2 structures) no longer applies. All of these items are now 'Protected Structures'.

Project Team

- Rónán Swan, B.A., M.Sc.
- Goorik Dehaene, B.A.

Difficulties Encountered in Compilation of Cultural Heritage Section

5.9.13 No difficulties were encountered in this survey.

Methodology

The Record of Monuments and Places

- 5.9.14 The Archaeological Constraint Maps, in conjunction with the County Record of Monuments and Places, provide an initial database for Planning Authorities, State Agencies and other bodies involved in environmental change.
- 5.9.15 The Record of Monuments and Places comprise the following elements: (i) Letter or Letters indicating County (DU = Dublin); (ii) A three digit number indicating the relevant Ordnance Survey Sheet Number (e.g. 022); (iii) A three, four or five digit number indicating the dedicated number of the individual site or monument.

The Topographical Files

- 5.9.16 The files held in the National Museum of Ireland have been consulted. Collectively known as the Topographical Files, they provide information on artefacts, their find spots, and any field monuments which have been notified to the National Museum.

Aerial Photographic Analysis

- 5.9.17 Aerial photographic analysis is an important aspect when undertaking an archaeological assessment. It is possible to identify archaeological sites (or potential sites) which may or may not be visible on the ground.
- 5.9.18 For the purposes of this report, two aerial photographs of the study area were acquired from the Ordnance Survey Office.

General Information

- 5.9.19 The proposed residential development is to be located at the site of the pitch and putt club, Enniskerry Road and encompasses c. 8 acres. It is located almost midway between Sandyford and Stepside, in the townland of Woodside (Refer Figs. 5.9.1 and 5.9.2).
- 5.9.20 Woodside townland is bounded on the north by Balally townland; on the east by Murphystown townland, on the south-east by Kilgobbin townland, on the south by Newtown Little townland and on the west by Barnacullia townland (Refer Fig. 5.9.3).

Local Topography

- 5.9.21 This area is part of the interface between the built-up suburban area of Sandyford and the more rural area of Stepside.

5.9.22 To the north of the proposed development are houses along the Hillcrest Road; agricultural land is located to the east and south. Woodside farm is located on the opposite side of Enniskerry Road.

5.9.23 The local topography is dominated by the gently rising land of the Dublin mountains.

Historical Background

5.9.24 Woodside is located between the villages of Sandyford and Stepside in south county Dublin. To the south-east of Woodside is the townland of Kilgobbin.

5.9.25 Kilgobbin is the earliest settlement in the vicinity of the proposed development. The earliest material is associated with the pre-Norman foundation at Kilgobbin Church. Local tradition has it that the St. Gobban who founded this church was from Swords, however there is no documentary evidence to support this contention (Goodbody, 1993).

5.9.26 In the middle of the 13th century the lands at Kilgobbin were recorded as being owned by the Harold family. The lands were then transferred to the Hackett family. In the 14th century the Walshe family took ownership of these lands and built a castle here. This castle was built in order to help reinforce the southern defences of the Pale. These lands and castle were transferred to the ownership of Sir Adam Loftus. During the rebellion of 1641 Matthew Talbot was given command of Kilgobbin castle and subsequent to this, the castle was owned by several different tenants (Ball, 1905).

5.9.27 There is no specific mention of Woodside townland in the Down Survey, however the area of Woodside belonged to the grange of Whitechurch Parish which is identified as being Protestant Land. Smyth describes how the pastoral parishes were aligned along the southern edges of the county centred on Tully, Kiltiernan, Kilgobbin and Whitechurch.

5.9.28 In 1699 there is a reference to James Atkinson leasing the lands of "Sandyford, The Wood [Woodside] and Barnakilly [Barnaculia]". According to Goodbody, Atkinson's holding was "comparatively large" which probably had its own farmhouse and outbuildings. These buildings are depicted on Rocque's Map of 1760 (Refer Fig. 5.9.4).

5.9.29 The village of Sandyford developed as a result of the re-emergence of institutional catholicism. A catholic chapel was established here in the early years of the 19th

century which attracted a range of service functions including the national school, priest's house and shop. As Simms and Fagan point out there are only five such villages in County Dublin (Simms and Fagan, 1992).

- 5.9.30 Rev. Smyth describes Sandyford National School, which is located a quarter of a mile from Sandyford Village: "It contains two large schoolrooms with dwelling included containing two small apartments, hall and coal house on the ground floor and two corresponding ones above approached by a stairs from the kitchen apartment. It is furnished with the proper accommodations for the use of children is approached from the road by two separate small iron gates, one for males and the other for females." (Smyth, 1959-60).

Folklore

- 5.9.31 There are no references to Woodside townland in the folklore archives. There is however reference to Kilgobbin, namely the cross and the castle which was built by the Walshe family (Vol. 797, 1938).

