

A photograph of a light rail train at night, illuminated by streetlights. The train is silver and yellow, with large windows reflecting the lights. It is positioned on the left side of the frame, extending into the distance. The background shows a dark night sky and some distant lights.

Dublin Light Rail Environmental Impact Statement

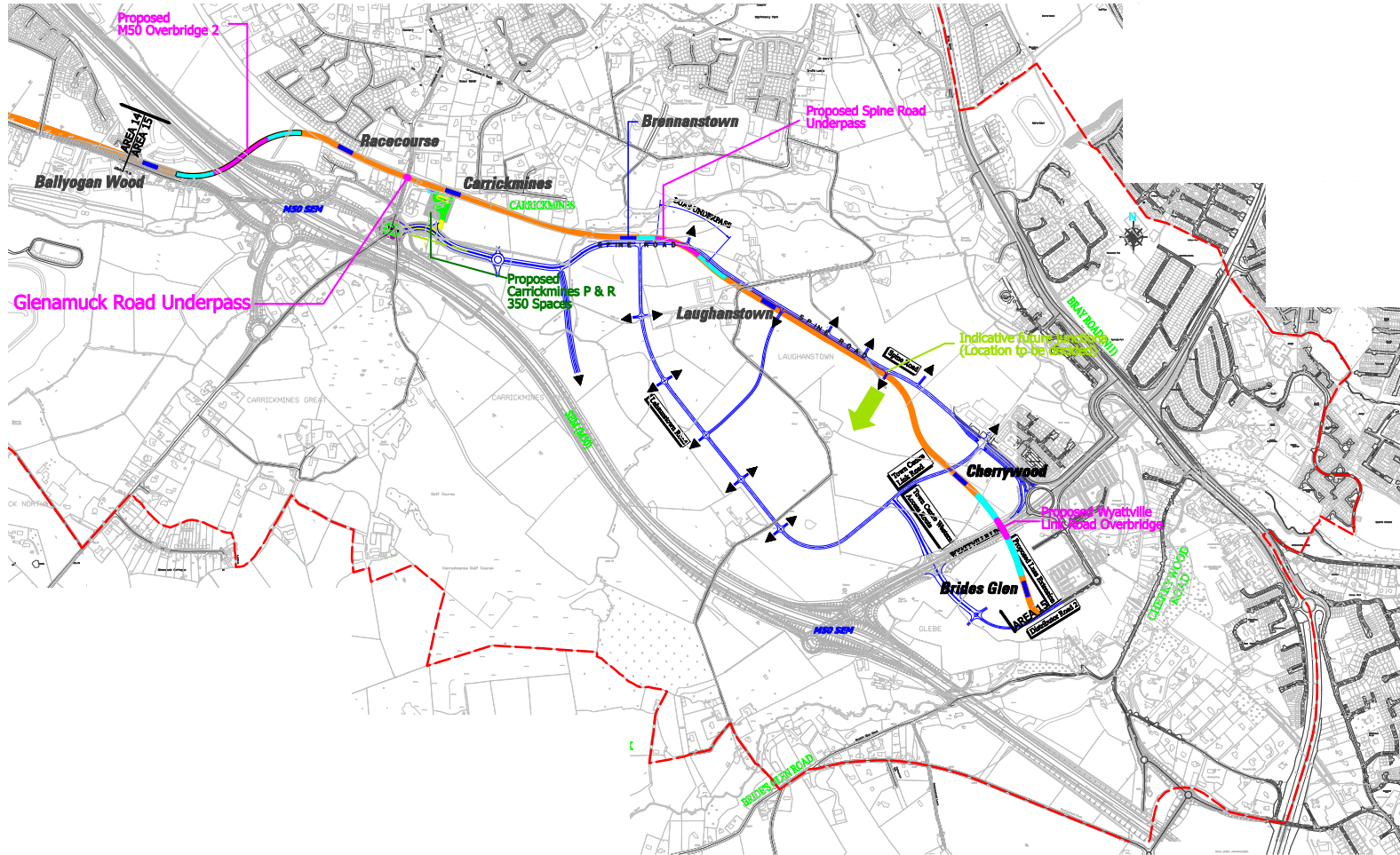
Line B1

Sandyford Industrial Estate to
Cherrywood

Volume 2
Area

15

Ballyogan Wood to
Bride's Glen



Area 15

Ballyogan Wood to Bride's Glen

ENVIRONMENTAL IMPACT STATEMENT

The Environmental Impact Statement is being published in three separate Volumes as follows:

Volume 1 Chapters 1, 2, 3, 4, 5, 6, and 8

Volume 2 Chapter 7 (Environmental Impact – Areas 13 to 15)

Volume 3 Chapter 9 (EIS Non-Technical Summary)

This Environmental Impact Statement (EIS) relating to Line B1 of the Dublin Luas Light Rail Transit (LRT) Project is set out in nine Chapters, titled as follows:

Chapter 1 Introduction

Chapter 2 Public consultation

Chapter 3 Consideration of alternatives Luas line B1

Chapter 4 Description of the proposed Luas line B1 alignment

Chapter 5 Aspects of the environment considered

Chapter 6 Interactions

Chapter 7 Environmental impact – Areas 13 to 15 inclusive

Chapter 8 Difficulties encountered in compiling this EIS

Chapter 9 Non-technical summary

The preparation of an Environmental Impact Statement requires the co-ordination and synthesis of associated yet diverse elements of the overall assessment. To facilitate this process, a schematic structure is used in order to provide a coherent documentation of the various aspects of the environment considered. An outline of the Grouped Format structure of the Environmental Impact Statement is detailed below.

1 Receiving Environment (Baseline Situation)

A description of the specific environment into which the proposal will fit, taking account of other developments likely to occur. The particular aspects of the environment are discussed in terms of their context, character, significance and sensitivity.

2 The Characteristics of the Proposal

A projection of the specific “load” on the particular aspects of the environment which the proposal would be likely to generate. This is set out at the commencement of each of the three individual areas in Volume 2.

3 The Potential Impact of the Proposal

- a) The potential impact of the proposal also comprises a general description of the possible types of impacts which proposals of this kind would be likely to produce.
- b) This includes a consideration of the “Do-Nothing” impact. The “Do-Nothing” impact describes the environment as it would be in the future if no development of any kind is carried out.

4 Remedial or Reductive Measures

A description of any specific remedial or reductive measures considered necessary and practicable resulting from the assessment of potential impacts described at (3a) above.

5 The Predicted Impact of the Proposal

- a) An assessment of the specific direct and indirect impact of the proposal arrived at by adding to the receiving environment (as in (1) above), the loading of the proposal (as in (2) above) and the remedial or reductive measures (as in (4) above).
- b) Also considered. is a “Worst Case” scenario, arising where a development, or its mitigation measures substantially fail.

6 Monitoring

A description of any monitoring of effects on the environment which might be necessary in both the construction and operational phases, covering the monitoring methods, and the agencies responsible for their implementation.

7 Reinstatement

Where required, a description of reinstatement measures and the agencies responsible for their implementation.

ENVIRONMENTAL IMPACT STATEMENT STUDY TEAM

The Environmental Impact Statement was prepared on behalf of the Railway Procurement Agency (RPA) by a study team led by RPS McHugh Planning and Environment, who were responsible for the overall study management and co-ordination as well as for Land Use Planning and Development, Demography and Employment, Property, Local History and Interactions. The other members of the study team are as follows:

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Railway Procurement Adency (RPA)

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Railway Procurement Agency (RPA)

Graphic Design and Photomontages

Arc Digital Photographic Ltd. Railway Procurement Agency (RPA)

AVAILABILITY OF THE EIS

Copies of this Environmental Impact Statement including the Non-Technical Summary may be purchased by any member of the public during normal office hours at the following locations:

Railway Procurement Agency (RPA), Parkgate Street, Dublin 8

Dublin Transportation Office, Hainault House, Floor 3, 69-71 St. Stephen's Green, Dublin 2.

The EIS may be purchased as a complete document for a sum of €50.00 (Volumes 1, 2 & 3).

Alternatively, reports on each of the three individual Areas of the Line B1 alignment discussed in Chapter 7 (Volume 2) of the EIS dealing with particular areas and topics may be purchased individually for a sum of €10.00 each.










Copies of Volume 1 may be purchased for €30.00 each.

Copies of the Non-Technical Summary (Volume 3) of this EIS may be purchased at any of the above locations for a sum of €3.00 each.

A CD version of the whole EIS (Vol 1; Vol 2 Area 13, 14 and 15 and NTS) for €5.00.

This EIS is also available to download through the RPA website at www.rpa.ie

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APPENDIX 15 E

Drawing detailing the area around Carrickmines showing RMP sites and recent archaeological investigations.

Drawing detailing the area around Laughanstown and Cherrywood showing location of RMP sites and recent archaeological investigations.

Drawing detailing the area around Carrickmines Castle showing location of Castle wall and ditches.

Characteristics of the proposal

Ballyogan Wood to Bride's Glen



Luas Line B1 THE PROPOSED DEVELOPMENT

Luas Line B1 comprises the construction, installation and operation of a twin tracked light rail transit system between Sandyford Industrial Estate and Cherrywood including the provision of track, cable supports, overhead power lines, stops, sub-stations and trams, as well as associated works. This route comprises an extension of the existing Green Line linking St. Stephen's Green in Dublin City Centre to Sandyford Industrial Estate, which commenced operation in June 2004. Luas Line B1, which is the subject of the Railway Order application which this EIS accompanies, runs for a distance of approximately 7.6km from the Sandyford Stop, adjacent to the Luas Sandyford Depot at the north-eastern corner of the Sandyford Industrial Estate, to the planned District Centre at Cherrywood via the Central Park scheme, Ballyogan Road, Carrickmines and Laughanstown, terminating at the Cherrywood Science and Technology Park. This alignment includes two bridge crossings of the reservation of the South Eastern Motorway (SEM); one spans from the lands of Central Park and links over the Leopardstown Valley to Murphystown Road; the other spans from a point north of Ballyogan Road to a point south of the alignment of the former Harcourt Street rail line, west of Glenamuck Road in Carrickmines. It also includes an elevated crossing of the Brewery Road/Leopardstown Road Roundabout and the Wyattville Link Road, an underpass at Glenamuck Road Bridge and the planned Cherrywood Spine Road.

Luas Line B1 runs predominantly off-street, or along a dedicated reservation. It will provide residents, workers and visitors within its catchment area with a fast and efficient public transportation service.

For ease of local identification and interest, the Luas Line B1 alignment has been divided into three Areas. This document concerns **Area 15**, running from a point to the eastern end of Ballyogan Road in the vicinity of the Ballyogan Wood residential scheme to the Cherrywood Science and Technology Park. The aim of this document is to highlight the specific environmental impact arising for the area from the construction, maintenance and operation of the proposed Luas Line B1, and the remedial measures that will be employed to reduce or remedy likely significant adverse impacts.

Area 15 Ballyogan Wood to North of the South Eastern Motorway



Area 15 commences at the entrance road serving the Ballyogan Wood housing scheme. Part of the SEM scheme will entail the reconstruction and widening of Ballyogan Road in the general vicinity of An Post Delivery Office eastwards to the planned SEM Carrickmines Interchange, including that area serving the Ballyogan Wood stop.

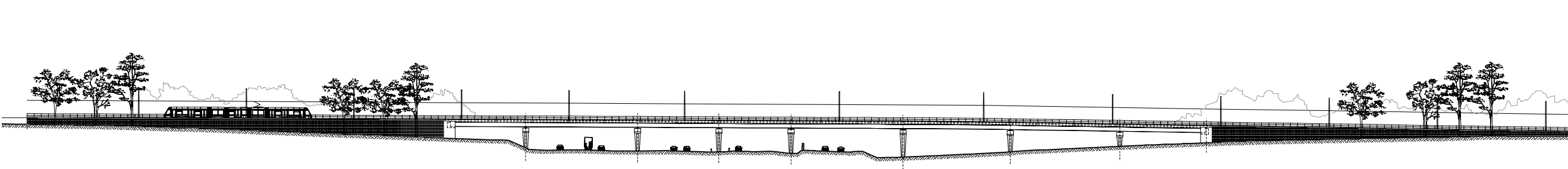
Luas Line B1 and the upgrading of the Ballyogan Road has been facilitated by the alterations to the road access arrangements to the Ballyogan Wood estate. The alterations produced a single entry/exit arrangement off Ballyogan Road. Ballyogan Wood stop will be located immediately to

the east of the entrance road to the Ballyogan Wood scheme.

East of the stop, the Luas Line B1 alignment turns to the north and ascends a ramp which will link to a bridge over the SEM. This bridge including associated ramps extends for some 450m. The soffit of the bridge will be elevated a minimum of 5.3m above the road level of the motorway, with piers located in the central median of the motorway and on its northern side, between the southbound off-ramp and a planned new service road to Leopardstown Race Course. North of the bridge, Luas Line B1 links at-grade to the alignment of the former Harcourt Street Railway, immediately to the south of

the houses of Brighton Court. This area of the alignment is currently filled in parts with rubble and other fill material which will require removal.





Elevation of Carrickmines Bridge



Embedded Track



Ballasted Track



Plinth Track



Typical LRT Stop



Existing Tree



Proposed Tree



Small Hedgerow Group



Large Hedgerow Tree



Small Hedgerow Tree



Proposed Shrubs



Planted Verge



Store/ Concrete Paving



Area 15 North of the South Eastern Motorway to west of Carrickmines Stop



A Luas stop, is planned to be located on the alignment at a point immediately to the south of the houses of Brighton Court. It is proposed to operate on event days at present with the potential to become a full time stop in the future.

A large temporary construction compound and assembly area is planned to be located on lands bounded to the west by the northern portion of the Motorway bridge and ramp structure, and to the north by the alignment of the former Harcourt Street Railway. It is bounded to the east by the existing Ballyogan Travellers' Grouped Housing Scheme.

The Luas Line B1 alignment runs eastwards along the existing rail reservation. The ground surface in this area is

marshy and waterlogged, with a slow-flowing rivulet running through the reservation. Existing dwellings, including the Travellers' Grouped Housing Scheme are located to the south of the alignment, while the Carrickmines Tennis Club is located to the north.

The Luas Line B1 alignment passes under the existing Glenamuck Road bridge. This bridge will require remedial works to its abutments and deck necessitating a road closure. The bridge will be altered and upgraded to accommodate the Luas underpass and facilitate road widening. The works will involve the insertion of a concrete box within the existing abutments. The works will also require the removal of the existing parapet and cast iron railings on the bridge in order to

provide a stronger parapet structure, in accordance with current requirements. The railings are intended for re-use as a boundary between the Luas alignment and the former station house.

Immediately east of the Glenamuck Road bridge, the Luas Line B1 alignment enters the property of the former Carrickmines Station House, a two-storey period dwelling, and a Protected Structure, which has retained the old station platform and some associated furniture at its northern boundary. A flat-roofed single-storey extension has been constructed across the alignment, and will be required to be demolished to facilitate the provision of the alignment.

The RPA is empowered to undertake certain conservation works to the existing architectural heritage in the area of the former Carrickmines Station. It is intended that the existing access ramp and path from Glenamuck Road, previously used to access the former Station's northern platform, will be re-utilised and extended to link to the new Carrickmines Luas stop. Following the required removal of the existing single storey extension across the track alignment, the rear elevation of the Station House will be reinstated to match the existing by means of the use of a similar form of materials and design as currently exist at this Protected Structure. A barrier structure will be provided between the former Station House and the Luas Line B1 alignment. As with all works within its remit, the RPA will seek to ensure that the works at



Carrickmines are undertaken within the principles of best practice for conservation of heritage.

Luas Line B1 continues eastwards along the alignment of the former Harcourt Street Railway, which contains young sapling trees and an undergrowth of ivy and other flora. A small watercourse occurs along this portion of the alignment.



Area 15 Carrickmines Stop to Carrickmines Wood (West Side)



The Carrickmines Stop, as well as a sub-station, will be located along the reservation, immediately to the south of the existing Brennanstown Vale residential scheme.

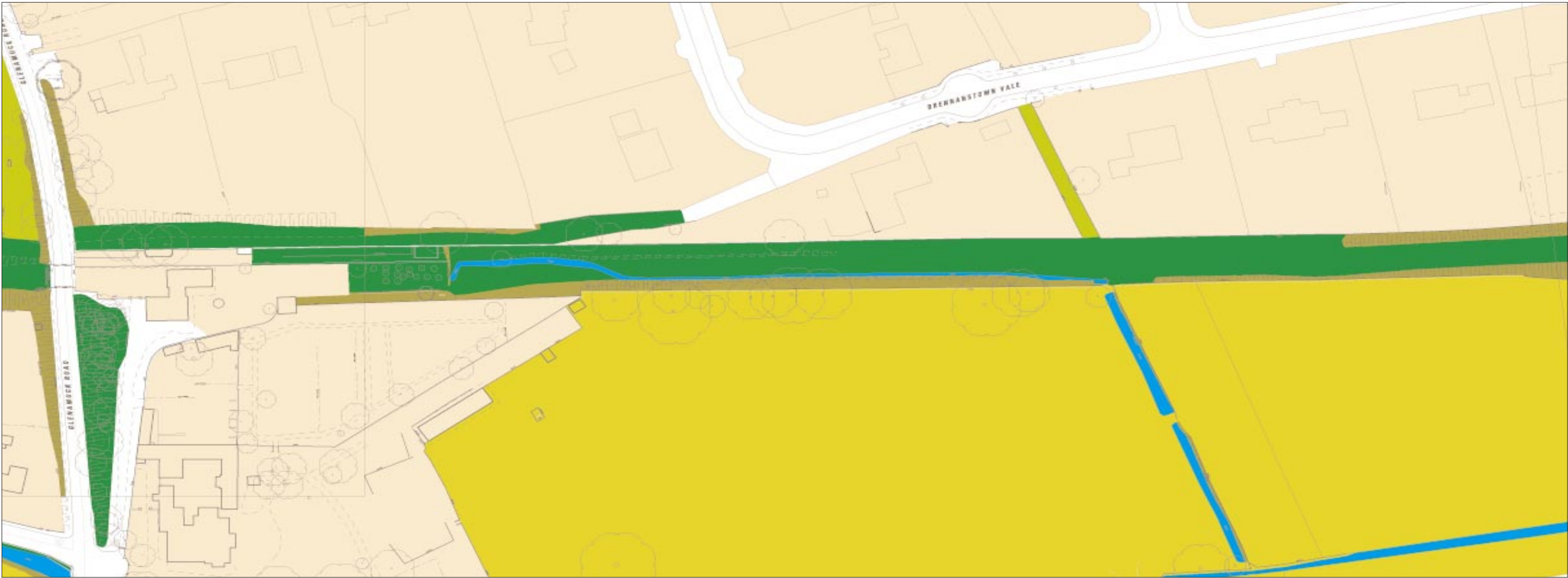
A 350 space Park and Ride facility is planned to be located to the south of the Carrickmines Stop, in the lands of Priorsland on the eastern side of Glenamuck Road. The provision of such a facility is an objective of the Dun Laoghaire Rathdown County Development Plan 2004-2010. A bus interchange will also be provided at this location.

Access to this proposed facility is to be from a road link

extending from the southern side of the SEM Carrickmines Interchange. This road will form the western end of the future planned Cherrywood spine road, linking from the Interchange to the planned Cherrywood District Centre. The Cherrywood Spine Road is planned as a major element of road infrastructure serving new development proposed in the Draft Carrickmines-Cherrywood Action Plan 2000 and subsequently zoned in the current County Development Plan.

The Luas Line B1 alignment continues to run eastwards along the alignment of the former Harcourt Street Railway, in

proximity to the rear (southern) boundaries of properties within the Brennanstown Vale residential scheme.





Area 15 Carrickmines Wood to Laughanstown Lane



Luas Line B1 runs immediately to the south of Carrickmines Wood, and is characterised by new growth that has occurred since the decommissioning of the Harcourt Street Railway. Where the alignment crosses over the Carrickmines River the lands fall sharply away to the north.

length, with a cutting at either end totalling approx. 200m. A temporary construction compound and assembly area is to be located in this vicinity.

At a point to the east of Carrickmines Wood, Luas Line B1 turns to the south-east away from the alignment of the former Harcourt Street Railway. It crosses the alignment of the planned Cherrywood spine road by means of a grade-separated underpass at a location to the west of Laughanstown Lane. This structure will be approx. 125m in



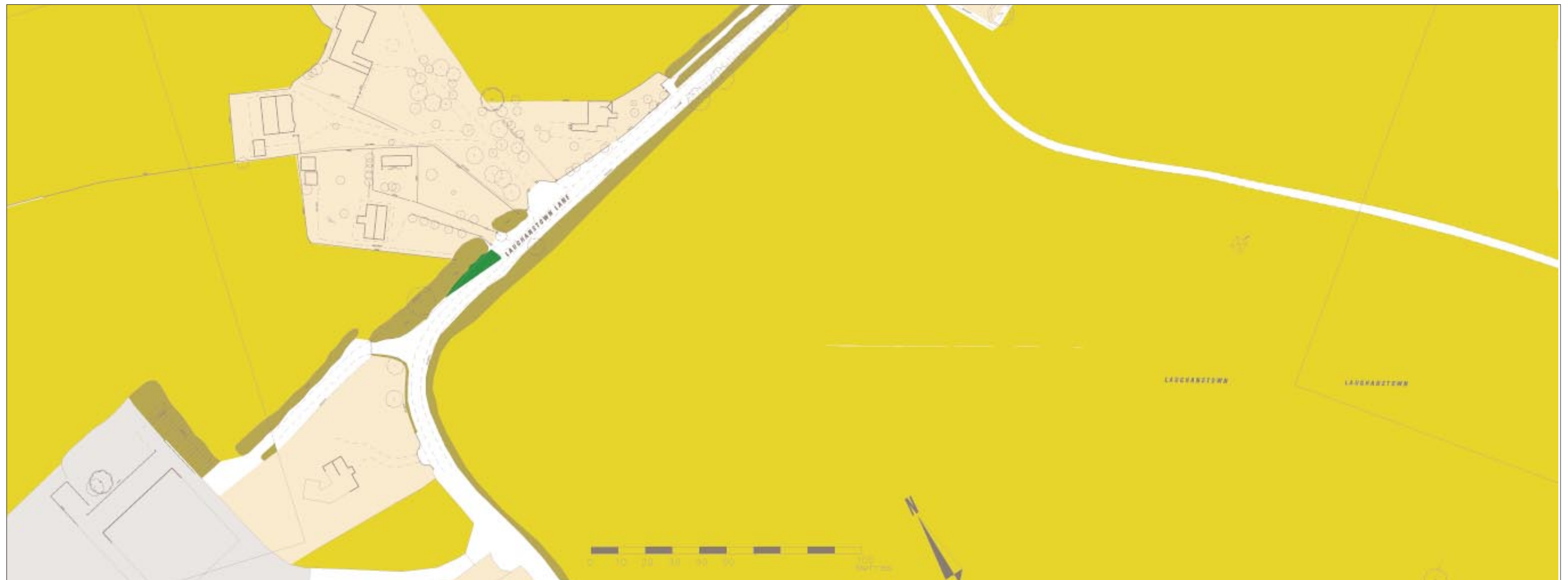


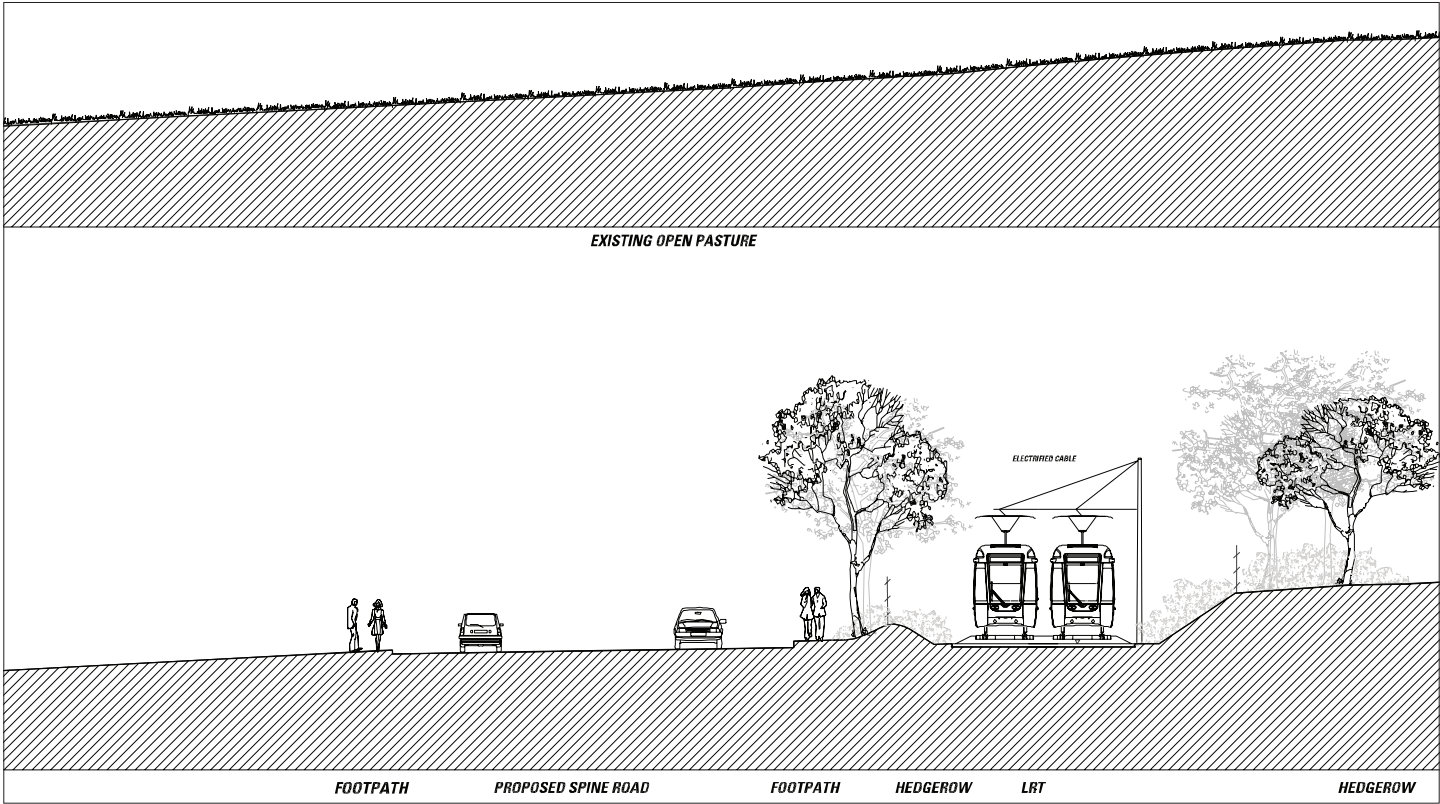
Area 15 Laughanstown Lane to Laughanstown Stop



East of Laughanstown Lane, the Luas Line B1 alignment runs eastwards, parallel to, and to the south of, the planned Cherrywood Spine Road alignment. It crosses Laughanstown Lane at grade, at a point to the south of a number of existing dwellings, including the old level crossing cottage associated with the operation of the former Harcourt Street Railway.

Laughanstown Stop will be located on lands on the eastern side of Laughanstown Lane and will be accessed from this carriageway.





Area 15 Laughanstown Stop to Cherrywood



Luas Line B1 will continue eastwards parallel to, and to the south of, the planned alignment of the Cherrywood spine road, between the SEM Carrickmines Interchange, and the planned District Centre at Cherrywood.

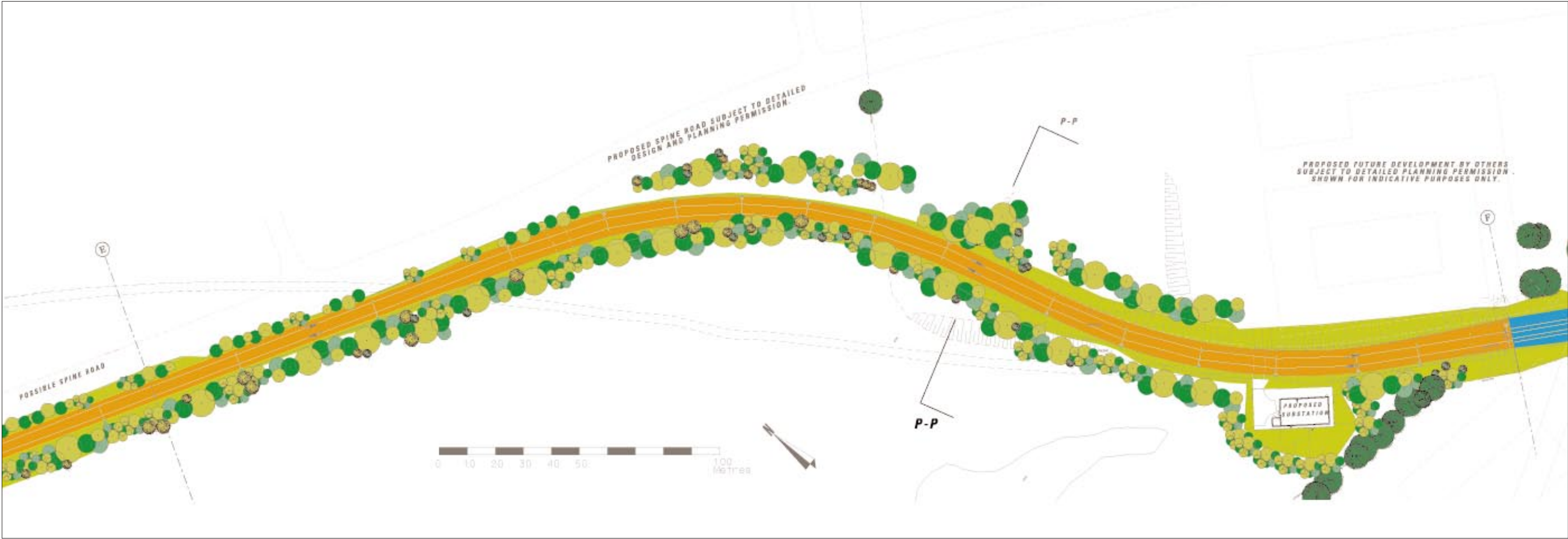
The Cherrywood-Rathmichael area has been identified by the 2004-2010 Dun Laoghaire Rathdown County Development Plan as an area with the greatest potential for comprehensive development, comprising residential, employment-related and amenity uses, as well as the creation of a large District Centre at Cherrywood. There is a specific objective in the Statutory Development Plan to

prepare a Local Area Plan for the Cherrywood-Rathmichael Areas, which will supercede the Draft Carrickmines-Cherrywood Action Area Plan.

The Luas Line B1 alignment passes at some distance to the north of the area of archaeological interest of Tully Church, a notable heritage structure in the vicinity. It then turns to the south-east, thereby departing from the line of the planned Cherrywood spine road, and enters the area of the planned Cherrywood District Centre. A substation will be located adjacent to the line at Cherrywood. The Cherrywood stop will be located within the planned Plaza area of the District

Centre. A temporary pedestrian access will link to the Luas stop, across third party developer owned lands, from the eastern end of the Cherrywood spine road which has been constructed to serve the existing residential development in this area. Once Luas is operational more formal access arrangements will be agreed with the developer and incorporated into future development schemes at this location.





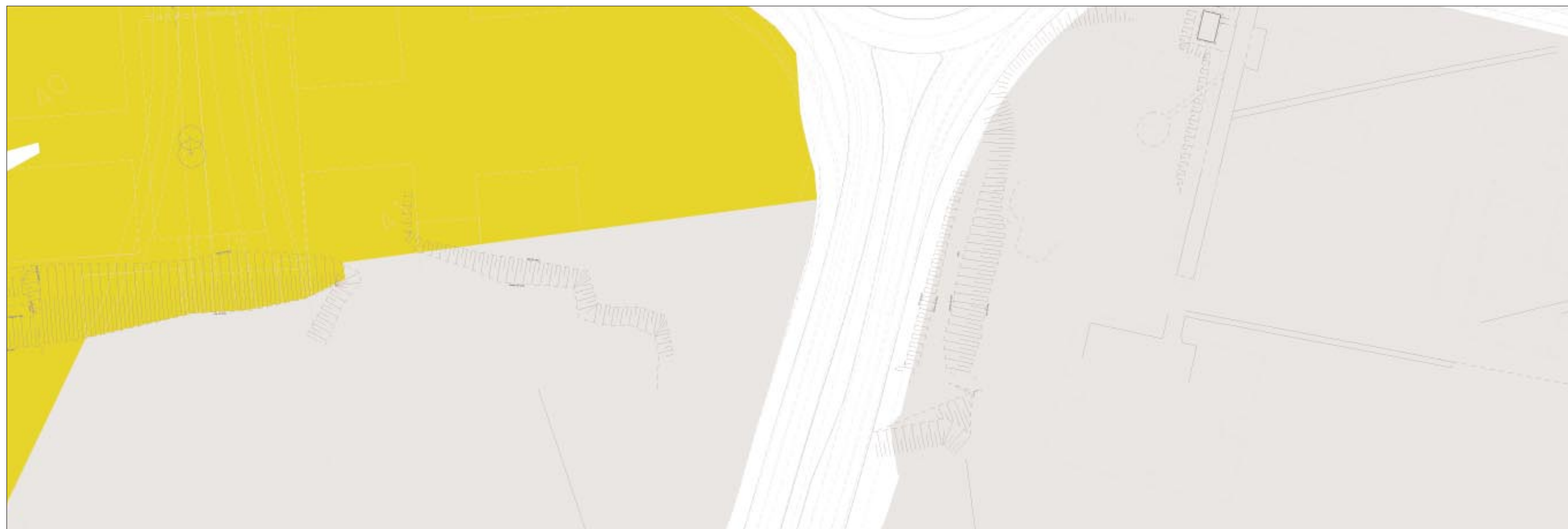
Area 15 Cherrywood to Bride's Glen Stop



Luas Line B1 continues approx. 400m south into the Science and Technology Park at Cherrywood. East of the Cherrywood stop, the Luas Line B1 alignment continues east over the Wyattville Link Road by way of a viaduct some 550m in total length. The soffit of the viaduct will be elevated a minimum of 5.3m above the Wyattville Link Road.

The Luas Line B1 alignment terminates at the Bride's Glen stop in the southern portion of the Science and Technology Park. It is envisaged that this stop will serve the existing and planned employment population in this area.

The alignment passes through a significant amount of lands zoned for economic development and employment under the current County Development Plan. These lands, which remain largely undeveloped at present, are located within the overall Cherrywood Science and Technology Park scheme.





7.15.1

Human Beings



7.15.1.1 INTRODUCTION

Human beings constitute a primary element of the ‘environment’ and any potential impact on human beings by Luas Line B1 proposal must therefore be comprehensively assessed. The principal concern is that human beings experience no significant unacceptable diminution in aspects of ‘quality of life’ as a consequence of the construction and operation of the proposed development. This assessment of ‘Human Beings’ considers demography and employment, land use planning and development, vehicular and pedestrian traffic and safety, and community severance.

7.15.1.2 DEMOGRAPHY & EMPLOYMENT

The key demographic and employment characteristics of Area 15 which are examined include: - the size and changing size of the population, number and size of households, employment and social profile, work and school travel patterns, and car ownership rates.

The Electoral Division (ED) is the smallest administrative area for which population statistics are published by the Central Statistics Office. There are three EDs within the catchment of Area 15 (Foxrock-Carrickmines, Cabinteely-Loughlinstown and Shankill-Rathmichael).

Table 7.15.1.2.1: Population Area 15, Luas Line B1 Alignment and DTO Area, 1991-2002

	Area 15	Total Line B1	DTO Area
1991	9,020	24,557	1,350,595
1996	10,172	28,981	1,405,671
2002	11,995	32,367	1,535,446

SOURCE: Census of Population 1991, 1996, 2002

7.15.1.2.1 Receiving Environment

Demography

In 2002 the resident population of the EDs incorporating Area 15 was 11,995 persons. This represents an increase of 33% since 1991. In comparison the population of the Line B1 Study Area has increased by 31.8% during the same period.

Table 7.15.1.2.2: Population Change Area 15, Luas Line B1 Alignment and DTO Area, 1991-02 (%)

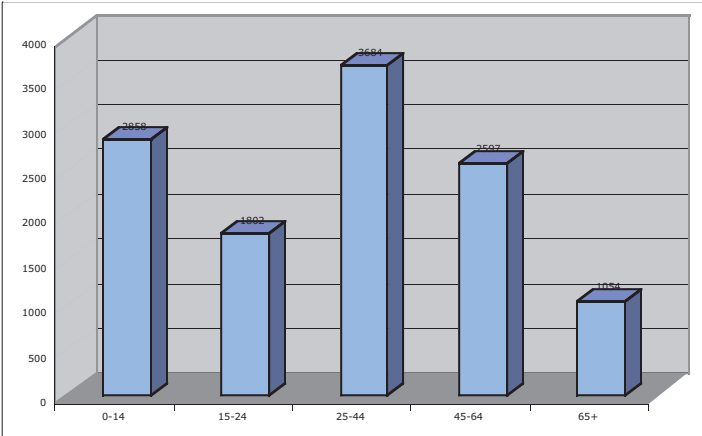
	Area 15	Total Line B1	DTO Area
1991-96	12.8	18.0	4.1
1996-02	17.9	11.7	19.2
1991-02	33.0	31.8	13.7

SOURCE: Census of Population 1991, 1996, 2002

Age Profile

In 2002, 67.4% of the population of Area 15 were in the working age groups, that is between 15 and 64 years of age. This is similar to the percentage in the overall Luas Line B1 Study Area of 67.6%. In 2002, 10.8% of the population of Area 15 were students over the age of 15. This compares with a figure of 9.6% for the overall Luas Line B1 Study Area.

Fig. 7.15.1.2.1 Area 15 Age Profile as % of Total Population 2002



Households

In 2002 there were a total of 3,832 households in the three EDs incorporating Area 15. This compares to a figure of 3,132 households in 1996 and represents an increase of 22.3%. The average household size for Area 15 was 3.1, down from 3.2 in 1996. Single private households accounted for a total of 15.7% of the total number of households. Conventional houses accounted for 90.2% of total houses in Area 15, while the number of apartments/flats/bedsits accounted for 8.2% of the total. Lower density suburban dwellings are the predominant form of house type in the area.

Table 7.15.1.2.3: Household Statistics, Area 15 and Line B1 2002

	Area 15	Total Luas Line B1
Total number of households	3,832	10,284
Average household size (persons)	3.1	3.1
Number of single private Households	15.7%	16.2%
Percentage apts/flats/bedsits	8.2%	5.2%

Employment

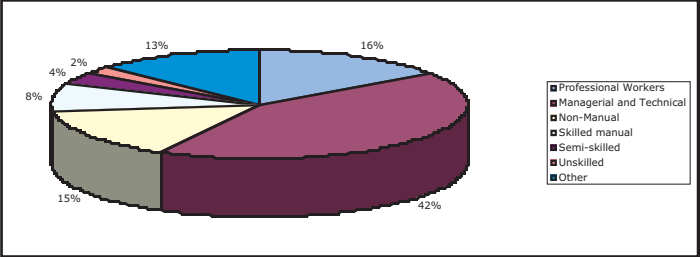
In 2002 a total of 5,010 persons in the EDs incorporating Area 15 were recorded as being at work. The number of people recorded as being unemployed was 223 persons, giving an unemployment rate of 4.3%. Unemployment rates varied within the various EDs, with Shankill-Rathmichael recording the highest rate of 6% and Foxrock-Carrickmines having the lowest rate of 3.2%. An examination of the occupational structure of those ‘at work’ in Area 15 shows that 29.4% of the total were classed as professional, technical and health workers, while 6.5% were classed as manufacturing workers.

Social Deprivation

Social class can be an indicator of the socio-economic character of an area. In 2002, 58% of the resident population in the EDs incorporating Area 15 were categorised as being of Social Classes 1 or 2, i.e. the highest social classes, generally representing higher professional and managerial occupations. 6% were classed as being of social class 5 or 6, comprising semi-skilled and unskilled manual labour and

low-level service occupations. This indicates that a very low level of social deprivation exists in Area 15.

Fig. 7.15.1.2.2: Area 15 Social Class



Travel Mode and Car Ownership

In 2002, 63.9% of the population of the three EDs of Area 15 over 5 years of age travel to work/school/college by car (be they drivers or passengers). For the Luas Line B Study Area this figure was 63.0%. The percentage of the population using public transport was 19.4%. This compares to a figure of 18.3% for the Luas Line B1 Study Area. 19.7% of the population of the DTO area travel to work/school/college by public transport.

In 2002, the rate of car ownership in Area 15 was 165 cars per 100 permanent households. In 1991, the rate of car ownership in Area 15 was 147 per 100 permanent households. In the Luas Line B1 Study Area, the rate of car ownership in 2002 was 159 cars per 100 permanent households. This highlights both the relative wealth of the catchment area of Luas Line B1, but also the lack of public transport provision in this area.

Table 7.15.1.2.4: Car Ownership Rates, 1991 and 2002

	1991	2002
Area 15	147	165
Luas Line B1 Catchment	132	159

Source: Census of Population 1991, 2002



7.15.1.2.2 Potential Impact of the Proposal

Construction Phase

Demography

No potential impact on demography is expected to occur during construction of the proposed development. Whilst the resident, working and visiting populations of Area 15 may experience temporary general disturbance and inconvenience due to construction works associated with the alignment, these will not affect demography, but rather are related to issues such as traffic and community severance, which are addressed elsewhere in this EIS. No potential impact on the structure of households and household size is anticipated in Area 15 during construction of Luas Line B1.

Employment

Construction of Luas Line B1 will create considerable employment opportunities. These opportunities would be open to suitable members of the labour force from the Area 15 population (as with all suitable members of the labour force throughout the Dublin Region and beyond). There could also arise some amount of associated and indirect employment during the construction phase, for example in local retail services, building suppliers etc.

Travel Mode and Car Ownership

Car ownership amongst the resident population will not alter significantly during the construction of Luas Line B1.

Operational Phase

Demography

The existing and future Area 15 resident and working populations will benefit from the introduction of a permanent efficient public transport service through this area, and the upgrading of existing road infrastructure. No significant impact on population structure as a direct consequence of Luas Line B1 is anticipated.

Employment

It is likely that there will be enhanced employment opportunities in the Cherrywood area, which will be facilitated by the operation of Luas Line B1 in the area, as well as by an

improved local distributor and National road network. It should be noted that both the recent and planned developments in this area will introduce a new working (and resident) population into this area, which will benefit from the provision of a modern efficient public transport facility.

Travel Mode and Car Ownership

There may be some shift away from private cars to public transport use by the working and visitor populations of Area 15. There is currently a very poor level of public transport serving this area. However, car ownership is not anticipated to alter significantly as a result of the operation of Luas Line B1 in Area 15, and is likely to remain above the averages for the total Luas Line B1 alignment catchment and the DTO Study Area.

“Do Nothing” Scenario

No likely and significant impact will accrue to the overall number, age profile or average household size of the resident, working and visitor populations.

7.15.1.2.3 Remedial or Reductive Measures

Construction Phase

Appropriate information and management procedures will be introduced before and during the construction phase for the resident, working and visitor populations. This will include traffic management and access measures. A Construction Team representative will be available during the construction phase for consultation with local residents and businesses.

Operational Phase

No remedial or reductive measures are necessary in terms of the demography of the Area 15 population during the operation of Luas Line B1.

7.15.1.2.4 Predicted Impact of the Proposal

Demography

No likely and significant impacts on demography are predicted as a result of the provision of Luas Line B1. Significant growth of the resident population in the area is likely by reference to the Draft Carrickmines-Cherrywood Action Plan.

Employment

Significant growth of employment in the area is planned by reference to the Draft Carrickmines-Cherrywood Action Plan, and which will be facilitated by the introduction of Luas Line B1. Overall, a beneficial impact is predicted.

Travel Mode and Car Ownership

The predicted impact on travel mode will be some shift away from private cars to public transport use by the working and visitor populations. However, car ownership will not alter significantly with the operation of Luas Line B1.

7.15.1.2.5 Monitoring

Appropriate information review and update will be carried out during construction of Luas Line B1 through Area 15.

7.15.1.2.6 Reinstatement

No reinstatement is required in respect of demography and employment.

7.15.1.3 LAND USE PLANNING AND DEVELOPMENT

7.15.1.3.1 Receiving Environment

Land Use Structure

East of Glenamuck Road, the proposed Area 15 Luas Line B1 alignment runs through lands which have been zoned under the Dun Laoghaire Rathdown County Development Plan 2004-2010 (and previously under the Draft Carrickmines Cherrywood Action Plan 2000) primarily for residential and recreational/open space use. The eastern end of the alignment at Cherrywood has been zoned for the provision of a District Centre. Other lands within the Action Plan area have been zoned for employment-related use.

The western portion of the Luas Line B1 alignment runs across undeveloped lands, prior to entering the alignment of the former Harcourt Street Railway, west of Glenamuck Road. In this area, the primary land use is residential to the north, with open space use to the south. The Carrickmines

Tennis Club, a significant local sporting facility, is also located immediately to the north of the alignment, fronting onto Glenamuck Road.

The land use structure in the vicinity of the alignment of the former Harcourt Street Railway, to the east of Glenamuck Road, currently comprises a small level of low density residential use, before giving way to undeveloped lands, an amount of which is in passive agricultural use. A significant amount of these lands are planned to accommodate new primarily residential development and are so zoned under the County Development Plan. The area of Laughanstown currently contains a very low level of existing residential development, as well as a number of farmsteads, primarily fronting onto Laughanstown Lane.

At Cherrywood itself there has been some amount of new residential and employment-related development, with the associated provision of road and drainage infrastructure. The Cherrywood Science and Technology Park, situated adjacent to Wyattville Link Road, is a low-density parkland scheme providing the highest quality office accommodation for technology based firms.

Statutory Development Plan Context

Dun Laoghaire Rathdown County Development Plan 2004-2010.

The Statutory Development Plan for Area 15 of the Luas Line B1 alignment is the Dun Laoghaire Rathdown County Development Plan 2004-2010. The plan states that its central emphasis is “*to plan for and co-ordinate appropriate sustainable development in Dun Laoghaire-Rathdown based on high quality residential, working and recreational environments and sustainable transportation patterns.*” It is also a specific objective of the Development Plan to ‘provide a proposed Luas stop at Cherrywood.

This section of the Luas Line B1 alignment passes through a significant extent of lands at Laughanstown and Cherrywood which are zoned Objective A1 “*To provide for new residential communities in accordance with approved Local Area Plans*”, before terminating at Bride’s Glen east of the Wyattville Link



Road, and immediately to the south of Cherrywood Science and Technology Park. A significant extent of lands at Cherrywood are also zoned Objective DC – *To protect, provide for and/or improve district centre facilities*” and Objective E “*To provide for economic development and employment*”.

The lands in the vicinity of Area 15 are subject to six main land use zoning objectives as listed below:

- “*To provide for new residential communities in accordance with approved Local Area Plans*”(A1)
- “*To provide for a special development area*”(A2)
- “*To protect, provide for and/or improve district centre facilities*”(DC)
- “*To provide for economic development and employment*”(E)
- “*To preserve and provide for open space and recreational amenities*”(F)
- “*To protect and improve high amenity areas*”(G)

Public Services are permitted in principle in Zones A1, A2, DC and E, and are considered ‘open for consideration’ in Zone F and G.

Area 15 of the Luas Line B1 alignment passes through the Stepside and Laughanstown/Shankill area for which the 2004-2010 Development Plan contains a number of specific objectives that include the following:

- To provide for a proposed Luas stop, on race days only, adjacent to Leopardstown Racecourse.
- To prepare the Cherrywood-Rathmichael Local Area Plan.
- To provide for a proposed Luas stop at Laughanstown.
- To provide for a proposed Luas stop at Cherrywood.
- To facilitate residential development in the Cherrywood Town Centre.

To ensure a mix of housing types in the Cherrywood-Rathmichael Local Area Plan and to ensure adequate recreational, amenity, educational, shopping and health facilities.

The current Development Plan contains a number of ‘6-year

Local Roads Objective’ for Area 15 including:

- SEM and associated roads.
- Glenamuck Road,
- Part of Lehaunstown Road (subject to design and stringent environmental considerations, land acquisition and fundings),
- Spine Road linking Carrickmines Interchange to Wyattville Link Road,
- Cherrywood – access roads to north and south of Wyattville Link Road.

With regards to the Link Road from the SEM to Wyattville, it is an objective of the Council to provide an extra junction on the Wyattville link road to serve Cherrywood. It is also an objective of the Council to redesign the SEM Lehaunstown Interchange to increase its capacity.

The Plan also contains a number of other long term roads objectives which are considered essential to provide a long term road network of sufficient standard to serve the anticipated future population growth in this area including the upgrading of part of Cherrywood Road and the Cherrywood-LaughanstownLane to the Spine Road.

There are a number of Protected Structures within the vicinity of the Area 15 Luas Line B1 alignment. These include the former Carrickmines Railway Station House, a viaduct located on Cherrywood Road, and a Dolmen located on the Brennanstown Road. Other Protected Structures include Cherrywood House and a Cairn site both located on the Cherrywood Road, as well as Loughlinstown House on the Bray/Wyattville Road.

Draft Carrickmines Cherrywood Action Plan 2000

Area 15 of the Luas Line B1 alignment passes through the Laughanstown/Shankill area for which the current Development Plan contains a number of specific objectives. One of these objectives ‘is “to prepare the Cherrywood-Rathmichael Local Area Plan”. The new Local Area Plan for the Cherrywood-Rathmichael Areas will supercede the Draft Carrickmines-Cherrywood Action Plan. The Draft Plan incorporates that area eastwards from Glenamuck Road to Cherrywood Road, and northwards from the line of the SEM

to the vicinity of the existing N11 Dublin - Arklow National Primary Route.

The Draft Action Plan sets out a framework for the co-ordinated development of the area. It envisages a future resident population of some 8,000 persons, and a working population of some 11,500 persons, including some 2,000 workers within a planned new District-Scale Centre serving the area. Other uses include a new public Golf Course at Laughanstown, as well as a linear belt of public open space in the Brennanstown area. This has resulted in a major rezoning of lands in the overall area in Area 15 from that contained in the 1998 Dun Laoghaire-Rathdown County Development Plan.

Another major element of the Draft Action Plan is the provision of a spine road serving the area, and linking from the planned Cherrywood District Centre to the SEM Carrickmines Interchange. The Plan also refers to a second Motorway interchange link at Cherrywood, to the south-east of the Draft Action Plan area. This road is now built and comprises the Wyattville Link Road.

The Action Plan also includes an objective for provision of a Luas Park and Ride facility on lands at the western end of the spine road, in the existing property of Priorsland off the eastern side of Glenamuck Road.

The Draft Action Plan identifies the provision of the Luas LRT system to the area as a fundamental component of the overall scheme, and states as follows:-

"It will be an objective of the Action Plan to encourage joint venture schemes for the construction of Luas in association with development of the area. The significance of implementing the Luas scheme is seen in the context of the DOELG Guidelines on Residential Density where the criteria for higher density include proximity to an existing or planned quality public transport system".

Recent Relevant Planning Application Decisions

A number of significant planning applications in the

immediate vicinity of the Luas Line B1 alignment in Area 15 have recently been determined by the Planning Authority. These are set out below.

Carrickmines/ Laughanstown

Under planning Reg. Ref: D94A/656 permission was granted for the construction of an 18-hole public golf course, clubhouse, driving range and associated parking facilities and for the partial demolition of Laughanstown Park House. However, the Planning Authority made a subsequent modification of the permission in 1997, in light of the adopted SEM scheme, requiring the developer to keep the southern boundary of the site along Tully Lane free from development.

Park Developments (Dublin) Ltd. received a grant of permission in April 2003, under planning Reg. Ref. D02A/0558 for development comprising c.53,741sq.m commercial, employment and retail warehousing development on a site of approx. 13.6ha at Brookfield Carrickmines Great and Jamestown, accessed via Glenamuck Road and Ballyogan Road. The development includes offices, office-based industry, retail warehousing, motor sales/showrooms, retail and restaurant uses. There is also provision for a link with the planned Ballyogan Wood Luas stop.

Under planning Reg. Ref. D02A/1061, Abbeyrock Developments Ltd. received a grant of permission in September 2003 for development comprising 332 residential units and a crèche approx. 464sq.m on a site of 6.2ha at Penryn, Glenamuck Road, Carrickmines Great, Dublin 18.

In February 2005 Coolgreen Properties received a grant of permission, under planning Reg. Ref. D04A/0642, to construct 4 five bedroom two storey houses on a site at Coolgreen, Brennanstown Road and Brennanstown Vale, Carrickmines Dublin 18.

In March 2005, under planning Reg. Ref. D04A/0877, Park Developments (Dublin) Ltd. received a grant of permission for a two storey leisure and fitness centre approx. 2,884 sq.m on a site c. 0.41ha at Brookfield, Carrickmines Great and Jamestown, Dublin 18.



Planning Reg. Ref. D04A/0327 for development consisting of 227 residential units, a crèche and retail units on a site of 3.9 ha on Glenamuck Road, Carrickmines Great, Dublin 18 is currently on appeal to An Bord Pleanála.

An application by Tudor Homes Ltd, under Planning Reg. Ref. D04A/0988, is currently on appeal with An Bord Pleanála. The development comprises a mixed use development consisting of 702 residential units in 26 buildings ranging in height from three to eight storeys. A two storey building is also proposed containing approx. 152 sq.m of retail, a library and a community hall and a single storey educational building all on a site of c.9.3ha immediately east of Laughanstown Lane at Brennanstown/Cabinteely, Co. Dublin.

Cherrywood

There are a considerable number of applications for development in the Cherrywood area, associated both with actual development schemes, and with the provision of services infrastructure to serve future development schemes.

Under Reg. Ref. D95A/247, permission was granted to William Neville and Sons for development comprising 549 dwellings plus a public park on 101.5 ha. at Druid Valley, Cherrywood, Laughanstown. Subsequently, in July 1999, under Ref. D98A/1022, the same Applicant was granted permission for the construction of 176 no. duplex and apartment dwellings in lieu of 59 houses within the scheme. In April 2001, under Reg. Ref. D00A/384, the Applicant was granted permission for the erection of 424 apartments and a 327 sq. m. crèche in lieu of 108 no. of the previously approved houses. However, Condition No. 4 of the permission required the phasing of development, with the number of units not exceeding 175 dwellings per annum until such time as the SEM Cherrywood interchange is completed and fully operational.

Under planning Reg. Ref. D98A/0424, Dunloe Ewart PLC was granted permission, in September 1998, for construction of two Science and Technology Buildings of 6,081 sq. m and 4,199 sq.m respectively and surface parking to accommodate 396 parking spaces, a section of the Wyattville

Link including a roundabout and ancillary development of roads all on a site of c.6ha at Cherrywood, Co. Dublin. In August 2002 the Applicant was granted permission for the alternative use of permitted science and technology buildings as office based industry.

Under Reg. Ref. D98A/0523, Cherrywood Science and Technology Park Ltd. were granted permission, in September 1998, for land-shaping, surface water drainage, ground water drainage, water supply and flood attenuation ponds on a c. 75 ha. site at Cherrywood with access from N11 at Wyattville Road, all to facilitate/serve future Science and Technology Park and district centre development. Later in June 2001, under Ref. D01A/0326 the same Applicant received permission for similar works on a c. 48 ha. site at Cherrywood/Laughanstown to facilitate such future development.

In March 2000 Cherrywood Science and Technology Park Ltd. were granted permission under planning Reg. Ref. D99A/0941 for 3 no. three storey Science and Technology Buildings, Building E c.2,467 sq.m, Building F c.3,894sq.m and Building G c.7,723sq.m, a switch room and refuse area and yard, ancillary car parking and 380m of distributor road at Cherrywood Science and Technology Park, Cherrywood, Co. Dublin.

Cherrywood Science and Technology Park Ltd. were also granted permission in March 2000, under planning Reg. Ref. D99A/0942 for development of a Park Centre building of c. 2,775sq.m comprising a crèche, telecommunications rooms, bank, retail units, café/restaurant, offices, and car parking (Building H) and a temporary marketing building c. 162sq.m all at Cherrywood Science and Technology Park, Cherrywood, Co. Dublin. Subsequently in May 2001, under planning Reg. Ref. D01A/0026, the same Applicant was granted permission for modifications to Buildings F and G and in April 2002 under planning Reg. Ref. D01A/1229 permission was granted for development comprising the alternative use of Building H, (all previously approved under D99A/0941).

Cherrywood Science and Technology Park Ltd. were granted permission in April 2001 for development comprising 2no.

three storey Science and Technology building c.4,818sq.m (Building J) and 3,974sq.m (Building K) and 95 car parking spaces at Cherrywood Science and Technology Park, Cherrywood, Co. Dublin.

In February 2004 Cherrywood Science and Technology Park Ltd. were granted permission under planning Reg. Ref. D03A/0626 for a three storey plus penthouse commercial building comprising 11,072 sq.m of office space and 350 car parking spaces all at Cherrywood Science and Technology Park, Cherrywood, Co. Dublin. The Applicant was subsequently granted permission under planning Reg. Ref. D04A/0335 for an extension and alterations to the previously approved development (under Reg. Ref. D03A/0626). There is a request for Additional Information pending on planning Reg. Ref.D04A/0924 by Cherrywood Science and Technology Park Ltd for development comprising a gateway building with a mix of uses comprising a total floor area of 7,666sq.m of commercial/office space to existing permitted block under reg. ref. D03A/0626.

Phase 1 of Cherrywood Science and Technology Park currently comprises seven office buildings (Block's AA, AB, AC, AD, E, G and H), a crèche and a convenience store. The majority of the blocks are currently occupied, with the remaining few ready for fit out in mid 2005. There is also planning permission for the development of a further 6,503sq.m office block in this successful business park.

7.15.1.3.2 Potential Impact of the Proposal

Construction Phase

The construction of Luas Line B1 in Area 15 has the potential to cause slight localised disruption and inconvenience during the construction phase to the low level of existing residences in this area. The Draft Action Plan for Cherrywood and the current County Development Plan provides for major new development in this area, including the construction of a new spine road from the SEM Carrickmines Interchange to Cherrywood. It is intended that Luas Line B1 will integrate with the existing and future planned uses in this area, such that its construction will have a minimal impact in terms of land use and planning.

Operational Phase

The proposed development of Luas Line B1 through Area 15 is a specific objective of the Statutory Development Plan, and the Draft Carrickmines-Cherrywood Action Plan, both of which support the construction of a light rail network ultimately linking the area to the City Centre.

Luas Line B1 in Area 15 will serve the Carrickmines-Cherrywood area, which is experiencing major new residential and employment-related development, thus providing a fast and efficient public transport system in this area.

Do-Nothing Scenario

If Luas Line B1 did not proceed, the Development Plan policy and DTO Strategy to provide a light rail network between Sandyford Industrial Estate and Cherrywood would not be fulfilled. The strategy of the Draft Carrickmines-Cherrywood Action Plan is based upon the provision of a Light Rail Transit alignment into this area as an alternative to the use of the private car. This includes the provision of a Luas Park and Ride facility at Priorsland Carrickmines, in order to facilitate the successful integration of public and private transportation modes.

7.15.1.3.3 Remedial or Reductive Measures

Construction Phase

Remedial or reductive measures include the provision of appropriate access to existing land uses in the vicinity of the Luas Line B1 alignment during construction. To reduce interference to a minimum, ongoing consultation and liaison with occupiers and owners of adjoining lands will be undertaken. However, it should be noted that this portion of Luas Line B1 will run for the most part on a new reserved bridge over the SEM, along an existing rail reservation, and across currently undeveloped lands, upon which any future development will require to have regard to the location of the alignment.

Operational Phase

Traffic management measures will be put in place to facilitate the operation of Luas Line B1. These management measures will be subject to the approval of Dun Laoghaire-



Rathdown County Council, as Road Authority, following consultation with the relevant Statutory agencies.

Temporary access arrangements across Dunloe Ewart Plc owned lands to the Luas have been agreed with the developer with more formal access arrangements to be incorporated into future development schemes at this location.

7.15.1.3.4 Predicted Impact of the Proposal

Construction Phase

The works associated with the construction of Luas Line B1 will have a slight short-term and temporary impact on land uses in the area. They are deemed to be acceptable in the interest of the common good and of the proper planning and development of the area.

Operational Phase

The proposed Luas Line B1 will comply with the policies and objectives of the Dun Laoghaire-Rathdown County Development Plan 2004-2010, the Draft Carrickmines-Cherrywood Action Plan 2000, and the DTO Strategy 2000-2016.

7.15.1.3.5 Monitoring

During the construction phase there will be ongoing monitoring of the impact/disturbance to existing land uses and activities.

7.15.1.3.6 Reinstatement

Reinstatement of pavement and street surfaces as far as is practicable will be carried out as part of the construction phase.

7.15.1.4 VEHICULAR AND PEDESTRIAN TRAFFIC AND SAFETY

7.15.1.4.1 Receiving Environment

Area 15 commences on Ballyogan Road in the vicinity of Ballyogan Wood housing development and spans eastwards

towards and including the new Cherrywood developments off the N11. It is currently comprised largely of farmland but is expected to undergo major transformation in the coming years.

There are currently no signalised junctions along Ballyogan Road and access traffic at the road junction with Ballyogan Wood currently operates under priority control without signals. There is road frontage access for the cottages along the southern side of Ballyogan Road.

Further east, the alignment passes under the Glenamuck Road bridge via the alignment of the former Harcourt Street Railway. There is thus no conflict with existing traffic in this area. Laughanstown Lane comprises a rural lane serving a number of individual dwellings and farmsteads. Currently it only provides access for pedestrians and local vehicular traffic.

Traffic Flows

Current road traffic volumes throughout the morning peak hour (0800–0900 hrs) are set out below in Table 7.15.1.4.1.

Table 7.15.1.4.1: Current AM Peak Road Traffic Volumes Area 15

Road	Location	Two-Way Volume (PCU)
AM Peak Hour		
Ballyogan Road	Ballyogan Wood	832
Glenamuck Road	Road Bridge	978
Cherrywood Access Road	Off N11 Bray Road	638

Pedestrian Movements

There are currently no controlled pedestrian crossing facilities along the proposed route of Luas Line B1 within Area 15. However, it must be noted that the alignment runs across an existing or planned reservation, or across open undeveloped fields for virtually its entire length.

Existing pedestrian movements in the area over the course of

the day (0700-1900 hrs) were recorded as being very light and as shown on the attached Table 7.15.1.4.2

Table 7.15.1.4.2: Daily Pedestrian Movements Area 15

Location	Pedestrian Numbers
Ballyogan Road/Ballyogan Avenue (East)	25
Cherrywood Access Road (off N11)	61

Cycle Facilities

There are no dedicated cycle facilities within Area 15 of the proposed Luas Line B1 alignment. Existing cyclist numbers in Area 15 are shown in Table 7.15.1.4.3.

Table 7.15.1.4.3: Daily Cyclist Numbers Area 15

Location	Cyclist Numbers
Ballyogan Road	18
Cherrywood Access Road (off N11)	11

Accident History

The Dublin Transportation Office provided accident data for the five year period from 1998 to 2002. There were pedestrian injuries sustained in two of the accidents on Ballyogan Road and one of the incidents on Glenamuck Road.

Table 7.15.1.4.4: Accident History for the Five Year Perios - 1998 to 2002 for Area 15

Location	Minor Injury	Serious Injury	Fatal Injury	Pedestrian involvement
Ballyogan Road	5	0	0	2
Glenamuck Road	6	0	6	1

7.15.1.4.2 Potential Impact of the Proposal

Construction Phase

The construction of the project will be accomplished in two phases – road works associated with the realignment of the Ballyogan Road and diversion of utility apparatus away from the influence of the track alignment, construction of structures and the construction of the trackbed itself together with the control systems for its operation. The general construction scenario is described in Section 7.15.10 of this EIS.

Within Area 15, the effect of construction activity on vehicular and pedestrian traffic will be managed in consultation with the Road Authority and An Garda Siochána to provide for the continued movement of people and goods. In the absence of a defined works programme of construction activity having due regard to traffic circulation patterns and pedestrian movements, the construction activity would have the potential to create significant delays to commuting traffic as well as compromise pedestrian amenity and safety. A co-ordinated approach to the management of these issues and involving all of the statutory authorities will be necessary.

Operational Phase

Traffic Flows

The projected traffic flows on the road network within Area 15 are illustrated in Table 7.15.1.4.5 below. This table highlights the likely traffic flows in the forecast year 2016, when compared with the network in 2016 without Luas Line B1.

Significant reductions in traffic volumes are projected for all routes within the area emphasising the significant contribution that Luas will provide for the travelling public.

The most significant impact on vehicular traffic under the operational stage of Luas Line B1 is likely to be at locations where it crosses, or runs adjacent to, public roads. In the absence of a strategy for defining priority and positive control of movements, road traffic would be presented with a situation that compromises the safety of all road users.



Pedestrian Safety

At locations where pedestrian routes cross the proposed Luas Line B1 alignment, the potential arises for conflict. The considerations for pedestrians include ample footpath width in addition to clearly defined pedestrian routings across the alignment. The installation of controlled pedestrian crossings of traffic routes such as at Ballyogan Road and at Cherrywood will significantly enhance safety and access for pedestrians.

Table 7.15.1.4.5: Projected Traffic Volumes 2016 Area 15

Road	Location	Two-Way AM Traffic Volume (pcu)	Two-Way AM Traffic Volume (pcu)	% Change
Ballyogan Road	Ballyogan Road	967	950	-2%
Glenamuck Road	Luas Bridge	2369	1996	-24%
Spine Road	Lehaunstown Lane	1071	809	-24%
Spine Road	Tully	432	408	-5%
Cherrywood Access Road Off N11	(Bray Road)	1956	1789	-9%

Cyclists

Clearly defined and suitably located cycle tracks accompanying the advent of Luas Line B1 along Ballyogan Road would minimise the potential risk of conflict between the various modes of travel and provide for greater cyclist safety. Cycle tracks will be provided within Cherrywood as part of the development of the roads infrastructure by others.

Do-Nothing Scenario

Under a ‘do-nothing’ scenario, the reductions in traffic volumes inherent in the provision of Luas Line B1 would not be realised and bus services would remain the only viable alternative to the private car. Road based travel would be less attractive as the continuing development in this area will place increased demands on the road network.

7.15.1.4.3 Remedial or Reductive Measures

Construction Phase

Traffic management measures will be implemented in agreement with the road authority to ensure a co-ordinated response to the construction activity. Temporary footpaths adjacent to the construction activity will be constructed to relevant standards and provision will be made for access by the mobility impaired.

During the construction phase private access arrangements to premises abutting the Luas Line B1 alignment on Ballyogan Road and at Laughanstown Lane will be maintained or alternative arrangements implemented.

Works to the Glenamuck Road bridge will necessitate some restrictions on Glenamuck Road for a period, and this will require a comprehensive traffic management plan supported by a coherent signage arrangement advising motorists of alternative route options, in particular given the number of fatal injuries recorded at this location.

Information outlining construction activities will be disseminated to local residences and businesses in advance of start-up such that prior arrangements regarding access and delivery and associated diversionary routings may be made available. Local liaison committees will be established to assist in this exercise.

Operational Phase

All road crossings of the Luas Line B1 alignment will be undertaken through signal control. This will provide for clear and positive control of all tram and road vehicle movements. The requisite road signage advising and warning of tram crossing points and track alignment will be installed along the adjacent roadways and at all junction locations. The improved signing at these locations will enhance the safety of all road and Luas users.

The widening of Ballyogan Road within Area 15 will ensure sufficient width to accommodate revised and signalised junction arrangements at Ballyogan Wood. Existing access arrangements onto Ballyogan Road have been incorporated into the new road design.

The realignment of Ballyogan Road will also include the implementation of cycle tracks on both sides.

7.15.1.4.4 Predicted Impact of the Proposal

Construction Phase

Predicted impacts on both vehicular and pedestrian traffic flows and safety will be slight, principally arising out of the road crossings and the widening and realignment of Ballyogan Road. Temporary disruption will be experienced largely in the form of diversions and lane restrictions. Effective traffic management arrangements agreed in advance with the local authority will assist in mitigating the potential effects.

Operational Phase

The reduction in traffic volumes in this area as a consequence of the delivery of Luas is a significant positive benefit. Overall, signal controlled tram crossings will provide a safer environment for both road and tram users and enhance pedestrian safety through the implementation of signal controlled pedestrian crossings of roadways.

The projected effects on road traffic of Luas Line B1 will be positive and there will be significant benefits accruing to pedestrians.

The loss of the service road at the cottages on the southern side of Ballyogan Road will be a negative impact on the residents of the cottages. This negative impact must be balanced against the significant benefits arising out of the implementation of a high quality, public transport system for all residents of the area providing quick, direct access to the city centre.

There will be no permanent diversions of traffic involved and the construction of the new Ballyogan Road will provide for a safer environment for all road users.

The cycling environment will benefit as a result of the implementation of Luas Line B1 in Area 15, through the provision of parking facilities at stop locations and the construction of cycle tracks on both sides along the length of the upgraded and realigned Ballyogan Road.

The provision of a bus interchange adjacent to the Carrickmines stop and the provision of a 350 space Park and Ride facility will provide for good interchange between these modes of travel.

There may be some slight negative and localised impact on the immediate road network arising out of the provision of a Park and Ride facility at Carrickmines. Overall however, whilst Park and Ride sites can be significant generators of vehicle movements, principally associated with peak commuting hours, the provision of a 350 space park and ride facility will not give rise to capacity issues for the surrounding road network.

7.15.1.4.5 Monitoring

In addition, Dun Laoghaire Rathdown County Council as Road Authority, will continue to monitor road traffic subsequent to the introduction of Luas Line B1 and will implement appropriate alterations to traffic movements in the light of changing circumstances as it may deem to be necessary from time to time.

7.15.1.4.6 Reinstatement

It is intended that the Luas should continue to operate indefinitely along the Line B1 alignment.

7.15.1.5 COMMUNITY SEVERANCE

7.15.1.5.1 Receiving Environment

Principal Activities and Nodes

Pedestrian movement occurs in the vicinity of the Ballyogan Wood residential development and along Glenamuck Road. The Cherrywood area also experiences pedestrian movement associated with the new residential and employment-related development. Pedestrian movements are generally accommodated along pavements in this area.

Traffic Flow

Ballyogan Road comprises a local distributor link in this suburban area. This is busiest during peak hours in the



morning and evening. Traffic flow also occurs along Glenamuck Road. Traffic accessing Leopardstown Race course via Glenamuck Road and Ballyogan Road on race days increases traffic flow on this local road network; additional volumes of traffic on Glenamuck Road also arise during the annual Open Week at Carrickmines Tennis Club. Traffic flow also occurs at Cherrywood, associated with the existing Science and Technology Park and new residential and employment-related development occurring there. (See Section 7.15.1.4). The Wyattville Link Road is nearing completion but is not open to through traffic at present. The link road will not open to the public until the SEM is completed.

7.15.1.5.2 Potential Impact of the Proposal

Construction Phase

Pedestrian Flow

Pedestrian flow in Area 15 is unlikely to experience any significant impact caused by construction inconvenience, due to the low level of pedestrian flow in the vicinity of the route (refer to Table 7.15.1.4.3), and due to the fact that the vast proportion of the route runs across open lands where no formal pedestrian access is available. There may be some very low level of disruption in the area of the Ballyogan Wood residential scheme, and in the area of Laughanstown Lane.

Traffic Flow

The construction phase will require some degree of traffic diversion in this area, particularly at the eastern area of Ballyogan Road and at Laughanstown Lane. The upgrading of the Glenamuck Road Bridge will also require some traffic diversion, affecting both local traffic flow, and traffic using this road to link to Ballyogan Road, in order to access the Sandymount Industrial Estate and other destinations. Diversion of traffic would potentially impact, not only upon vehicles which are diverted from the actual area of the Luas Line B1 alignment, but also those which are travelling on those roads to which the diverted traffic is re-routed. The planned construction works may require some diversion/re-routing of bus services. However, there is currently a low frequency of service in this area. The construction of the

overbridge over the Wyattville Link Road will not impact on existing traffic flows in the area. It is envisaged that the construction of the overbridge would have a slight impact on traffic using the Wyattville Link Road but that this impact would be temporary in nature.

Operational Phase

Pedestrian Flow

In general, no significant severance impact on pedestrian flow is anticipated in the vicinity of the Area 15 Luas Line B1 alignment. There will be no impact in terms of pedestrian flow on existing roads. In addition, the planned upgrading and realignment of Ballyogan Road includes the provision of new footpaths along this carriageway.

Traffic Flow

Access and delivery movements in most of this section of the Luas Line B1 alignment are unlikely to be significantly impacted upon. The planned upgrading of Ballyogan Road will constitute a significant positive impact on traffic flow. The planned widening of Laughanstown Lane in the vicinity of its intersection with the Luas Line B1 alignment will result in a positive impact on traffic flow.

In addition, the existing road network serving the Cherrywood-Rathmichael area is proposed to be significantly upgraded, with Luas Line B1 running parallel to the planned Cherrywood spine road. A dedicated Park and Ride facility is also proposed to serve Luas Line B1 at Carrickmines. Thus, whilst future traffic flow in the area will be facilitated by the significant upgrading of road infrastructure, there will be no conflict with the separate and segregated provision of Luas Line B1 in this area.

Do-Nothing Scenario

Under a Do-Nothing Scenario, the proposed provision of new land uses in the area might be compromised, as their development is likely to be phased to the provision of public transport alternatives to this area. Moreover, as a consequence of the extremely limited public transport (bus) service along this section of the route, there is currently no

realistic option to the private car for commuters residing or working in this area.

7.15.1.5.3 Remedial or Reductive Measures

Construction Phase

Pedestrian Flow

Temporary pedestrian crossings and other facilities will be provided where appropriate and necessary. This will serve to mitigate any potential severance impact and result in only a short-term modest inconvenience caused by diversions around construction sites.

Traffic Flow

The planned road improvements to Ballyogan Road, the Glenamuck Road Bridge and Laughanstown Lane will comprise remedial measures in themselves. It is intended that traffic management measures put in place during the construction phase, will be the permanent designed traffic management measures for this area during the operation of Luas Line B1. Agreed management measures for bus routing with bus operators will mitigate any impact to passengers in terms of access to bus services.

Operational Phase

Pedestrian Flow

Luas Line B1 in operation will in general reduce severance for pedestrians, particularly in terms of access between residences and places of work. No remedial or reductive measures are required.

Traffic Flow

Remedial or reductive measures include the introduction of appropriate traffic management measures by Dun Laoghaire-Rathdown County Council following consultation with the relevant statutory agencies.

7.15.1.5.4 Predicted Impact of the Proposal

Construction Phase

Pedestrian Flow

The construction phase will not result in any significant predicted severance impact on pedestrians. Any short-term inconvenience is not considered to be a significant impact which would result in an increase in community severance.

Traffic Flow

During the construction phase, there will be significant short-term disruption to traffic flow along the alignment, particularly on Ballyogan Road, which is to be re-aligned to facilitate the planned Luas Line B1 alignment, and in the area of the Glenamuck Road Bridge and Wyattville Link Road. Slight local impact will occur at Laughanstown Lane where the existing carriageway is to be widened. However, the introduction of appropriate management measures, the retention of access, and the temporary nature of the construction works, will mean that there will be a moderate overall predicted impact in terms of community severance.

Operational Phase

Pedestrian

A beneficial impact on pedestrian movement is predicted for the residential, working and visiting communities of the area during the operation of Luas Line B1.

Traffic Flow

Given the remedial and reductive measures proposed, a significant beneficial impact is predicted, as an efficient public transport alternative will be provided in an area currently experiencing a serious deficiency in such service. This will also be facilitated by the provision of an associated Park and Ride facility and bus interchange at Carrickmines. The planned road improvement works associated both with the scheme and separately proposed for the overall Cherrywood-Rathmichael area will benefit access, delivery and through traffic movements.



7.15.1.5.5 Monitoring

A Construction Team representative will be available during the construction phase, for consultation and co-ordination with residents and local businesses on an ongoing basis.

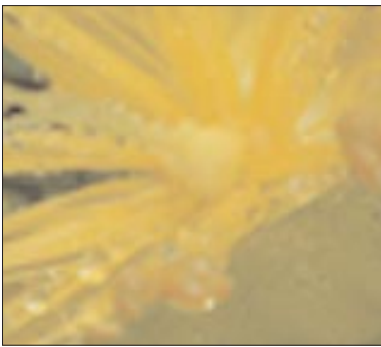
7.15.1.5.6 Reinstatement

No reinstatement measures are required in respect of community severance.

7.15.1.5.7 Potential Route Deviation

It is not considered that any of the potential deviations of the route alignment stated within the Railway order shall pose any additional significant impact upon community severance.

Flora and Fauna



7.15.2.1 INTRODUCTION

Area 15 of Luas Line B1 extends from Ballyogan Wood on Ballyogan Road, across the South Eastern Motorway (SEM) section of the M50 currently under construction, to join the former Harcourt Street Line alignment just west of Glenamuck Road. It then follows the former Harcourt Street Line route with minor variations to terminate at Bride’s Glen stop in Cherrywood, in a large land holding which is currently partially developed with a mix of residential and commercial developments. The Wyattville Link Road is also under construction in this area.

The alignment runs through a significant area of land which was formerly in agricultural use, but which is currently fallow and either subject to development proposals, or likely to be subject to development proposals in the future.

7.15.2.2 FLORA

7.15.2.2.1 Receiving Environment

Habitats on and adjoining the alignment of Luas Line B1 area 15 are as follows:

- Houses/buildings and gardens
- Spoil and bare ground ED2
- Amenity grassland GA2
- Neutral grassland GS1
- Arable BC (fallow)
- Treeline WL2
- Hedgerow WL1
- Immature woodland WS2
- Scrub WS1
- Conifer plantation WD4
- Broadleaved woodland WD1
- Standing water FW4
- River/streams FW.

No rare or protected plant species occur on or near the alignment (Curtis and McGough, 1988).

Houses/buildings and gardens

Houses/buildings and gardens adjoining the alignment were not surveyed.

However, two gardens are directly affected by the proposal. The garden of Carrickmines Station House extends over the trackbed and existing platforms. Ornamental trees and shrubs are planted among closely mown amenity grassland, and to the eastern end there is an apple orchard with less frequently mown grass. An area of the existing garden to the north-west of the dwelling Priorsland, on the eastern side of Glenamuck Road, will be incorporated into the planned area of the Carrickmines stop park and ride facility. This garden incorporates a walled garden to the north adjoining the alignment, formal hedges of yew, box, holly and beech, fruit trees, and ornamental shrubs and trees, and is somewhat overgrown. The southern portion of the garden includes ornamental shrubs and trees, planted in amenity grassland. Mature trees present include beech, walnut, yew, cherry and larch. There is a stable building in this area also.

Spoil and bare ground

Spoil and bare ground occurs on the SEM section of the M50, where construction work is nearing completion, and in the Cherrywood area, on development land where topsoil has been stripped or stored and roads and buildings are under construction. This habitat is sparsely vegetated with yellow clover, which is the dominant species at Cherrywood. Other plants which occur occasionally are creeping bent-grass, common ragwort, hard rush, and ribwort plantain. These plants are common colonising species of bare ground.

Amenity grassland

A small area of amenity grassland occurs on the Area 15 alignment at Ballyogan Wood. It is dominated by ryegrass and white clover, with frequent daisy and annual meadow-grass.

Neutral grassland

Neutral grassland on and adjoining Area 15 varies somewhat in species composition with land use.

Closely grazed and trampled neutral grassland at Carrickmines, lying between the SEM construction land take

and the former Harcourt Street Line, is sparsely vegetated. Grasses present include crested dog's-tail, red fescue, creeping bent-grass, Yorkshire fog and ryegrass. Cowslip and glaucous sedge are abundant. Yellow clover, white clover and red clover are frequent, together with ribwort plantain, daisy, dandelion, and hawkbit. Less closely grazed neutral grassland on the adjoining former Harcourt Street Line is more grassy, with additional grass species meadow foxtail, cock's-foot and sweet vernal grass. Additional dicotyledons are creeping buttercup, meadow buttercup, self-heal, and burdock.