- 5.9.32 Reference is made to Sandyford village and it is described as being "situated in the valley at the foot of Three Rock Mountain. Where the Gullet Road now stands there was a ford. The principal industry is granite quarrying"(Vol. 797, 1938).

Archaeological and Cultural Heritage Background

- 5.9.33 There are three recorded monuments in the townland of Woodside, Recorded Monument Nos. DU022-068 (also numbered DU025-010), DU022-069 and DU025-014 (Refer Fig. 5.9.2).
- 5.9.34 Woodside House (Recorded Monument No. DU022-068 and DU025-010) is located on the opposite side of the Enniskerry Road from the site for development. The rear portion of this house is likely to date from the 1690's, while the front facade was built in the 1890's.
- 5.9.35 Recorded Monument No. DU022-069 is identified in the Record of Monuments and Places listings as a possible ringfort. It is located approximately 138m from the proposed development site (distance measured from the outer edge of circle to closest point of site). It has an external diameter of 29m, average dimensions of bank 3.50m at the bottom, 1.50m at the top and 0.50m-0.70m in height. Ancient beech trees are located around the bank, while the internal area is obscured with rotting vegetation and brambles. This site was tested in 1998 by Martin Reid who concluded

that it is in fact a 17th or 18th century 'Tree Ring' as it is circular in plan, with no definitive entrance and no finds predating the 17th century (Reid, 1998).

5.9.36 A potential site, identified from an aerial photograph (Site DU025-014) is situated along the western boundary of Woodside townland with Barnacullia townland. However, there was no visible trace of this site when it was inspected in 1994 by the relevant field archaeologist from the Office of Public Works.

5.9.37 There are a number of archaeological sites in the townlands adjacent to Woodside. These include a settlement (Site DU025-017) and ecclesiastical remains (Site DU025-016) in Kilgobbin townland; an enclosure site (Site DU025-012) and well (Site DU025-013) in Barnacullia townland; ecclesiastical remains (Site DU022-036) and castle site (DU022-024) in Sandyford townland and a tower house (Site DU023-025) in Murphystown townland.

5.9.38 None of the above sites will be impacted upon by the proposed development.

Cartographic Evidence

5.9.39 An analysis has been carried out of various maps for the study area including the 1:5000 map, Archaeological Constraint Map, The First Edition Ordnance Survey Map, 1836-37 and Rocque's Map of County Dublin, 1760.

5.9.40 A comparison between the 1:5000 (Fig. 5.9.2) and the First Edition Ordnance Survey map (Fig. 5.9.3) reveals that there has been significant changes to the area of the proposed development itself and the surrounding landscape. Field boundaries have changed

5.9.41 On the First Edition Ordnance Survey Map (Fig. 5.9.3) the area is depicted as being of scrubby woodland with a path cutting across it to the north-east. There is no indication of the possible ringfort to the south-east of the proposed development site. However, the National School and Woodside House are shown.

5.9.42 Rocque's map, 1706 (Fig. 5.9.4) depicts the village of Kilgobbin but only shows a few buildings in the area of Sandyford. A variation in the road pattern is evident from an examination of this map and the First Edition Ordnance Survey map. Many of the roads on the First Edition Map are not evident on Rocque's. On Rocque's map the road follows the townland boundary (between Balally and Woodside), however the area of Woodside is labelled as New Town.

The Topographical Files

- 5.9.43 No Topographical Files are held in the National Museum in relation to Woodside townland. However nine artefacts have been recorded from the nearby townlands. A stone axehead (NMI Reg. No. 1979:73) and bronze flat axe (No Reg. No.) have been recorded from Murphystown. A bronze ring (NMI Reg. No. 1971:1050), two sherds of Bellarmine ware (NMI Reg. Nos. 1971:1126 and 1127), a single sherd of stoneware (NMI Reg. No. 1972:17) and a broken iron tube (NMI 1972:18) in the townland of Kilgobbin in a field adjacent to Kilgobbin Castle. An ornamented stone (NMI Reg. 1968:407) and a flint blade (NMI 1961:142) were recovered from the townland of Barnaculia.

Aerial Photography (Plates 5.9.1 and 5.9.2).

- 5.9.44 A series of aerial photographs were analysed in the course of this study. The black and white aerial photograph (Plate 11.1), taken in 1982, shows the south-eastern corner of the proposed development where the golf course is situated. Immediately to the east of the golf course is Site No. DU022-069.
- 5.9.45 The colour aerial photograph taken in 1997, shows the entire area of the proposed development (Refer Plate 5.9.2).
- 5.9.46 There is no indication from these photographs of any additional sites of cultural heritage either in the area of the golf course or in the surrounding fields.