Elsewhere along the alignment, improved neutral grassland (fertilised but not re-seeded recently) includes the following grass species: ryegrass, meadow foxtail, Yorkshire fog, creeping bent-grass, common bent, red fescue, sweet vernal grass, meadow grasses, and occasional soft brome. Herbaceous dicotyledons present include creeping buttercup, bulbous buttercup, meadow buttercup, white clover, ribwort plantain, daisy, common ragwort and occasional hogweed. Neutral grassland in the Cherrywood land-holding, which was lightly grazed by horses, includes additional species: cock's-foot grass, red clover, cut-leaved geranium, bush vetch, creeping thistle, willowherbs, and occasional hard rush and sycamore and birch seedlings. Perforate St. John's-wort is abundant on and in the vicinity of the alignment in the western portion of the Cherrywood site. This species occurs occasionally in Co. Dublin in calcareous grasslands, gravel pits and railway embankments.

Arable

Land which had been in arable use up to the year 2000, between the proposed Brennanstown and Laughanstown Luas stops, has been lying fallow and unused apart from light grazing by horses. A grass dominated vegetation has developed, with grass species including cock’s-foot, creeping bent grass, common couch, annual meadow grass, red fescue, ryegrass and Yorkshire fog. Broad-leaved plants present here include willowherb species and dandelion, with occasional spear thistle, creeping thistle, and bramble.

Treeline

Treelines along the former Harcourt Street alignment west of Glenamuck Road are dominated by coppiced and early

mature sycamore and ash, with occasional hawthorn, elder and bramble. There is a woodland ground flora dominated by ivy, hogweed and cow parsley. Frequently occurring species include clustered dock, wood avens, nettle, speedwell, with occasional common dog violet, ground elder, primrose, male fern, hart's tongue fern, false brome, bush vetch and cleavers.

Similar treelines extend along the alignment boundaries east of Glenamuck Road, where the alignment runs between existing housing and agricultural land, but additional tree species occur here in places with mature oak, sycamore, horse chestnut and birch rooted on the field side of the alignment (see tree survey). There is some regenerating elm in this section also.

A treeline along the left bank of the Loughlinstown River at Priorsland, at Glenamuck Road, is dominated by beech and holm oak with some ash, while vegetation along the right bank has been partially removed as part of the SEM work, leaving some ash and sycamore.

Treelines immediately adjoining the alignment at Cherrywood are dominated by sycamore, with ash, hawthorn and bramble, and occasional willow in poorly drained areas.

Hedgerow

Few field boundary hedgerows remain in the general area of the alignment in area 15. These are dominated by mature hawthorn and bramble, with occasional grey willow, elder, dog rose and honeysuckle, and often containing some tree cover of sycamore and ash, and blackthorn.

Immature woodland

Immature woodland occurs on the alignment immediately to the west of Glenamuck Road, and also on the alignment and embankment slopes to the east of Glenamuck road where the alignment crosses the Loughlinstown River valley. This woodland is self-sown, and has developed since the Harcourt Street Line closed.

The main section of immature woodland, to the east of Glenamuck Road, is dominated by ash and sycamore saplings, with occasional saplings and semi-mature trees of



oak, fir, birch and grey willow. Young beech occurs on the alignment near the Loughlinstown River crossing. Willow and blackthorn occur on the alignment to the rear of properties at Brennanstown Vale, with one mature larch and small stands of pheasant-berry. Dog rose, elder and hawthorn saplings occur occasionally, bramble is frequent throughout. The steep embankment slope from the former trackbed down to broadleaved woodland in the Loughlinstown River valley has a semi-mature sparse cover of ash and sycamore, with occasional beech.

The ground flora present in immature woodland varies with the degree of shading. Ivy dominates the most shaded sections, with hogweed, cleavers, bush vetch, celandine, herb robert, male fern and hart's-tongue fern. Primrose is occasional. More open sections are grassy, with some bracken cover.

A small section of immature woodland on the alignment to the west of Glenamuck Road grows on waterlogged ground. Early mature grey willow occurs here, with sycamore and ash in drier areas.

Scrub

Small areas of bramble scrub occur on the former Harcourt Street Line alignment, and along a field boundary wall to the west of Laughanstown Lane. Further small areas of scrub adjoin the alignment in the Cherrywood site. These are variously dominated by gorse and bramble on dry, mounded areas, with grey willow, goat willow, sycamore, ash, bramble and occasional gorse in the wetter areas closer to the Cherrywood stop.

More extensive developing scrub lies to the south of the alignment near the proposed Brennanstown stop, on both sides of the Loughlinstown River upstream of the alignment. This is dominated by gorse and willow, with bramble, holly, ash and sycamore.

Conifer plantation

A small area of conifer plantation occurs beside the Loughlinstown River, near the alignment.

Broadleaved woodland

There is an extensive area of broad-leaved woodland in the Loughlinstown River valley. This is of planted origin, and is dominated by beech and Scot's pine, with frequent oak, ash and sycamore. Holly dominates the shrub layer. Elder and regenerating elm are frequent along the river channel in the lower valley. The ground flora is dominated by great wood-rush. Wood anemone, sanicle, goldilocks buttercup and wood speedwell occur, with primrose, common dog violet, celandine and wood avens. This woodland area extends to the alignment, which runs on an embankment in this area. Branches of mature beech trees overhang the alignment in places. This woodland adjoins the alignment in the area of the proposed Brennanstown stop.

Standing water

Standing water is present on the former Harcourt Street alignment in area 15 in several locations. Plant species present in these areas typically include great willowherb and fool's watercress, with brooklime, plicate sweet-grass, creeping bent-grass, common duckweed, broad-leaved dock, hard rush and jointed rush present in less shaded areas at Cherrywood. Angelica occurs rarely. The flora adjoining standing water on the former Harcourt Street alignment at Cherrywood also includes small areas of common sedge, carnation sedge and glaucous sedge. The proposed alignment diverges from the original alignment in this area.

River/streams.

Rivers and streams occurring near the alignment are the Loughlinstown River, and one of its tributary streams, the Racecourse stream. Both watercourses have been culverted under the SEM. The combined channel of the Loughlinstown River emerges from twin pipe culverts immediately upstream of the bridge on Glenamuck Road. Immediately downstream of Glenamuck Road, the Loughlinstown River channel has a marginal flora of fool's water-cress and water cress with occasional brooklime, growing on silt banks along the edge of the channel. The channel here has a gravel bed, with some siltation and accumulations of fallen timber. The river banks are ivy dominated under trees, hard rush and pendulous sedge grow in more open areas with ground elder, cow parsley, bramble and occasional wood anemone.

Further downstream, where the existing Harcourt Street Line alignment crosses the river, the banks are shaded and sparsely vegetated. Moss cover on stones in the channel is frequently suppressed by growth of green algae. Great willowherb and reed canary grass grow in silty areas along the channel margin in places.

7.15.2.2.2 Characteristics of the Proposal

The proposal involves the construction of the light rail alignment crossing over the South Eastern Motorway (SEM) to the west of Glenamuck Road. The alignment then follows the former Harcourt Street Line, with minor variation, to Cherrywood. A construction compound is proposed for a closely grazed neutral grassland field at Carrickmines, between the SEM and the former Harcourt Street Line alignment. A further construction compound will be located on fallow arable land at Laughanstown. Park and ride facilities will be provided in improved neutral grassland fields and in part of the garden of Priorsland, to the east of Glenamuck Road, in the context of a separate development.

7.15.2.2.3 Potential Impact of the Proposal

Construction phase

The proposed Luas Line B1 alignment impacts directly on the following habitats:

- Amenity grassland
- Arable (fallow)
- Neutral grassland and improved neutral grassland
- Immature woodland
- A house extension and garden
- Bare ground
- Standing water
- Hedgerow and bramble scrub.

The construction phase also has the potential to impact on the more significant habitats in the area: treelines, broadleaved woodland, and rivers and streams.

The main impacts of the construction phase are the loss of

immature woodland and neutral grassland on the alignment, construction compound and car parking area. There are potential impacts on broadleaved woodland, treelines and rivers and streams. These impacts are assessed as significant in the context of the local area.

Loss of immature woodland is assessed as being of local significance for flora and habitat. Permanent loss of neutral grassland in the proposed car park, and temporary loss of neutral grassland in the construction compound, are assessed as being of moderate local significance.

Broadleaved woodland in the Loughlinstown River valley is potentially impacted by construction work. The embankment on which the former Harcourt Street Line runs adjoins a section of this woodland. While the embankment appears to be stable, detailed site investigation may indicate a requirement for engineering work in this section, which could impact on some trees. However, the main area of the woodland will be unaffected by the proposed development.

Significant treelines potentially impacted by the development adjoin the alignment to the east of Glenamuck Road, in particular that lying on the southern side of the alignment and separating it from adjoining neutral grassland currently in agricultural use. These trees have the potential to be damaged by any excavation work affecting root systems, or stockpiling of materials within the root spread area. Some mature trees will be removed on the access road to, and within the park and ride facility at Carrickmines stop.

The Loughlinstown River is potentially impacted by spillage of oils, fuels and concrete products, and run-off from fresh concrete. The river will be culverted under the access road to the park and ride facility at Carrickmines stop. These impacts are assessed as potentially moderately significant for flora.

Impacts on amenity grassland, arable land, garden, hedgerow, bare ground and standing water are assessed as being of slight significance; while hedgerow habitats are significant ecologically, the proposed development does not impact on extensive sections of existing hedgerow.



Operational phase.

No additional impacts on flora are anticipated during the operational phase.

'Do nothing' scenario.

In a 'do nothing' scenario, immature woodland on the former Harcourt Street Line will continue to develop. Flora and habitats in the general area of the alignment will be impacted by other approved and planned developments.

7.15.2.2.4 Remedial or Reductive Measures.

Construction phase

Existing treelines and broadleaved woodland adjoin c. 20% of the alignment in Area 15. The main mitigation measures for flora are the retention of mature trees in treelines and woodland adjoining the alignment where possible, and new planting of trees and shrubs. Where possible, trees adjoining the alignment will be retained, lopping branches which overhang the line if necessary. Track clearance work will be carried out carefully in the vicinity of mature trees so as to minimise damage to root systems. Young sycamore and ash trees growing on the embankment supporting the alignment where it adjoins the Loughlinstown River valley woodland will be retained where possible; these species can be coppiced occasionally to control size if necessary. Removal of vegetation on this embankment could result in siltation impacts to the Loughlinstown River.

New planting of hedgerow and treelines along the alignment boundaries will be carried out. About 60% alignment in Area 15 lies on fallow arable land and neutral grassland where development is either in progress, or likely in the future, with an additional c. 10% on embankment slopes where the route crosses the Southeastern motorway. Native shrubs and small trees suitable for inclusion are hawthorn, blackthorn, guelder rose, spindle, gorse, hazel and holly. Trees suitable for inclusion are ash, elm and oak.

Construction sites will be strictly managed to minimise the risk of fuels, oils, concrete products or silt entering watercourses. The design of the bridge or culvert on the Loughlinstown River will be agreed with the Eastern Regional Fisheries Board prior to construction. Similarly, any

engineering work on the existing embankment and bridge over the river, and silt control measures, will be subject to prior agreement with the Eastern Regional Fisheries Board. Topsoil will be stripped from the construction compounds and stored for replacement on completion of the work.

Any post-planning route deviations will be subject to the mitigation measures given above.

Operational phase.

No additional remedial measures are required during the operational phase.

7.15.2.2.5 Predicted Impact of the Proposal

As noted above, some 70% of the alignment boundary is suitable for the development of new hedgerow and treeline planting. While loss of immature woodland on the alignment will occur during the construction phase, new planting will replace the habitat lost. In the medium and long term, tree and shrub cover along the alignment will increase as new planting matures, with overall significant positive impacts in the immediate vicinity of Area 15.

Losses of neutral grassland arise on the construction sites and car-parking area, the latter being likely to arise under a separate proposal. Replaced topsoil in the construction compound will contain seeds of the plant species which occur there currently; their subsequent growth and survival will depend on management and land use change in an area where ongoing development is likely to occur.

No rare or protected plant species will be impacted by the proposed development.

7.15.2.2.6 Monitoring

No monitoring is required.

7.15.2.2.7 Reinstatement

No additional reinstatement is required.

7.15.2.2.8 Potential Route Deviation

Lateral route deviation in area 15 of Luas Line B1 could have the potential to impact to a greater or lesser extent on mature treelines and broadleaved woodland adjoining the alignment. Vertical deviation could also result in increased or reduced impacts on treelines and broadleaved woodland.

7.15.2.3 FAUNA

7.15.2.3.1 Receiving Environment

Fish and water quality in the Loughlinstown River

The EPA currently reports a Biotic index (Q value) of 3 for the Loughlinstown (Shanganagh) River, indicating moderate pollution of this watercourse. The Loughlinstown Carrickmines River was reported as having no trout in a survey carried out for the South Eastern Motorway EIS (Anon, 1997), but has since been reported as supporting a healthy trout population (Greta Hannigan, Eastern Regional Fisheries Board, pers. comm.). The river water is turbid, reflecting the impact of development upstream.

Birds

Bird fauna in area 15 is more diverse than in other section of Luas Line B1, reflecting the greater habitat diversity on adjoining land and the proximity of a substantial area of broad-leaved woodland. Birds recorded as breeding in the broad-leaved woodland were robin, wren, song thrush, mistle thrush, blackbird, chaffinch, greenfinch, goldcrest, dunnoek, woodpigeon, the four tit species including long-tailed tit, and the migratory warblers chiffchaff and blackcap. A rookery is located in this woodland, and jays are also reported to occur. Sparrowhawk were confirmed as breeding in this woodland, and ravens are also present. Chiffchaff, blackcap and long tailed tit were also recorded in the adjoining immature woodland on the alignment, together with the commoner resident songbirds. Stonechat were recorded in scrub areas. There is another rookery in holm oak and ash trees growing along the left bank of the Loughlinstown River at Priorsland, with 15-20 nests present in early April 2005. These trees are scheduled for felling as they lie of the line of the proposed access road to Carrickmines stop park and ride facility.

Yellowhammer were recorded singing in hedgerows in the Laughanstown to Cherrywood area. A single female wheatear was recorded at Laughanstown in early May 2001, and was probably a late migrant; this species normally breeds in more upland areas, with lowland breeding more common in the west of Ireland.

Grey wagtail and dipper are reported to occur along the Loughlinstown River; grey wagtail was recorded during the survey downstream of Glenamuck Road. Kingfisher may also occur; this species has been recorded further downstream along the river.

Mammals

Badger feeding signs were found on the alignment in immature woodland on the embanked section near the Loughlinstown River bridge, but no setts were found in this area, which is much frequented by walkers and dogs. Badger setts are located in the broad-leaved woodland in the river valley. Fox signs were found occasionally throughout area 15, and grey squirrels recorded in immature woodland near the Loughlinstown River bridge. Rabbits occur throughout the area in neutral grassland, with burrows located in hedgerows. Bats are likely to occur in this area, particularly in the Loughlinstown River valley woodland, but were not surveyed for this EIS. Otters occur along the Loughlinstown River.

Other mammal species likely to occur are hedgehog, rodents, stoat and pygmy shrew.

7.15.2.3.2 Characteristics of the Proposal

The proposal involves the construction of the light rail alignment crossing over the South Eastern Motorway (SEM) to the west of Glenamuck Road. The alignment then follows the former Harcourt Street Line, with minor variation, to Cherrywood. A construction compound is proposed for a closely grazed neutral grassland field at Carrickmines, between the SEM and the former Harcourt Street Line alignment. A further construction compound will be located on fallow arable land at Laughanstown. Park and ride facilities will be provided in improved neutral grassland fields and in part of the garden of Priorsland, to the east of Glenamuck Road, in the context of a separate development.



7.15.2.3.3 Potential Impact of the Proposal

Construction phase

The main impact of the proposed development on fauna arises from the loss of immature woodland habitat on the alignment. Its removal will sever broadleaved woodland habitat from scrub and agricultural land, and reduce the function of the former Harcourt Street Line as a corridor for animal movement. No badger setts will be impacted. Disturbance impacts may result in a reduction in breeding bird populations during the construction phase, but no breeding territories are likely to be confined solely to the alignment, so impacts are assessed as slight and temporary.

There is a potential for bat roosts to be impacted by the removal of mature trees on the access road and park and ride facility at Carrickmines stop, and by the removal of existing buildings in this area. The rookery at Priorsland will be impacted by tree felling and the colony displaced.

There is a potential for pollution of aquatic habitats in the Loughlinstown River by silt and spillages of oils, fuels and runoff from fresh concrete, which could impact adversely on aquatic fauna during the construction phase.

Operational phase

During the operational phase, movement of trams on Luas Line B1 has the potential to result in fatalities to badgers crossing the line in the vicinity of Loughlinstown River valley woodland. Provision of lighting in this section could also impact on bat movement out of the woodland.

'Do nothing' scenario

In a 'do nothing' scenario, immature woodland on the former Harcourt Street Line will continue to develop. Fauna and habitats in the general area of the alignment will be impacted by other approved and planned developments in the general vicinity of the alignment.

7.15.2.3.4 Remedial or Reductive Measures

Construction Phase

As for flora, the main mitigation measures for fauna in Area 15

are the retention of mature trees in treelines and woodland adjoining the alignment, and new planting of trees and shrubs, as described in section 6.2.2.4. above. The objective is to retain habitat where possible, and to replace immature woodland with linear hedgerow and tree planting in the sections where the alignment passes through neutral grassland.

Construction sites will be strictly managed to minimise the risk of fuels, oils, concrete products and run off, and silt entering watercourses. The design of the bridge or culvert on the Loughlinstown River will be agreed with the Eastern Regional Fisheries Board prior to construction. Similarly, any engineering work on the existing embankment and bridge over the river, and silt control measures, will be subject to prior agreement with the Eastern Regional Fisheries Board.

Additional mitigation measures for fauna are as follows:

1. Immature woodland, hedgerow and scrub clearance, and tree lopping will be carried out between 1 September and 28 February, to avoid impacts on breeding birds.
2. A bat survey will be carried out at the appropriate time of year (preferably June to August) prior to the commencement of construction, to assess the current usage of woodland and mature treelines in the immediate vicinity of the Area 15 Luas B1 alignment. Buildings and mature trees scheduled for demolition/removal at Priorsland and Carrickmines Station House will be included in the bat survey. Any other mature trees due for removal will be examined for bat roosts prior to felling. It is necessary to seek a derogation from the National Parks and Wildlife Service to exclude bats from a roost, if roosts are found to be in use in any trees scheduled for felling, or buildings scheduled for demolition. Any process of exclusion required will be undertaken by a licensed bat expert. Seasonal constraints on felling may apply, to minimise the risk of death and injury to bats. Bat survey results may indicate additional mitigation measures including the provision of bat boxes to replace roosts which may be lost because of tree felling.

3. Lighting should only be provided where necessary for safe movement. Bat activity may be inhibited by lights, particularly in the more sensitive species brown long-eared bats and Natterer's bats. Lights should be directed at the areas where they are required, avoiding overspill into woodland areas at the proposed Brennanstown stop. Lighting in the vicinity of Loughlinstown River valley woodland will be restricted Brennanstown stop, to avoid extensive lighting disrupting bat flight lines.

4. There is an access culvert under the alignment to the east of the Loughlinstown River bridge. This will remain open during the construction and operational phases, to provide safe access for mammals.

These mitigation measures apply to the existing proposed alignment, and also to any post-planning route deviations.

Operational phase

No additional mitigation measures are required during the operational phase.

7.15.2.3.5 Predicted Impact of the Proposal

Residual impacts on fauna when mitigation measures have been taken are assessed as slight in the context of the local area. Cumulative impacts of this, and other developments affecting larger land areas, are likely to be significant for fauna in the local area. The Loughlinstown River valley woodland is likely to increase in importance as a habitat for fauna in the local context.

7.15.2.3.6 Monitoring

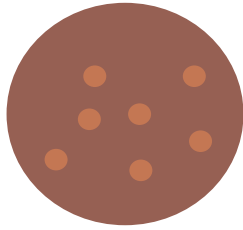
No monitoring is required.

7.15.2.3.7 Reinstatement

No additional reinstatement is required.

7.15.2.3.8 Potential Route Deviation

Any route deviation which results in the removal of mature trees adjoining the alignment has the potential to result in impacts on bat roosts.



7.15.3.1 INTRODUCTION

This section addresses impacts arising out of the construction and operation of Luas Line B1 on soil, based on available information in Area 15. It includes an evaluation of potential for contamination arising from previous land uses, but it does not include soil dispersed as dust during construction, which is addressed in Section 7.15.6 – *Air Quality* of this EIS.

7.15.3.2 RECEIVING ENVIRONMENT

From Ballyogan Wood to the Brides Glen Stop in the Cherrywood Science and Technology Park, the soil profile generally comprises topsoil, reworked natural soils or made ground (road or rail pavement materials and materials associated with construction of the Cherrywood Science and Technology Park) over glacial till over a weathered granite profile. A section of the former Harcourt Street Railway to the west of Glenamuck Road Bridge has been infilled with construction rubble associated with the development of the Brighton Hall residential scheme, and in particular Brighton Court. The natural soils are expected to be relatively impermeable.

No major potential contaminative uses have been identified on the proposed route in Area 15; however, there is a possibility of some contamination on former railway land and the infill material near Glenamuck Bridge. Furthermore, local contamination in near surface soils cannot be completely discounted.

7.15.3. POTENTIAL IMPACT OF THE PROPOSAL

Construction Phase

Where the Luas Line B1 alignment runs at grade, ground disturbance will generally be limited to a construction depth of 800-1200mm. Deeper ground disturbance will occur associated with foundation and construction works required for the Glenamuck Road bridge, in the backfill material near Glenamuck Road Bridge and for the underpass beneath the proposed Cherrywood Spine Road. Other ground

disturbance will occur associated with the foundation and construction works required for the Luas Carrickmines Bridge and the bridge over the Wyattville Link Road.

Impacts can arise from the disturbance, handling and transport of contaminative substances including made-ground, reworked soils, subsoil and construction wastes during the construction process. Although no major potentially contaminative uses have been identified on the line of the Line B1 alignment in Area 15, the possibility of residual contamination being present in made-ground generally, and in rail construction materials and the backfill material near Glenamuck Bridge specifically, should be catered for. This constitutes a slight adverse potential impact.

In addition, the potential for the spillage of construction wastes exists. However the boulder clay/granite soil structure provides a relatively impermeable barrier against leakage into the surrounding environment.

Although not proposed under the terms of this Railway Order application it should be noted that the provision of a two level Park & Ride facility at *Priorsland* Carrickmines will require the excavation of approximately 40,000 cubic metres of material, which will comprise principally of glacial deposits and weathered granites. A small volume of rock also will have to be broken out in order to attain the formation level for the construction of the structure and its foundations.

Excavation through overburden materials may give rise to slope instability on excavation faces.

Excavation through pockets of perched groundwater may give rise to some de-watering of the glacial deposits and subsequent subsidence of the surrounding soil environment.

Boulders are likely to be encountered whilst excavating through the glacial deposits. These boulders may require breaking prior to removal off site which may give rise to dust and noise generation (see relevant sections of this EIS).

Excavation through bedrock is likely to be required over some of the area of the Park & Ride facility should a two level underground facility be proposed at some stage in the future. Excavation may entail a variety of techniques dependent on

rock quality. Fractured or weathered rock may be capable of being ripped. More competent rock may require excavation by breaking or blasting. These operations may result in dust, noise and vibration generation. The blasting operations may result in the widening of existing fractures and joints or the creation of new joints or fractures. Further consideration of this matter is outside the scope of this EIS given that a surface Park and Ride facility is proposed as part of this Railway Order application.

Deeper excavations are likely to extend below the true groundwater table, giving rise to the potential for large scale water ingress into the excavation.

Operational Phase

In respect of Luas Line B1 there will be no operational impacts other than the possible release of minor quantities of dust from the tram braking system and release of minor quantities of oils from the electrical substations. This is not considered to be likely or significant.

Do-Nothing Scenario

Under a Do-Nothing Scenario, no likely and significant implications arise in respect of soil.

7.15.3.4 REMEDIAL OR REDUCTIVE MEASURES

Construction Phase

Prior to excavation of the infill material near the Glenamuck Road Bridge, in order to protect construction workers and to allow waste management of excavated materials, intrusive ground investigations will be carried out to confirm that no contaminated materials are present. During the construction process, the contractor will be bound by the terms of the contract to exercise due care and attention in the handling and disposal of any potentially contaminated material in accordance with the Waste management acts 1996-2003 and subsequent legislation.

Operational Phase

No remedial or reductive measures are considered necessary in respect of soil.

7.15.3.5 PREDICTED IMPACT OF THE PROPOSAL

Construction Phase

Neutral impacts are predicted from the construction process if the remedial and reductive measures are adhered to.

Operational Phase

Neutral impacts are predicted from the operation of Luas Line B1. However, it should be noted that the Carrickmines-Brides Glen area through which the Luas alignment will run is planned to accommodate significant new residential and employment-related development. The cumulative impact of such development will result in a far greater disturbance to soil than will occur with the provision of the alignment within the existing environment.

7.15.3.6 MONITORING

Requirements to monitor for possible emissions to soil during the construction process will be laid down in the contract documents. There are no requirements to monitor for possible effects during the operational phase.

7.15.3.7 REINSTATEMENT

Where any of the excavation boundaries are greater than, or are overcut beyond, the proposed construction area overcut areas will be reinstated or backfilled with a geotechnically stable material. There are no requirements for reinstatement during the operational phase.

7.15.3.8 POTENTIAL ROUTE DEVIATION

It is not considered that any of the potential deviations of the route alignment stated within the Railway order shall pose any additional significant impact upon the soil.



7.15.4.1 INTRODUCTION

This section addresses impacts arising out of the construction and operation of Luas Line B1 on the aquatic environment in Area 15. It does not include issues of surface water and foul drainage, which are addressed in Section 7.15.8.2 – Public Utilities of this EIS.

7.15.4.2 RECEIVING ENVIRONMENT

Between Ballyogan Wood and the alignment of the Former Harcourt Street Railway (FHSR), Luas Line B1 will cross the Racecourse Stream on a new bridge. The rest of the route lies within the catchment of the Carrickmines River, over which the Luas Line B1 alignment crosses on an existing bridge. Within the cutting of the FHSR, the Luas Line B1 alignment shall run alongside the line of a minor tributary of the Carrickmines River present approximately 20m to the west of the Glenamuck Road Bridge, to approximately 50m west of the Brennanstown Stop. The stream will therefore require a minor diversion to run alongside the alignment.

Rainfall is likely to infiltrate the ground or run-off into the Racecourse Stream and the Carrickmines River. The near surface deposits crossed by Luas Line B1 are relatively impermeable.

The glacial till and the granite are generally considered to be non-aquifers; however, groundwater storage can occur in the weathered horizons of granite and existing abstractions in Laughanstown provide drinking water to a few properties although it is understood from Dun Laoghaire Rathdown County Council that these properties are in the process of being connected to the mains water supply. This groundwater is believed to be from a weathered granite horizon that is separated from the Luas Line B1 alignment formation level by over 40m of impermeable clays.

The Racecourse Stream is currently open but will be diverted and culverted as part of the SEM accommodation works. The Carrickmines River will remain open.

7.15.4.3 POTENTIAL IMPACT OF THE PROPOSAL

Construction Phase

No evidence for any material potentially harmful to the aquatic environment has been identified on the proposed route. However, the possibility for local contamination to be present in made-ground should be catered for.

Luas Line B1 is on a raised structure supported on piers as it crosses the Racecourse Stream and the SEM, which is currently under construction. Construction activities associated with the Racecourse Stream and Carrickmines River crossings, within the FHSR and within construction compounds in the Leopardstown Racecourse and along the Cherrywood Spine road have the potential to introduce construction waste materials, dust, rubbish and sediment to the watercourses. The Racecourse Stream is expected to have been culverted as part of the SEM accommodation works and therefore it will be protected to some extent from local construction activities. At the Carrickmines River crossing, although the river is open, relatively minor construction activity is planned. The minor stream currently flowing within the cutting of the FHSR would need diverting and/or culverting. Although both the EPA and County Council currently hold no water quality information on this stream, there is considered to be a moderate impact of moderate severity on this stream throughout the construction phase of Luas Line B1 and during the diversion and/or culverting phases.

There is a potential slight impact of low severity to the Racecourse Stream and a potential slight impact of medium severity to the Carrickmines River.

The only sensitive ground water resources, identified near Laughanstown, lie below 40m of impermeable clays and are not likely to be affected by the Luas Line B1 alignment.

Operational Phase

The majority of track finishes comprises a relatively permeable ballasted track, with the remaining comprising a less permeable raised or embedded track. All surface water will be collected and run off via a positive drainage network. Where the track runs on or adjacent to existing roads

discharges of surface water from Luas Line B1 will be to the existing or upgraded highway drainage system. Where the alignment runs across open land a new drainage system will be built. Since the trams are powered by electricity, the potential for contaminating leakages or spillages is minimal. Consequently no potential adverse impacts arise in this instance.

The Park and Ride facility will provide parking for 350 vehicles and the possibility of oil spillages to the drainage system could arise via surface runoff from paved areas.

Do-Nothing Scenario

Under a do-nothing scenario, no implications arise in respect of water.

7.15.4.4 REMEDIAL OR REDUCTIVE MEASURES

Construction Phase

Careful design and control of the method of working during the construction will do much to alleviate any potential adverse effects. The contractor will be required to implement control procedures in order to maintain safe working practices and the protection of the Environment.

At the Racecourse Stream and Carrickmines River crossings, within the cutting of the FHSR, and within the proposed construction compounds, construction management practices including dust suppression measures will be key to mitigating any adverse effects from construction activities. Proper and strict planning of construction activities and site management will minimise the potential for spillages, wastes, dust, rubbish or an increased sediment load reaching the watercourses.

Sillage of contaminating material could possibly occur during the construction phase. If it reaches the watercourses there is the potential for a moderate impact of low severity at the Racecourse Stream, a moderate impact of medium severity at the Carrickmines River.

Operational Phase

As there are no likely and significant adverse impacts arising

in respect of water during the operational phase of Luas Line B1, no remedial or reductive measures are necessary. Interception of surface runoff from paved areas in the Park & Ride facility could minimise the risk of oil spillages in the car park reaching the Carrickmines stream. A Class 1 petrol interceptor should be provided on the surface water drainage system at the Park & Ride facility in order to eliminate this potential impact.

7.15.4.5 PREDICTED IMPACT OF THE PROPOSAL

Construction Phase

Provided the remedial or reductive measures outlined above are adhered to, no likely or significant impact to water is predicted during the construction process. Any adverse impact will be slight to moderate.

Operational Phase

No likely and significant impact to water is predicted during the operation of the Luas. Overall a neutral impact is predicted.

7.15.4.6 MONITORING

Requirements to monitor for possible emissions to water during the construction process will be laid down in the contract documents.

7.15.4.7 REINSTATEMENT

No reinstatement measures are required in respect of water.

7.15.4.8 POTENTIAL ROUTE DEVIATION

It is not considered that any of the potential deviations of the route alignment stated within the Railway order shall pose any additional significant impact upon the soil.



7.15.5.1 INTRODUCTION

This section of the Environmental Impact Statement considers the impact of the construction of Luas Line B1 in Area 15 on the Noise, Vibration, Lighting and Electromagnetic environments.

7.15.5.2 NOISE

7.15.5.2.1 Receiving Environment

The proposed route from Ballyogan Wood to Cherrywood carries along the Ballyogan Road and then curves north to cross the M50 via a bridge and continues along the Old Harcourt Street railway alignment. From Ballyogan Road to just beyond Glenamuck Bridge the existing ambient noise is due to road traffic. Where the line continues through open country at Laughanstown to Cherrywood and Bride’s Glen the ambient noise level is rural in character, being composed of noise from birds and distant traffic.

The existing noise environment was measured at three representative locations along the proposed route.

Four samples of fifteen minutes duration were taken at each location. Where practical the microphone was located one metre from the facades, otherwise in close proximity to the facades. The samples were analysed to yield the equivalent continuous noise level L_{Aeq} and the percentile levels L_{A10} , and L_{A90} , the noise levels in dBA equalled or exceeded for 10% and 90% of the sample time. The maximum noise level at LAMAX was also measured for each sample. The measurements were carried out over two days, on the 14th June and 17th January 2005, between the hours of 08.00am and 20.00pm. The instrumentation consisted of a Bruel and Kjaer Precision Integrating Sound Level Meter Type 2236. This was calibrated using a Bruel and Kjaer Calibrator Type 4230.

The results are summarised in table 7.15.5.5.2.1.

Table 7.15.5.2.1 Summary Of Noise Monitoring Results Taken At 1 Metre From Facades Of Building.*

LOCATION	L_{Aeq}	L_{A10}	L_{A90}	L_{AMAX}
21 Brighton Court	47	49	44	60
Rear Al Fatima,Brennanstown Vale	47	49	41	59
House at Laughanstown	46	48	37	61

* Mean value of four 15-minute samples.

7.15.5.2.2 Characteristics of the Proposal

Noise generated by the passage of trams will impinge on the facades of residences and other noise sensitive areas. The source of noise is deemed to be at the top of the railhead nearest to the facade.

7.15.5.2.3 Potential Impact of the Proposal

The noise from the passage of trams has the potential to cause disturbance to the occupiers of premises along the route.

7.15.5.2.4 Remedial or Reductive Measures

Construction Phase

All construction equipment will be required to comply with the EC Directives relating to noise emission from construction plant and equipment. These include compressors, welding generators; hand held concrete brakes and picks, excavators, dozers, loaders and excavator loaders.

Operational Phase

To reduce the risk of additional noise from trams going around curves, anti-wear and anti-squeal measures will be applied to the rails.

The existing trams running along the Green Line have incorporated noise control measures in their design, as will any additional trams running along the Luas B1.

7.15.5.2.5 Predicted Impact of the Proposal

Construction Phase

Comparatively high noise levels will arise during the construction phase, particularly from the use of pneumatic jackhammers and/or hydraulic rock breakers used for road breaking in the diversion of services and the preparation for laying of the track bed. Within 10 metres of this type of activity the noise levels are likely to be of the order of L_{Aeq} of 88dBA. Other types of construction noise are likely to be of the order of L_{Aeq} 75dB at a distance of 10 metres. This will be temporary and intermittent in nature and will be similar to that occurring in the laying and maintaining of public utility services. Its impact will be moderate to significant.

Operational Phase

The noise level expected from the operation of the Luas one metre outside the facades of the noise monitoring locations are shown in Table 7.15.5.5.2.2.

Table 7.15.5.2.2 Predicted Noise Levels 1 Metre Outside Facades due to Operation of LRT

LOCATION	Track to Reception (metres)	Mean By-Pass Speed (Km/h)	$L_{Aeq, 18}$	LAMAX
21 Brighton Court	17	45	60	81
Rear Al Fatima, Brennanstown Vale	5	15	63	65
House at Laughanstown	15	30	57	75

It should be noted that the methodology set out in "*Calculation of Railway Noise 1995*", is valid for distances from 10 metres to 300 metres from the rail head to the nearest receptor point, which is taken as 1 metre outside the nearest effected window.

The projected noise levels, and their exceedance or otherwise over the existing ambient noise levels are shown in table 7.15.5.2.3.

Table 7.15.5.2.3 Projected Noise Levels Due To Operations Of Trams And Existing Ambient Levels

Location	Projected Traffic Noise (dBA)	Existing Traffic Noise (dBA)	Expected Traffic Noise (dBA)	Resultant Noise (dBA)	Exceedance over LRT
21 Brighton Court	60	47	55*	61	+6
Rear Al Fatima, Brennanstown Vale	63	47	55*	63	8
House at Laughanstown	57	45	50*	57	+7

* Due to expected traffic flow along South Eastern Motorway when opened in August 2005

At locations A, B and C it is projected that during the operation of Luas Line B1 there will be an increase of 6 dBA to 8 dBA over the likely ambient noise level in the area which, it should be noted, will alter significantly from existing ambient noise levels following the opening of the SEM, which will occur prior to the operation of Luas Line B1 alignment. It is considered that the increase in noise level will be primarily due to road traffic arising from the operation of the SEM. The impact will be moderate. The operation of the park and ride facility at Carrickmines will have no additional impact on this altered noise environment

7.15.5.2.6 Monitoring

Construction Phase

The noise levels due to construction will be monitored at selected noise sensitive locations.

Operational Phase

Noise levels will be monitored at selected locations to check for compliance with predicted levels.

7.15.5.2.7 Potential Route Deviation

It is considered that the potential route deviation as set out in the Railway Order application will not have any material effect in terms of noise.

7.15.5.3 VIBRATION

7.15.5.3.1 Receiving Environment

A comparatively low level of vibration is generated by the passage of road vehicles along the existing roadways. This is due to all these vehicles having pneumatic tyres. Consequently vibration levels transmitted to the residences along the route is comparatively low.

7.15.5.3.2 Characteristics of the Proposal

During the construction phase vibrations will arise from machinery and plant involved, and during operational phase vibrations will arise from the dynamic interaction of the wheels of the rail cars on the rails themselves.

7.15.5.3.3 Potential Impact of the Proposal

Construction Phase

During the construction phase the proposed development has the potential to create an adverse impact on the adjoining residences due to vibration caused by the mechanical tools and equipment used during this process.

Operational Phase

During the operational phase the Luas has the potential due to the running of the tram's on the trackbed to create vibratory effects, which could have an adverse impact on properties adjoining the Luas.

7.15.5.3.4 Remedial or Reductive Measures

Construction Phase

Remedial measures to be considered are the control of working hours by agreement with the Local Authority. A balance has to be achieved between hours which are too restrictive and which might further prolong the impact. During demolition and construction the best practical means will be utilised to minimise vibration transmitted to sensitive areas and buildings. A criterion for vibration will be set at a level of 5mm/sec when measured near the foundation of any

building. For listed and vulnerable buildings the criterion will be 3mm/sec. This follows the German standard DIN 4150. This level is very conservative and is used to protect against the onset of superficial damage in listed buildings or ancient monuments.

Operational Phase

To reduce vibration transmitted from the interaction of wheels on tracks to the ground and through to sensitive areas, vibration isolation techniques will be incorporated into the track and track-bed design. To take account of possible amplification of vibration, which may occur between the foundations and upper floors, an amplification factor of 3 will be allowed for in the design.

7.15.5.3.5 Predicted Impact of the Proposal

Construction Phase

Vibrations will arise and may be perceptible inside residential areas during the breaking out of the roadway or rock with the use of pneumatically operated hammers or hydraulic rock breakers. Vibration levels of 1 to 2 mm/sec are clearly perceptible. Levels up to 3mm/sec do not pose any risk of structural or cosmetic damage to the most sensitive of buildings such as ancient monuments, etc.

Operational Phase

The level of vibration will meet the criterion for residential properties both by day and night set out in Annex A, Table 2 of International Standard 2631-2 "*Evaluation of human exposure to whole-body vibration Part 2: Continuous and shock induced vibration in buildings (1 to 80Hz)*." The impact will be negligible. This naturally concerns the human response to vibration. This criterion for human response is much more stringent than that for slight cosmetic damage to buildings therefore the possibility of slight cosmetic damage to any buildings will be negligible.

7.15.5.3.6 Monitoring

Construction Phase

Vibration levels will be monitored at sensitive buildings where the vibration level may exceed the criteria set.

Operational Phase

During commissioning of the system, which is likely to last for up to six months, vibration levels will be monitored at selected locations to check for compliance with the design criterion.

7.15.5.4 LIGHTING

7.15.5.4.1 Receiving Environment

There is no public lighting system along this section of the route.

7.15.5.4.2 Characteristics of the Proposal

During the construction period the construction site may be lit at night-time when necessary for safety reasons. The stops, accesses and crossings associated with the operation of the Luas will require appropriate levels of lighting for reasons of safety also.

The Luas system will operate from overhead lines fed at 750 Volt D.C.. Occassional sparking and flashing from these overhead lines will occur in an unpredictable pattern as the collector on the light rail vehicles make contact with them. This will not occur on a regular basis or frequency.

7.15.5.4.3 Potential Impact of the Proposal

Construction Phase

As the construction site may be lit at night-time only when working during the construction period, this is likely to give rise to some impacts on established residences where these adjoin the Luas route.

Operational Phase

The stops and crossings associated with the Luas will require appropriate levels of artificial lighting for reasons of safety. This will introduce a new additional lighting source.

A proposal of this kind can be expected to have a neutral impact on existing natural lighting.

Do-Nothing Impact

Were the proposed development not to take place the 'do-



nothing' impact the current levels of both natural and artificial lighting would remain unchanged.

7.15.5.4.4 Remedial or Reductive Measures

Construction Phase

When required, the night-time lighting of the construction site will be facilitated through the use of low angle lighting with a minimum of 25 Lux which concentrates the light beams downwards thereby minimising the impact of night-time light disturbance to local residences.

Operational Phase

The operation phase will involve the following factors:-

- Provide lighting at stops and level crossings.
- Proposed lighting at stations, car parks shall be to a level recommended by C.I.B.S.E. in the interest of public safety.

During the operation of the Luas a 'worst case' impact is unlikely as the mitigation measures concerning public lighting will be built into the lighting actually provided. These lights will be in accordance with B.S. 5489 which sets out the requirements for such lighting.

As the proposal is not expected to have any significant adverse impacts on artificial lighting no further remedial or reductive measures are necessary.

7.15.5.4.5 Predicted Impact of Proposal

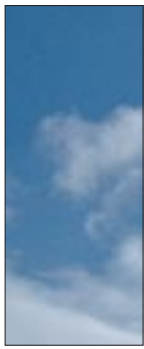
Construction Phase

When required, the night-time lighting of the construction site will have a temporary impact, though is not considered to be significant. Proposed night-time lighting at the construction site shall be to a level of not less than 25 Lux in the interest of public safety.

Operational Phase

The proposal will not have any significant adverse impact on the natural lighting along this route section.

It is anticipated that, as in other similar systems, residents along the route section will quickly become accustomed to



infrequent sparking and flashing of the contact between the tram collector and the overhead lines and that such limited intrusion will not cause an adverse impact of significance.

It is also anticipated that significant adverse impact is unlikely as the mitigation measures concerning public lighting will be built into the lighting actually provided. These lights will be in accordance with B.S. 589 which sets out the requirements for such lighting.

If cycleways are introduced on this section, public lighting will be required and this will have the effect of enhancing security for the residents whose property abuts on the Luas tracks.

The proposed route of the Luas is primarily along the disused Harcourt St. line and across currently undeveloped lands where no public lighting exists. The introduction of public lighting to stations, pedestrian crossing, etc. will improve the environment.

7.15.5.4.6 Monitoring

Construction Phase

Throughout the construction phase there will be an on-going consultation process between RPA and local residents and businesses. Night-time lighting shall be monitored to ensure that it does not exceed the acceptable limit of 25 Lux for such lighting, thereby negating the possibility of a 'worst case' scenario.

Operational Phase

No monitoring of Lighting will be required during the operation phase of this proposal.

7.15.5.4.7 Reinstatement

No reinstatement will be necessary.

7.15.5.4.8 Potential Route Deviation

Where the route may deviate laterally for this section of the proposal, this will have no impact on the existing lighting.

7.15.5.5 ELECTROMAGNETIC ASPECTS

7.15.5.5.1 Receiving Environment

There are likely to be ESB cables in this area that may need protection. A full asset data will be requested from ESB and where necessary stray current design protection, in accordance with the Code of Practice, will be incorporated. This cable may be exposed to stray currents. Other than this, it is unlikely that there is any further sensitive equipment along this portion of the route.

7.15.5.5.2 Potential Impact of the Proposal

Construction Phase

No potentially adverse electromagnetic effects arising during the construction phase have been identified at this stage.

Operational Phase

The trams take their power source from 750v D.C. overhead cables supported by headspans attached to poles. Further parallel Traction Power supplies cables will run in ducts below ground at the edge of the trackbed. In addition there will be two substations along this section of the route, one located immediately adjoining the Carrickmines Stop, and the other adjacent to the alignment at Cherrywood. These will take power from ESB supplies and rectify AC current to DC.

In respect of the track alignment, there may be potential electro-magnetic impacts arising from the distribution of current to the trams. Experience with new and developing trams through out the E.U. suggests that adverse effects can be “designed out” prior to the selection of the vehicle. The contract will require the contractor to carry out rigorous analysis, testing and monitoring of the tramway equipment with regard to EMC. The Contractors will be required to comply with the relevant European and International Standards and Directives.

Do-Nothing Scenario

Under a Do-Nothing scenario no likely and significant impacts arise in respect of electromagnetic aspects.

7.15.5.5.3 Remedial or Reductive Measures

Construction Phase

Luas Line B1 will be constructed to meet the requirements of the EU Directive on Electromagnetic Compatibility (89/336/EEC) and the emerging 'best engineering standards' from the European Committee for Electrotechnical Standardisation (CENELEC). Thus, further remedial and reductive measures are not expected to be called for. All components of Luas Line B1 will be designed for compliance with the current European Standard, EN 50121 (Electromagnetic compatibility for railways). The contractor shall ensure that sufficient procedures are in place to ensure compliance with the above legislation and standards.

Testing for electromagnetic interference will be undertaken during the testing and commissioning phase to confirm that the system is performing to the manufacturer's specifications.

With reference to stray current, suitable spacing and design measures will be provided. Where this cannot be achieved, appropriate remedial actions will be agreed to conform with the specification.

For telecommunication facilities, field measurements will be undertaken during the testing and commissioning stages to check that measures adopted are sufficient. Further remedial and reductive measures should not be required.

Operational Phase

If any adverse impacts are identified, then intensive consultation with owners/occupiers of sensitive premises or equipment will be undertaken to eliminate the adverse effects.

7.15.5.5.4 Predicted Impact of the Proposal

Construction Phase

No residual electromagnetic impacts are predicted during the

construction phase.

Operational Phase

If the remedial and reductive measures outlined above are adhered to no likely or significant residual electromagnetic impacts are predicted.

7.15.5.5.5 Monitoring

Requirements to monitor for possible electromagnetic emissions during the commissioning process will be laid down in the Contract documents.

7.15.5.5.6 Reinstatement

No reinstatement measures are required during either the construction or operational phases of Luas Line B1.

7.15.5.5.7 Potential Route Deviation

It is not considered that any of the potential deviations of the route alignment stated within the Railway Order Application shall pose any additional significant electromagnetic impact



7.15.6.1 INTRODUCTION

This section of the Environmental Impact Statement addresses the issue of Air Quality in terms of the impact of the construction and operation of Luas Line B1 on existing air quality levels.

7.15.6.2 AIR QUALITY

7.15.6.2.1 Receiving Environment

The air quality in Area 15 of Luas Line B1 is rated as satisfactory and reflects the levels of air pollutants found in the outer-suburbs of the Dublin conurbation. There are no significant industrial emission sources in the area and the primary sources of atmospheric emissions is from traffic on the local roads and emissions from the housing developments in the Ballyogan and Carrickmines area. The majority of houses in the area burn either natural gas or low-sulphur oil as the main fuel for heating. Beyond Carrickmines, the planned route crosses mainly agricultural land and passes only a small number of houses at Brennanstown and at Loughanstown. The Cherrywood area is currently being developed with commercial/retail and residential schemes under construction. Near the kerb-side of Ballyogan Road, Glenamuck Road and other minor roads elevated levels of nitrogen oxides, hydrocarbons, carbon monoxide and particulates may be observed due to motor vehicle exhausts. The volume of traffic traveling along the roads in this area increases during the morning and evening peak periods. However, the volume of traffic is substantially lower than observed on the N11, further to the east.

Ambient levels of sulphur dioxide would be well below the National Air Quality Standards (NAQS) contained in the Air Quality Standards Regulations 2002 (SI No 271 of 2002) within Area 15. These Regulations give air quality limit values for hourly and daily sulphur dioxide levels. In the case of daily concentrations the limit to be met is 125 g/m^3 , expressed as a 99.2 percentile (3rd highest daily value of the year). Maximum daily levels of smoke and sulphur dioxide would be well below $40 \text{ } \mu\text{g/m}^3$ within the housing developments along Brennanstown Road and Carrickmines.

Nitrogen dioxide levels, which are primarily due to motor vehicle exhaust emissions are well below the current NAQS limit value (SI No 244 of 1987) of $200 \text{ } \mu\text{g/m}^3$ (expressed as a 98 percentile, or 175th highest hourly level recorded over the year) in the Carrickmines and Brennanstown area. Hourly levels of nitrogen dioxide alongside the eastern end of Ballyogan Road and Carrickmines would be generally less than $50 \text{ } \mu\text{g/m}^3$, with annual average levels less than $20 \text{ } \mu\text{g/m}^3$. These concentrations are also less than the future hourly and annual limit values, specified in the 2002 Regulations, which are to be met by January 2010. Adjacent to the former Harcourt St. Railway line, ambient concentrations would be substantially lower, with typical annual average NO₂ concentrations of less than $10 \text{ } \mu\text{g/m}^3$.

Annual levels of benzene would be below $1 \text{ } \mu\text{g/m}^3$ in the area of the proposed Luas Line B1 alignment. The future annual limit value of $5 \text{ } \mu\text{g/m}^3$, which is specified in the 2002 Regulations, comes into effect in 2010. With further reductions in the benzene content of petrol, the levels will continue to decline over the next few years. The 2002 Regulations specify a limit value for an 8-hour exposure of 10 mg/m^3 for carbon monoxide. Vehicle exhausts are the main source of these air pollutants, with high levels commonly experienced in areas of traffic congestion and poor air movement such as within inner city streets. The speed of vehicles and dispersion of emissions along the local roads would be sufficient to prevent high levels of carbon monoxide being experienced. Given the relatively low volume of traffic along Ballyogan Road and other local roads in the Carrickmines and Brennanstown area kerb-side levels would be below 1 mg/m^3 , or less than 10% of the NAQS.

Levels of particulates referred to as PM₁₀ (particulate material with a mean aerodynamic diameter of less than $10 \text{ } \mu\text{m}$) in the area would be generally below the NAQS specified in the 2002 Regulations. The annual limit value is $40 \text{ } \mu\text{g/m}^3$ with a daily limit value of $50 \text{ } \mu\text{g/m}^3$ (no more than 35 exceedances per year). The primary sources of PM₁₀ along the Luas Line B1 alignment would be from traffic travelling along the Ballyogan Road and from the house-building and other construction programmes being carried out. Temporary elevated levels of particulates alongside the route of the South Eastern Motorway (SEM) near Carrickmines are

likely due to this major road construction programme currently being undertaken. However, beyond this part of the Luas Line B1 alignment, ambient concentrations decrease rapidly and would be in the order of $15\text{-}20 \text{ } \mu\text{g/m}^3$.

7.15.6.2.2 Potential impact of the proposal

Construction Phase

This phase of the development has a potential to generate dust emission and gaseous emissions from the construction of the trackbed and from the use of machinery and delivery of materials. Dust emissions will occur from the activities including minor regrading of the ground, ramp/bridge construction over the SEM, laying of track, construction of the station-stops and sub-stations along this portion of the Luas Line B1 alignment.

A surface park and ride facility is planned for the Carrickmines stop, which will be accessed off the SEM motorway interchange on the Glenamuck Road.

Movement of vehicles to and from the construction compounds and assembly areas along this section also has the potential to generate dust and PM₁₀ emissions from temporary haul roads. Emissions from construction plant equipment as well as from vehicles delivering building materials to the construction compounds along this section can also result in short-term elevated concentrations of air pollutants in the immediate vicinity of the construction activities.

Operational Phase

This section of Luas Line B1 through Area 15 generally runs along the alignment of the old Harcourt St. railway line, before crossing open fields east of Carrickmines to Cherrywood. It is therefore primarily located on undeveloped ground with no reduction in existing roadways and so traffic volumes along the existing road network will be unaffected. As a result, there will be no significant changes in exhaust-pipe emissions along the existing road network. The lands at Cherrywood and Rathmichael are currently undergoing major development with new residential, commercial, retail as well as new roads planned and so this will result in additional changes in traffic volumes and hence vehicle emissions in this area over the next few years.

7.15.6.2.3 Remedial or reductive measures

Construction Phase

Dust suppression measures, in accordance with effective site management, will be implemented to control dust emissions caused by resuspension of material on roads and from construction areas during dry windy weather conditions. This may include the use of a mobile water spray on the road surface near to the construction compound and any temporary haulage routes along public roads. Any spillages or drag-out of silt and mud on the road surface from construction traffic should be promptly removed to prevent a possible local dust nuisance in the immediate locality.

Burning of construction waste material will be prohibited, with material recycled and re-used where practicable.

Diesel engines of trucks and other plant machinery should be regularly maintained so that they do not emit excessive black smoke likely to cause a local nuisance at nearby private properties.

Operational Phase

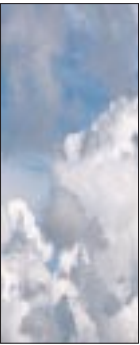
No remedial measures are required in respect of air quality.

7.15.6.2.4 Predicted impact of the proposal

Construction Phase

It is projected that the construction of the track-bed will take approximately two years to complete and this will be undertaken in sections, reinstating each section as it is completed. Materials to construct the track-bed will be stored along with plant machinery in the designated temporary construction compounds at Ballyogan Road, Carrickmines, and to the West of Laughanstown. Management procedures for these construction compounds will be implemented to ensure that dust emissions from movement of trucks delivering materials and handling of track bed materials is undertaken so that dust and PM₁₀ emissions are minimised.

Regrading of the existing ground levels will be minor as the Luas Line B1 alignment will follow the present slope grades where practicable. Clearance of rubble and other debris on the former Harcourt St. railway line near Carrickmines and



Brennanstown will be necessary. However, along most of its length the track-bed will be at the existing grade; apart from some minor regrading between Carrickmines and Cherrywood where the track bed will cross undeveloped agricultural lands. At the eastern end of Ballyogan Road an earthen ramp leading to the bridge across the SEM will be constructed and this will involve importation of stone for the ramp. To the west of Laughanstown the Luas Line B1 alignment will also pass under the planned Cherrywood Spine Road through a box-tunnel construction. These two operations will require the importation and exportation of fill material and control measures will be in place to ensure traffic travelling along temporary haul roads do not cause a local dust nuisance.

Air emissions from the diesel engines of the trucks and other construction vehicles comprise mainly of nitrogen oxides, hydrocarbons and particulate emissions from the engine exhausts. The volume of emissions will be low and given the open nature of this portion of the Luas Line B1 alignment will be adequately dispersed. The impact of the exhaust-pipe emissions from haul trucks and plant machinery during the construction phase will have a minor or not significant impact on ambient air quality.

There may be a short-term impact on air quality in terms of dust emissions in the vicinity of the construction areas as the track-bed is laid. However, with the proposed dust control measures (Sect 7.15.6.2.3) the impact on air quality in terms of dust deposition rates and PM₁₀ will be slight to moderate. Given, the planned approach to constructing the track-bed in sections along the Luas Line B1 alignment this impact will be temporary at any private property along the route.

Operational Phase

Atmospheric emissions from a motor vehicle are dependent on the type of vehicle, age and speed along the section of a roadway. Exhaust-pipe emission rates for cars and commercial vehicles have declined significantly over the past decade with stricter controls on the quantity of pollutants permitted from petrol and diesel engines. Additional reductions were introduced in 2000 with the implementation of EU Council Directive 98/69/EC relating to measures to be taken against air pollution by emissions from motor vehicles.

This E.U. Directive sets stringent limits on the emissions of nitrogen oxides, hydrocarbons (benzene), carbon monoxide and suspended particulates from post 2000 vehicles. As the age of the motor fleet changes with older models on the roads being replaced by newer vehicles, there will be an overall reduction in emissions per vehicle.

Estimates of traffic flows on the road network within Area 15 are provided in the traffic impact analysis (Section 7.15.1.4) for the 2016 'With' and 'No Luas' scenarios. A reduction in traffic flows along the Ballyogan Road of 2% and a 24% reduction along Glenamuck Road are predicted with the operation of the Luas. In addition, future reductions in predicted traffic are also likely along the planned Cherrywood Spine Road and N11 Access Road with the operation of Luas to Cherrywood . This will result in a reduction in exhaust-pipe emissions from vehicles traveling along these local roads.

The planned Luas Line B1 runs along the undeveloped ground for much of its length through Area 15 and so the impact on air quality from the operation of the Luas is predicted to be neutral.

7.15.6.2.5 Monitoring

No air quality monitoring is proposed during the construction or operational phases in respect of Luas Line B1.

7.15.6.2.6 Reinstatement

Not applicable in relation to air quality

7.15.6.2.7 Potential Route Deviation

Minor deviations of the final Luas Line B1 track from the original route may occur that are no more than 5m laterally, no more than 2m vertically and longitudinally by no more than 20m. These minor changes to the original planned alignment will not significantly change the magnitude of the predicted impacts on air quality described above.

Landscape & Visual Impact



7.15.7.1 INTRODUCTION

This section sets out to describe the visual environment of the area, to assess the Impacts of the Luas Line B1 on the existing suburban townscape and landscape including the existing trees in the area it also assesses the visual impact of the development. It sets out measures to eliminate, ameliorate and mitigate these impacts. This section also undertakes a detailed assessment of trees, which constitute a major landscape feature of the Luas Line B1 corridor alignment.

7.15.7.2 LANDSCAPE

7.15.7.2.1 Receiving Environment

Leaving the Ballyogan Road, the route travels in a north-easterly direction, crossing a broad open derelict field and the reservation of the planned SEM. The SEM is, at present, under construction. This field is fenced along the Ballyogan Road by a concrete post and chainlink fence, approximately 2 metres in height. To the east of the field is the precast concrete wall structure, which forms part of the SEM works. A new roundabout has been constructed at the end of the Ballyogan Road to accommodate a vehicular fly-over across the SEM.

The route crosses the alignment of the SEM towards a small Traveller's housing scheme to the east. It links at the southern end of Brighton Court housing development with the alignment of the former Harcourt Street Railway.

The alignment of the former Harcourt Street Railway is screened by a tall hedgerow of Ash and Thorn. Brighton Court is screened by a tall concrete block wall with red brick coping. There is some intermittent natural plant regeneration at its base. Brighton Place is part of Brighton Hall residential development and consists of two storey half-bricked detached houses.

At Glenmuck Road, the route passes under a road bridge and is colonized by regenerated Willow and Ash up to 8 metres in height. The Carrickmines Tennis Club to the north of the

alignment at Glenamuck Road bridge comprises a two storey timber- faced building and the grounds are enclosed by a Griselinia hedge. There is an enclosed field adjoining the rear gardens of a group of houses on the Ballyogan Road to the south of the alignment.

To the east of the Glenamuck Road, the route passes through annex buildings of a two- storey private house, formerly the Carrickmines Station House. The annex buildings consist of single storey, flat roofed structures separated from each other by an open yard. The station platform associated with its previous use is still in existence. The property is surrounded by 12m high Sycamores and Cypresses. To the rear there is a lawn which terminates at a rough hedge forming the western edge of Brennanstown residential development. The houses are very large two- storey units in a variety of materials but with a preponderance of white or off-white paint finishes. The rear gardens are contained by stone walls, and ornamental planting. The boundary commences at grade on the western end of the scheme gradually rising to 2m. above grade at its eastern end.

The southern edge of the alignment is enclosed by tall Ash and Hawthorn, and beyond which are open fields in agricultural use, with groups of mature trees on the field boundary lines. These are Beech, Ash and Sycamore. The route itself has extensive regenerated Ash, Willow and Sycamore and a mixed shrub understorey.

The alignment, continuing eastwards from Brennanstown Vale development, skirts along the edge of a mature woodland, bisected by a steep valley, for about 700m. From a point to the west of Laughanstown Lane, the alignment veers to the south-east through open fields, used for rough grazing. The fields adjoining Laughanstown Lane have mounds of excavated material which have re-vegetated with Gorse and rough Grasses.

The alignment from Laughanstown Lane is open and exposed, apart from the section along a plateau where the topography provides some concealment. The route passes at some distance to the north of Tully Church and rises steeply on to a plateau, with the land rising steeply to the south west, and falling steeply to the north east. The top of the

southern embankment supports a line of mature, widely spaced trees-Sycamore, Beech and Oak. The route approaches the Cherrywood Development, passing passing through an area of hedgerows and trees on either side of the alignment of the former Harcourt Street Railway. Another remnant of hedgerow lies on the south side for approximately 20m. The alignment crosses an open landscape where the soil has been disturbed due to construction works at Cherrywood. To the north-east of this open space is Druid Valley residential development consisting of a mix of two-storey houses and four – five storey apartment buildings. The boundary of this residential development is defined by a 2 metre high pebbledashed block wall with brick piers. The Luas Line B1 alignment runs parallel to the spine road that services the residential development and then deviates in a south easterly direction to cross the Wyattville Link Road to the south west of a large roundabout, off which are located the various office and residential buildings of the evolving Cherrywood Development and finally, to the terminus of the alignment, which will be located to the west of the Friend First office building. To the south of this building there are high voltage overhead powerlines running in an east – west direction.

7.15.7.2.2 Potential Impact Of The Proposal

Conatruction Phase

An impact on the existing landscape is inevitable during construction. The insertion of the track bed with its rails, kerbs, edges and paved surfaces could have a moderately negative impact on segments of the route. There are some areas where locally significant negative impacts could arise. In particular, the provision of a bridge over the existing valley north-east of the Ballyogan Wood residential scheme will have a locally significant impact upon the existing local rural landscape. However the construction of the SEM has served to alter this landscape even in the absence of Luas Line B1. Moreover, the SEM is planned to be completed prior to the completion of Luas Line B1.

Similarly the viaduct to take Luas Line B1 across the Wyattville Link Road will have a significant visual impact upon the existing landscape in this area. The ongoing development works at Cherrywood will alter the existing

landscape character in this area even if Luas Line B1 is not inserted into the landscape.

Construction will be preceded by preliminary works, including as follows:

- Segregation of the contractor's compounds and assembly areas to be located at Carrickmines, on the eastern side of the Luas Line B1 alignment, immediately north of the SEM motorway alignment, on lands within the ownership of Leopardstown Racecourse Authority and in the vicinity of the intersection of the Luas Line B1 alignment with the planned Cherrywood Spine Road.
- Segregation of the Luas Line B1 alignment, including the park-and-ride facility and the Wyattville Link Road bridge, and securing of entrances as appropriate, demolition of the existing single-storey extension to the former Carrickmines Station House, immediately east of the Glenamuck Road bridge.
- Removal of scrub vegetation and temporary spoil heaps as necessary.
- Modification of kerbs and carriageways to provide temporary road diversions, and final alignments where appropriate.
- Excavation of trenches and laying of service mains and diversions. They will be suitably secured and fenced-off.
- Accessible parts of the Luas Line B1 alignment will also be fenced and secured to a height of 1.2m while the trackbed is being excavated, formed and laid, and at other times when work which could be dangerous to the public is in progress;

The provision of Overhead Line Equipment (OHLE), with its power lines supports and masts, could have severe negative impact on the suburban townscape and rural landscape. This could be particularly so where the alignment crosses open land, were the OHLE to cross the line of vision of road / footpath users.



The construction phase will involve considerable movement of machinery and goods, and enclosure of temporary works. Site activities will include excavation, demolition, clearance, materials storage, concreting pouring, and fabrication, erection and fixing sequences.

Access to the construction site will primarily be provided from the contractors compound and assembly area to the east of the SEM Ballyogan Overbridge onto the Luas Line B1 alignment west of Glenamuck Road, from the compound area west of Laughanstown Lane, and from the Wyattville link road at Cherrywood which is currently facilitating the construction of major new mixed-use development.

Where necessary, to ensure continuous public access to properties, temporary road, paths and footbridges will be provided. Construction will be planned to minimise disruption and dust from compounds and assembly areas, and particularly along the track bed. Damage to property, to grassland, planting and carriageways will be minimised. Where damage cannot be avoided, it will be repaired.

The main construction work will include:

- Excavation, widening, formation and surfacing of the track bed, and the insertion of parallel service ducts.
- Excavation, formation and surfacing of the parking areas and associated bus interchange at the park and ride facility, east of Glenamuck Road, and construction of an access road onto the planned Cherrywood spine road.
- Construction of ramped and elevated sections of the trackbed from Ballyogan Road to the alignment of the former Harcourt Street Railway.
- Construction of the Glenamuck Road underpass and associated alterations to the existing bridge structure.
- Construction of a grade-separated underpass where the Luas Line B1 alignment crosses the line of the planned Cherrywood Spine Road.

- Construction of a bridge to cross over the Wyattville Link Road at Cherrywood.
- Construction of stops at Ballyogan Wood, south of Brighton Court (Racecourse Stop - intended primarily to operate on event days at Leopardstown racecourse), Carrickmines, Brennanstown, Laughanstown, Cherrywood and Brides Glen.
- Construction of sub-stations, the track, drainage and ducting at Carrickmines and Cherrywood.
- Installation of electrical equipment, support masts and OHLE. Insertion of footpath connections, grading, top soiling, grassing and planting of landscaped areas.

The alignment area from Laughanstown to Cherrywood is currently an open landscape. The proposed development will significantly alter the existing condition of the local landscape. However, it must be noted in this regard that the Luas Line B1 alignment crosses an extensive development area under the Carrickmines – Cherrywood Action Plan and the Dun Laoghaire Rathdown County Development Plan 2004-2010. Substantial development has already taken place to the North of the planned Luas Line B1 alignment. Thus, it is intended that the existing open landscape will be further and profoundly altered in any event to comprise a new suburban townscape. This will have an overall far more significant impact upon the landscape than would occur should the planned Luas Line B1 alignment be constructed in isolation.

Other areas that would experience a significant impact in terms of landscape include the following:

- At Brennanstown Vale, where gardens abut on to the Luas Line B1 alignment.
- At the proposed park and ride facility in the vicinity of the Carrickmines Stop. This will constitute an intrusive element in an essentially rural landscape. However, this facility will be located in proximity to the SEM, and in particular, the SEM Carrickmines Interchange.

There is also significant potential for positive visual impact along the eastern end of Ballyogan Road. The interface between the suburban developments and semi-urban landscape has fragmentary, unkempt and difficult to maintain edges. The widening of the carriageway and road edges provides an opportunity to comprehensively address the landscape design of the roadway in the context of it's edge setting. This will be particularly valuable in respect of the frontage along the former landfill site.

Operational Phase

In operation Luas Line B1 provide positive impacts by:

Enlivening the suburban setting by the trams travelling through well-designed reservations, notably where it adjoins built-up areas.

The long-term impact of improved transport in raising perception of environmental quality.

Do nothing impact

If Luas Line B1 is not inserted, the existing corridor is likely to remain in its current unmanaged state.

7.15.7.2.3 Remedial Or Reductive Measures

Primary amelioration of the line will be achieved through the co-ordination of the design of Luas Line B1 with the adjoining carriageways, boundaries and paths, and through careful design of raised embankments, bridges and stops. The visual integration of the OHLE with the landscape will be achieved by careful choice of the support systems.

The Luas Line B1 alignment will be exposed between Ballyogan Road and the alignment of the former Harcourt Street Railway.

Mitigation will be achieved by:
Providing a visually suitable bridge connection across the valley, which will be assimilated into the landscape, and which will register as a lightweight interesting structure. However as stated above the bridge itself is required to cross the alignment of the SEM which will be constructed prior to

the completion of Luas Line B1, and which thereby, will have already altered the existing open landscape in this area.

The elevated viaduct at Wyattville Link Road will be mitigated by provision of a visually suitable structure, which will be designed to blend in with the existing overall development of Cherrywood which is, at present, under construction.

The scale of the buildings at Cherrywood along with the construction of the Wyattville Link Road, which will be constructed prior to the completion of Luas Line B1, will assist in absorbing the visual impact of the bridge into the landscape.

Planting selected trees and shrubs where possible along the ramps along both sides of the SEM Ballyogan Bridge to form a screened corridor.

Established vegetation along the alignment of the former Harcourt Street Railway already provides effective screening for much of this section as far as the eastern side of the Carrickmines Wood. The boundary vegetation has not been managed in recent years and will require trimming. Overall this vegetation will require some degree of protection during construction.

Overall, mitigation generally will be achieved by:

- Pruning, shaping and weeding the existing hedgerow vegetation on the side of the corridor, and where necessary, planting additional material into the local planting regime where there are gaps to screen.
- Planting a mixed hedge adjoining the retaining wall to the south of the houses of Brighton Court to match the existing hedge in this area.
- Providing additional screen planting on the western side of the line at Glenamuck Road bridge along the boundary of the Carrickmines Tennis Club and the houses of Brighton Court.
- All elements of the proposed stops to be carefully designed, and finishes in high quality materials, and well designed in respect of planting.



- Planting of natural hedging at Brennanstown Vale residential development between the line and the property boundaries.
- Provision of appropriate landscaping to soften any potential impact arising from provision of the park and ride facility at Priorsland Carrickmines.
- Exercising care in the installation of the Line B1 alignment as it passes the edge of the woodlands to ensure minimal damage to the trees.
- Planting trees and shrubs at the woodland edge to the east of Brennanstown Vale and continuing with that treatment as far as Laughanstown Lane.
- Selecting a visually appropriate method of support for the OHLE- generally comprising lateral poles with cantilevered arms.

The lands from Laughanstown Lane to the Cherrywood will be developed over the next number of years. The Luas Line B1 alignment will consequently be visually-absorbed at the larger scale. There will be local impacts, for which mitigation measures will be required.

Mitigation will be achieved by planting trees and shrubs on both sides of the corridor in groups, in order not to emphasise the linear aspect of the Luas Line B1 alignment and to assist in absorbing the alignment into the future streetscape of new developments.

7.15.7.2.4 Predicted Impact Of The Proposal

Construction phase

The temporary and intermittent construction impacts-temporary enclosure of the compounds and assembly areas, creation of temporary carriageways, diversion of traffic, construction operations, moving vehicles, dust and vibration-fall into a number of categories:

- The enclosure of the main contractor’s compound and assembly areas, and their use as a temporary storage and welfare area.

- Where appropriate, the segregation of the various elements of Luas Line B1 while the main construction work – the building and surfacing of the trackbed – is carried out.
- The intermittent work involved in equipping the line and erecting the OHLE.
- The final grading, finishing and landscaping of the assembly area and construction compounds, following completion of construction.

All of these are temporary, some are intermittent, and dust and dirt will be strongly controlled. They are all impacts that are normal in the urban scene, though irregular in the rural environment. In the context of this project these are not regarded as being significant in terms of impact upon landscape.

Following amelioration and mitigation, the trackbed will have a moderate, positive impact on Luas Line B1 in general. This impact will be strengthened by provision of new planting which will assist in integrating the alignment into the existing and planned urban and semi-urban landscape fabric.

Following amelioration and mitigation the OHLE and the supports will have moderate, negative visual impact. The SEM Ballyogan bridge cannot be screened, and will require careful architectural treatment to minimise its impact. The impact at Brennanstown Vale will be temporarily severe because of the proximity of the line to the residences rear gardens.

Operational Phase

The increase in the use of the Luas as a safe and environmentally attractive movement corridor will have a positive impact on the area. The provision of the overall Luas Line B1 from Sandyford Industrial Estate to Cherrywood via Ballyogan, Carrickmines and Laughanstown will have a continuing positive effect on the amenity of the areas and underpin gradual environmental improvement.

The long-term reduction in car traffic passing through the areas will be beneficial to the pedestrian environment.

The impact of Luas Line B1, including the OHLE and its supports, and the residual overlooking from trams into private gardens will reduce as the landscaping matures.

Luas Line B1 will have a widespread, significant and positive visual impact on the landscape and townscape of the three areas. The residual negative impact of the OHLE and its supports will be greatly outweighed by the positive impacts of the other parts of the system and by the anticipated long term benefits that will accrue to the visual environment. Overall moderate positive visual impact will result from the operation of Luas Line B1.

7.15.7.2.5 Monitoring

Construction phase

During the construction phase it will be necessary to monitor the method statements of contractors to ensure that the work conforms to good engineering and landscape conservation practice. It will be particularly important to limit the work areas and to minimise topsoil loss. The control of dust and dirt, and the protection of existing trees and shrubs, will be important throughout the period of the works, particularly at points of access to the line.

During the operation phase the landscape elements, including grassing, trees and shrub planting, will require planned maintenance and replacement, to ensure their health and long term growth.

7.15.7.2.6 Reinstatement

Construction phase

During the construction phase all disturbed fencing, garden walls, and flanking soft areas along the Luas Line B1 alignment will be reinstated to provide a consistent visual edge to the corridor.

7.15.7.2.7 Potential Route Deviation

The proposed possible route deviation will not, in most cases, significantly alter the assessment of visual impacts outlined above, due to the large scale and open nature of the landscape compartments it passes.

7.15.7.3 TREES

7.15.7.3.1 Receiving Environment

In the field south of the alignment of the former Harcourt Street Railway, west of Glenamuck Road, there is a small section of hedge at right angles to the old railway bed that is an unmanaged agricultural field boundary. It comprises mature hawthorn, blackthorn, elder and willow and is in fair condition.

Alongside the alignment of the former railway there is a mixed hedge beside a ditch and a bank that has not been recently managed. It consists of mature hawthorn and elder with numerous early mature multiple stemmed elm and ash, all in fair condition. There is an open area before the start of the following section.

West of the Glenamuck Road bridge, the alignment runs through a steep-sided cutting. On the sides of the cutting are self-seeded trees that comprise young to early mature ash, sycamore and willow, early mature holly, early mature to mature elder and mature hawthorn, all of which are in fair condition. Since the Harcourt Street Railway was closed, the track bed has become overgrown with self seeded trees.

In the garden of the property of the former Carrickmines Station House, there are three large, mature, multiple stemmed sycamore which overhang the boundary wall and which are in good condition. In the Station House property itself there are a range of mature ornamental shrubs along the old platform with a mature laburnum and an early mature elm, all in good condition. Along the old track bed there is a mature sycamore and a mature cypress, both in good condition. At the base of the water tower are two mature Acacia trees, in fair condition, that lean towards the old trackbed. East of the water tower is a mature beech tree in good condition. Growing across the old trackbed, half way down the garden is a mature, well-managed Griselinia hedge in good condition.

Immediately to the east of the Griselinia hedge in the middle of the old track bed is an outstanding specimen of an early mature to mature Atlantic Cedar that is in excellent condition. In addition there is a small orchard made up of seventeen



mature fruit trees, all of which are in good condition. There are also two further trees of significant value, the first of which is an early mature Monterey cypress which is growing on the old platform and is in good condition. The second is a mature silver birch in good condition.

The proposed park and ride facility falls within the bounds of the property Priorsland,, on the eastern side of Glenamuck Road, Carrickmines. To the north of the site there is an old walled garden laid out in a formal style that is now neglected. Within the garden are beds bordered with clipped box, holly, yew and beech hedging that is in good condition. Along the southern boundary wall are five trees that are tagged and scheduled below, along with fruit trees, ornamental shrubs and self-seeded ash and sycamore seedlings. Trees 606 and 607 are early mature to mature ash in good to fair condition that appear free from significant defects. Tree 607 is an early mature to mature sycamore in good to fair condition that appears free from significant defects. Tree 609 is an early mature to mature Turkey oak in good condition and tree 610 is an over mature cherry in poor condition with extensive bacterial canker.

Outside the southern wall of the garden is a dense shrubbery with interspersed trees that is generally in good condition. It comprises cherry laurel, Pittosporum, a large coppice of hazel in good condition, a young to early mature cypress in fair condition, young yew in good condition and a suppressed young hornbeam in fair condition. There is one dead stump and an early mature to mature ash, tagged 612, in good to fair condition that is bifurcated at approximately 0.5 metres with an included union.

Between the disused long building and the southern boundary of the walled garden, heading east, this shrubbery enters a narrow path. Along this path are trees and shrubs in good to fair condition, though the track is overgrown and neglected. Amongst the vegetation is a mature yew in good condition, regenerated cherry, ash, beech and oak in good to fair condition, with box, holly, privet, hazel, Euonymus, cherry plum and elder in good to fair condition. In addition there is a remnant hawthorn hedge in fair condition at the back of the building, an early mature cherry in fair condition, a purple cherry plum in fair condition and a small section of cherry

laurel hedge, also in fair condition, along with the following scheduled trees. Tree 615 is a mature beech in good to fair condition that appears free from significant defects. Tree 616 is a mature cherry in good to fair condition and tree 617 is a mature multiple stemmed cherry in fair condition.

At the north east corner of the site, behind the shed, there are three mature trees. Tree 622 is a mature walnut in good condition that bifurcates at approximately 2 metres and has a wide, open crown. Trees 623 and 624 are mature larch, both in poor condition. Tree 623 has a severe lean and considerable dead wood and tree 624 only has a small amount of live crown.

South of the disused long building is an area of open grass with scattered trees that are scheduled below. West of the site, close to the summerhouse are four mature yew that are in excellent condition and should not be affected by the development. Tree 613 is a mature beech in good condition that appears free from significant defects. Tree 614 is a mature cherry in poor condition with a large cavity, decay and extensive bacterial canker. Tree 620 is an early mature birch in good to fair condition that appears free from significant defects.

At the south west corner of the site is tree 618, a mature beech in fair to poor condition. It is a large, wide-spreading tree that is heavily infected with the root and butt-rot fungi Ganoderma spp. and it has dense ivy throughout. Tree 619 is a mature beech in good condition that appears free from significant defects.

To the south of tree 619 are a number of shrubbery's that comprise, amongst others, Rhododendron, Berberis and Garrya, all in good to fair condition. There is a series of formal clipped hedges comprising Cypress, holly, cherry laurel, beech and Lonicera, all in good to fair condition. There is also a mature laburnum in fair condition.

Along the eastern boundary of the site are mature rose beds that are in good to fair condition. South east of the site, in the open field, is tree 621, a mature to over-mature ash in fair condition. It is a large, possibly veteran tree that is quite outstanding. It has a large, wide-spreading crown with many

hazard beams and a history of branch shed. It has fruit bodies of what appears to be the wood decay fungi Polyporus squamosus at the base.

From the eastern boundary of the former Station House to the former level crossing at Brennanstown Vale, there is a dense, naturally regenerated woodland that has established since the railway line was closed. It is multi-layered, has a good age structure and a diverse species composition. Within this woodland are young, early mature and mature sycamore, elder, ash and hawthorn, all in good condition.

To the north of the track bed, behind the boundary wall, are three early mature ash trees in good condition, which are growing on the site of the proposed Carrickmines stop. Also on the northern side of the track outside the boundary wall there is a young cypress hedge in good condition. Opposite this hedge, on the south side, there is a group of ten mature trees. These trees consist of three mature ash trees, one in poor condition and two in fair condition, three mature oak, one in fair and two in good condition, one mature beech in poor condition, a mature sycamore, a mature horse chestnut and a mature birch, all in good condition.

South of the track, growing up against the boundary wall, is a mature larch in good condition. Opposite the proposed stop, on the south side of the wall, are two large mature trees, one of which is a sycamore and the other a horse chestnut, both in good condition.

In the middle of the track there is naturally regenerated early mature goat willow in fair condition and a mature multiple stemmed white willow in good condition.

From the area of the former level crossing to the south-western area of Brennanstown Vale, there is regenerated woodland on the old track bed, which has established since the railway line was closed. This woodland has less mature trees than the previous section but has a denser under-story and all the trees are in fair condition. Its canopy has a more open nature with young to early mature ash and goat willow as the dominant species. Also present are young, early mature and mature hawthorn, early mature to mature sycamore, young elm, early mature cherry plum and mature blackthorn and elder.

From the end of the houses at Brennanstown Vale, to the edge of Carrickmines Wood, there is a section of elevated track with steep downward embankments to the north and south. Growing here is young oak, young to early mature ash, beech, hawthorn, elder, silver birch and sycamore with early mature goat willow and holly and a mature larch. All are in fair condition, with the exception of the larch that is in good condition.

Outside the northern boundary of the alignment is mature woodland with numerous mature beech that will require monitoring as they were noted as having some significant defects. Inside the boundary are mature beech, pine and larch, all in fair condition. On both sides of the alignment, on the downward slope, are early mature ash, sycamore and beech that are in good condition and are worthy of retention.

From the eastern end of Carrickmines Wood, beside an old stone wall, to the south there is isolated vegetation comprising mature hawthorn and elder with brambles and ivy. At the end of this wall there is a group of properties with private gardens.

At the proposed intersection of the Luas Line B1 alignment with Laughanstown Lane there are mature hedges on either side of the road; on the western side there is an unmanaged hedge comprised of hawthorn, elder, blackthorn and dense bramble either side of a farm gate. On the eastern side is a bank with mature multiple stemmed ash and mature cherry plum which appear to have been coppiced to form bushes with multiple stems. The hedge is in-filled with bramble.