Dun Laoghaire-Rathdown County Development Plan 1998

- 5.9.47 There are seven protected structures included in the Dun Laoghaire-Rathdown County Development Plan which are in the general area of the site under consideration. These include the possible ringfort in Woodside and the cross in Kilgobbin Lane (both former List 1 sites). Also included are the enclosure site on Woodside Road, the former Carnegie Library and Woodside House on Enniskerry Road, Kilgobbin castle and Kilgobbin church and graveyard (all former List 2 sites). None of these structures will be impacted upon by the proposed development.

Field Inspection

- 5.9.48 The field inspection was undertaken by Rónán Swan, Archaeologist, on 29th October 2000. This inspection involved a detailed examination of the area of the proposed development with a view to identifying any impacts that the proposed development

might present to surviving features of cultural significance.

5.9.49 The area of the proposed development has been highlighted on Fig. 5.9.2. This development will be entirely within the bounds of the golf course.

5.9.50 The construction of the golf course has radically altered the original topography, with the positioning of the greens, bunkers and the putting green and no archaeological features were visible.

5.9.51 However, an assessment of the area to the south of this development (Parcel 6) was undertaken by Mr. Goorik Dehaene, Archaeologist, in May 2001 (Fig. 5.9.5.). Following the field inspection (in which a possible section of the Pale ditch was identified) and further analysis of the recorded monuments in the landscape, it was concluded that a possible section of the pale ditch crosses the area of the golf course.

5.9.52 The Pale ditch was constructed after an Act of Parliament was passed in 1494. This Act proposed that a linear earthwork (consisting of a double ditch 6' above ground level) would be constructed along the borders of the Pale. This feature has been recorded in the Record of Monuments and Places in several locations close to the proposed residential development, thus it is possible that the Pale ditch crossed the proposed residential area, Parcel 1 (refer Fig. 5.9.6.).

Impact Assessment and Proposed Mitigatory Measures

5.9.53 The report pertaining to Parcel 1 recommends that a programme of archaeological testing be undertaken to establish if the Pale ditch crossed the golf course. This archaeological feature, if present, extends across the entire golf course and will therefore be impacted upon. It is not deemed necessary to carry out a separate testing programme for Parcel 1 and 6 as one will be sufficient in assessing this feature within the golf course.

5.9.54 This testing programme should be carried out under archaeological license prior to the commencement of groundworks within, or in the vicinity of, the existing golf course.

5.9.55 All recommendations are subject to the approval of the relevant Archaeological Officer, Dúchas, The Heritage Service.

References

Ball, F. E. *A History of the County Dublin*, Dublin, 1905 (Reprinted 1995).

Dun Laoghaire - Rathdown County Development Plan, Dublin, 1998.

Folklore Archive: Sandyford National School, County Dublin, Vol. 732, 1934 - 1939.

Goodbody, R. *On the Borders of the Pale, A History of the Kilgobbin, Stepside and Sandyford Area*, Dublin, 1993.

Lewis, S. *A Topographical Dictionary of Ireland*, Vol. II, London, 1837.

Reid, M. in Bennett, I.(ed). *Excavations 1998, Summary Accounts of Archaeological Excavations in Ireland*, Dublin, 2000.

Simington, R. C. *The Civil Survey, A.D. 1654-1656, Vol. VIII, County of Dublin*. Dublin, 1952.

Simms, A. & Fagan, P. "Villages in County Dublin: Their Origins and Inheritance" in Aalen, F. H. & Whelan, K. (eds.) *Dublin, City and County: From Prehistory to Present*. Dublin, 1992.

Smyth, P. P. The Parish of Sandyford (Contemporary Account 1828-1853), *Reportorium Novum*, Vol. 2, No. 2, 1959-60.

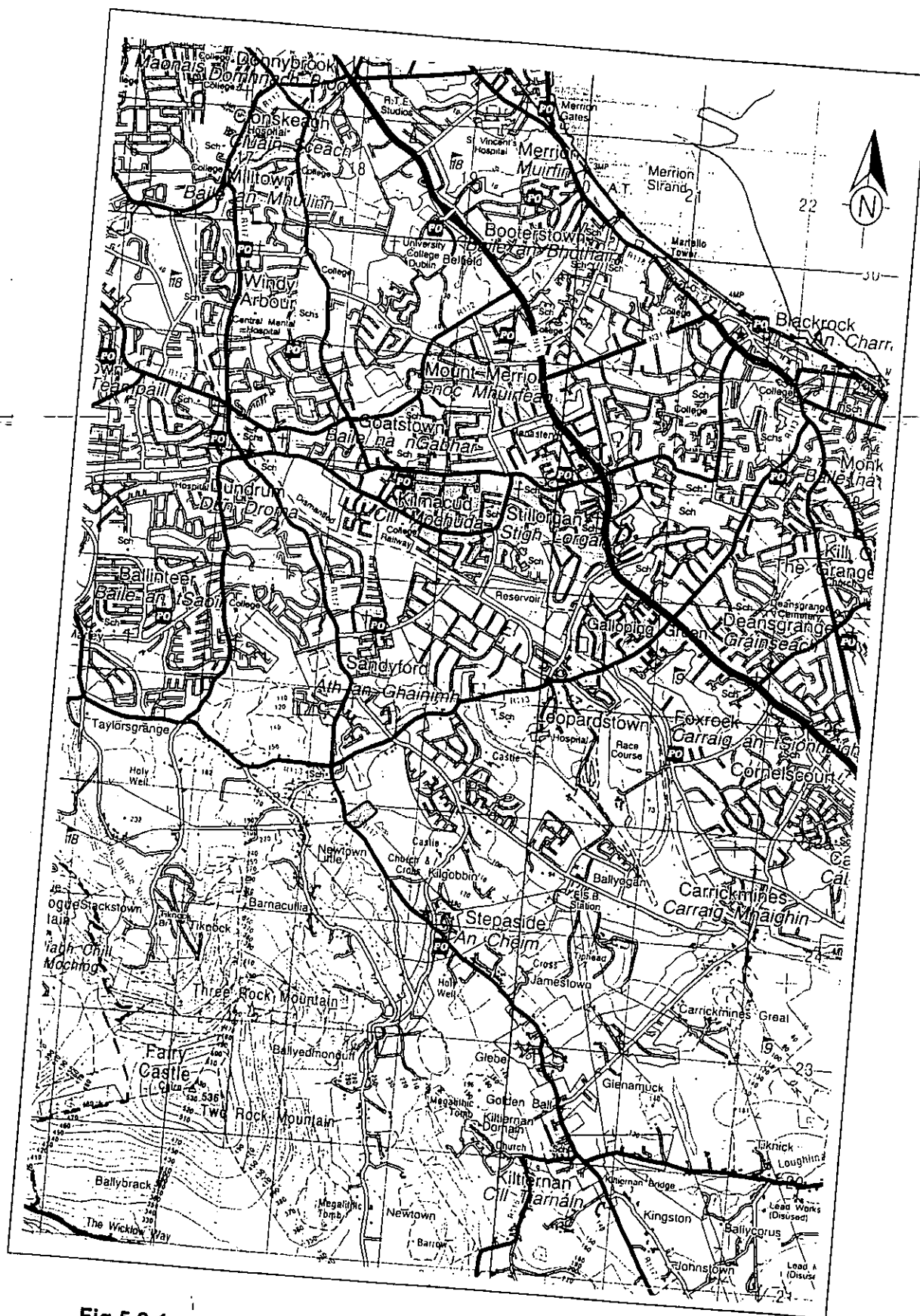


Fig 5.9.1 Extract from Ordnance Survey Discovery Series, Dublin Sheet No. 50 showing location of site.