Within the Cherrywood lands the proposed Luas Line B1 alignment follows a remnant section of the old track bed. Here is an area of isolated scrub on the side of the old embankment. There is also an area of sparse scrub including early mature elder, goat willow, ash, sycamore and hawthorn, with gorse all in fair condition.

To the north of this area is a remnant hedge which includes number of mature sycamore, five of which are in poor There is also a mature ash in poor condition together with a weak suppressed oak and an early mature sycamore in fair condition.



7.15.7.3.2 Potential Impact of the Proposal

The potential impact of the proposed development will result in all the vegetation and trees growing on the alignment of the former Harcourt Street Railway, and on the side of embankments and cuttings being removed. In addition, the trees and vegetation in sections of agricultural field boundaries, crossed by the proposed Luas Line B1 alignment will have to be removed. The proposed development of the park and ride facility will result in the removal of all the ornamental shrubs and trees within the bounds of the property affected by the development at Priorsland, Carrickmines.

Do-Nothing Scenario

Most of the existing trees along the alignment of the former Harcourt Street Railway would be expected to remain in their current unmanaged condition.

7.15.7.3.3 Remedial or Reductive Measures

As Luas Line B1 follows the alignment of the former Harcourt Street Railway, there are no remedial or reductive measures that require to be taken specifically to retain trees within this area. New landscaping will help to mitigate the loss of trees and vegetation in this area.

Where the Luas Line B1 alignment crosses agricultural land and requires the removal of poor quality hedges, there is only a slight negative impact. Any new landscape proposals will mitigate for the loss of trees and vegetation in these areas. (see also Section 7.15.7.2 Urban Townscape and Landscape).

At the location of the park and ride facility at Priorsland, Carrickmines, there are no remedial or reductive measures that can be taken as the vegetation will have to be removed to facilitate the development.

7.15.7.3.4 Predicted Impact of the Proposal

The section of the Luas Line B1 alignment between Ballyogan Road and the alignment of the former Harcourt

Street Railway will result in the removal of sections of unmanaged agricultural hedgerows. This represents a slight negative impact. However, a significant area of this landscape is committed to accommodate the alignment of the SEM. The section of the Luas Line B1 alignment on the alignment of the former Harcourt Street Railway, will result in the removal of all regenerated vegetation. It will also require trees and vegetation on the sides of cuttings to be removed on to have their growth controlled. This represents a moderate negative local impact to the receiving environment.

The old track bed at the former Carrickmines Station House has been planted with ornamental trees and shrubs. These will all have to be removed, which represents a significant negative local impact.

The removal of vegetation at Priorsland, Carrickmines to facilitate the development of the park and ride facility will have a significant negative local impact.

The insertion of Luas Line B1 on the old track bed will result in the loss of all trees and vegetation, which have grown since the Harcourt Street Railway was closed. Due to the presence of overhead wires, trees and vegetation along the sides of the old track bed will also have to be removed or have their canopies pruned in order to facilitate the safe operation of Luas Line B1. The removal of trees and vegetation in this area represents a significant negative local impact to the receiving environment.

To the west of Laughanstown lane, the Luas Line B1 alignment is through the Cherrywood lands. These land have been extensively modified and only a short section of the old track bed remains. The removal of some scrub in this area will have a locally moderate impact.

7.15.7.3.5 Monitoring

Any trees to be retained should be protected from construction damage by suitable fencing in accordance with the current best practices for the protection of trees on construction sites (BS 5837 Trees in Relation to Construction; Protection of Trees on Development Sites Part

1 & 2, Arboricultural Association; The National Joint Utilities Group 10, Guidelines for Planning, Installation & Maintenance of Utility Services in Proximity to Trees) .

All excavations near trees should also be in accordance with the current best practices. Monitoring of fences and the effects on construction will be required for the duration of the construction phase.

7.15.7.3.6 Reinstatement

A comprehensive scheme of new planting should be carried using suitable species alongside the re-aligned Ballyogan Road. Trees planted close to the overhead cables should be selected so as to be compatible with the operation of Luas Line B1. Typically trees should have an upright growth habit and should not have large leaves.

7.15.7.3.7 Potential Route Deviation

Lateral route deviation has the potential to further impact to a lesser or greater degree existing mature trees adjoining the alignment in Area 15.

7.15.7.4 THE BUILT ENVIRONMENT AND VISUAL IMPACT

7.15.7.4.1 Receiving Environment

At the eastern end of Ballyogan Road, the receiving environment is dominated by the SEM and associated interchange at Carrickmines. To the north of the SEM, at Carrickmines, the alignment of the former Harcourt Street Railway passes under the original railway bridge on Glenamuck Road. South west of the bridge, the alignment is bounded by a travellers halting site, and the back gardens of a group of cottages. North west of the bridge are the grounds of Carrickmines Tennis Club. North east are large private detached houses in their own grounds. The former Carrickmines Railway Station is situated immediately east of the railway bridge. The station house is now a private house,

and a single storey extension to that house has been built across the alignment. The northern platform and platform shelter are still largely intact, as is the pedestrian ramp down from Glenamuck Road. South of the station, a large house, Priorsland, stands in its own grounds. There is a proposal to construct a new road from Glenamuck Road to Cherrywood, running east from just south of Priorsland.

7.15.7.4.2 Potential Impact of the Proposal

Construction Phase

The potential impacts, on the M50, of the construction of the bridge carrying the Luas from Ballyogan Road back to the alignment of the former Harcourt Street Railway will be slight to significant in extent. The construction impacts will probably be perceived as neutral in character. The construction of the Motorway has brought about major changes in the character of the area, and the Motorway construction work is very extensive. This fact will reduce the perceived impact of work to construct Luas Line B1, even if work on the Luas alignment is not commenced until after the Motorway is open and fully complete. Once back on the alignment of the former Harcourt Street Railway, the potential impacts of construction work on the Luas Line B1 alignment are imperceptible to slight. Work within the confines of the former alignment is likely to go largely unnoticed except from some properties in proximity to the line. At Carrickmines, however, the impact of the reconstruction of the bridge is likely to be moderate, and probably neutral, during the construction phase, and short in duration. The impact of works to remove the extension to the former Station House will be significant in the immediate area of the building itself, but imperceptible to slight in the general area. The impact of the works to widen and extend the pedestrian access at the north side of Carrickmines Stop is likely to be perceived as slight. The impacts of the construction of road access and of extensive clearance works for the park and ride at the south side of the stop is likely to be significant to profound and negative in the immediate location of the work, slight to significant in the general area.

Impacts between Carrickmines and Brides Glen (Rathmichael) are generally not impacts on the character of

the built environment, and are more appropriately classified as landscape impacts, or, at Tully Church, impacts on architectural heritage. These impacts are addressed in other sections of this EIS. In the Cherrywood area, there is much new development, some completed, some under construction and yet more being planned. Where, at Cherrywood, development is complete or nearing completion, the Luas will bring about moderate visual impacts on the built environment. On the other hand, where Luas works coincide with the construction of other infrastructure or development, it is not appropriate to assess the development of the Luas as having an impact on other simultaneous development.

Operational Phase

The potential impact, on the M50, of the existence of the bridge carrying Luas Line B1 from Ballyogan Road back to the alignment of the former Harcourt Street Railway will be significant, but is likely to be regarded as positive in character. The sight, from the Motorway, of trams passing over the bridge is likely to provide visual interest. Once back on the former alignment, the impact of the existence of Luas Line B1 will be generally imperceptible to slight. The impact will be greatest on premises close to the alignment. It is likely that the presence of trams on what was once a local railway line will be regarded positively. At Carrickmines, the impact of the existence of the reconstructed railway overbridge will be imperceptible to slight. The bridge is almost unnoticeable at the moment, and although the new bridge parapet may be more apparent than the existing, it is probable that many users of Glenamuck Road will have little awareness of the existence of the altered bridge. The impact of the absence of the extension to the former Station House is likely to be regarded as positive. The impact of the existence of reopened pedestrian access point at the north side of Carrickmines Stop is likely to be perceived as slight. Because it is likely to be used by local residents, it is likely to be seen as making a positive contribution to the character of the area. The impacts of the existence of the new Carrickmines Stop, and in particular, of road access to it and of the park and ride at the south side of the stop, has the potential to be significant and negative. The impact of Luas Line B1 on passengers

using the tram is likely to be positive in character.

7.15.7.4.3 Remedial and Reductive Measures

Construction Phase

No remedial or reductive measures are proposed

Operational Phase

It is proposed to screen the park and ride facility and the access points to Carrickmines Stop with landscaping, so as to reduce impacts on the character of the surrounding area. However, it should also be noted that the character, and hence visual appearance, of areas along Luas Line B1 are planned to be significantly altered from their current rural setting to a new suburban built environment, by reference to the Draft Carrickmines-Cherrywood Action Plan.

7.15.7.4.4 Predicted Impact of the Proposal

Construction Phase

It is predicted that impacts, on the M50, of the construction of the bridge carrying Luas Line B1 from Ballyogan Road back to the alignment of the former Harcourt Street Railway will be slight to significant in extent. The construction impacts will probably be perceived as neutral in character. Once back on the alignment of the former Harcourt Street Railway, the impacts of construction work on Luas Line B1 will be imperceptible to slight. At Carrickmines, the impact of the reconstruction of the bridge will be moderate during the construction phase, and short in duration. The impact of works to remove the extension to the former Station House will be significant in the immediate area of the building itself, imperceptible to slight in the general area. The impact of the works to the pedestrian access at the north side of Carrickmines Stop will be slight. The impacts of the construction of road access and of extensive clearance and surfacing works for the park and ride at the south side of the stop will be significant to profound and negative in the immediate location of the work, slight to significant in the general area. Between Carrickmines Stop and Cherrywood the impacts of the Luas Line B1 alignment on the character of

the area are regarded as being impacts on landscape character, and so are not addressed here. There will be moderate impacts at Cherrywood arising from Luas construction works.

Operational Phase

It is predicted that the impact, on the M50, of the existence of the bridge carrying Luas Line B1 from Ballyogan Road back to the alignment of the former Harcourt Street Railway will be significant and positive. Once back on the former alignment, the impact of the existence of Luas Line B1 will be imperceptible to slight, and positive in character. The impact will be greatest on premises close to the alignment. At Carrickmines, the impact of the existence of the reconstructed railway overbridge will be imperceptible to slight. The impact of the absence of the extension to the former Station House will be positive. The impact of the existence of reopened pedestrian access at the north side of Carrickmines Stop will be slight, and positive in character. The impacts of the existence of the new Carrickmines Stop, of road access to it and of the park and ride at the south side of the stop, mitigated by suitable landscaping, will be slight to significant, but neutral in character. The impact of Luas Line B1 on passengers using the tram will be positive in character.

7.15.7.4.5 Monitoring

No monitoring of the impacts of the existence of Luas Line B1 alignment on the character of the built environment is proposed

7.15.7.4.6 Reinstatement

Not applicable in respect of the Built Environment and Visual Impact



The Former Carrickmines Station House



7.15.8.1 INTRODUCTION

This section addresses impacts on Material Assets. It includes an evaluation of the diversion and/or relocation of statutory undertakers equipment and all pipes and cables laid under the wayleave for the Luas Line B1 alignment. It is a key objective of this project that there should be no interruption to the operation of the alignment, for repairs or alterations to public utilities. The issue of Property is also assessed under the main heading of Material Assets.

7.15.8.2 PUBLIC UTILITIES

7.15.8.2.1 Receiving Environment

There are a number of services located within Area 15. Some of these may require diversion. The following utilities are known to exist within the receiving area which will be used for the trackbed:

Water

There are 14" and 33" watermain running in parallel with the Luas B1 alignment. Where necessary, diversion of these lines will be limited to removing them from under the limits of the Luas alignment.

Gas

There is a 200mm transmission main along the alignment of the former Harcourt Street Railway. This main will need diverting or protection prior to construction.

Sewers/Drainage

The Luas B1 alignment crosses a number of sewer/surface water lines within Area 15, ranging from 225mm to 900mm in diameter. All lines recorded are at sufficient depth and may only require protection where interaction occurs.

ESB

There is little or no interaction with low voltage supplies. There currently exist 110kV and 38kV overhead lines at Carrickmines and Laughanstown which will need to be lowered under the B1 alignment. A 220 kV transmission line

at Ballyogan East will need lowering/diverting under Glenamuck bridge.

Telecommunications

There is little or no interaction with existing telecommunications services.

The area of the Luas B1 alignment between Carrickmines and Cherrywood is planned to accommodate major development, and this may require additional study to determine the full extent of new services within this area. The extent of services throughout the receiving environment has been determined from extensive records, However, surveying and mapping will be required at a later date to determine the final diversionary requirements.

7.15.8.2.2 Potential Impacts of the Proposal

Construction Phase

Many services in Area 15 are outside the Luas B1 alignment. Diversion of utilities will be carried out prior to construction of the trackbed. Existing services with the exception of major sewers will be diverted out of the trackbed into the footway or into other parts of the carriageway. Service ducts under the alignment may be provided if required, for example to support redevelopment. Manholes will be required to provide sewers located outside the alignment. Impacts can arise from the disturbance of the existing roadway such as delays to traffic and access limitations to residential and commercial property. It may be noted that other than the cumulative effect of diverting all services out of the Luas Line B1 alignment, the works are no different to those carried out on a day to day basis by the statutory undertakers.

It is not anticipated that there will be any significant impact of the project in terms of public utilities, since the size of the services is such as not to require exceptional plant or equipment. Where trenching is undertaken there will be short periods when access to individual premises may be limited.

Operational Phase

In respect of public utilities, there will be no operational impacts.

Do-Nothing Scenario

Under a do-nothing scenario there are no implications in respect of public utilities other than to note that ongoing maintenance and repair work would continue to be done in any event.

7.15.8.2.3 Remedial or Reductive Measures

Construction Phase

In respect of the construction of the Luas B1 alignment, no specific remedial or reductive measures are required during the construction process.

Operational Phase

No remedial or reductive measures are required in respect of public utilities during the operational phase of Luas Line B1.

7.15.8.2.4 Predicted Impact of the Proposal

Construction Phase

Overall, a neutral impact is predicted.

Operational Phase

Overall, a neutral impact is predicted.

7.15.8.2.5 Monitoring

Any requirements to monitor for possible effects during the construction process will be laid down in the contract documents.

7.15.8.2.6 Reinstatement

Upon completion of the diversionary works of public utilities, these will be restored and full services access will be provided outside the Luas B1 alignment.

7.15.8.3 PROPERTY

7.15.8.3.1 Receiving Environment

Area 15 comprises for the most part a rural suburban setting which is beginning to witness significant change associated

with substantial planned new development in this area. Properties within Area 15 primarily comprise suburban residential dwellings. To the west of Glenamuck Road existing development includes the dwellings of Ballyogan Wood and Brighton Court, as well as a travellers' halting site. The Brennanstown Vale housing estate is located east of Glenamuck Road, on the northern side of the former Harcourt Street Railway alignment. The former Carrickmines Station House is located immediately adjoining this alignment with an extension constructed on the actual alignment itself. Another property, *Priorsland* is located immediately to the south and east of the former Station House property, with its lands extending northwards to the alignment of the former Harcourt Street Railway.

Other properties are located on Laughanstown Lane, and within new residential estates at Cherrywood.

A number of non-residential properties are located in the vicinity of the alignment. These include the Carrickmines Tennis Club fronting onto the western side of Glenamuck Road, the eastern lands of Leopardstown Racecourse bounded to the north by the alignment of the former Harcourt Street Railway and to the south by the SEM alignment, and existing farmholdings on Laughanstown Lane. Substantial new residential development of apartments and a partially complete Science and Technology Park have been developed at Cherrywood.

7.15.8.3.2 Potential Impact of the Proposal

Construction Phase

Acquisition of strips of land will be necessary to insert the Luas Line B1 alignment into Area 15. Significant and permanent property acquisition is shown on Map 3. Luas Line B1 runs for a significant distance along the alignment of the former Harcourt Street Railway. The existing extension of the former Carrickmines Station House will need to be demolished. This will constitute a significant and adverse potential impact. Overall, however, the potential impact on existing property in Area 15 during the construction phase of Luas Line B1 is not anticipated to be significant.

An area of lands within the property *Priorsland* will be



required for the construction of the planned Carrickmines park and ride facility. This area currently comprises the northern garden area and an agricultural grassland field to the east of the dwelling. This property will be impacted upon to a significant degree by the construction of the SEM Carrickmines Interchange immediately to the south, the associated upgrading of Glenamuck Road to the west as an Interchange slip road, and the planned construction of the Cherrywood spine road extending from the SEM Carrickmines Interchange to the south and south-east, which is an objective of the Draft Carrickmines-Cherrywood Action Plan. It is intended that the park and ride facility and bus interchange will ultimately link to the Cherrywood spine road. The potential impact of the facility on the existing property will be moderate, in cognisance of all other planned infrastructural development in the area.

Construction works could give rise to adverse effects by restricting or impeding access to properties within the existing Ballyogan Wood residential scheme. The development could also impede access to properties off Laughanstown Lane to the south of the Luas Line B1 alignment.

Operational Phase

Overall, the operation of Luas Line B1 in Area 15 will link the existing and planned future expanded residential and commercial properties of Carrickmines, Cherrywood-Rathmichael to Sandyford Industrial Estate and Dublin City Centre. The upgrading of road infrastructure in this area will improve road access in this area. Such road improvements include the SEM, Ballyogan Road (as an element of the Luas Line B1 proposal) and the planned Cherrywood spine road linking the Cherrywood District Centre to the SEM Carrickmines Interchange and thus opening up the currently undeveloped lands of Carrickmines and Laughanstown. This road will also serve the Carrickmines park and ride facility. These planned transportation improvements will result in a significant positive impact on property in the area by increasing the attractiveness of this area, and thereby strengthening the property market in the vicinity. While the property market in this area is strong at present, such demand could potentially increase due to the construction of Luas Line B1.

Do Nothing Scenario

Under a Do-Nothing Scenario, the property market in this section of the Luas Line B1 would remain strong due to the high demand for residential properties in the Carrickmines-Cherrywood area, particularly due to the planned construction of the SEM. However, it may be the case that major new development schemes may not be permitted to occur in their entirety in the absence of an efficient public transportation scheme serving the area.

7.15.8.3.3 Remedial or Reductive Measures

Construction Phase

Where applicable, compensation will be payable to the owners of acquired property, in accordance with the general Compulsory Purchase Code.

Following the removal of the existing extension to the former Carrickmines Station House – a Protected Structure, the wall of the original building will be closed with materials that will match those existing, in order to ensure a minimal impact on the property.

Landscaping, noise abatement, and other measures will be put in place to protect the amenities of the existing residential properties in proximity to the Luas Line B1 alignment. This will also include the area of the Carrickmines park and ride facility. Such measures are set out elsewhere in this EIS.

During the construction phase access to properties along the Luas Line B1 alignment will be maintained. In particular, the provision of a bridge and ramped structure at Ballyogan will ensure continued access to all parts of the eastern area of the property of Leopardstown Racecourse, with a minimal impact upon the operation of the Racecourse in this area.

Operational Phase

No remedial or reductive measures are required in respect of property.

7.15.8.3.4 Predicted Impact of the Proposal

Construction Phase

Overall, where acquisition of property is required to

accommodate the Luas Line B1 alignment, the remedial measures set out above will ensure that the impact on property will not be significant.

The impact on the existing property of the former Carrickmines Station House is predicted to be significant, comprising the loss of the existing extension, and that area of the property required to accommodate the Luas Line B1 alignment.

The impact on the existing property *Priorsland* is predicted to be slight to moderate, arising from the loss of existing undeveloped property required to accommodate the Carrickmines park and ride facility and bus interchange. Such development is anticipated to occur subsequent to the construction of the SEM Carrickmines Interchange, the upgraded Glenamuck Road and the Cherrywood spine road.

Operational Phase

Existing and planned future properties along the Area 15 section of Luas Line B1 will benefit from their location in close proximity to a new permanent public transport and upgraded road system. This will effect an overall significant positive impact on property in the area.

7.15.8.3.5 Monitoring

A Construction Team representative will be available during construction for consultation and liaison with members of the public.

7.15.8.3.6 Reinstatement

Reinstatement of property boundaries affected by acquisition of land will be carried out during the construction phase.

7.15.8.3.7 Potential Route Deviation

The purpose of the powers of deviation is to facilitate on-site construction and to further mitigate rather than contribute to an increased impact on any given aspect of the environment considered. It is not envisaged that any increased impact on property will result from the potential employment of these powers.



7.15.9.1 INTRODUCTION

This section of the EIS considers the impact of the proposed development on Cultural Heritage in Area 15 which is examined in terms of local history, buildings of artistic, historic and architectural merit and archaeology.

7.15.9.2 LOCAL HISTORY

7.15.9.2.1 Receiving Environment

Harcourt Street Railway

The development of railways had some parallels with rail and light rail developments being undertaken now. In the Nineteenth century, a group of investors would propose the route for a new railway, and submit their proposals to Parliament for approval in the form of a Bill. If the proposal was successful, Parliament would pass an Act approving the railway company and the carrying out of railway works, including the purchase of lands for such works. The Board of Works would appoint an arbitrator to prepare valuations of lands to be taken for use by the railway; the arbitrators fees and costs being paid by the railway company.

The Act of Parliament setting up the Dublin, Dundrum & Rathfarnham Railway (DD&RR) was passed on the 16th of July 1846. Running powers on that railway were granted to the Waterford, Wexford, Wicklow and Dublin Railway (WWW&DR) whose proposal for a line south from Dundrum were approved by an Act passed the same day. Section 27 of the DD&RR Act empowered the WWW&DR to take over the construction of the line between Dublin and Dundrum should the DD&RR not complete it within two years. The contract for construction of the DD&RR was awarded to William Dargan who started work in 1849. It appears that negotiations between the two railway companies continued over several years. The WWW&DR reduced its ambitions seeking to build only as far as Wicklow. The DD&RR abandoned its proposed branch to Rathfarnham but sought instead to go to Bray. There were new Acts and new names, the WWW&DR becoming the Dublin & Wicklow Railway, and the DD&RR becoming the Dublin & Bray Railway. The stipulation that the

Dublin & Bray Railway, if it failed to complete construction on time, could be taken over by the larger company was restated in the new Acts (Shepherd).

The minutes of the Board of the Dublin & Wicklow Railway record the process of the takeover of the Dublin & Bray Railway starting with negotiations in May of that year, with the formal takeover effectively complete in October. The first passenger service of the Dublin & Wicklow Railway between Dublin and Bray opened on the 10th of July 1854. It is noted in the minutes that among the directors of the Dublin & Bray Railway were a Mr Manders, Joseph Cowper and a William Frederick Darley. The last two became directors of the D&WR.

The Waterford, Wexford, Wicklow and Dublin Railway was much the more ambitious of the two concerns. It had been set up as part of a proposed new route from Dublin to London, with a port connecting by sea to Fishguard to be built at Greenore Bay (Rosslare Harbour). It was promoted by the Great Western Railway in England, who also supported the development of the South Wales Railway who would connect to Fishguard. The early ambitions of the WWW&DR were eventually realised. Later the railway had become the Dublin, Wicklow and Wexford Railway.

William Dargan was a central figure in the construction of this railway, as he was for most of the railways in Ireland. He was the main contractor for both the Dublin & Wicklow and the Dublin and Bray Railways. The minutes of the Board of the Dublin & Wicklow Railway record many transactions with him including payments of £16,000 on the 2nd of March 1852, and £20,563 on the 5th of August 1853. The minutes also record the transfer of 11,200 shares owned by the South Wales Railway to Dargan on the 20th of January 1852, and the purchase by Dargan of 9,763 shares on the 4th of January 1853. Perhaps most remarkably, at a meeting with Dargan present on the 29th of October 1853, when the Board resolved to draw a cheque in favour of Dargan for £50,000 due for his contracting work, Dargan offers to take payment in shares. This offer is gratefully accepted. It can be seen that Dargan was a railway engineer and financier as well as contractor. It may even have been he who designed the

structures that supported the elevated railway through Ranelagh, and probably the high viaducts at Milltown and Cherrywood as well. Dr Maurice Craig in his book '*Dublin 1660 to 1860*' says of Dargan:

'The great figure of the Irish Railway Age was William Dargan, who had worked under Telford on the Holyhead Railway, and returned to Ireland to have a finger in every railway scheme which touched Dublin either as engineer or financier, for he was both. He was the arch-improver of his time, making and losing several fortunes, the last of which disappeared in the attempt to make Bray, Co. Wicklow, the 'Brighton of Ireland'. He died in 1867. He projected and largely financed the Dublin Exhibition of 1853, a counter blast to the Cork Exhibition of 1852, and his committee included Roe the distiller and Sweetman the brewer. Queen Victoria visited it, and visited also Dargan himself at Mount Annville, Dundrum, offering him a baronetcy, which he refused. This exhibition was held on Leinster Lawn, the open space fronting Merrion Square. On this space, in 1859-60, rose the National Gallery (by Francis Fowke, later enlarged by Sir T. Deane the younger), of which the long return facade is by no means to be despised. It was built by subscriptions to a Testimonial Fund raised to commemorate Dargan's services, and his statue now stands in front of the Gallery.'

Another important figure is the renowned engineer Isambard Kingdom Brunel. Brunel was chief engineer to the Dublin & Wicklow Railway, and payments to him for engineering services are noted in the minutes of the Dublin & Wicklow Railway well after its takeover of the Dublin & Bray Railway. His presence in Ireland and his involvement with the D&WR probably arises out of his being one of the prime movers in the Great Western Railway in England, and out of the planned route from Dublin to London through Rosslare.

In 1846, the Dublin Dundrum and Rathfarnham Railway Company (later known as the Dublin–Wicklow Railway Company) was incorporated to run a railway from the city to Dundrum with a branch from Rathfarnham. The Dublin and South Eastern Railway line was constructed in 1854 and ran from Harcourt Street station initially to Bray in Co. Wicklow

and later was extended to Wicklow town and on to Wexford town. There were seven stations on its route from Harcourt Street to Bray and a nine arch bridge was constructed to carry the train across the River Dodder at Miltown. The last train which ran from Harcourt Street to Bray left the station on December 31, 1958. Carrickmines Station is still upstanding and is now in use as a private residence. Features of the original station, such as the station house, waiting shelter, and the platforms survive. This house is a Protected Structure.

Carrickmines

Historical references show that in 1360, a troop of light horsemen under the leadership of Sir John Bermingham was stationed at Carrickmines. In 1375 a large force under the leadership of John Colton, then Dean of St. Patrick's Cathedral and Treasurer of Ireland (and later Archbishop of Armagh), stayed at Carrickmines on one occasion for 3 days, and on another occasion for a month. On another occasion in 1388, forty mounted archers were stationed there, for which a contribution was levied from the distant lands of Fingal (Ball 1902).

In 1441 Henry Walshe was allowed ten marks - a large sum in those days - for protecting his liegemen and probably it was by him that the castle of Carrickmines was erected in the form which it stood for the next two centuries (Ball 1902). It is the ruins of this castle that are seen today.

The 16th century found the Walshes in occupation either as tenants or owners of a wide extent of country, and they had become one of the most important families on the south side of Dublin. However, the lands were subjected to devastating attack from Irish tribes towards the end of that century when the property was in the custody of Peter Barnewall, a guardian of Richard Walsh, who was a minor at the time (Ball 1902).

At the start of the 17th century the Walshes were described as '*a large and ancient stock and as men of note in the metropolitan county*', which was then 'rich and plenteous in corn and cattle, and inhabited by a people of stately port and garb' (ref. from 1642 in Ball 1902). However, before the



middle of that century the Walshes' prosperity was at an end. The part taken by the owner of Carrickmines Castle in the Cromwellian Rebellion of 1641 is not clear, but as a family the Walshes threw themselves behind the Irish side, and proved that they had become more Irish than the Irish themselves. Whether with or without the consent of the owner Carrickmines became the centre for disaffection in the southern part of County Dublin, and the Walshes figure prominently in the depositions made by those who suffered losses during that first winter (Ball 1902).

During that winter after the rebellion, the county of Dublin, south of the city, was in the hands of the rebels. Their defeat in February 1642 at Deans' Grange meant that they fell back to Carrickmines Castle, preparing to stand a siege. They put up a brave fight for a day but eventually the castle was breached. All within it, men, women and children were put to the sword and the castle was blown up and levelled to the ground (ref. from 1642 in Ball 1902). This probably explains why only a portion of one wall remains. After the Restoration, the Commissioners of Settlement awarded the lands of Carrickmines to the Earl of Meath.

Brennanstown

Ball (1902) records that the first documentary references to Brennanstown are in the fourteenth century, when it is listed as belonging to the Priory of the Holy Trinity. A large fortified house was built here at the end of the fourteenth century and leased to the chaplain of Tully church. At the beginning of the seventeenth century the house was leased to a William Walsh of Kilbogget. Ball also mentions that the lease included a clause that tenant must plant twenty oak or ash trees every year (1902, 104-6). It is possible that the trees around the valley of Glendruid, and in Laughanstown are part of that legacy. The Down Survey (1654) shows a large house and a cross, and what appear to be two water mills along the river.

Laughanstown

The lands at Laughanstown (or sometimes referred to in historical texts as Lehaunstown) lie between Carrickmines and Cherrywood and were originally known under the denomination of Tully, Before the English Conquest, they

were given by Sigrahere, son of Thorkil, to the Priory of the Holy Trinity. Amongst their occupants from the fourteenth to the 17th century, were the family of Macnebury, of Ashpoll, or Archbold, whose members were suspected of complicity in the murder of the owner of Bullock, and took part in the attack on that place, and of Crehall, in whose time a lease of the lands was given, probably for some legal purpose, to Thomas Smith, a Fellow of Trinity College.

After the Restoration the lands, which had been seized by the Parliament, and leased to Dame Sara Reynolds, were recovered, with those of Killiney, by Dr. Lightburne, and were subsequently held by the same lessees. There was at the time of the Restoration on the lands a good thatched castle, which was occupied by Edward Buller, whose tomb is the oldest in Stillorgan Churchyard, (the Tombstone in Stillorgan Churchyard bears the following inscription :- "Here under lieth the body of Edward Buller, who departed this life ye 1st of April, 16 [91], his wife, Jane Buller, alias Ferrar, caused this stone to be laid here for them and their posterity.") and five cottages, inhabited by nineteen residents, of whom five were of English and fourteen of Irish extraction.

At the close of the 18th century, in 1795, the lands of Laughanstown, then held by the tenants of Brennanstown, the Mercer family, were selected as the site of the great camp, which enters so largely into the history of the Rebellion of 1798, and which is connected with the fate of the brother Sheares. It accommodated as many as 4,000 soldiers concurrently.

From 1794 to 1799 the military camp extended over 120 acres, and at which over two thousand men were garrisoned, in response to threats from Napoleon. It also became a focus for social activities in the area (Ball 1902, 103-104). Simpson suggests that the camp may have been located either at Laughanstown Park, the site of Laughanstown Castle, recently identified by Swan (1998, 163 RMP No. DU026:093), or at Beechgrove, a Georgian house on the Bray Road, built on the site of a seventeenth century inn (Simpson 1995), which was demolished in 1997. Laughanstown Road is a military road, and is probably contemporary with the camp.

The first camp was located here in 1690 when it was occupied by the army of King James II. This camp appears to have been centred on and gave its name to Gun and Drum Hill north of Tully Church. King James is recorded as having spent the night in Puck's Castle near Rathmichael at the time. The second more extensive and historically more important camp was established here by the British government in 1795 to defend Killiney Bay from a possible French landing. It was later used as a garrison during the 1798 rebellion. This second camp had two lines of encampment - one on Gun and Drum Hill that probably stretched further south towards the current development area and one to the east on a line west of, and parallel to the current N11.

According to Ball (1902), the camp was a sight unparalleled in Ireland at the time. The original scheme was for a summer stay and the militia-men were to 'fold up their tents in six months time and leave'. However, extensive use was made of wooden houses or army huts, which were unusual for 1795. The first occupiers of the camp were the Westmeath militia, the Drogheda militia, and the Scottish Perthshire fencibles. Ferrar (1796) described the layout of the encampment thus:

"On the first and second lines are sixty-four wooden houses, each containing thirty-six privates and two non-commissioned officers. On the third line are the captains and subalterns' houses, in some of which three are quartered in distinct apartments; and on the fourth are the staff, to the rear of which are mess-houses and kitchens, with the quarter-guard in front, making in all 125 houses.....The wooden houses.....were pitched, canvassed and made waterproof."

The entire length of the line from right to left is one-third of a mile, which is gravelled forty-five feet in breadth.....and is the centre of a grand parade."

The camp was described by Ferrar as novel for its kind. It contained a ballroom and coffee room supplied with Irish and foreign newspapers and public breakfasts. Murray notes that the camp in reality had little enough concern with the rebellion of 1798 (Murray, 1944) though it was undoubtedly an object

of interest on the part of both the government and the rebels because of its situation between Dublin and the Wicklow Mountains. By April 23, 1799 the camp at Laughanstown was completely dismantled and all the troops were moved to other garrisons.

There were two lines of encampment, the first lay to the east of the line of the mid-19th century railway line from Harcourt Street to Shankill, which cut the Laughanstown lands in half. Ferrar's View of Ancient and Modern Dublin with its improvements to the year 1796 described the camp as lying 'between two hilly ridges', it was well watered by a mountain river and a perpetual spring. He also described a gravelled 'Grand Parade' which was one-third of a mile long and forty-five feet wide. This first line extends north-south running parallel to the modern Bray Road. A winding river lies at the base of the ridge, on the eastern side. To the west of the ridge the ground falls very sharply, creating a deep hollow with the land rising upwards again to the west. This was one of the hilly ridges described. The second line of encampment according to Ferrar was based on Gun & Drum Hill to the north-east of Tully Church, the second hilly ridge, which lies to the west of the railway embankment and is partly destroyed by it, its southern extent is not known. The second line of the camp may have extended quite far south from Tully Church. The road from Bray across the mountains via Herenford Lane and Puck's Castle Lane was also a military road.

Cherrywood

According to Joyce (1912) Bride's Glen (named after St. Brigid to whom Tully Church was dedicated) was once referred to as Cherrywood Glen in the eighteenth century, and as such, was mentioned in The Kilruddery Hunt. The slopes of the glen was thickly planted with larches, Scotch firs, chestnut trees and limes; amongst them remnants of cherry trees, which Joyce suggests may have given the short lived English name to the glen. The name has long since been discarded in favour of the original one. The word Cherrywood has remained however in the name of a townland which was associated with the early eighteenth century Cherrywood House. The first edition Ordnance Survey map shows the extent of the Cherrywood estate, which includes a large house and decorative gardens and some farmland.



7.15.9.2.2 Potential Impact of the Proposal

No likely or significant potential impacts on local history during the construction or operational phase are anticipated.

Do-Nothing Scenario

Under a do-nothing scenario, no implications arise in respect of local history.

7.15.9.2.3 Remedial or Reductive Measures

No remedial or reductive measures are necessary during the construction or operational phases of Luas Line B1.

7.15.9.2.4 Predicted Impact of the Proposal

No likely and significant impacts on local history are predicted during the construction or operational phases of Luas Line B1.

7.15.9.2.5 Monitoring

No monitoring measures are necessary in respect of local history.

7.15.9.2.6 Reinstatement

No reinstatement measures are required.



Detail of the parapet of the overbridge at Carrickmines

7.15.9.3 ARCHITECTURAL HERITAGE

7.15.9.3.1 Receiving Environment

The former Carrickmines Station House is a protected structure, and under the provisions of the Planning Act, 2000, structures and elements associated with the station fall within the definition of protected structure. These elements located within its curtilage include the railway overbridge, the former station shelter on the former north platform, the platform itself, the former tank house, and various walls, gates etc. Priorsland, a large house immediately south of the former station is also a protected structure, as are its outoffices and gates. Barrington’s Tower, a protected structure north east of the station, is a house built in the Georgian style in the 1950s around a Victorian folly in the form of a medieval tower. Glendruid, another protected structure nearby, is a substantial two storey Victorian house. Both stand in their own grounds north of the Luas Line B1 alignment. It is unlikely that Luas Line B1 will be visible from either. Tully Church, a national monument, stands on high ground south of the Luas Line B1 alignment as it approaches Cherrywood. The alignment will be visible from Tully Church.

7.15.9.3.2 Potential Impact of the Proposal

Construction Phase

The deck of the railway overbridge at Carrickmines has been altered and strengthened at some time in the past, and a central pier added, and so it is no longer as originally designed. As part of the Luas works, it is proposed to widen the bridge deck, providing new parapets, and supporting the deck on a new structure placed between the old abutments. The existing bridge parapets are to be removed for reuse at the station house. The impacts of the proposed works on the bridge are likely to be significant and negative, though less negative than would be the case if the bridge had not already been altered. The demolition of the extension to the former Carrickmines Station House is likely to be perceived as a significant positive impact on the building. The restoration of the Station House itself is outside the legal remit of the Luas Line B1 project. The proposed demolition of the former platform shelter is likely to result in a profound negative impact on the shelter itself, and a moderate impact on the station complex as a whole. The reuse of elements from the

former Carrickmines Station is likely to result in moderate positive impacts.

The construction of access to the new Carrickmines Stop across the lands of Priorsland, and of a park and ride facility on these lands, has the potential to result in significant to profound negative impacts on the heritage value of the Priorsland. It is unlikely that Luas works will have any impacts on Barrington’s Tower or Glendruid. Construction work at Laughanstown, visible from Tully Church is likely to have an imperceptible to slight impact on the heritage value of the church and its setting. The whole valley north of the church is to be the subject of development, and Luas Line B1 works will bring about very small impacts when compared with other works proposed.

Operational Phase

The existence of Luas Line B1, running along the alignment of the former Harcourt Street Railway, will bring the former line back into use and so is likely to result in a positive heritage impacts in the area. The proposed reuse of elements of the former station is also likely to result in positive heritage impacts in the area. The existence of access to the Carrickmines Stop across the lands of Priorsland, and of a park and ride facility on these lands, has the potential to result in significant negative impacts on the heritage value of Priorsland. The existence of Luas Line B1 is likely to result in either no impact or imperceptible impacts on Barrington’s Tower, Glendruid or Tully Church and their settings.

Do Nothing Scenario

Under a Do-Nothing Scenario, no impact arises in terms of architectural heritage.

7.15.9.3.3 Remedial and Reductive Measures

Construction Phase

At Carrickmines rail overbridge it is proposed to remove the cast iron parapet elements carefully and reuse them along the boundary between the Luas Line B1 alignment and the lands of the former Station House. It is proposed to record the bridge fully before alteration. It is also proposed to record the former platform shelter fully before demolition, and to offer it for salvage.

Operational Phase

It is proposed to screen the park and ride facility and that access to Carrickmines Stop with landscaping, so as to reduce impacts on the heritage character of Priorsland and the Station House.

7.15.9.3.4 Predicted Impact of the Proposal

Construction Phase

The alteration of the railway overbridge at Carrickmines will result in a significant negative impact on the bridge itself and slight negative impacts on the heritage of the surrounding area. The extent of these impacts will be reduced by the mitigation measures proposed. The demolition of the extension to the former Carrickmines Station House is likely to result in a significant positive impact on the building. The demolition of the former platform shelter will have a profound negative impact on the shelter itself, and a moderate impact on the station complex as a whole. The construction of access to the new Carrickmines Stop across the lands of Priorsland, and of a park and ride facility on these lands, mitigated by landscaping, will result in significant negative impacts on the heritage value of the house and slight negative impacts on the Station House. There will be no impacts on Barrington’s Tower or Glendruid. The impact of Luas Line B1 alignment works on Tully Church will be imperceptible when compared with other proposed works in the area.

Operational Phase

The existence of Luas Line B1 running along the alignment of the former Harcourt Street railway, will bring the former line back into use and so is likely to result in a positive heritage impact in the area. The proposed reuse of elements of the former station is also likely to result in a positive heritage impact in the area. The existence of access to the new Carrickmines Stop across the lands of Priorsland, and of a park and ride facility on these lands, mitigated by landscaping, will result in slight to significant negative impacts on the heritage value of the house, and imperceptible to slight impacts on the Station House. The extent of these impacts will be reduced as the proposed landscaping matures. There will be an imperceptible impact on Tully Church from the existence of Luas Line B1.



7.15.9.3.5 Monitoring

No monitoring of the impacts of the existence of Luas Line B1 on architectural heritage is proposed.