Scale 1:50 000

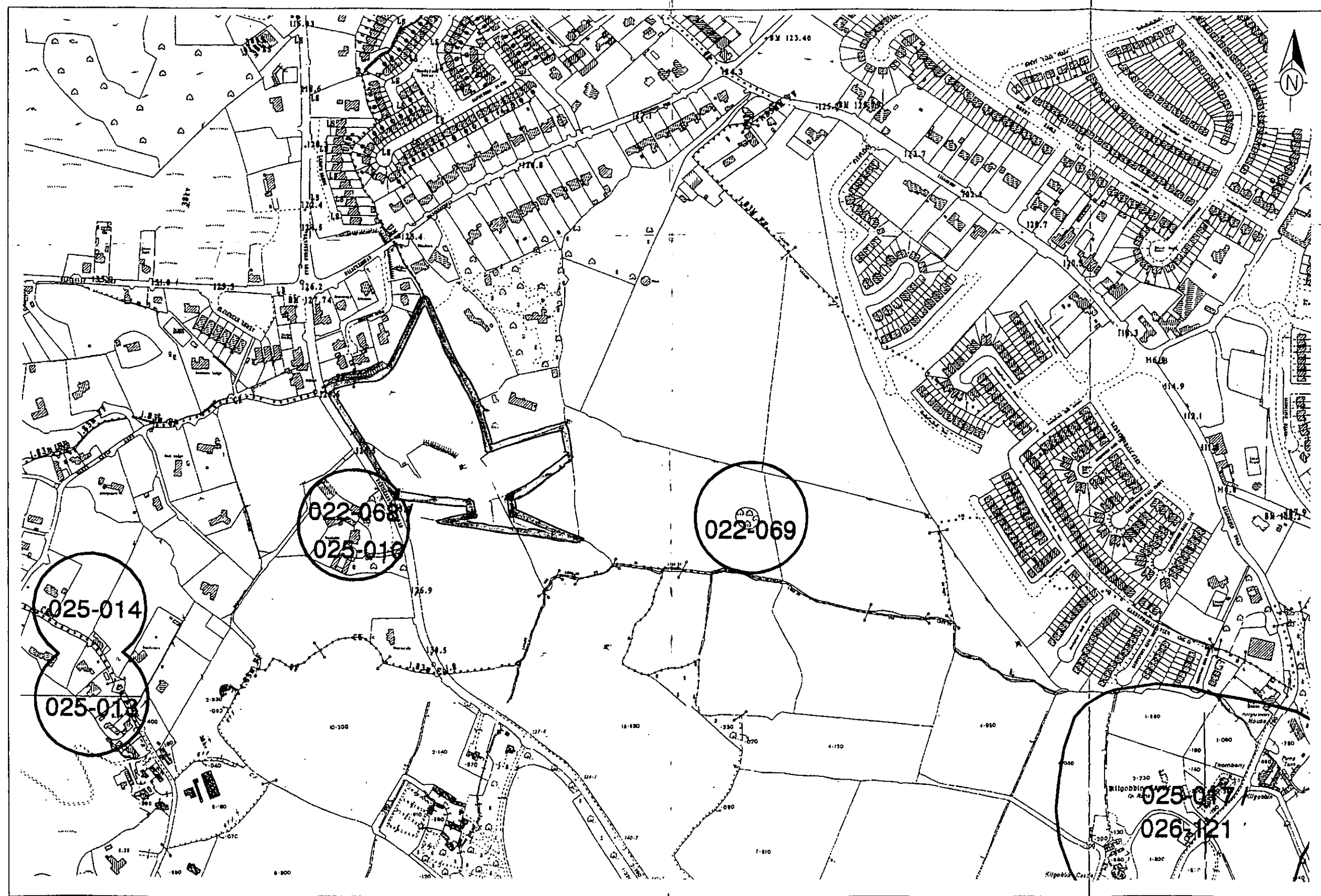


Fig 5.9.2 Extract from Archaeological Constraint Map, Dublin Sheet No. 3455.

Scale 1:5000

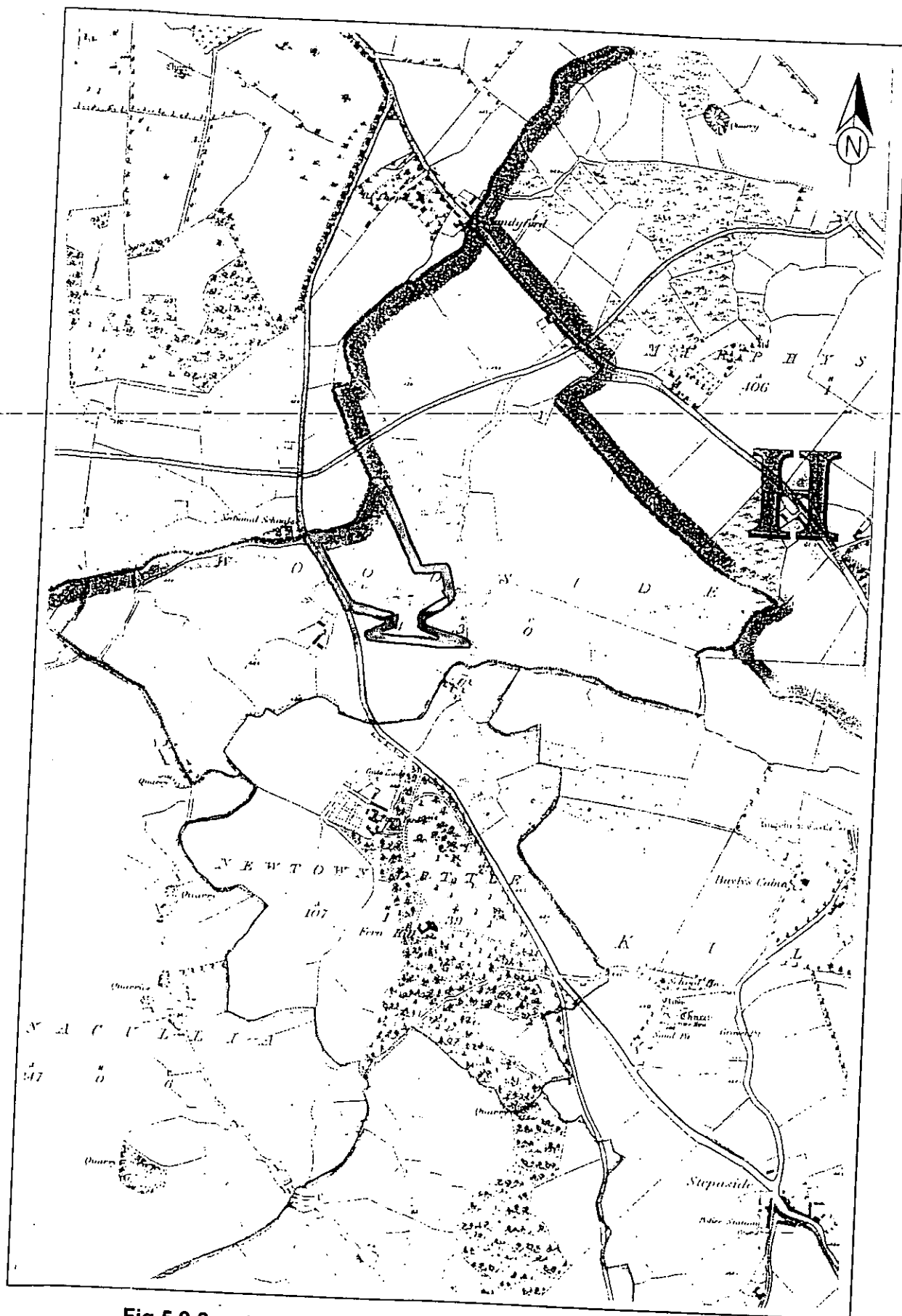


Fig 5.9.3 Extract from First Edition Ordnance Survey Map,
Dublin Sheet Nos. 22 and 25.

Scale 1:10560

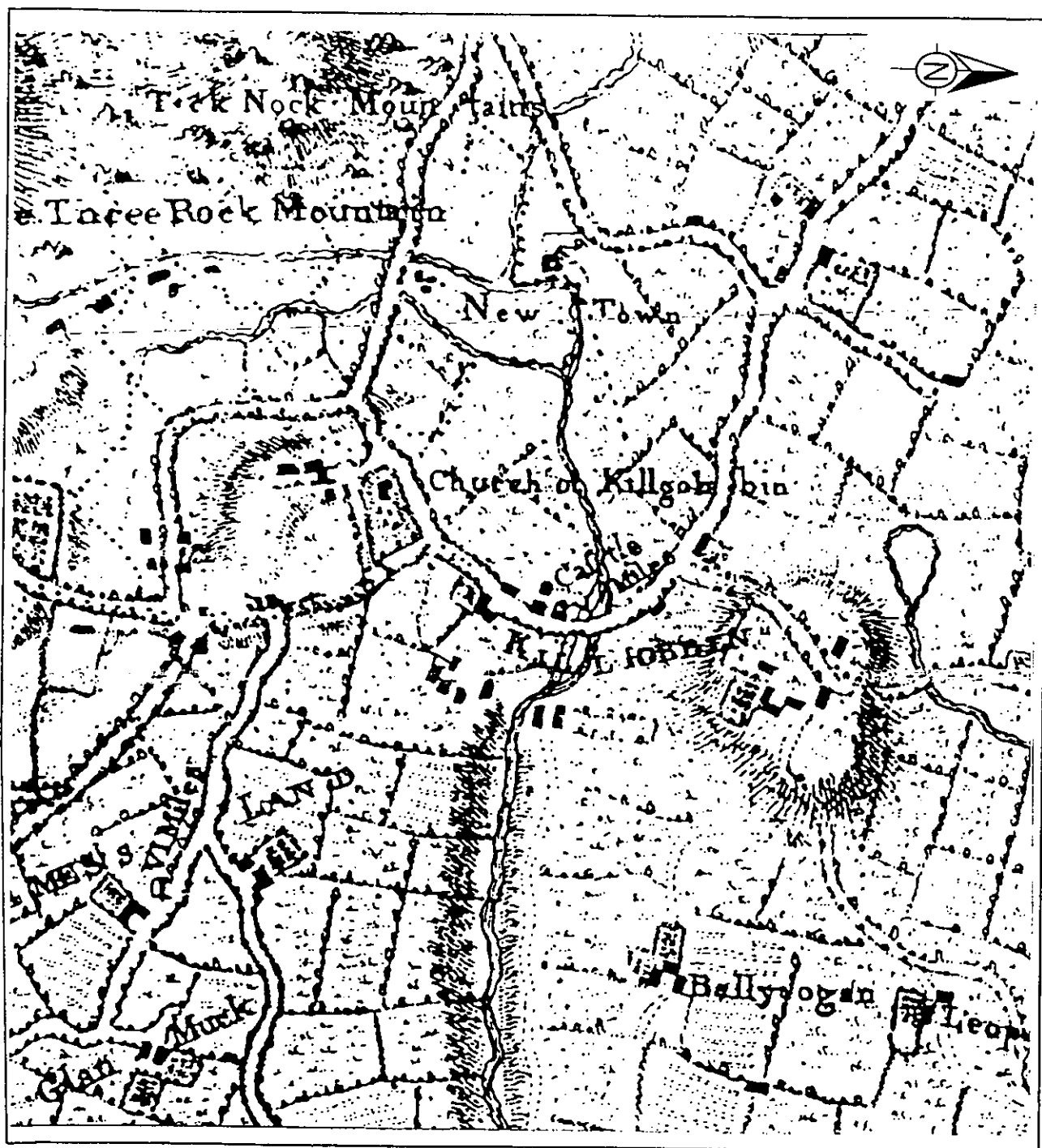


Fig 5.9.4 Extract from Rocque's Map of County Dublin, 1760.