7.15.9.3.6 Reinstatement

Not applicable in respect of architectural heritage.

7.15.9.9.3.7 Potential Route Deviation

It is understood that the potential to vary the alignment, if invoked, will be in order to avoid and/or minimise impact in terms of the built and architectural heritage along the route and therefore should not result in an increased impact.

7.15.9.4 ARCHAEOLOGY

7.15.9.4.1 Receiving Environment

The following archaeological appraisal of Area 15 (Ballyogan Wood to Brides Glen stop) is based on a field inspection, targeted archaeological testing and a desk study, with reference to the Record of Monuments and Places (RMP) of the Department of Environment, Heritage and Local Government, several published sources, information from recent archaeological investigation and historic cartographic sources. Information on stray finds is taken from the topographical files of the National Museum of Ireland.

The main purpose of this section of the EIS is to assess the importance of the receiving archaeological environment and to assess the impact of the proposed route on this environment. Ameliorative measures are also proposed to safeguard any monuments, features or finds of antiquity.

Archaeological sites are broadly classified for the purposes of impact assessment in such a way that their importance in the archaeological record is suggested. A zone of archaeological potential (ZAP) is the area around the extant remains where related archaeological features are likely to occur. The numbers used to identify the sites are those of the RMP; all

sites listed in the RMP are given full protection under national monuments legislation.

Archaeological sites that occur within approximately 100m of the Luas route corridor are described below, sites which are relevant to the general archaeological landscape of the area are also mentioned in the text (refer to figure 1).

The Luas route corridor runs through the townlands of Ballyogan, Carrickmines Little, Brenanstown, Laughanstown and Cherrywood. The nearest recorded monument is located in Laughanstown and Cherrywod townlands. Recent infrastructural developments in the area have revealed further sites which had no visible archaeological remains, suggesting an even greater density of archaeological activity than the standing monuments alone would indicate .

The proposed Luas Line B1 runs near a number of recorded monuments. It runs near the former location of Carrickmines Castle (DU026:00501-04) and associated structures which were revealed during excavation of the South Eastern motorway (SEM); a watermill site (DU026:08001-08003); Brenanstown portal tomb (DU026:007); Tully Church and associated ecclesiastical remains (DU026:02301-09) and a dwelling site (DU026:114). The Proposed Luas line runs along the edge of the former military camp at Laughanstown (DU026:127). A ‘Park and Ride’ facility is proposed approximately 100m to east of (DU026:00501-04). This site was subject to archaeological testing by Abigail Cryerhall of MGL on the 25th and 26th of January 2005.

Archaeological background

No recorded monument will be impacted by the proposed scheme, however it must be noted that Luas Line B1 proposes to pass through the rich archaeological landscape of south county Dublin. Luas Line B1 also passes through the zone of archaeological potential (ZAP) for Lehaunstown camp (DU026:127) and in close proximity to the recently excavated sites along the SEM and in Cherrywood townland. Monuments and finds in the area date back to the Mesolithic through to the early medieval periods. Recent infrastructural, housing and industrial developments in the area and particularly in Carrickmines, Laughanstown (or

Lehaunstown) and Cherrywood, have produced a large number of sites that had no visible surface indications, suggesting even a greater density of archaeological activity than the standing monuments alone would indicate. One of the sites identified and excavated during works associated with the SEM was a prehistoric rock art site comprising three small boulders featuring cupmarks (licence no.: 01E0364) (Clinton 2003).

Mesolithic (9000–5000 BC)

The Mesolithic as yet is not well defined in south county Dublin, although there is a possible settlement on Dalkey Island dating from the late fourth millennium BC (Liversage 1968). One of the earliest prehistoric finds in the study area is a flint tool (NMI ref. 1967:137), either Mesolithic or Neolithic in date, found in Loughlinstown townland. More recently an early Mesolithic microlith was found in the area as part of the SEM excavations (Seaver 2004, 9). Greater evidence for early settlement in south county Dublin comes from burial sites and stray finds dated to the Late Neolithic (c. 2500BC) and Bronze Age (c. 2200 - 600BC).

Neolithic (c. 5000 – 2500 BC)

The evidence for settlement of the area during the Neolithic period occurs in the form of megalithic tombs and a distribution of datable stray artefacts. In south county Dublin, settlement appears to have been located at the foot of the Dublin/Wicklow Mountains and there is a striking east–west band of surviving tombs in this area. The earliest monument in the vicinity of the proposed Luas scheme is the portal tomb at Brennanstown (DU026:007, a National Monument). Portal tombs are a type of megalithic tomb, dating to the early part of the Neolithic, characterised by their massive capstones, balanced on two portals (the ‘door’ feature) and side stones and back stone. They are almost always situated near streams and rivers. The Brennanstown tomb is a particularly magnificent example, and is situated in a steep-sided wooded stream valley, facing upstream to the west. It has an additional set of side stones to the rear of the main chamber, which suggests the tomb may have had a second burial chamber.

There is another megalithic tomb at Laughanstown to the

south of the Luas line, this time a wedge tomb DU026:024, dating to the end of the Neolithic and the beginning of the Bronze Age (c. 2500–500 BC). It is unusual for a wedge tomb in that it faces north, across a small valley, whereas most wedge tombs face west. It is adjacent to a possible cairn site in Glebe townland DU026:025, possibly dating to the Bronze Age.

Recent Excavations: Further evidence of Neolithic settlement was identified in recent excavations at Cherrywood (Ó Néill 2000, Licence no: 99E0518), which seems to suggest that during this period, settlements were located in the narrow valleys leading down to the Loughlinstown River. Neolithic artefacts were recovered during excavations associated with the SEM motorway, where there was also evidence for Beaker occupation (2460-2200 BC) (O’ Drisceoil 2002, licence no: 02E0272) (Seaver 2004, licence no: 02E1133).

Excavations carried out to the south and west of the wedge tomb (DU026:024) produced material of probable Neolithic date. This included a number of broken and complete stone axes, concave and hollow scarpers, leaf-shaped arrowheads, blades, cores and stray western Neolithic potsherds (Seaver 2004, 9-10).

Bronze Age (2000–500 BC)

During the Bronze Age, settlement continued in the valleys occupied by the Neolithic habitations. As mentioned previously there is a cairn site in Glebe townland DU026:025, which may date to the Bronze Age, located to the southwest of Luas Line B1. It appears to be at least partly composed of natural rock outcrop. A further cairn was located in Laughanstown DU026:026 to the southeast of the wedge tomb. This site was excavated as part of the SEM and nothing of archaeological significance was encountered (Seaver 2004, licence no: 00E0283).

The tradition of incorporating natural features such as rock outcrops and glacial erratics into monuments is a feature of the Bronze Age and the fact that the feature was known locally as a cairn and marked as such on the Ordnance Survey map, suggest the possibility that it may be of



archaeological and folkloric significance, even if it is partly natural in origin. Predevelopment excavations associated with the SEM, housing and commercial developments in Cherrywood and Laughanstown have produced a large number of Bronze Age sites that had no visible surface indications (figure 4).

Recent Excavations: During works associated with the South-Eastern Motorway two possible *fulachta fiadh* were excavated in Ballyogan townland by Thaddeus Breen and Gary Conboy under licence numbers 02E0481 and 02E1276 (Breen 2004, Conboy 2004). One of which was found close to a stream, close to the proposed M50 overbridge two.

Two burnt mounds or *fulachta fiadh* and Early Bronze Age settlement evidence were excavated in Laughanstown and have been dated to the Bronze Age. These sites are located to the southwest of Tully church (DU026:023) (Seever 2004, licence no: 02E1133). Another two burnt mounds were identified in the same townland (McQuade 2003b, licence no: 03E1145), a short distance south of the Luas route. Middle Bronze Age structures and evidence for settlement activity were also uncovered in the fields surrounding the wedge tomb (DU026:024) to the southwest of the Luas line (Seaver 2004, licence no: 00E0283). Sub-circular post-built structures formed an unenclosed settlement, where pottery and querns were indicative of domestic activity. Within a stone enclosure 30m in diameter were a series of post holes and a pit, which provided a Bronze Age date. Prehistoric pits and settlement activity were excavated to the north of Tully Church (O'Donovan 1997, licence no: 97E0279), close to the route of the Luas line.

Other bronze age sites excavated as part of the SEM in Carrickmines Great townland include a Bronze Age flint knapping site with associated settlement evidence (licence number 02E0700) (Conboy 2004); a prehistoric settlement site with both Neolithic and Bronze Age evidence (licence number 02E0272) (O Drisceoil 2004) and a fulacht fiadh and burnt mound (licence numbers 02E1130 and 02E1188) (Conboy 2004, Reilly 2004). A further burnt mound, pits and a roadway was excavated by Fiona Reilly (licence number 02E0428). Pottery found in the trough dates the burnt mound to the Bronze Age, further attesting to the intensive use of this area at that period (Reilly 2004).

Bronze Age cremation burials were identified and subsequently excavated during earlier developments in Cherrywood, Laughanstown and Glebe (O'Donovan 1997; Ó Néill 2000; McQuade 2003a; Seever 2004). At Cherrywood Park II a ring barrow (licence no. 98E0526 & RMP no. DU026:027) has been dated to this period (Ó Néill 2000). Barrows are circular monuments, defined by a fosse and outer bank, with a flat or domed interior, dating from the Bronze Age into the Iron Age.

Iron Age

There is record of an extended inhumation in a long stone cist (NMI ref. 1957:350) in Loughlinstown, which is likely to date to the late Iron Age or early historic period. There is no mention of grave goods, suggesting it may be a Christian burial. By the Iron Age, the pattern of burial on the higher ground is well established at Cherrywood.

Recent Excavations: A late Bronze Age/Early Iron Age burial enclosure was excavated in Cherrywood as part of the Phase I mitigation works (Ó Néill 2000, Licence no: 99E0523). This was located adjacent to the Brides Glen stop of Luas Line B1 (figure 4). It measured 43m in diameter. A number of cremated human bone deposits were found in the ditch on the eastern side of the site; some small fragments of bronze and glass beads were recovered from these burials. Burials of cremated bone in the western part of the ditch did not contain finds, and two were placed on stone settings. Two pits were also inserted into the silted-up ditch fill and covered over with a large boulder. Although only one cremation, in the centre of the site, was found intact, the presence of fragments of burnt human bone in the grave fills of the later inhumation cemetery probably derive from cremation burials disturbed during the later interments. Some blue glass beads, a bronze fragment, a bone pin and an iron pin from separate deposits of burnt bone suggested that the burials date to the Iron Age (Ó Néill 2000). This site was subsequently reused during later periods.

Early historical (Christian) period (AD 400–1200)

The Iron Age burial enclosure mentioned above was reused during the sixth or seventh century AD as an inhumation cemetery (Ó Néill 2000, licence no: 99E0523). It certainly pre-dates Tully Church, but the burials are probably contemporary with the earliest phases of Mount Offaly in

Cabinteely (Conway 1999, licence no: 98E0035), where close to one thousand five hundred burials, ranging in date from the sixth/seventh centuries to the thirteenth century, were uncovered.

Recent Excavations: Thirty-eight burials were recovered at the Cherrywood site. Adult male, female and child burials were placed in earth-dug graves oriented roughly east–west, with the head to the west; in some 76% of cases, the head was protected by ‘ear muff’ stones. Two buckles and some other iron fragments suggested that some burials were clothed. An iron spade shoe was uncovered from one of the grave fills. Two structures were built at the southern end of the site during the early use of the cemetery, although one isolated burial lay between the two. The eastern structure appears to be some form of keyhole-shaped drying kiln. The western structure (Structure 4) was described by an oval setting of post holes containing a sunken area. A bone pin/needle was recovered from the sunken area. A single sherd of B ware and a lignite bracelet found in topsoil may also date to this phase (Ó Néill 2000). It is unclear what relationship this site had, if any, to the nearby ecclesiastical settlements (figure 4).

A series of earth-cut grain drying kilns were excavated along the line of the Southern motorway to the southwest of the study area (Seever 2004, licence no: 00E0283). These have been dated from the mid-sixth to mid-seventh century and are indicative of large scale crop husbandry.

A substantial ringfort, measuring 46m in diameter was excavated in the townland of Glebe as part of the SEM. Finds from this site include bone pins, metal pins, glass beads and slag associated with smithing. Field boundaries were also recorded and at least one of these was dated to the late seventh and late ninth centuries AD (Seever 2004, licence no: 00E0758) (figure 4).

There are several pre-Norman ecclesiastical settlements in the area. These are located in Kilgobbin, Tully (DU026:023) and Rathmichael, where the base of a round tower also survives.

In Cherrywood, the late Bronze Age/early Iron Age enclosure which was reused in the sixth and seventh centuries as an

inhumation cemetery was again reused in the ninth century (Ó Néill 2000, Licence no: 99E0523). In the late ninth century Norse settlers constructed a long house on the site of the enclosure. The rubbish from the demolition of this long house was deposited in a pit on the site and contained a large amount of animal bone and artefacts, including a whale bone plaque, generally associated with Norse women, and other typical Norse finds. When the long house was deliberately demolished, it was replaced by two structures. The path linking the two structures survived in one place as a narrow cobbled area. The northern structure was similar to Type 1 houses from urban levels in Dublin and appears to have been rebuilt in situ a number of times. The entranceway was marked by a small cobbled area, and a ringed pin and bone comb were uncovered from this structure. The second structure was rectangular and had an entrance to the south (Ó Néill 2000). This site is very important, as it is among the very few known rural Norse settlements in Ireland and the first one to be excavated to this extent.

At Tully Church DU026:023, a small ruined medieval church there are stone crosses and decorated cross slabs dating from the 8th to 12th centuries. By 1615 the church was in ruins, it was repaired in 1630, but went out of use after the 1641 rebellion. The church is described in further detail in the section on Laughanstown.

Recent Excavations: Archaeological monitoring and excavations were carried out in 1997 by Edmond O'Donovan (Licence no.: 97E0279) along the line of access roads leading to a housing development at Cherrywood, Laughanstown and Loughlinstown, Co. Dublin. An enclosure ditch was located on the north western side of Tully Church (RMP DU026:023). A trench was fortuitously excavated immediately inside a gate adjacent to Tully church to prevent unauthorised access to the development site. The gate is located on the north western side of the graveyard with good views over Laughanstown and the hillock on which prehistoric activity was located. The trench uncovered the inner edge of the ditch, however neither the base of the ditch or its outer edge were revealed. The ditch was located 7.60m from the present graveyard wall and was cut into layers of banded compact gravel and sand. The exposed section revealed that the ditch was at least 1.80m wide and 0.60m

deep. The lowest fill evident in the ditch was a grey/tan plastic clay. A grey/brown silty clay was identified above the plastic clay. Bone was evident in silty clay layer, however nothing datable was identified during the cleaning of the section. A thick (c. 0.68m) deposit of modern spoil sealed all the features.

Medieval period (AD 1200–1600)

A fragment of gable wall now located on a central island within the newly constructed interchange for the SEM (formerly located in a farmyard adjacent to the Glenamuck Road) is all that remains of a strongly fortified castle which was erected at Carrickmines (DU026:005). This castle was part of a deserted settlement. A castle was probably first constructed here in the mid 13th century to protect the southern marches of the city of Dublin. The new settlers were exposed to frequent attacks in this area, as it was a convenient point for Irish tribes such as the O'Tooles and the O'Byrnes to raid from the mountains. A branch of the Walsh family, to which the lands of Carrickmines had been given, garrisoned the castle. They were very successful agriculturists and military men (Ball 1902). At first they were able to withstand attack alone but later troops were dispatched from time to time to aid them. The castle ceased to function in late March 1642, when it was overrun by Dublin forces under the command of Sir Simon Harcourt (Clinton 2004). A section of the Pale boundary survives west of the castle site (DU026:115). A Watermill Site (DU026:080) located to the east of the castle may be associated with the castle and settlement site.

The medieval tower house, southwest of Tully Church at Lehaunstown Park was identified by Swan in an EIS for a development in the area (Swan 1998). He refers to a study by Kathleen Turner (1983) of the antiquities of the barony of Rathdowney in which she mentions a 'Lehaunstown House' (Swan 1998). A reference to an episode in the 1641 rebellion gives a description of a 'good thatched castle' belonging to the dean of Christ Church Cathedral. It is probably one of a line of castles built to protect south county Dublin from attacks by Irish tribes, who had been driven into the Wicklow Mountains after the Norman invasion. The site was subsequently added to the RMP as DU026:093. A possible field system identified to the southwest of this site may

represent the medieval settlement at the time of the tower house or earlier (DU026:071). The area was tested in 1997 by Eoin Sullivan and nothing of archaeological significance was revealed (licence no: 97E0360).

A single base sherd of medieval pottery (NMI ref. 1975:247) provenanced to Laughanstown was recorded in the topographical files of the National Museum of Ireland. Glebe House (DU026:114) located to the south of the proposed Rathmichael Luas stop is shown on the first edition Ordnance Survey Map (1843). There are also a group of five buildings shown in the area of Glebe House on Rocque's 1756 map of Dublin described as belonging to Dr. John Lyons.

Recent Excavations: Archaeological assessment, trial trenching and monitoring took place adjacent to Carrickmines Castle in 1996, in advance of the Carrickmines to Shanganagh Main Drainage Scheme (Connolly in Bennett (ed.), 1997). Although no medieval features were revealed in the 200m stretch of pipeline, Michael Moore of the Department of Environment, Heritage and Local Government identified a series of significant earthworks in a field west of the castle. They appeared to be the remains of a deserted settlement associated with the castle. Accordingly, the RMP designation for Carrickmines Castle was extended to include all of these outlying earthworks. The area of interest of this site (DU026:005) was excavated as part of the SEM (2000-January 2005; licence no. 00E0045, 00E0525 & 02E1532).

Excavations at Carrickmines Castle (DU 26:005) revealed a medieval landscape which included a revetted fosse, two outer earthen banks and fosses, an earlier ringwork castle type enclosure featuring a massive fosse, an outer fosse and attendant banks, a mill pond and mill race, house sites, industrial features, the main castle entrance and a medieval village (Clinton 2004). Some of these sites were located east of the designated zone of archaeological potential (figure 4).

A medieval ditch was excavated along the route of the SEM in the townland of Laughanstown (Conboy 2002b).

Historical Background

Historical background of the townlands along proposed Area 14 Luas Line B1.

Harcourt Street Railway

In 1846, the Dublin Dundrum and Rathfarnham Railway Company (later known as the Dublin–Wicklow Railway Company) was incorporated to run a railway from the city to Dundrum with a branch from Rathfarnham. The Dublin and South Eastern Railway line was constructed in 1854 and ran from Harcourt Street station initially to Bray in Co. Wicklow and later was extended to Wicklow town and on to Wexford town. There were seven stations on its route from Harcourt Street to Bray and a nine arch bridge was constructed to carry the train across the River Dodder at Milltown. Harcourt Street station was built in 1859 to the design of George Wilkinson and the line was officially opened after the completion of the station. Much of the railway can still be seen including the spectacular nine arch viaduct at Milltown. The last train which ran from Harcourt Street to Bray left the station on December 31, 1958. Carrickmines Station is still upstanding and is now in use as a private residence. Features of the original station, such as the station house, waiting shelter, and the platforms survive. This house is listed in the County Development plan as a protected structure.

Brennanstown

Brennanstown is probably best known for its magnificent portal tomb or cromlech (DU026:007, a national monument), situated in the valley of Glendruid along the Loughlinstown River. Luas Line B1 proposes to run in a culvert beneath the proposed M50 interchange link to the Cherrywood District Centre c. 70m (and south of the river) from the area of interest of this site.

Ball (1902) records that the first documentary references to Brennanstown are in the fourteenth century, when it is listed as belonging to the Priory of the Holy Trinity. A large fortified house was built here at the end of the fourteenth century and leased to the chaplain of Tully church. At the beginning of the seventeenth century the house was leased to a William Walsh of Kilbogget. Ball also mentions that the leases



included a clause that tenant must plant twenty oak or ash trees every year (1902, 104-6). It is possible that the trees around the valley of Glendruid, and in Lehaunstown are part of that legacy. The Down Survey (1654) shows a large house and a cross, and what appear to be two water mills along the river.

Carrickmines

The name Carrickmines is derived from the Irish word Carraig–maighin meaning the little plain of the rocks. Historical references show that in 1360, a troop of light horsemen under the leadership of Sir John Bermingham was stationed at Carrickmines. In 1375 a large force under the leadership of John Colton, then Dean of St. Patricks and Treasurer of Ireland (and later Archbishop of Armagh), stayed at Carrickmines on one occasion for 3 days, and on another occasion for a month. On another occasion in 1388, forty mounted archers were stationed there, for which a contribution was levied from the distant lands of Fingal (Ball 1902).

In 1441 Henry Walsh was allowed ten marks - a large sum in those days - for protecting his liegemen and probably it was by him that the castle of Carrickmines was erected it stood for the next two centuries (Ball 1902). It is the ruins of this castle that are seen today.

The 16th century found the Walshes in occupation either as tenants or owners of a wide extent of country and they had become one of the most important families on the south side of Dublin. However, the lands were subjected to devastating attack from Irish tribes towards the end of that century when the property was in the custody of Peter Barnewall, a guardian of Richard Walsh, who was a minor at the time (Ball 1902).

At the start of the 17th century the Walshes were described as 'a large and ancient stock and as men of note in the metropolitan county', which was then 'rich and plenteous in corn and cattle, and inhabited by a people of stately port and garb' (ref. from 1642 in Ball 1902). However, before the middle of that century the Walshes' prosperity was at an end. The part taken by the owner of Carrickmines Castle in the Cromwellian Rebellion of 1641 is not clear, but as a family the Walshes threw themselves behind the Irish side, and proved



that they had become more Irish than the Irish themselves. Whether with or without the consent of the owner Carrickmines became the centre for disaffection in the southern part of county Dublin, and the Walshes figure prominently in the depositions made by those who suffered losses during that first winter (Ball 1902).

During that winter after the rebellion, the county of Dublin, south of the city, was in the hands of the rebels. Their defeat in February 1642 at Deans’ Grange meant that they fell back to Carrickmines Castle, preparing to stand a siege. They put up a brave fight for a day but eventually the castle was breached. All within it, men, women and children were put to the sword and the castle was blown up and levelled to the ground (ref. from 1642 in Ball 1902), the remains of the massacre victims were revealed during the recent excavations (licence no: 00E0525) (figure 4). This levelling work probably explains why only a portion of one wall remains. After the Restoration, the Commissioners of Settlement awarded the lands of Carrickmines to the Earl of Meath.

Laughanstown

The Civil Survey (Vol. VII) of County Dublin (Simington 1945) does not refer to any properties within the townland of Laughanstown or Lehaunstown in the parish of Tully, although it does refer to a ‘castle and strong bawn’ in ‘Loughanstown, Parish of Killeny.’ The Trace (map) of the Down Survey, however, clearly depicts a structure in ‘Loghenstowne’ townland, accurately located in Tully Parish. The church is correctly positioned a short distance to the northeast, indicating that this may well be the property now known as Lehaunstown Park (DU026:093). It is marked in Rocque’s 1756 map as ‘Loughlans To.’ and is shown as a substantial building with several outbuildings and what appears to be a bawn wall.

Tully Church (DU026:023) in Laughanstown (or Lehaunstown) townland is one of the best-known archaeological monuments in this part of Dublin County. It is a small ruined medieval church in an oval graveyard set within an outer enclosure. There are three stone crosses, which date to between the eighth and eleventh centuries AD, and two decorated cross-slabs known as Rathdown slabs, due to their prevalence in this barony. A third slab is decorated with three concentric circles. The twelfth-century cross to the

north of the graveyard appears to mark the outer boundary or tearmann of the sacred area around the church.

Tully Church itself is first mentioned in 1179 as Tullaghnaneptscop (Hill of the Bishops) when it was granted to the Priory of the Holy Trinity by a Viking lord, Sigrahnre son of Thorkil, who also owned lands in Brennanstown. Joyce (1912) relates that the name derives from a legend in which seven holy men went from this establishment to visit St. Brigid. The church is dedicated to Brigid and Joyce also suggests that the nearby Bride’s Glen derives its name from her. Tully Church was ruined by 1615 and went out of use altogether after the 1641 Rebellion, having been repaired in 1630.

Laughanstown townland had a large military camp from 1794 to 1799, at which over two thousand men were garrisoned, in response to threats from Napoleon. It also became a focus for social activities in the area (Ball 1902, 103-104). Simpson suggests that the camp may have been located either at Lehaunstown Park, the site of Lehaunstown Castle, identified by Swan (1998, 163 RMP No. DU026:093), or at Beechgrove, a Georgian house on the Bray Road, built on the site of a seventeenth century inn (Simpson 1995), which was demolished in 1997. Lehaunstown Road is a military road, and is probably contemporary with the camp.

The first camp was located here in 1690 when it was occupied by the army of King James II. This camp appears to have been centered on and gave its name to Gun and Drum Hill north of Tully Church. King James is recorded as having spent the night in Puck’s Castle near Rathmichael at the time. The second more extensive and historically more important camp was established here by the British government in 1795 to defend Killiney Bay from a possible French landing. It was later used as a garrison during the 1798 rebellion. This second camp had two lines of encampment - one on Gun and Drum Hill that probably stretched further south towards the current development area and one to the east on a line west of, and parallel to the current N11.

According to Ball (1902), the camp was a sight unparalleled in Ireland at the time. The original scheme was for a summer stay and the militia-men were to ‘fold up their tents in six

months time and leave’. However, extensive use was made of wooden houses or army huts, which were unusual for 1795. The first occupiers of the camp were the Westmeath militia, the Drogheda militia, and the Scottish Perthshire fencibles.

The camp was described by Ferrar (1796) as novel for its kind. It contained a ballroom and coffee room supplied with Irish and foreign newspapers and public breakfasts. Murray notes that the camp in reality had little enough concern with the rebellion of 1798 (Murray, 1944) though it was undoubtedly an object of interest on the part of both the government and the rebels because of its situation between Dublin and the Wicklow Mountains. By April 23, 1799 the camp at Lehaunstown was completely dismantled and all the troops were moved to other garrisons.

There were two lines of encampment, the first lay to the east of the line of the mid-19th century railway line from Harcourt Street to Shankill, which cut the Lehaunstown lands in half. Ferrar’s View of Ancient and Modern Dublin with its improvements to the year 1796 described the camp as lying ‘between two hilly ridges’, it was well watered by a mountain river and a perpetual spring. He also described a gravelled ‘Grand Parade’ which was one-third of a mile long and forty-five feet wide. This first line extends north-south running parallel to the modern Bray Road. A winding river lies at the base of the ridge, on the eastern side. To the west of the ridge the ground falls very sharply, creating a deep hollow with the land rising upwards again to the west. This was one of the hilly ridges described. The second line of encampment according to Ferrar was based on Gun & Drum Hill to the northeast of Tully Church, the second hilly ridge, which lies to the west of the railway embankment and is partly destroyed by it, its southern extent is not known. The second line of the camp may have extended quite far south from Tully Church. The road from Bray across the mountains via Herenford Lane and Puck’s Castle Lane was also a military road.

Cherrywood

According to Joyce (1912) Bride’s Glen (named after St. Brigid to whom Tully Church was dedicated) was once referred to as Cherrywood Glen in the eighteenth century, and as such, was mentioned in The Kilruddery Hunt. The slopes of the glen was thickly planted with larches, Scotch firs, chestnut trees and limes; amongst them remnants of cherry trees, which Joyce suggests may have given the short

lived English name to the glen. The name has long since been discarded in favour of the original one. The word Cherrywood has remained however in the name of a townland which was associated with the early eighteenth century Cherrywood House. The first edition Ordnance Survey map shows the extent of the Cherrywood estate, which includes a large house and decorative gardens and some farmland.

Recorded Archaeological Monuments:

RMP No.	DU026:005 (/01–04)
Townland:	Carrickmines Great
Site Type:	Deserted Settlement
NGR:	32182/22407
Castle Site	32185/22404
Bawn	32188/2240
Earthworks	32176/22405
Mill race (possible)	32189/22417

Distance: The proposed Luas Line B1 runs c.73m from the area of interest of DU026:005(01-04), a deserted settlement site (figure 4).

Description: A fragment of gable wall c. 4m high, built of randomly coursed blocks of granite incorporated into farm outbuildings is all that remains of a strongly fortified castle which was erected at Carrickmines (DU026:005). It is now located on a central island within the newly constructed interchange for the SEM (formerly located in a farmyard adjacent to the Glenamuck Road). This castle was part of a deserted settlement. As stated above recent excavations (2000-January 2005; licence no. 00E0045, 00E0525 & 02E1532) have dated the castle to the mid 13th century and was in use until 1642, when it was overrun by Dublin forces under the command of Sir Simon Harcourt (Clinton 2004). See general archaeological background for further detail.

Impact: The proposed Luas line B1 will not impact on the known medieval landscape of Carrickmines Castle DU026:005. Recent excavations extended east outside the sites designated zone of archaeological potential suggesting that there may be further unknown archaeological features associated with the castle in the area. The re-use of the Old Harcourt Street railway line along this section of the route ensures that the Luas will not impact on the archaeological resource, however the development of the ‘Park and Ride’ facility at the Carrickmines stop will result in the development



of previously undisturbed land which may result in the identification of previously unknown archaeological sites.

RMP No.	DU026:080
Townland:	Brennanstown/Carrickmines
Site Type:	Earthworks
NGR:	32249/22396
Watermill Site	32250/22395

Distance: The proposed Luas Line B1 runs along the line of the disused railway c.30m from the area of interest of this site (figure 4).

Description: Both sites are marked on the 1837 Ordnance Survey map as the ‘Site of an Ancient Mill’. The site is also marked on the Down Survey Map of 1655. Ordnance Survey letters (1837) include sketches which show foundations of rectangular buildings and a feature marked as an ‘Old Quern’ a series of enclosures are marked to the south of these.

Impact: The proposed Luas line B1 will not impact on the earthworks and watermill site DU026:080 as it will run along the old Harcourt Street line.

RMP No.	DU026:007
Townland:	Brennanstown
Site Type:	Megalithic tomb
NGR:	32290/22419

Distance: Luas Line B1 runs c. 70m (and south of the river) from the area of interest of this site (figure 4).

Description: Portal tomb (National Monument) with portal stones, each 1.53m in height, and a full door-stone. The tomb comprises a portico, a chamber and a suggestion of another chamber at the rear. The capstone is very large and roughly square, estimated weight 40–60 tons.

Impact: Luas Line B1 runs along the old Harcourt Street line some 70m south of the monument DU026:007 and south of a river. The Luas Line proposes to run in a culvert beneath the proposed M50 interchange link to the Cherrywood District Centre c. 70m (and south of the river) from the area of interest of this site. Luas Line B1 will not impact on the Megalithic tomb DU026:007.

RMP No.	DU026:023
Townland:	Laughanstown
Site Type:	Ecclesiastical remains
NGR:	32331/22345

Distance: The proposed Luas Line B1 runs c.90m from the area of interest of this site (see figure 4)

Description: Site of Tully church and graveyard. It has two associated high crosses, one possible cross and a fragment of a fourth, four grave slabs and a cross-inscribed stone. The remains of the church include a chancel with a round-headed arch. The nave does not survive but its outline can be seen as narrower than the chancel which was a later addition, probably in the 11th or 12th centuries. There appears to have been two enclosures, an inner and outer one noted from aerial photographs by Leo Swan (1994). The inner enclosure may have been the line of the graveyard wall. The outer enclosure ditch was located on the northwestern side of the church during monitoring of an adjacent development area (Ed O’Donovan, pers. comm.). As part of the Science and Technology Park development an extensive programme of geophysics was carried out at Cherrywood and Laughanstown. This extended as far as Tully church. An outer ditch and a number of internal features were noted and the field system noted on Rocque’s map was also visible (Ó Néill 2000). Test trenching in the northeast corner of the site was tested exposing glacial tills and heavily scarred tills, suggesting that the ground surface may have been modified during the construction of the Harcourt to Shankill railway line to the north in the 1850s (Ó Néill 2000, 00E0565).

Impact: The proposed Luas Line B1 runs c.90m from the area of interest of this site. It will not impact on the known archaeology of Tully church and given the distance from the Luas line it is highly unlikely to impact on any subsurface outer enclosure remains.

RMP No.	DU026:127
Townland:	Loughlinstown
Site Type:	Military Camp (Site of)
NGR:	Unknown

Distance: The proposed Luas Line runs adjacent to and inside the area of interest for this site (see figure 4)

Description:mTesting was carried out within part of the

military camp affected by the construction of the southern motorway, but nothing of archaeological significance was identified (Lynch 2000, 00E880). A quasi- industrial site dating from the 18th-century was excavated to the southwest within the site of the military camp (DU026:127) (McQuade 2003c, licence no:04E0896). Further 18th century activity was excavated just north of the proposed Luas (McQuade 2003c, licence no:03E1471). Following monitoring of topsoil stripping within the former military camp (McQuade 2003d, licence no: 03E1598) an area of archaeological potential was identified and subsequently excavated (Phelan 2004, licence no: 03E1598). The archaeological features comprised a series of pits and two linear ditches. No datable artefacts were retrieved during excavation and as yet no date is available for the site (Phelan pers. comm.). The pits were located at the northern extent of the site and one of the ditches continued beyond the northern limit of topsoil stripping into the present study area. The excavator concluded that the excavated features are probably ‘part of a larger archaeological complex extending northwards and westwards’ (Phelan 2004). The present study area lies to the north and west of the excavated features and it is highly likely that further archaeological material exists within the proposed area of development. Recently south of the military camp and Luas line, a Bronze Age site was excavated. The archaeological features included a cremation pit, possible kiln and in situ burning (McQuade 2003a, 00E1145). Excavations undertaken by Ed O’Donovan in the area revealed features dating from the prehistoric to post medieval periods (licence no: 97E0279)

Impact: The proposed Luas Line B1 travels through a section of the zone of archaeological potential of the military camp (DU026:127). However, a substantial part of this site (the southeastern portion) has been tested and monitored (see above). Relatively few finds relating to the military encampment were revealed. It is thought that the intensive agricultural activity has led to the ploughing out of many of the features. The construction of the Harcourt Street line alongside the site also resulted in disturbed ground. However recent excavations have revealed that the immediate area along the route of the Luas Line is rich in archaeology, therefore there is the potential of subsurface archaeological remains being encountered during the construction of the line.

RMP No.	DU026:028
Townland:	Loughlinstown
Site Type:	Inn site
NGR:	32440/22342

Distance: The site of the 18th century Kilruddery Inn (DU026:028) lies some distance to the northeast of the Luas line (see figure 4).

Description:In the 19th century the inn was converted to a villa and was known as Beechgrove House. This two-storey Georgian house, cobbled yard and outhouse were demolished prior to pipelaying for the Carrickmines – Shanaganagh drainage scheme and the foundations were investigated in advance of pipelaying (Breen). A linear stone feature, possibly a wall foundation and an 18th century rubbish deposit, were excavated to the west of the Inn and are most probably associated with it (O’Donovan 1997).

Impact: There will be no impact on the previously excavated inn site.

7.15.9.4.2 Archaeological Testing

As part of the Luas Line B1 development, a ‘Park and Ride’ facility with an access road to the motorway is proposed for the Carrickmines stop. The proposed site incorporates parts of Priorsland house gardens and an adjoining field. The ‘Park and Ride’ facility is located in a known sensitive archaeological landscape (figure 4).

The location of the ‘Park and Ride’ facility was tested on the 25th and the 26th of January 2005 by Abi Cryerhall (licence no: 05E0010). It lies northeast of Carrickmines Castle (DU026:005) and north of a prehistoric rock art site (Clinton 2004, licence no: 01E0364). A Bronze Age settlement site with evidence for at least three structures, flint knapping/tool production and other industrial activity was located two fields to the south of the proposed development site (O’Drisceoil, 2004). These sites were excavated during the construction of the SEM.

A total of nine trenches were mechanically excavated by JCB within half of the proposed development site. Eight of these were excavated in the ‘Park and Ride’ site, and one along the associated access road.



The testing programme uncovered evidence of archaeological activity comprising two finds of a prehistoric date and one archaeological feature of an unknown date. The two finds, a small pottery sherd and a flint blade/scraper were found in the subsoil layer. There were no features identified within the trenches that were associated with these finds.

The archaeological cut feature, consisting of a post hole was located during the test trenching in Trench 8. This posthole is suggestive of prehistoric structural remains and it was sealed by the subsoil layer and cutting the natural layer.

While this posthole appears to be an isolated feature of as yet undetermined function, it does suggest the existence of a larger archaeological site. This may only be uncovered during topsoil removal over a larger area. It is worth noting that the posthole and two stray finds were located in close proximity to each other, to the south of the ‘Park and Ride’ area and along the northern part of the access road. Carrickmines Castle is located to the south-west of the proposed development site. The extent of these remains has been established by archaeological work associated with the construction of the SEM. The boundary of this medieval castle complex does not appear to encroach into the Park and Ride site. No medieval finds or features were uncovered during the testing programme. Though it is noted that only half of the footprint was available to test, and the remaining area is closer to the medieval castle site (see Appendix 15D for full testing report).

7.15.9.4.3 Characteristics of the proposal

The proposed Luas Line B1 travels through the townlands of Ballyogan, Carrickmines Great, Brennanstown, Laughanstown and finally through Cherrywood. The route commences at Ballyogan Wood travelling along the Ballyogan Road; it curves northwards across the M50 via a proposed bridge. It then continues along the Old Harcourt Street Railway line for just over a kilometre and passes under Glenamuck Bridge which will be upgraded for the scheme, it continues along the railway alignment until it passes in a culvert beneath the proposed Cherrywood Spine Road and will run parallel to it at grade. The route will then continue, by way of a viaduct, over the Wyatville Link Road to

Cherrywood Science and Technology Park. There will be six Luas stop locations in Carrickmines Little, Brennanstown/Carrickmines Great and in the Cherrywood District Centre. A Luas sub-station will be located at the Carrickmines and Cherrywood stops. A 350 space park and ride facility is proposed south of the proposed Carrickmines stop. It is ultimately likely to be incorporated within a proposed mixed use development on site.

7.15.9.4.4 Potential Impact of the Proposal

The construction of the Luas track involves the excavation of a trench 6–7m wide and 0.8–1.2m deep. A working width of 10m-15m will be observed by the contractor along the route of the Luas. As with each of the Luas alignment sections, and in all areas where ground disturbance is proposed, there exists the potential for disturbing previously unrecorded archaeological soils, features or deposits. It is advised that all archaeological recommendations are implemented during the pre-construction/site preparation phase of the development.

As has been described in this report, Area 15 of Luas Line B1 passes through a landscape that has a wealth and variety of archaeological features that demonstrate a continuity of settlement dating from the Neolithic to modern times. Sites within 100m of the proposed route include, DU026:005 a castle and deserted settlement, DU026:080 earthworks and mill site, DU026:127 the site of a military campsite and two National Monument sites DU026:007, a megalithic tomb and DU026:023, the ecclesiastical remains of Tully Church.

From an archaeological perspective it is significant to note that the Racecourse–Brennanstown section of the Luas Line B1 proposes to re-use the line of the Old Harcourt Street Railway and will involve a minimal amount of ground disturbance, it is considered unlikely that the ground preparation for the system will penetrate to levels at which archaeological soils could exist, which will therefore reduce the impact on known and yet to be discovered archaeological remains.

The construction of the Carrickmines ‘Park and Ride’, on a greenfield site, includes the construction of a car park and

access road. This will involve ground preparation and large scale earthmoving. Such works can reveal previously unrecorded archaeological sites with little above-ground expression and it is likely that archaeological deposits will be disturbed during this process. Archaeology in the form of one posthole and two prehistoric finds were identified during the testing.

The construction of the Luas sub-stations will also involve clearance and excavation, which may have an impact on any sub-surface archaeological deposits that may survive.

There are no upstanding archaeological monuments in the townland of Cherrywood, however a significant number of subsurface archaeological sites have been identified by geophysical survey and monitoring of ground disturbance works and were subsequently excavated in advance of recent housing and industrial developments (as described above). Archaeological investigations also took place in advance of the SEM road scheme and associated infrastructural works in the area around Cherrywood. This work revealed a large number of previously unknown archaeological sites which had no visible archaeological remains, suggesting an even greater density of archaeological activity that the standing monuments alone would indicate.