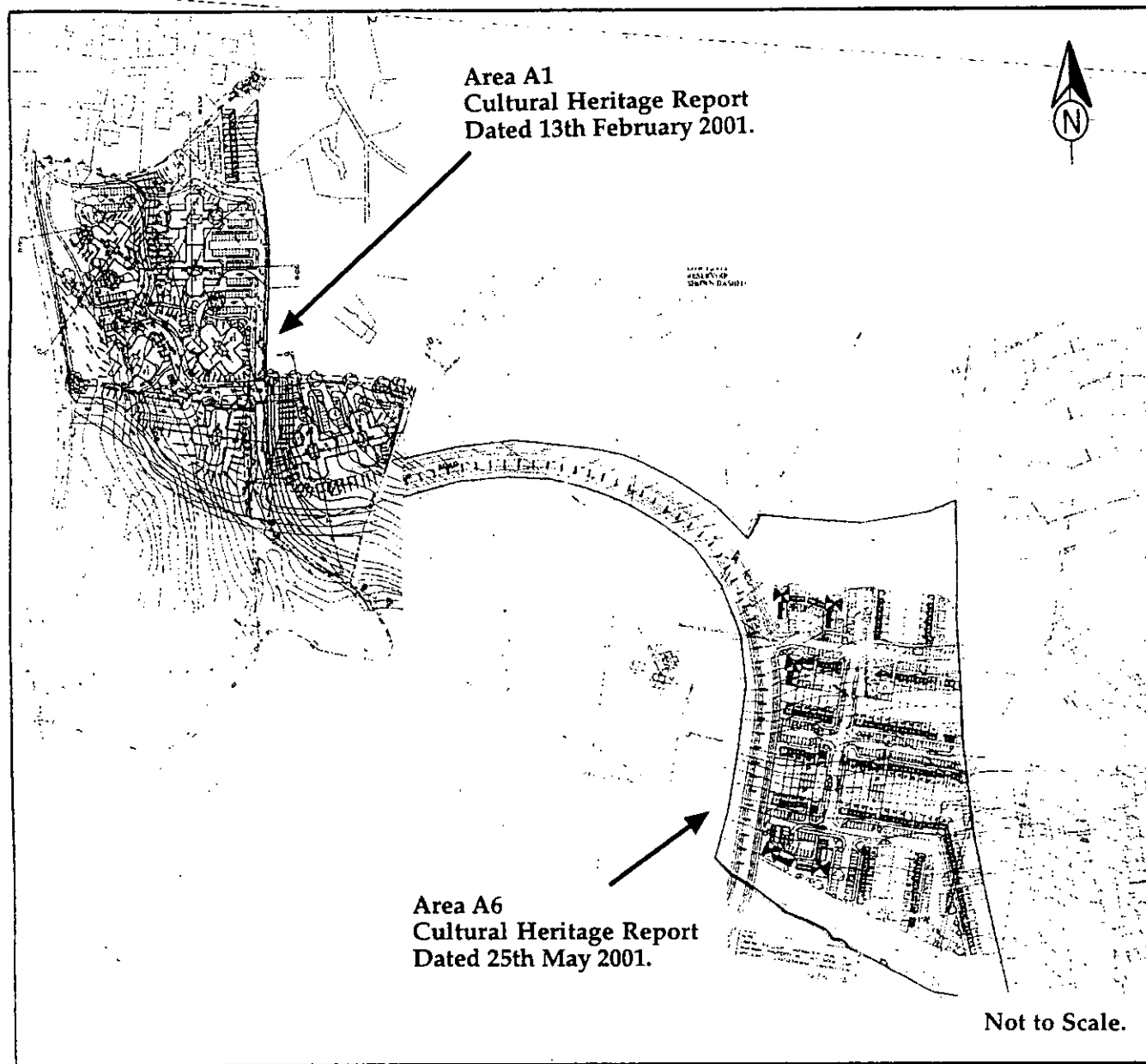


Fig 5.9.5 Composite drawing showing Areas A1 and A6, courtesy of Brady Shipman Martin.

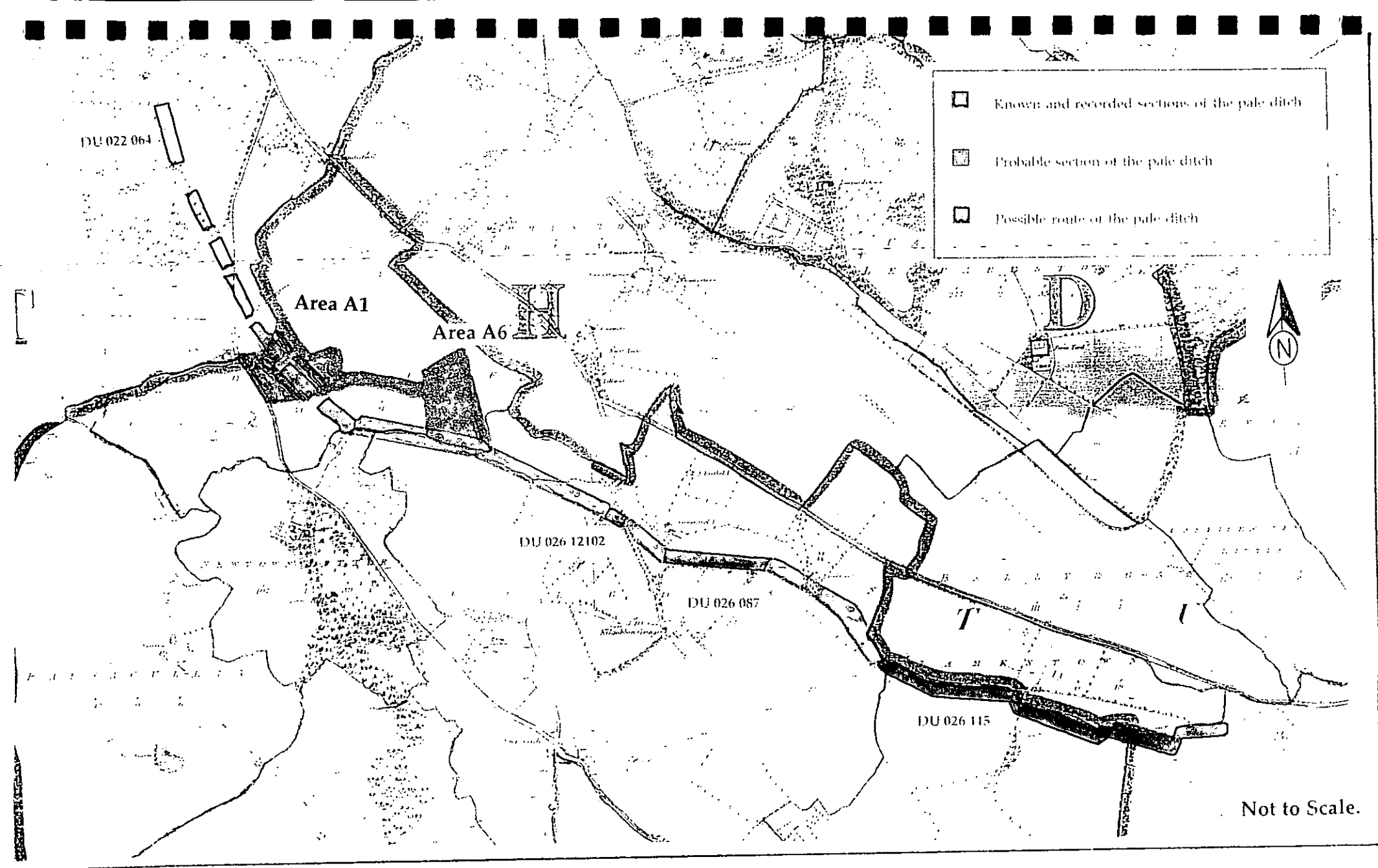


Fig 5.9.6 Reduced extract from the First Edition Ordnance Survey Map 1836-37 showing route of Pale Ditch.



Plate 5.9.1 Aerial Photograph, 6899 OS1, 1982
[Ordnance Survey of Ireland].



Plate 5.9.2 Aerial Photograph, 8736 OS17, 1997
Ordnance Survey of Ireland

6.0 INTERACTIONS

	Human Beings	Flora & Fauna	Soils	Water	Air	Climate	Landscape	Material Assets	Cultural Heritage
Human Beings		Minor	Negligible	Minor	Minor	Negligible	Moderate	Minor	Minor
Flora & Fauna			Minor	Significant (Potentially)	Moderate (Noise)	Negligible	Moderate	Moderate	Minor
Soils				Significant (Potentially)	Negligible	Negligible	Minor	Negligible	Significant (Potentially)
Water					Negligible	Negligible	Minor	Minor	Moderate (Potentially)
Air						Negligible	Minor (Noise)	Minor	Negligible
Climate							Negligible	Negligible	Negligible
Landscape								Minor	Minor
Material Assets									Minor
Cultural Heritage									

Significant Interactions

- 6.1 The only potentially significant interactions are between Soils / Cultural Heritage (where disturbance may impact on un-discovered sites); Soils / Water (surface run-off to Ballyogan Stream); and Flora & Fauna / Water (also run-off to aquatic habitat). However, these aspects have been comprehensively considered under the relevant chapters and in particular in Chapters 5.2 Flora & Fauna & 5.9 Cultural Heritage.