The route runs along side and through the zone of archaeological potential of RMP site DU026:127, the site of Laughanstown military camp. The southeastern section of this site has been subject to substantial development and archaeological resolution. The old Harcourt Street line which ran along the southwestern limits of the designated zone of archaeological potential of the military camp which also would have disturbed any intact archaeological deposits along the route.

However, Luas Line B1 deviates off the Harcourt line in sections. At Brennanstown the Luas veers slightly south of the original Harcourt line and rejoins the line for a short distance southeast of Laughanstown before veering off the original line again into the zone of archaeological potential of RMP site DU026:127. Some of the northwestern section of the site DU026:127 is still intact and recent excavations in the

immediate area have proved the immediate area to be archaeologically sensitive.

As mentioned above much of the southeastern end of the proposed Luas line has already been extensively tested and monitored and it is extremely unlikely that any archaeological features remain on that part of the site. It cannot be certain however that the section of this proposed route between Brennanstown and to the edge of the topsoil stripping northwest of the proposed Cherrywood stop would produce the same results.

7.15.9.4.5 Remedial or Reductive Measures

Carrickmines ‘Park and Ride’

Approximately one half of the entire proposed ‘Park and Ride’ site was archaeologically tested. The area not tested consisted of land under cover of mature trees, hedges and shrubs; the lawn in front of Priorsland house and the walled rose garden to the north, all was inaccessible for a JCB. Further testing of the ‘Park and Ride’ facility is required once access can be gained. The general area around the isolated features revealed in Phase 1 of the testing exercise must be examined to establish if they extend further or are part of a larger comprehensive feature.

Based on the findings of this testing programme, it is recommended that all groundworks prior to topsoil removal be monitored by a suitably qualified archaeologist under licence to the Department of the Environment, Heritage and Local Government, and the National Museum of Ireland (see monitoring section 7.15.9.4.7 below for further details).

General

All subsurface works in undeveloped areas along the length of the proposed Luas route, apart from the Old Harcourt Street Railway Line, will be subject to full monitoring. Archaeological monitoring will also be necessary on the sites of the two Luas sub-stations, during topsoil removal, to ensure the recognition of previously unrecorded sites and to further ensure that any soils, features or deposits of an archaeological nature encountered during the pre-construction phase are fully recorded, thus preserving the archaeological material by record (see monitoring section 7.15.9.4.7 below).



All mitigation measures in this report are subject to discussion with, and approval from the National Monuments Section of the Department of the Environment, Heritage and Local Government and the National Museum of Ireland and the Dún Laoghaire Rathdown County Council.

7.15.9.4.6 The Predicted Impact of the Proposal

Given the archaeological background of the area and the results from previous excavations in this part of south county Dublin it is predicted that archaeological material will be uncovered. Therefore, the predicted impacts are considered significant.

7.15.9.4.7 Monitoring

Archaeological monitoring should take place at the site clearance/soil stripping stage prior to construction, by machinery with grading buckets only and under the direction of the monitoring archaeologist.

The re-use of the Old Harcourt Street railway line along part of the route will obviate the necessity for a full-time archaeological monitoring. It is however recommended that an archaeological watching brief be maintained during the construction phase in areas where ground disturbance and cut-and fill operations is to occur i.e. in the cases of sub-station construction and site clearance for the proposed Park & Ride facility and along the part of the alignment that has been previously undisturbed. This includes the Luas route between the SEM at Ballyogan and the old Harcourt line/Racecourse stop and between Brennanstown and the area of the military camp (DU026:127) (see figure 4)

This will ensure the recognition and recording of any archaeological soils, features or deposits which may be disturbed. Monitoring will be carried out under licence to and in consultation with Department of Environment, Heritage and Local Government, which will advise on any further remedial action it considers appropriate.

In the case of the proposed 'Park and Ride' facility at the Carrickmines stop, topsoil removal should take place well in

advance of the main bulk excavation for the park and ride facility and other construction works in order to allow an adequate amount of time for archaeological resolution should further features be identified.

In the event that archaeological remains are discovered during site clearance works, Department of Environment, Heritage and Local Government and the National Museum of Ireland must be informed, all construction works must cease in the vicinity of the remains and the area must be fenced off until the archaeological issues have been resolved by a licensed archaeologist. The RPA should make provision to allow for and fund the archaeological works required to resolve any remains that are noted during the construction phase of development. The attention of the RPA is drawn to the relevant portions of the National Monuments Acts (1930–2004), which describe the responsibility of the site owners to report the finding of archaeological items if any should be discovered during construction works.

7.15.9.4.8 Reinstatement

In an archaeological context, no reinstatement measures are necessary.

7.15.9.4.9 Potential Route Deviation

The present line of the Luas runs on the Former Harcourt Street Railway Line between Racecourse Stop and Brennanstown. Any suggested deviations off the line will necessitate predevelopment archaeological monitoring.

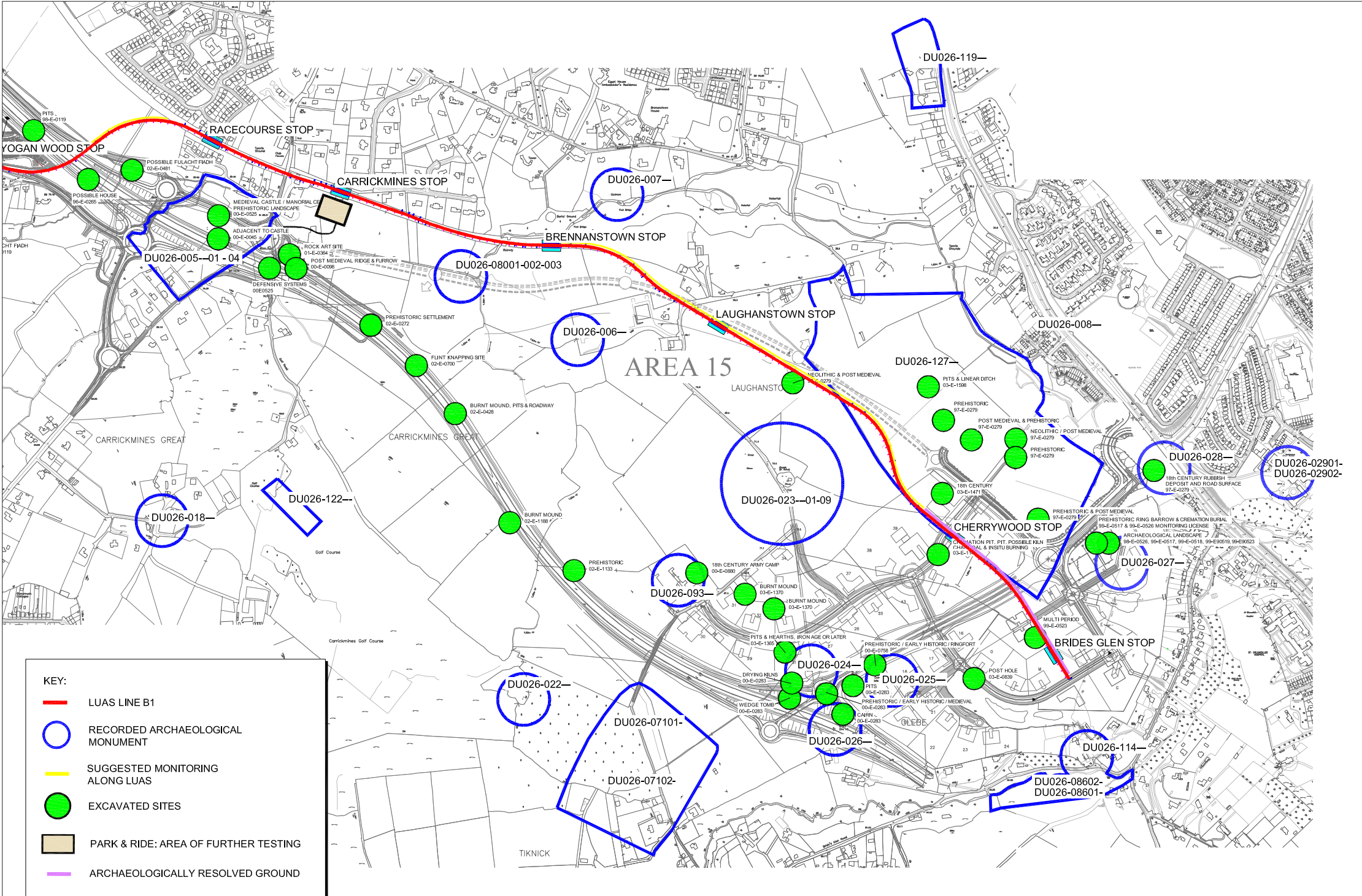


Figure 1 Area 15 Showing RMP Sites & Locations of Recent Excavations

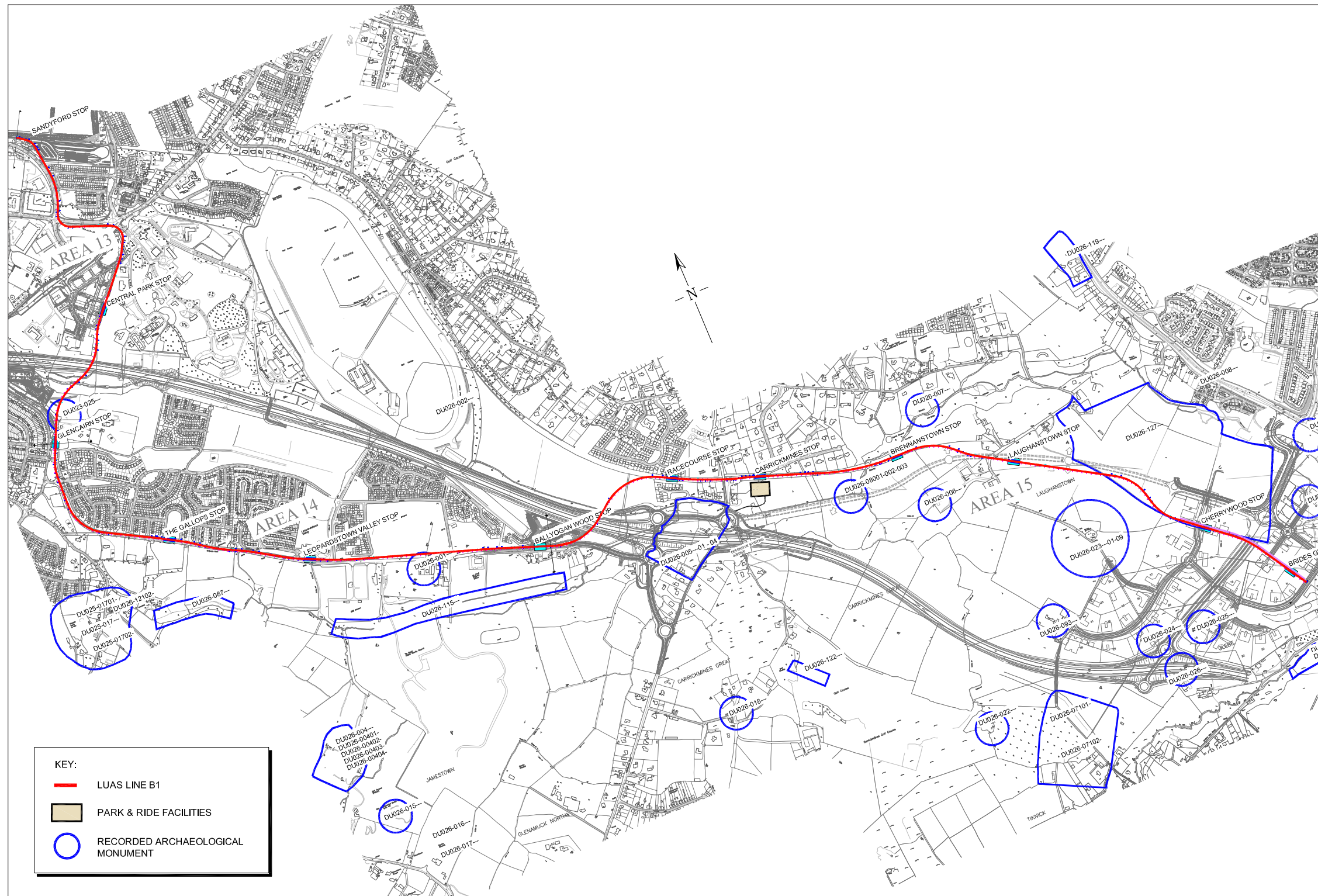


Figure 4 RMP Locations along Luas Route

Area 15

Construction Scenario



7.15.10.1 URBAN FUNCTION

Area 15 runs from the Ballyogan Wood residential scheme at the eastern end of Ballyogan Road and crosses the reservation of the SEM to link to the alignment of the former Harcourt Street railway, and eastwards to Laughanstown and Cherrywood before terminating at Bride's Glen, Rathmichael located within the zoned lands of the Cherrywood Science and Technology Park. There will be seven stops in total provided along Area 15. The first, Ballyogan Wood stop, will be located within the existing grassed reservation to the front of the housing scheme. Racecourse stop will be provided immediately to the south of Brighton Court residential development, intended primarily to operate on event days at the Leopardstown Racecourse. Carrickmines stop is to be provided immediately to the east of Glenamuck Road, adjacent to a planned park and ride facility for some 350 cars. Brennanstown Stop will be located along the alignment of the former Harcourt Street Railway, immediately to the north of the planned spine road and to the east of the Brennanstown Vale residential scheme. Laughanstown Stop will be provided in the vicinity of Laughanstown Lane. Cherrywood stop will be located within the planned Plaza area of the proposed future Cherrywood District Centre while Bride's Glen Stop, which comprises the terminus of the Luas Line B1 route alignment, is to be located within the existing Cherrywood Science and Technology Park.

Construction compounds and assembly areas will be located at an area east of the alignment to the north of the reservation of the SEM, west of the Glenamuck Road Bridge, and adjacent to the underpass under the planned Cherrywood spine road west of Laughanstown Lane. Substations serving the scheme will be constructed in the vicinity of the Carrickmines stop, and in the vicinity of the Cherrywood stop.

7.15.10.2 ORGANISATION OF THE WORK

Preparatory works and service diversions will be limited, particularly in the western half of the Luas Line B1 alignment, as it traverses along an existing railway alignment before crossing undeveloped fields in a largely rural context. Along

the alignment of the former Harcourt Street Railway between Carrickmines and Laughanstown, site clearance will include removal of household waste and construction fill to licensed tip, the cutting down of trees or trimming of branches where appropriate and removal. Particular care will be taken during the construction of this section of the Luas Line B1 alignment to avoid any existing utilities on the alignment.

The construction of Luas Line B1 involves the provision of a bridge over the SEM at a location to the east of the Ballyogan Wood residential scheme. The existing Glenamuck Road bridge deck will require to be replaced. A temporary diversion of Glenamuck Road will be necessary during the upgrading works to the Glenamuck Road bridge.

In addition, the Luas Line B1 alignment will cross the line of the planned Cherrywood spine road by means of a grade-separated underpass. The alignment will also cross the Wyattville Link Road by means of an overbridge.

Until a contractor has been formally appointed to undertake the construction of the Luas trackbed, no precise programme can be established. For the purposes of this EIS the following assumptions can reasonably be made based on the required end date for completion of the works and the commissioning of the system, and on the basis of experience gained on similar projects elsewhere.

- Work will start simultaneously at a number of locations.
- Duration - overall approximately 38 months
- A period for testing and commissioning the system is included.
- Light Rail Vehicles will be supplied during the construction period.

7.15.10.3 SITE ACCESS

The Luas Line B1 alignment may be accessed primarily from three points,

- Ballyogan Road will be used as a construction access point for the portion of Luas Line B1 to the south of the overbridge, including the Ballyogan Wood stop.
- Access to the alignment will be available from the planned construction compounds and assembly areas, at Ballyogan, and Laughanstown.
- Access will be available to the eastern section of Luas Line B1 from the area of the Cherrywood District Centre.
- Access to the planned park and ride facility will be provided from what will ultimately comprise the western end of the planned Cherrywood spine road.

The distance between the points is substantial, and the stocks of material being stored and passing through these access points are expected to be relatively large. These movements will have to be managed with considerable care. An access route via Laughanstown Lane was considered, as it would provide access to a mid-point along this portion of the alignment. However, this was rejected due to the narrow width of the lane and its intrinsic rural context which would be significantly disturbed in order to facilitate the movement of construction equipment.

The alignment of the former Harcourt Street Railway is not sufficiently wide to allow for the establishment of a service corridor adjacent to the Luas Line B1 alignment during construction. Construction will have to be organised so that the alignment itself, where necessary, is used as a service corridor without detriment effect to the construction programme and cost.

7.15.10.4 CONTRACTORS COMPOUNDS AND STORAGE AREAS

A contractors compound and assembly area will be created to the south of the alignment of the former Harcourt Street Railway, to the east of the planned SEM bridge. This will be approximately 18,500m² in area. Access to the Luas Line B1 alignment will be available at this point. At present, this is an area of open undeveloped fields, comprising the eastern

lands of Leopardstown Racecourse. Following construction of Luas Line B1, the contractors' compound and assembly area will be reinstated.

Another construction compound and assembly area is to be created on the western side of Laughanstown Lane, in the vicinity of the planned grade-separated intersection of the Luas Line B1 alignment and the planned Cherrywood spine road. This will be approximately 28,900m² in area. Access to the alignment will also be available from this compound.

7.15.10.5 WASTE MANAGEMENT

A Waste Management Plan will be prepared by the appointed contractor prior to the commencement of development. It will be implemented by the appointed contractor on site. This will involve identification of all likely waste materials prior to construction work commencing and a review and selection of of the most appropriate means of waste disposal in accordance with best practice and the provisions of the Waste Management Acts.

All excavated inert material will be reused, where possible, to create embankments and bunding elsewhere along the alignment. Any remaining material will be reused and/or disposed of by licensed operator/carrier within the Dublin area, the location to be determined at the time of development.

7.15.10.6 SPECIAL MATTERS

Critical Crossroads

During construction, the only at-grade crossing point in Area 15 is located at Laughanstown Lane. This is a narrow rural lane, with little local traffic in either direction. Provision will be made to maintain local vehicular and pedestrian movement in this area during construction to the greatest extent possible. It is noted, however, that it is an objective of the Draft Carrickmines-Cherrywood Action Plan to close this Lane at a point adjacent to its junction with the planned spine road.

**Local Residents**

There is no contact between the works site and adjacent residences along Area 15 of the Luas Line B1 alignment. Houses in the vicinity back onto the alignment at Brighton Court and Brennanstown Vale; however, no direct access to the alignment will be available to these residences. The construction works will not extinguish formal access, even on a temporary basis, to residences, as this is taken off Brennanstown and Brighton Roads, to the north of the alignment.

Access to a small number of residences along Laughanstown Lane may be affected by the necessary construction works in this vicinity.

**7.15.11
DIRECT AND INDIRECT EFFECTS RESULTING
FROM USE OF NATURAL RESOURCES**

Area 15 of the Luas Line B1 alignment will run from the area of the termination of Area 14 at Ballyogan Wood, and will cross the SEM before following the alignment of the former Harcourt Street Railway. It will cross open lands at Laughanstown to link to the planned Plaza area of the proposed Cherrywood District Centre and on to the terminus at Bride's Glen, Rathmichael in the southern portion of the existing Cherrywood Science and Technology Park, by means of an overbridge crossing of the Wyattville Link Road. The likely significant direct and indirect effects on the environment of the proposed development which may result from the use of natural resources, in this case the natural resources being the land encompassed within the subject lands, have been comprehensively assessed in this Environmental Impact Statement in keeping with Paragraph 3 (e) (i) of S.I. No. 349 of 1989 as amended. It is expected that the building materials required for the construction of Luas Line B1 will be sourced from Ireland and elsewhere within the E.U.

**7.15.12
DIRECT AND INDIRECT EFFECTS RESULTING
FROM EMISSION OF POLLUTANTS,
CREATION AND NUISANCES AND**

Details of emissions arising from the development were outlined in the relevant sections of this Chapter which dealt with the aspects of the environment considered in relation to Area 15. There will be no significant direct or indirect effects arising from emissions. Waste Management has been addressed under Section 7.15.10.

**7.15.13
FORECASTING METHODS USED FOR 7.15.10
AND 7.15.11**

The methods employed to forecast the effects on the various aspects of the environment are standard techniques used in the particular professional disciplines. The general procedure employed was to address the receiving environment in a dynamic fashion, to add to that a projection of the "loading" placed on aspects of the environment by the development in it, mitigated by appropriate measures and thereby arrive at a net or predicted impact. The methodology employed by each of the specialist consultants is outlined in the relevant sections of Chapter 5 of the Environmental Impact Statement.

**7.15.14
INTERACTIONS**

Human Beings/The Landscape/Visual Issues
The Luas Line B1 alignment, together with its overhead lines and ancillary structures, including a Motorway overbridge at Ballyogan, will be observed by pedestrians and residents as they become accustomed to the new environment. Whilst the construction phase will initially have an adverse effect on the visual and residential amenities of the area, this will be outweighed by the long term positive visual impacts resulting from environmental improvements associated with Luas Line B1, and the maturing of remedial landscaping provision. Furthermore, it should be noted that the wider area and landscape environment of the alignment is planned to be significantly altered by major new development, and by the provision of new local, regional and National roads infrastructure.

Flora/The Landscape/Human Beings
The removal of existing foliage during construction of Luas Line B1 will interact with the landscape environment. The introduction of new planting where appropriate alongside the operational Luas trackbed, and ultimately along the planned road alignments will help to establish a new landscape and flora.

Material Assets/Human Beings
The operation of Luas Line B1 in Area 15 will provide a new permanent public transport service for this outer suburban residential area, which is planned to accommodate a significant new resident and employment population. Luas Line B1 will provide an efficient public transport alternative to the private car, and will link the area to the existing or planned employment and residential areas of Cherrywood-Rathmichael and the City Centre. This will lead to a significant positive interaction between Material Assets and Human Beings, and will also achieve planning policy and objectives for Area 15 relating to public transport.

Material Assets/Flora/Fauna
The main interaction between Flora and Fauna is that the loss of vegetation necessary for the proposal will result in a loss of cover and habitat for insects, birds and mammals, and disturbance along the route which will reduce its use as a corridor for animal movement. This will particularly occur along the alignment of the former Harcourt Street Railway.

However, it should be noted that the provision of a Luas alignment along this route is an objective of the Statutory Development Plan. New landscape planting, as well as the retention of a significant extent of existing flora in the area will ensure a slight overall impact in terms of interaction between material assets and flora and fauna.

Human Beings/Material Assets/Landscape/Air

Luas Line B1 will run along a landscaped corridor, which is predominantly segregated from the existing road infrastructure. This will ensure a minimum of conflict with existing and planned future vehicular or pedestrian traffic movement in the area. In addition, the provision of a viable public transportation option will facilitate a reduction in traffic flow in the area, thereby contributing to reduced vehicles exhaust emissions.

Appendix 15A

List of plant species in area 15

Common name	Scientific name
Ferns	
Hart’s-tongue fern	Phyllitis scolopendrium
Male fern	Dryopteris felix-mas
Bracken	Pteridium aquilinum
Rushes	
Great wood-rush	Luzula sylvatica
Hard rush	Juncus inflexus
Jointed rush	Juncus articulatus
Grasses	
Annual meadowgrass	Poa annua
Cock’s-foot	Dactylis glomerata
Common bent	Agrostis capillaris
Common couch-grass	Elymus repens
Creeping bent-grass	Agrostis stolonifera
Crested dog’s-tail	Cynosurus cristatus
False brome	Brachypodium sylvaticum
Meadow foxtail	Alopecurus pratensis
Meadow grass	Poa spp.
Plicate sweet-grass	Glyceria plicata
Red fescue	Festuca rubra
Reed canary grass	Phalaris arundinaceae
Ryegrass	Lolium perenne
Soft brome	Bromus mollis
Sweet vernal grass	Anthoxanthum odoratum
Yorkshire fog	Holcus lanatus
Sedges	
Carnation sedge	Carex panicea
Common sedge	Carex nigra
Glaucous	sedge Carex flacca
Herbaceous dicotyledons	
Angelica	Angelica sylvestris
Bittercress	Cardamine hirsuta
Broad-leaved dock	Rumex obtusifolius
Brooklime	Veronica beccabunga
Bulbous buttercup	Ranunculus bulbosus
Burdock	Arctium minus agg.
Bush vetch	Vicia sepium
Celandine	Ranunculus ficaria
Cleavers	Galium aparine
Clustered dock	Rumex conglomeratus

Common name	Scientific name
Common dog violet	Viola riviniana
Common fumitory	Fumaria officinalis
Common ragwort	Senecio jacobaea
Cow parsley	Anthriscus sylvestris
Cowslip	Primula veris
Creeping buttercup	Ranunculus repens
Creeping thistle	Cirsium arvense
Curled dock	Rumex crispus
Cut-leaved geranium	Geranium dissectum
Daisy	Bellis perennis
Dandelion	Taraxacum agg.
Fool’s watercress	Apium nodiflorum
Goldilocks buttercup	Ranunculus auricomus
Great willowherb	Epilobium hirsutum
Ground elder	Aegopodium podagraria
Groundsel	Senecio vulgaris
Hawkbit	Leontodon spp.
Hawk’s beard	Crepis spp.
Herb robert	Geranium robertianum
Hogweed	Heracleum sphondylium
Knotgrass	Polygonum aviculare
Meadow buttercup	Ranunculus acris
Meadowsweet	Filipendula ulmaria
Nettle	Urtica dioica
Nipplewort	Lapsana communis
Perforate St. John’s wort	Hypericum perforatum
Primrose	Primula vulgaris
Red clover	Trifolium pratense
Red dead-nettle	Lamium purpureum
Ribwort plantain	Plantago lanceolata
Sanicle	Sanicula europaea
Self-heal	Prunella vulgaris
Sow thistle	Sonchus spp.
Spear thistle	Cirsium vulgare
Speedwell	Veronica spp.
Sun spurge	Euphorbia helioscopia
Water mint	Mentha aquatica
White clover	Trifolium repens
Wild pansy	Viola tricolor
Willowherb	Epilobium spp.
Wood anemone	Anemone nemorosa
Wood avens	Geum urbanum

Common name	Scientific name
Wood speedwell	Veronica montana
Yellow clover	Trifolium dubium
Trees and shrubs	
Ash	Fraxinus excelsior
Beech	Fagus sylvatica
Birch	Betula spp.
Blackthorn	Prunus spinosa
Bramble	Rubus fruticosus agg.
Dog rose	Rosa canina
Elder	Sambucus nigra
Elm	Ulmus spp.
Fir	Abies spp.
Goat willow	Salix caprea
Gorse	Ulex europaeus
Grey willow	Salix cinerea
Hawthorn	Crataegus monogyna
Holly	Ilex aquifolium
Honeysuckle	Lonicera periclymenum
Horse chestnut	Aesculus hippocastanum
Ivy	Hedera helix
Larch	Larix decidua
Oak	Quercus spp.
Pheasant-berry	
Scot’s pine	Pinus sylvestris
Sycamore	Acer pseudoplatanus
Willow	Salix spp.

Appendix 15B

List of Tree species in Area 15

Location	Ref. No.	Species	Age	Condition	Ref. Code	Comments
Small section at right angles to the old railway bed	Hedge 025	Hawthorn, Blackthorn, Elder, Willow	M	Fair	B	An unmanaged agricultural field boundary.
Alongside old railway track	Hedge 026	Hawthorn, Elder	M	Fair	B	A mixed hedge beside a ditch and bank. Not recently managed. There is an open area before the start of 134.
		Elm	EM	Fair	B	Multiple stemmed and numerous.
		Ash	EM	Fair	B	
Start of old track bed to next over bridge	Section 027	The old track runs through a steep sided cutting. On the sides of the cutting are self seeded trees, which comprise predominantly early mature multiple stemmed ash with willow, elder, holly and sycamore. Many of these are large and multiple stemmed and are growing on very steep slopes. On the track bed are early mature multiple stemmed ash, willow and sycamore with mature hawthorn.				
		Ash	Y-EM	Fair	B	
		Hawthorn	M	Fair	B	
		Sycamore	Y-EM	Fair	B	
		Willow	Y-EM	Fair	B	
		Holly	EM	Fair	B	
		Elder	EM-M	Fair	B	
Carrickmines Station Section 028	Garden to north	Sycamore	M	Good	B	Three large multiple stemmed sycamore which overhang the boundary wall to the station, platform and trackbed. They have minor scattered dead wood and dense ivy growth. In addition there is mature hawthorn growing along the wall extending along the length of the old station.
	Station house property	Ornamental shrubs	M	Good	B	Along old platform..
		Laburnum	M	Good	B	
		Elm	EM	Good	B	
	Trackbed	Sycamore	M	Good	A	A tree with a well formed balanced crown.
		Cypress	M	Good	A	Growing through overhead cables.
	At base of water tower	Acacia	M	Fair	B	Two Acacia trees leaning towards the track and carrying minor scattered dead wood.
	East of water tower	Beech	M	Good	B	This tree has three main scaffolds from 1.5m.
	Across track half way down the garden	Griselinia	M	Good	B	A well managed hedge growing across the track.
	After hedge	Atlantic Cedar	EM/M	Good	A	A specimen with a well-formed balanced crown.

Appendix 15B

List of Tree species in Area 15

Location	Ref. No.	Species	Age	Condition	Ref. Code	Comments
		Fruit Trees	M	Good	A	Seventeen trees making up a small orchard.
		Monterey Cypress	EM	Good	A	This tree has a well formed tree, growing on the old platform.
		Silver Birch	M	Good	A	A specimen, which appears free from defects.
Priorsland	606	Ash	EM-M	Good	A	This tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	607	Ash	M	Good-Fair	A	This large tree has a full, wide-spreading, balanced crown that appears free from significant defects. It has scattered tip die-back and carries scattered minor and major dead wood.
	608	Sycamore	M	Good-Fair	B	This tree is growing against the wall and has minor basal suckers. It has a full, wide-spreading, balanced crown that is formed by multiple scaffolds. It appears free from significant defects
	609	Oak	EM	Good-Fair	B	This tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	610	Cherry	M	Poor	C	This tree has extensive canker, die-back and dead wood. It has no future potential and should be felled.
	611	Ash	EM	Good	A	This tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	612	Ash	M	Good-Fair	B	This tree bifurcates at approximately 0.5m with an included union. Its crown is full, wide spreading, balanced and appears free from significant defects.
	613	Beech	M	Good	A	This large tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	614	Cherry	M	Poor	C	This tree has a large cavity and decay on the main stem. It is infected with bacterial canker and has die-back in its crown that is heavily suppressed by tree 613.
	615	Copper Beech	M	Good	A	This large tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	616	Cherry	M	Good-Fair	B	This large tree has a full, wide-spreading, balanced crown that appears free from significant defects. It has dense ivy throughout.
	617	Cherry	M	Fair	B	This multiple stemmed tree has a full, balanced crown that appears free from significant defects. It has leaning stems.

Appendix 15B

List of Tree species in Area 15

Location	Ref. No.	Species	Age	Condition	Ref. Code	Comments
	618	Copper Beech	M	Poor	C	This large old specimen tree has a full, wide-spreading, balanced crown that is formed by multiple scaffolds. It has numerous fruit bodies of Ganoderma spp. and dense ivy throughout. It may have been pollarded in the past.
	619	Beech	M	Good	A	This tree has a full, wide-spreading, balanced crown that appears free from significant defects.
	620	Silver Birch	EM	Good-Fair	B	This tree has a full, slightly unbalanced crown that appears free from significant defects.
	621	Ash	M-OM	Fair	B/C	This is an extremely old veteran tree. It has a very large, wide-spreading, open, balanced crown formed by multiple scaffolds. It has a history of branch shed and is infected with Inonotus hispidus and Pholiota squarrosa. It has decay at its base and hazard beams. It requires a crown reduction.
	622	Walnut	M	Very Good	A	This specimen tree has a full, wide-spreading, balanced, open crown that appears free from significant defects. It bifurcates at approximately 2m and has dense ivy throughout.
	623	Larch	M	Poor	C	This suppressed tree has a small crown, a severe lean and naturally suppressed dead wood on the lower stem. It has very dense ivy throughout.
	624	Larch	M	Poor	C	This tree has only a small section of live growth on the track-side. It has very dense ivy throughout.
End of station house property to old level crossing. Section 029	North of track	Sycamore, ash, elder ans hawthorn	Y,EM & M	Good	A/B	Dense naturally regenerated woodland on the old track bed, which is multi-layered, has a good age structure and a diverse species composition
		Ash	EM	Good	A/B	North of the track bed, behind the boundary wall are three ash trees they appear sound and free from defects.
		Cypress	Y	Good	A	A young hedge on the north side of the track, outside the boundary wall. Opposite this hedge are 10 trees, which are described as follows:
	Opposite Cypress hedge	Ash	M	Poor	C	This tree has slight die-back and is heavily infected with canker.
		Oak	M	Fair	B	This tree has isolated major dead wood with some storm damage.
		Beech	M	Poor	C	A tree in major decline, 80% dead.
		Sycamore	M	Good	A/B	A multiple stemmed with some branches overhanging the track and dense ivy growth.
		Birch	M	Good	A	This tree has an open crown with numerous witches brooms and minor scattered die-back.
		Ash	M	Fair	B	Two ash, they have multiple stems with scattered minor dead wood and dense ivy growth.
		Horse Chestnut	M	Good	A/B	A well, formed tree that appears sound.
		Oak	M	Good	A/B	Two trees with scattered minor dead wood.

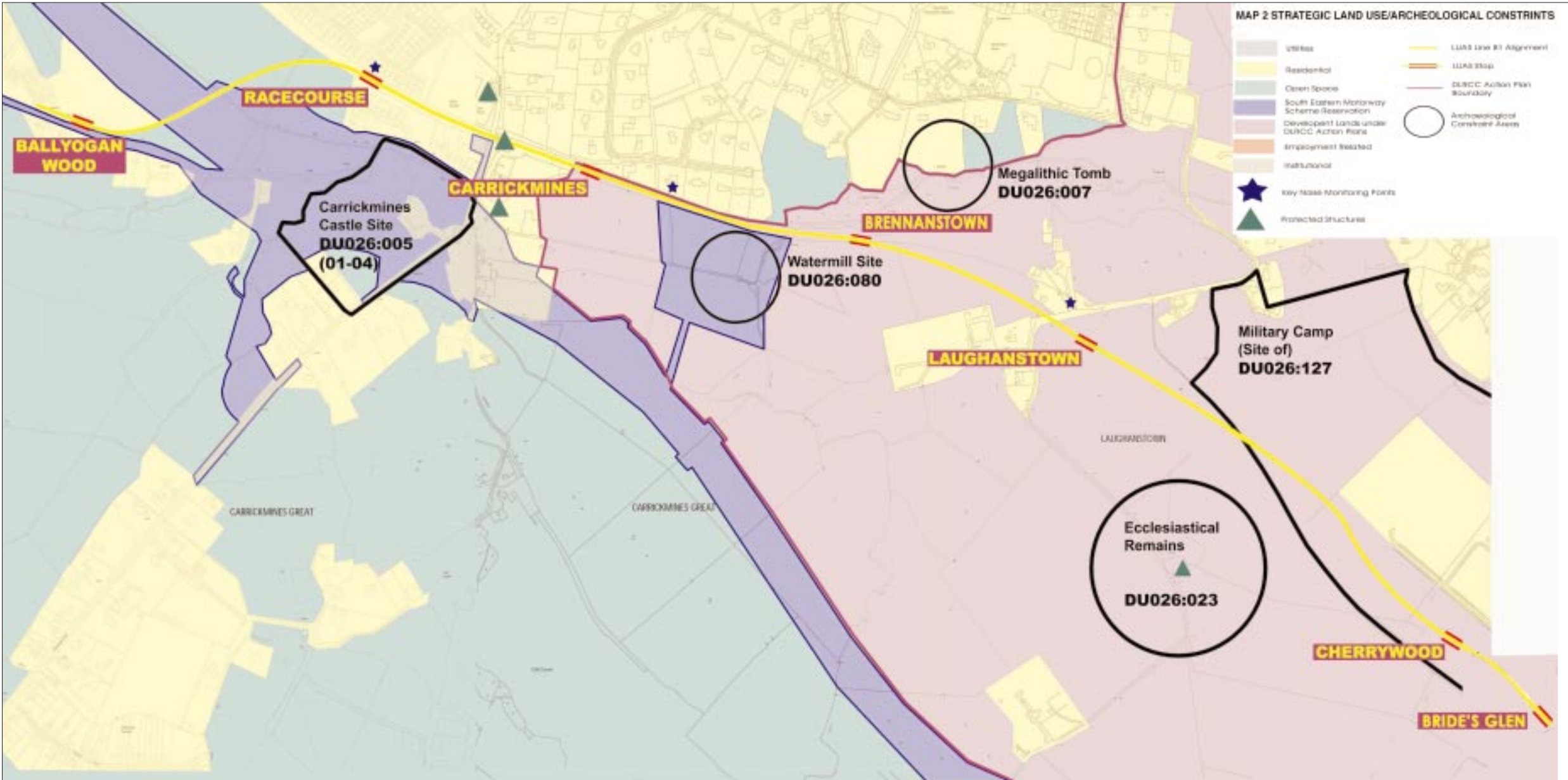
Appendix 15B

List of Tree species in Area 15

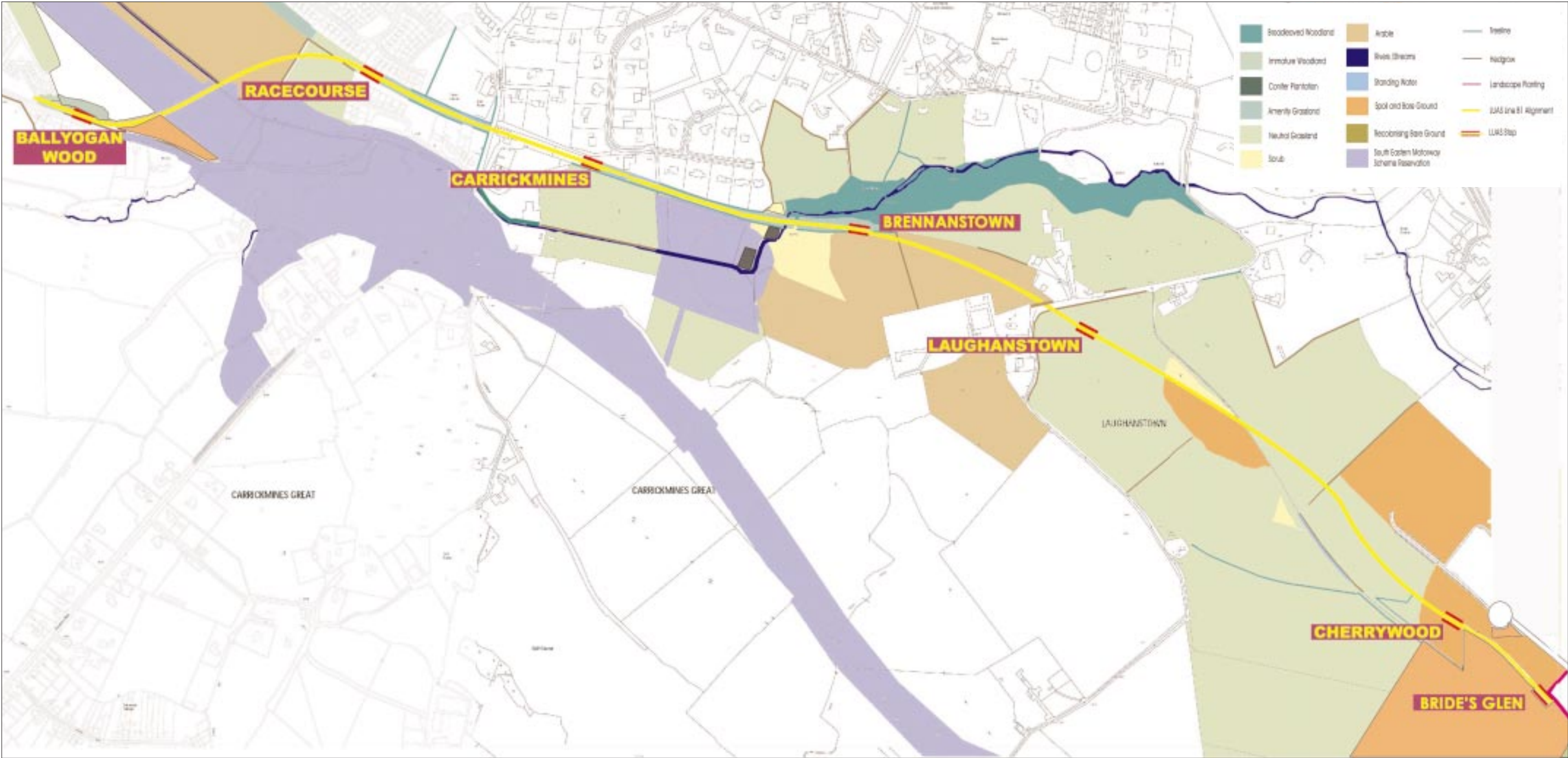
Location	Ref. No.	Species	Age	Condition	Ref. Code	Comments
	South of track	Larch	M	Good	A	Growing up against the boundary wall, they has some minor scattered deadwood.
		Sycamore	M	Good	A	
		Horse Chestnut	M	Good	A	
	Middle of track	Goat Willow	EM	Fair	B	Natural regeneration on the old track.
		White Willow	M	Good	A	A multiple stemmed trees with dense ivy growth.
	Area 030	Mixed	Y/EM	Fair	B	Regenerated woodland on old track bed. Has less mature trees than 136 and more under-storey The under-storey is comprised Goat willow , hawthorn, blackthorn, elder and elm with some early mature sycamore, ash and cherry-plum. To the rear of the second last property is a cypress hedge
From end of houses at Brennanstown Vale to edge of Druids Wood	Area 031	Mixed	Y/EM	Fair	B	An elevated section of track with steep embankments to the north and south. Along the old track bed and on the embankments are self seeded trees; ash, goat willow, hawthorn, oak, elder, beech, holly, birch and sycamore In addition thee is a mature larch , this tree has dense ivy growth and scattered deadwood.
	North of track	Beech, Pine and Larch	M	Fair	B	At the edge of the north side of the wall is mature woodland with numerous mature beech which will require monitoring as some were noted as having significant defects such as Ganoderma infections, cavities and included unions In this condition they are a potential hazard.
Old stone wall towards Windfield	Area 032	Hawthorn, Elder	M	Fair	B	Isolated vegetation with predominantly brambles and ivy.
Laughanstown Road	Area 033	Hawthorn, Blackthorn, Elder, Ash	EM/M	Fair	B/C	Either side of the road are mature hedges, on the western side is an unmanaged hedge comprising hawthorn, elder, blackthorn and dense brambles and mature ash with dense ivy cover and significant crown die back.. On the eastern side is a bank with multiple stemmed early-mature ash. In the field to the east of the hedge is an area of scrub willow.
Cherrywood	Area 034	Sycamore. Ash, Elder and willow	Y-EM	Fair	B/C	Within the Cherrywood lands is a small remnant of the old Harcourt to Bray track bed. To the south is a steep embankment with regenerated scrub. There is also some areas of scrub on the slope to the north and seedling willow on the old track bed. To the north is a remnant hedge with some mature ash and sycamore.

Appendix 15C
Specialist Maps

Map 1 Strategic land Use / Archaeological Constraints



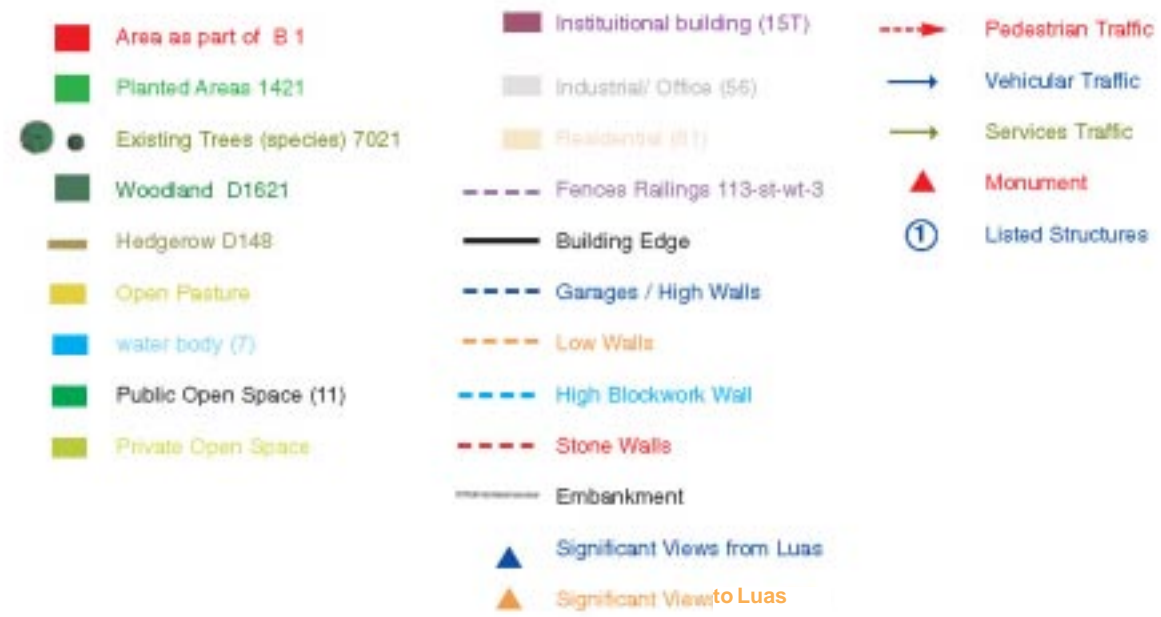
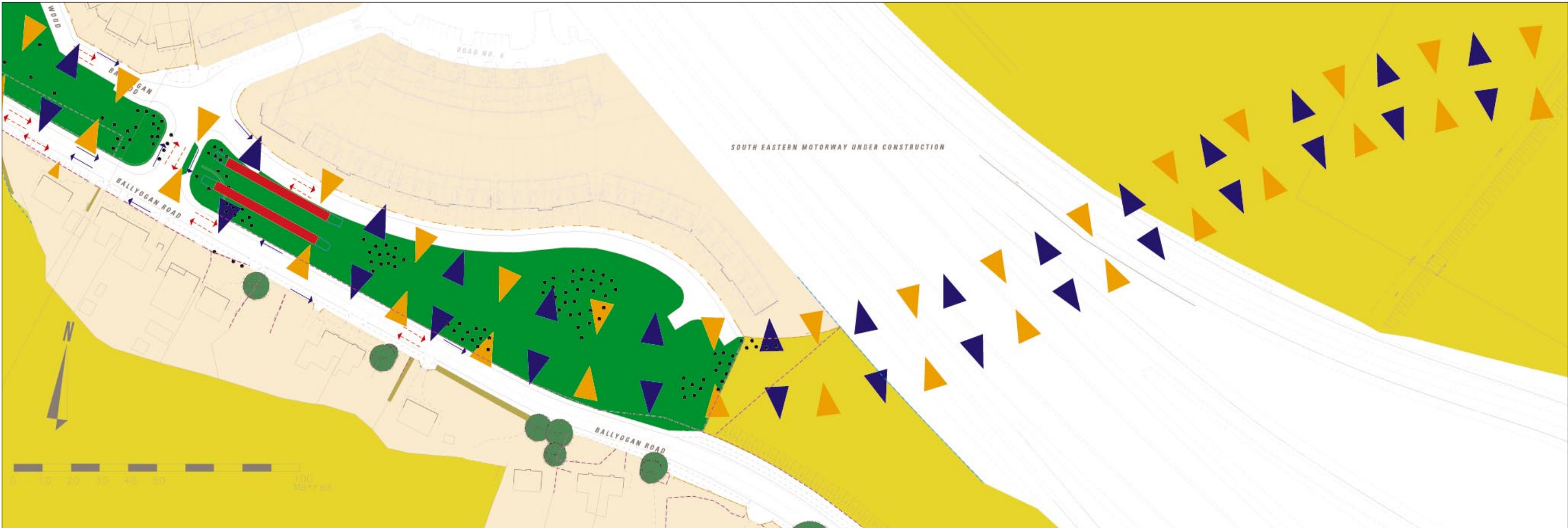
Map 2 Trees and Hedgerows Receiving Enironment



Map 3 Property Acquisition	
<div><div></div>Property to be acquired</div>	Note For precise information on property acquisition see property drawings attached to Railway Order Application. Map identifies significant and permanent acquisition only.
<div><div></div>Luas Line B1 Alignment</div>	
<div><div></div>Luas Stop</div>	



urban analysis
Ballyogan Wood to north of the South Eastern Motorway



urban analysis

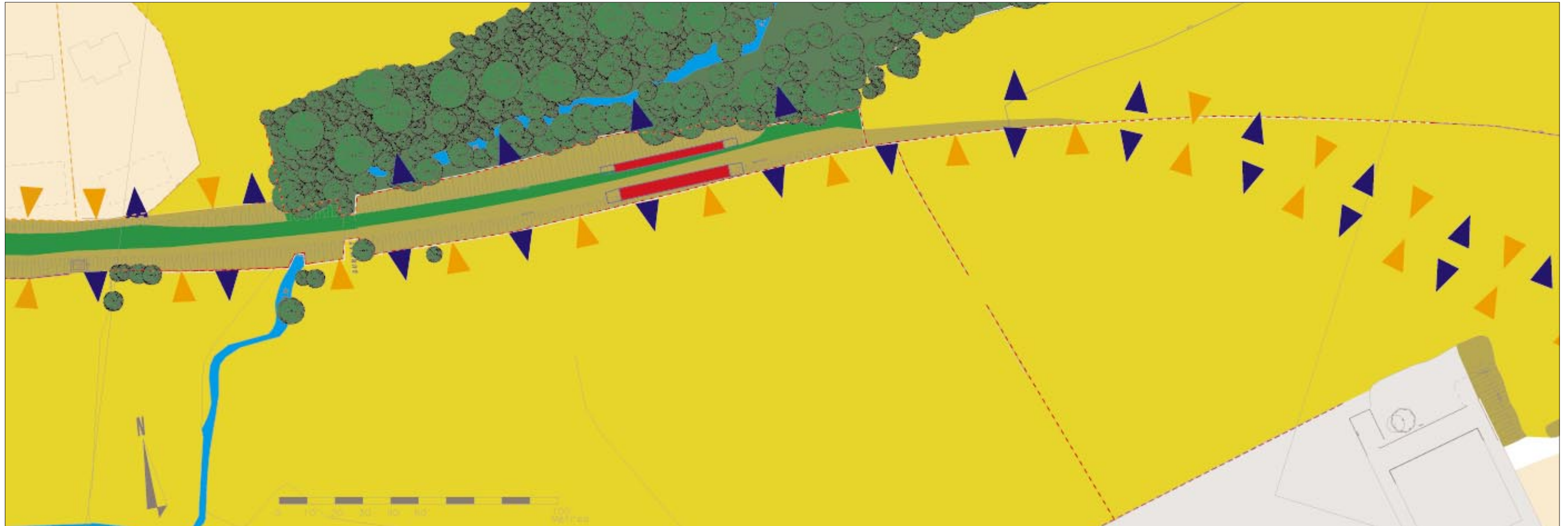
North of the South Eastern Motorway to west of Carrickmines Stop



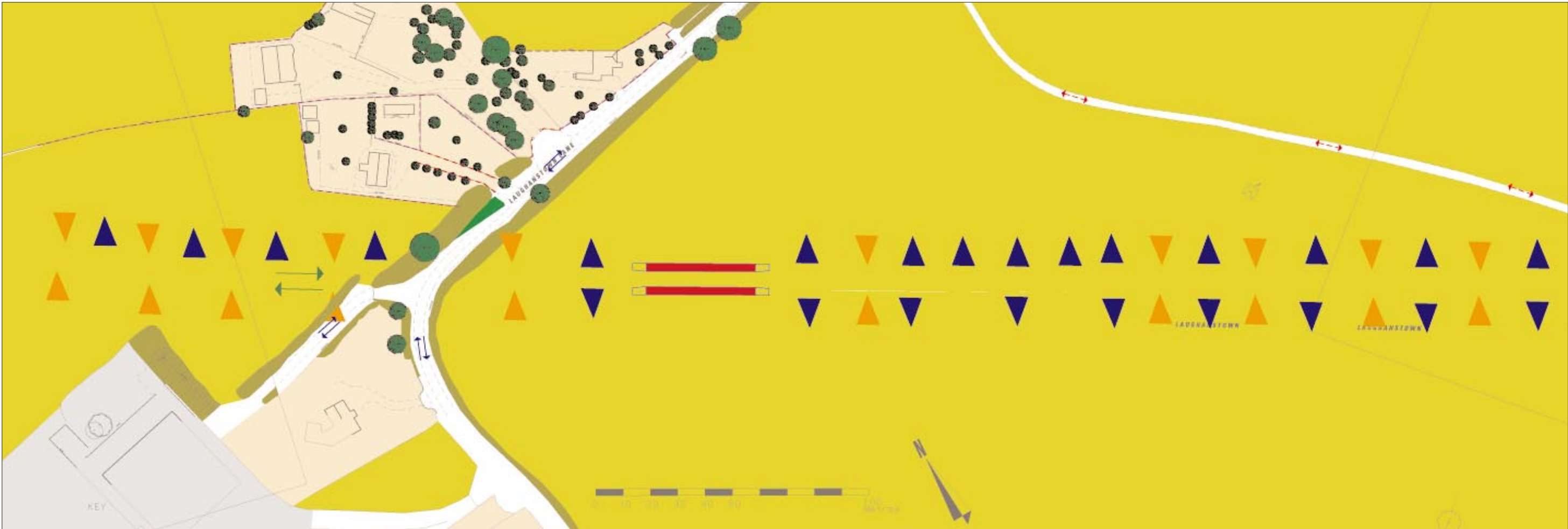
urban analysis
Carrickmines Stop to Carrickmines Wood (west side)



urban analysis
Carrickmines Wood to Laughanstown Lane



urban analysis
Laughanstown Lane to Laughanstown Stop



urban analysis
Laughanstown Stop to Cherrywood



Appendix 15C
Specialist Maps cond.

urban analysis
Cherrywood to Bride's Glen stop



Archaeological Assessment Luas Line B1. 'Park & Ride' at Carrickmines.

1 Introduction

This report describes the results of the archaeological assessment carried out on the proposed location of the 'Park and Ride' facility (Fig 3) for the Carrickmines stop of the Luas Line B1 preferred route (Fig 2).

The proposed development site lies just to the northeast of Carrickmines Castle (Fig 1). This assessment was undertaken to provide further information for the archaeological component of the EIS (Environmental Impact Statement) for the scheme.

Approximately half of the development footprint was tested. It was not possible to test certain areas due to the presence of mature trees, hedges, shrubs and hedgerows. Part of the proposed development area is located within the lawn and walled rose garden of Priorsland house; these areas were also not accessible for machinery at the time of testing.

A total of nine test trenches were excavated in the greenfield part of the development site. Eight of these were located in the eastern half of the 'Park and Ride' and one trench was located along the northern half of the proposed access road to the South Eastern Motorway (Fig 7).

This assessment was carried out for RPS McHugh on behalf of the Railway Procurement Agency and the test trenching took place on the 25th and 26th of January 2005.

2 Archaeological and Historical Background

This section relies heavily on the work of Siobhan Deery and Sarah Halpin and is taken from a previous report (Deery 2003) and the current archaeological research for the EIS for this scheme (Deery and Halpin, forthcoming). The following summarises the archaeology in Carrickmines Great and also the surrounding townlands to highlight the richness of the archaeological landscape.

2.1 General

The preferred route of Luas Line B1 passes through the rich archaeological landscape of South County Dublin.

Monuments in the area date back from the Neolithic, through the Bronze Age and up to the Early Medieval periods. Recent infrastructural, housing and industrial developments in the area and particularly in Carrickmines Great, Laughanstown (or Lehaunstown) and Cherrywood, have produced a large number of sites that had no visible surface indications, suggesting even a greater density of archaeological activity than the standing monuments alone would indicate. One of the sites identified and excavated during works associated with the South Eastern Motorway was a prehistoric rock art site comprising three small boulders featuring cupmarks (Clinton 2003). This site was located just to the south of the proposed 'Park and Ride'.

2.2 Mesolithic (9000–5000 BC)

The Mesolithic as yet is not well defined in south County Dublin, although there is a possible settlement on Dalkey Island dating from the late fourth millennium BC (Liversage 1968). One of the earliest prehistoric finds in near the development site is a flint tool (NMI ref. 1967:137), either Mesolithic or Neolithic in date, found in Loughlinstown townland. Greater evidence for early settlement in south County Dublin comes from burial sites and stray finds dated to the Late Neolithic (c. 2500BC) and Bronze Age (c. 2200 - 600BC).

2.3 Neolithic (c. 5000 – 2500 BC)

The evidence for settlement of the area during the Neolithic period occurs in the form of megalithic tombs and a distribution of dateable stray artefacts. In south county Dublin, settlement appears to have been located at the foot of the Dublin/Wicklow Mountains and there is a striking east–west band of surviving tombs in this area. The earliest monument in the vicinity of the proposed Luas scheme is the portal tomb at Brennanstown (DU026:007). Portal tombs are a type of megalithic tomb, dating to the early part of the Neolithic, characterised by their massive capstones, balanced on two portals (the 'door' feature) and side stones and back stone. They are almost always situated near streams and rivers.

There is another megalithic tomb at Laughanstown, this time a wedge tomb DU026:024, dating to the end of the Neolithic and the beginning of the Bronze Age (c. 2500 – 500 BC). It is

unusual for a wedge tomb in that it faces north, across a small valley, whereas most wedge tombs face west. It is adjacent to two possible cairns (one in Laughanstown, the other just over the townland boundary in Glebe DU026:025 and DU026:026), which may be Bronze Age in date, although one of them appears to be at least partly formed of rock outcrop.

Recent Excavations: Further evidence of Neolithic settlement was identified in recent excavations at Cherrywood (Ó Néill 2000), which seems to suggest that during this period, settlements were located in the narrow valleys leading down to the Loughlinstown River. Neolithic artefacts were recovered during excavations associated with the South Eastern Motorway, where there was also evidence for Beaker occupation (2460-2200 BC) (O' Drisceoil 2004, Seaver 2004b). One such site was located just to the south of the proposed 'Park and Ride' facility across the stream.

2.4 Bronze Age (c. 2000–500 BC)

During the Bronze Age, settlement continued in the valleys occupied by the Neolithic habitations. As mentioned above two other monuments in the vicinity of Cherrywood that may date to the Bronze Age, cairn sites (DU026:025 and DU026:026). These appear to be at least partly composed of natural rock outcrop. The tradition of incorporating natural features such as rock outcrops and glacial erratics into monuments is a feature of the Bronze Age, and the fact that the two features were known locally as cairns and marked as such on the Ordnance Survey maps; suggest that they are of archaeological and folkloric significance, even if they are partly natural in origin. Predevelopment excavations associated with the South Eastern Motorway and housing and commercial developments in Cherrywood and Laughanstown have produced a large number of Bronze Age sites that had no visible surface indications.

Recent Excavations: During monitoring for the motorway two possible fulachta fiadh were excavated in Ballyogan townland by Thaddeus Breen and Gary Conboy under licence numbers 02E0481 and 02E1276 (Breen 2004, Conboy 2004c).

Two burnt mounds or fulachta fiadh were excavated in Laughanstown and have been dated to the Bronze Age

(Seaver 2004c). Another two burnt mounds were identified in the same townland (McQuade 2003b). Middle Bronze Age structures and evidence for settlement activity were also uncovered in the fields surrounding the wedge tomb (DU026:024) to the southwest of the development (Seaver 2004b). Sub-circular post-built structures formed an unenclosed settlement, where pottery and querns were indicative of domestic activity. Within a stone enclosure 30m in diameter were a series of post holes and a pit, which provided a Bronze Age date. Prehistoric pits and settlement activity were excavated to the north of Tully Church (O'Donovan 1998).

Other Bronze Age sites uncovered during monitoring for the motorway in Carrickmines Great townland include a Bronze Age flint knapping site with associated settlement evidence (licence number 02E0700) (Conboy 2004a); a prehistoric settlement site with both Neolithic and Bronze Age evidence (licence number 02E0272) (O'Drisceoil 2004). These two sites were located very close to the proposed 'Park and Ride', being in the fields just to the south across the stream.

Also associated with the motorway works near the development site was the excavation of a fulacht fiadh and burnt mound (licence numbers 02E1130 and 02E1188) (Conboy 2004b, Reilly 2004b), and a further burnt mound, pits and a roadway was excavated by Fiona Reilly (licence number 02E0428). Pottery found in the trough dates the burnt mound to the Bronze Age, further attesting to the intensive use of this area at that period (Reilly 2004a).

Bronze Age cremation burials were identified and subsequently excavated during earlier developments in Cherrywood, Laughanstown and Glebe (O'Donovan 1999; Ó Néill 2000; Ó Néill 2000; McQuade 2003a; Seaver 2004b). At Cherrywood Park II a ring barrow (licence no. 98E0526) has been dated to this period (Ó Néill 2000). Barrows are circular monuments, defined by a fosse and outer bank, with a flat or domed interior, dating from the Bronze Age into the Iron Age.

2.5 Iron Age (c. 500 BC – 400 AD)

There is record of an extended inhumation in a long stone cist (NMI ref. 1957:350) in Loughlinstown, which is likely to date to the late Iron Age or early historic period. There is no mention

of grave goods, suggesting it may be a Christian burial. By the Iron Age, the pattern of burial on the higher ground is well established at Cherrywood.

Recent Excavations: A late Bronze Age/Early Iron Age burial enclosure was excavated in Cherrywood as part of the Phase I mitigation works (Ó Néill 2000). It was 43m in diameter. A number of cremated human bone deposits were found in the ditch on the eastern side of the site; some small fragments of bronze and glass beads were recovered from these burials. Burials of cremated bone in the western part of the ditch did not contain finds, and two were placed on stone settings. Two pits were also inserted into the silted-up ditch fill and covered over with a large boulder. Although only one cremation, in the centre of the site, was found intact, the presence of fragments of burnt human bone in the grave fills of the later inhumation cemetery probably derive from cremation burials disturbed during the later interments. Some blue glass beads, a bronze fragment, a bone pin and an iron pin from separate deposits of burnt bone suggested that the burials date to the Iron Age (Ó Néill 2000). This site was subsequently reused during later periods.

2.6 Early Medieval (Christian) period (AD 400–1200)

The Iron Age burial enclosure mentioned above was reused during the sixth or seventh century AD as an inhumation cemetery (Ó Néill 2000). It certainly pre-dates Tully Church, but the burials are probably contemporary with the earliest phases of Mount Offaly in Cabinteely (Conway 1999), where close to one thousand five hundred burials, ranging in date from the sixth/seventh centuries to the thirteenth century, were uncovered.

Recent Excavations: Thirty-eight burials were recovered at the Cherrywood site. Adult male, female and child burials were placed in earth-dug graves oriented roughly east–west, with the head to the west; in some 76% of cases, the head was protected by ‘ear muff’ stones. Two buckles and some other iron fragments suggested that some burials were clothed. An iron spade shoe was uncovered from one of the grave fills. Two structures were built at the southern end of the site during the early use of the cemetery, although one isolated burial lay between the two. The eastern structure appears to be some form of keyhole-shaped drying kiln. The

western structure (Structure 4) was described by an oval setting of post holes containing a sunken area. A bone pin/needle was recovered from the sunken area. A single sherd of B ware and a lignite bracelet found in topsoil may also date to this phase (Ó Néill 2000). It is unclear what relationship this site had, if any, to the nearby ecclesiastical settlements.

A series of grain drying kilns were excavated along the line of the South Eastern Motorway (Seaver 2004b). These have been dated from the mid-sixth to mid-seventh century and are indicative of large scale crop husbandry.

A substantial ringfort, with a 46m diameter, in the townland of Glebe again associated with the South Eastern Motorway was also excavated. Finds from this site include bone pins, metal pins, glass beads and slag associated with smithing. Field boundaries were also recorded and at least one of these was dated to the late seventh and late ninth centuries AD (Seaver 2004a).

There are several pre-Norman ecclesiastical settlements in the area. These are located in Kilgobbin, Tully (DU026:023) and Rathmichael, where the base of a round tower also survives.

In Cherrywood the earlier Bronze Age/Iron Age site was reused. In the late ninth century Norse settlers constructed a long house on the site. The rubbish from the demolition of this long house was deposited in a pit on the site and contained a large amount of animal bone and artefacts, including a whale bone plaque, generally associated with Norse women, and other typical Norse finds (Ó Néill 2000). When the long house was deliberately demolished, it was replaced by two structures. The path linking the two structures survived in one place as a narrow cobbled area. The northern structure was similar to Type 1 houses from urban levels in Dublin and appears to have been rebuilt in situ a number of times. The entranceway was marked by a small cobbled area, and a ringed pin and bone comb were uncovered from this structure. The second structure was rectangular and had an entrance to the south (Ó Néill 2000). This site is very important, as it is among the very few known rural Norse

settlements in Ireland and the first one to be excavated to this extent (Licence numbers 98E0526, 99E0517, 99E0518, 99E0519 & 99E0523).

At Tully Church, there are three stone crosses, which date to between the eighth and eleventh centuries AD, and two decorated cross-slabs known as Rathdown slabs, due to their prevalence in this barony. A third slab is decorated with three concentric circles. The twelfth century cross to the north of the graveyard appears to mark the outer boundary or tearmann of the sacred area around the church. It was ruined by 1615 and went out of use after the 1641 rebellion, having been last repaired in 1630. The church is described in further detail in the section on RMP monuments.

Archaeological monitoring and excavations was carried out (O'Donovan 1998) along the line of access roads leading to a housing development at Cherrywood, Laughanstown and Loughlinstown, Co. Dublin. An enclosure ditch was located on the northwestern side of Tully Church (RMP DU028:023). A trench was excavated immediately inside a gate adjacent to Tully church. The gate is located on the northwestern side of the graveyard with good views over Laughanstown and the hillock on which prehistoric activity was located. The trench uncovered the inner edge of the ditch, however neither the base of the ditch or its outer edge was revealed.

2.7 Medieval period (AD 1200–1600)

The medieval period is represented by a wide range of monuments, and the range of tower houses such as occur in Murphystown (DU023:025), Kilgobbin (DU025:017/026:121) and at Carrickmines (DU026:005) is indicative of the frontier nature of these areas as outposts of the Pale. Along with the churches, holy wells, and crosses in the area the settlements around these castles point to a considerable local population, living in well-defined villages and hamlets, rather than scattered across the landscape. They also appear to reflect a relatively stable medieval population, as the church in Kilgobbin (DU025:016) appears to have been rebuilt with stones from an older church, rather than being deserted. It is only when people moved to larger villages in the last few centuries that smaller hamlets such as Kilgobbin, were deserted.

On the right hand side of Glenamuck Road (going towards Golden Ball) and to the southwest of the proposed ‘Park and Ride’ were the extensive remains of Carrickmines Castle (DU026:005). Excavations associated with the construction of the South Eastern Motorway uncovered the large complex of external castle works such as ditches, banks, structures and settlement, all associated with the continuous use of the castle through the medieval period.

Carrickmines Castle was probably first constructed here after the Anglo-Norman invasion to protect the southern marches of the city of Dublin. The new settlers were exposed to frequent attacks in this area, as it was a convenient point for Irish tribes such as the O'Tooles and the O'Byrnes to raid from the mountains. A branch of the Walsh family, to which the lands of Carrickmines had been given, garrisoned the castle. They were very successful agriculturists and military men (Ball 1902). At first they were able to withstand attack alone but later troops were dispatched from time to time to aid them.

Historical references show that in 1360, a troop of light horsemen under the leadership of Sir John Bermingham was stationed at Carrickmines. In 1375 a large force under the leadership of John Colton, then Dean of St. Patricks and Treasurer of Ireland (and later Archbishop of Armagh), stayed at Carrickmines on one occasion for 3 days, and on another occasion for a month. In 1388, forty mounted archers were stationed there, for which a contribution was levied from the distant lands of Fingal (Ball 1902).

In 1441 Henry Walsh was allowed ten marks - a large sum in those days - for protecting his liegemen and probably it was by him that the castle of Carrickmines was erected in the form, which it stood for the next two centuries (Ball 1902). It is the ruins of this castle that are seen today.

The 16th century found the Walshes in occupation either as tenants or owners of a wide extent of country and they had become one of the most important families on the south side of Dublin. However, the lands were subjected to devastating attack from Irish tribes towards the end of that century when the property was in the custody of Peter Barnewall, a guardian of Richard Walsh, who was a minor at the time (Ball 1902).

At the start of the 17th century the Walshes were described as ‘a large and ancient stock and as men of note in the metropolitan county’, which was then ‘rich and plenteous in corn and cattle, and inhabited by a people of stately port and garb’ (ref. from 1642 in Ball 1902). However, before the middle of that century the Walshes’ prosperity was at an end. The part taken by the owner of Carrickmines Castle in the Cromwellian Rebellion of 1641 is not clear, but as a family the Walshes threw themselves behind the Irish side, and proved that they had become more Irish than the Irish themselves. Whether with or without the consent of the owner, Carrickmines became the centre for disaffection in the southern part of County Dublin, and the Walshes figure prominently in the depositions made by those who suffered losses during that first winter (Ball 1902).

During that winter after the rebellion, the county of Dublin, south of the city, was in the hands of the rebels. Their defeat in February 1642 at Deans’ Grange meant that they fell back to Carrickmines Castle, preparing to stand a siege. They put up a brave fight for a day but eventually the castle was breached. All within it, men, women and children were put to the sword and the castle was blown up and levelled to the ground (ref. from 1642 in Ball 1902). However, Petty’s Down Survey of 1656 shows a substantial tudor-type house still standing at this time in Carrickmines as well as a number of smaller buildings so the level of destruction at the end of rebellion may not have been as great as reported. After the Restoration, the Commissioners of Settlement awarded the lands of Carrickmines to the Earl of Meath.

RMP designation for Carrickmines Castle was extended to include all of the outlying earthworks (DU026:005). This defined area is to the southwest of the proposed ‘Park and Ride’. The final phase of the excavation of the castle site is nearing the end (Directed by G. Conboy, VJK).

In summary the excavations at Carrickmines Castle (DU 26:005) revealed a medieval landscape which included a revetted fosse, two outer earthen banks and fosses, an earlier ringwork castle type enclosure featuring a massive fosse, an outer fosse and attendant banks, a mill pond and mill race, house sites, industrial features, the main castle entrance and a medieval village (Clinton 2004).

A section of the Pale boundary survives west of the castle site (DU026:115). A Watermill Site (DU026:080) located to the east of the castle may be associated with the castle and settlement site.

An assessment for a large residential scheme off Glenamuck road, to the south of the castle complex (DU026:005) was undertaken in 2004 (Dennehy 2004). The development site encroaches on the area of archaeological potential associated with the cross-base (DU026:018) for the crossroads of a medieval landscape. No features or deposits of an archaeological nature were uncovered.

2.8 Cartographic Analysis

2.8.1 William Petty’s Down Survey map of the Barony of Half Rathdown, dated c. 1656 (Figure 4)

The parish of Tully is shown on the Down Survey Map, as consisting of the townlands of Loughenstowne, Brenanstowne, Carrickmaine and Glanamuck, and Leperstowne. Today the townlands of Carrickmines Little and Carrickmines Great are located in the parish of Tully within the Dublin barony of Rathdown.

Due to the nature of the map the exact position of the proposed ‘Park and Ride’ is difficult to determine, its location can however be roughly determined by using other features identifiable on the map. The settlement at Carrickmines is shown as a large house/castle with three smaller structures/settlement west of it, it is marked as Carrickmaine and Glanmuck. What is known as Carrickmines hill is indicated on this early map edition, the proposed development area on this map can be approximately located to the northeast.

2.8.2 John Rocque’s An Actual Survey of the County of Dublin, dated 1760 (Figure 5)

Rocque’s 1760 map, though small scale has considerably more detail than that of the latter map source. The settlement of Carrickmines is clearly shown south of an easterly flowing river. Along this watercourse there appears to be a footpath

on the line of the ditch stretching from Carrickmines to Kilgobbin Castle, but no road. As the banks of Pale earthworks were frequently used as paths or roadways this may signify that this earthwork was in use as a path prior to the construction of the Ballyogan Road in 1800. Three routes pass through Carrickmines, namely the above-mentioned path from Ballyogan, a road from Corner’s Court (Cornel’s Court) to the north and a road from Puck Castle/Tully/Shankill to the southeast. The road from Kilternan/Jamestown links with the latter road. These roads are likely to have medieval origins.

The proposed development area, as depicted on Rocque’s map, is located to the north of the stream and Carrickmines. The land is depicted as a field, with a structure on the road frontage to the west indicated.

2.8.3 John Taylor’s Environs of Dublin, dated 1816 (Figure 6)

In the intervening years between Rocque’s 1760 and Taylor’s 1816 map the Ballyrogan (Ballyogan) and Glanamuck (Glenamuck) Roads were laid out and are both marked as New Roads. Carrickmines appears to have grown considerably in size with several new structures within the village and along the roads leading into it. The development area is still depicted as greenfield, with a structure to the west.

2.8.4 First Edition Ordnance Survey Map 1837 (Figure 7)

The First Edition Ordnance Survey Map provides the earliest complete and accurate survey of the study area. One of the most striking changes evident since Taylor’s 1816 map; is the reduction in size of Carrickmines village. Carrickmines Castle is marked as Site of Castle. Only a few houses remain along the roads that lead into Carrickmines. The Priorsland house complex is clearly marked on this map, to the west of the ‘Park and Ride’ area. To the northeast a quarry is marked. The southeastern road from Carrickmines to Pucks Castle/Shankill appears to be abandoned as a roadway and its southern section has been incorporated into the surrounding fields.

3 Archaeological Testing Programme

3.1 General

As part of the Luas Line B1 development, a ‘Park and Ride’ facility with an access road to the motorway is proposed for the Carrickmines stop. The proposed site incorporates parts of Priorsland house gardens and the adjoining field.

A total of nine trenches were mechanically excavated by JCB within half of the proposed development site (Fig. 8). These trenches were backfilled after they were recorded. Eight of these were excavated in the Park and Ride site, and one along the associated access road.

3.2 Trench 1

0.00–0.17m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.
0.17–0.47m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking.
0.47–0.57m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
0.57m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

This was a north-south orientated trench 5m in length and 1.6m in width. It was excavated to a depth of 0.6m. No archaeological features or finds were found within this trench. Natural flint pebbles were noted in the subsoil layer and the orange natural layer.

3.3 Trench 2

0.00–0.18m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones. Sherds of modern factory produced pottery were noted to be within the topsoil.
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0.18–0.53m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking. This layer contained a sherd of nineteenth century stoneware and one piece of prehistoric pottery.
0.53–0.63m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
0.63m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

This was an east-west orientated trench located in the southeastern corner of the Park and Ride site. It was 11.5m in length, 1.6m in width and was excavated to a depth of 0.7m. An area of disturbed ground associated with animal burrowing (rabbits) was located within this trench. The natural was consistent throughout the trench. One small sherd of prehistoric pottery was found within the subsoil layer close to the area of burrowing. No archaeological feature was associated with the pottery.

3.4 Trench 3

0.00–0.20m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.
0.20–0.55m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking. There were also occasional flint pebbles and quartz. One piece of struck and retouched flint was found in the eastern end of the trench. This find dates from the prehistoric period and is likely to be either Bronze Age or Neolithic in date.
0.55–0.65m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone and occasional quartz stones (natural).
0.65m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

This was an east-west orientated trench. It was 18m in length and had a width of 1.6m. The maximum depth of the trench was 0.8m. One piece of worked flint was located at the eastern end of the trench (towards trench 2). This piece of worked flint appears to be a small blade or scraper (Neolithic?). It was found in the subsoil layer and no associated archaeological features were located within the trench.

3.5 Trench 4

0.00–0.16m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones. Sherds of modern factory produced pottery were noted to be within the topsoil.
0.16–0.46m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking.
0.46–0.56m	Light brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
0.56m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

This was a north-south orientated trench 12m in length and 1.6m in width. It was excavated to a maximum depth of 0.6m. The natural was slightly different in colour to that in the majority of trenches. This light brown layer thinned out towards the northern end of the trench as there was a slight rise in the landscape.

3.6 Trench 5(a)

0.00–0.18m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones. A few sherds of modern factory produced pottery were noted to be within the topsoil.
0.18–0.40m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking.

0.40–0.50m Orange brown gritty friable clay with

0.50m+	occasional inclusions of black decayed stones and small angular and rounded limestone (natural). Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).
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This trench was an east-west orientated trench and was 15m in length. It had a width of 1.6m and a maximum depth of 0.6m. Crossing the trench northwest to southeast was a cobbled path associated with the stables. This was located within the topsoil and cut into the subsoil slightly. It was 5m in width and had a maximum depth of 0.3m. The pathway consisted of loose to compact small stones and cobbles. No archaeological features or finds were located within this trench.

3.7 Trench 5(b)

0.00–0.14m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.
0.14–0.40m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking. There were occasional quartz stones and natural flint pebbles within the subsoil.

0.3–0.8m Field drain 0.6m in width with a U to irregular shaped profile. Contained one fill consisting of grey stony material that was quite waterlogged (modern 19th or 20th century).

0.40–0.54m	Orange brown gritty friable clay with occasional inclusions of black decayed stones, quartz and small angular and rounded limestone (natural).
0.54m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

This was an east-west orientated trench and a continuation of 5(a). The area between the two trenches appeared to contain

pipes with visible manholes (drainage) and therefore the trench was discontinued for 10m. The orange brown natural was patchy in this trench with high patches of the stony natural. Cutting the natural in a northwest to southeast direction was a field drain. This was 0.6m in width and was a maximum of 0.5m in width. It had a U shaped to irregular profile and was filled with a grey and wet stony deposit. It contained no datable finds, though it may relate to post-medieval or modern land usage.

3.8 Trench 6

0.00–0.14m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.
0.14–0.39m	Light brown compact subsoil with inclusions of grit, quartz stones, small stones (limestone) and some charcoal flecking.
0.39–0.47m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
0.47m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

Located in the northern part of the proposed development site this trench was 15m in length and 1.6m in width. It had a maximum depth of 0.5m and was in a north-south direction. This area of the site is on a slight slope (north to south) and the deposits were not as deep as the rest of the trenches to the south. The two natural layers described were not as consistent, and there were frequent high patches of the stony natural layer through the orange brown natural clay. No archaeological features or finds were located within the trench.

3.9 Trench 7

0.00–0.18m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones. Sherds of modern factory produced pottery and red earthenwares were noted to be within the topsoil.
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0.18–0.48m	Light brown compact subsoil with inclusions of grit, small stones and some charcoal flecking.
0.48–0.53m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
0.53m+	Loose grey deposit of angular and rounded stones (limestone and occasional quartz) with grit and coarse sand (natural).

Trench 7 was 8m in length and was orientated north-south. It was 1.6m in length and had a maximum depth of 0.6m. The orange brown natural layer was notably thinner in this trench.

3.10 Trench 8 (Plate 1)

Northern 10m	
0.00–0.15m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.
0.15–0.45m	Light brown compact subsoil with inclusions of grit, quartz, small stones and some charcoal flecking.
0.35–0.75m	Field drain 0.5m in width and a U shaped profile. Contained a greyish brown silty clay fill with charcoal and stone inclusions (modern 19th or 20th century).
0.45–0.62m	Sub-circular posthole and post-pipe. No datable finds or associated features located within the trench or posthole (archaeology).
0.45–0.60m	Orange brown gritty friable clay with occasional inclusions of black decayed stones and small angular and rounded limestone (natural).
Southern 10m	
0.00–0.15m	Dark brown topsoil (loose silty clay) with very occasional inclusions of charcoal and small stones.

0.15–0.45m	Light brown compact subsoil with inclusions of grit, quartz, small stones and some charcoal flecking.
0.45–0.65m	Mid brown gritty material with little clay. Relatively loose and dry deposit with inclusions small stones and quartz fragments (natural).
0.65–1.05m	Various layers and deposits of coarse sands, quartz gravels, grey compact clays and finer sands. These layers all contained very small rounded stones and grit with no organic content. The deposits abutted the base of the orange brown natural giving the appearance that they were within a cut. However, these layers were geological in nature (natural).

This trench was excavated along part of the proposed access road route for the development. It was orientated in a northeast to southwest direction. The trench was 20m in length, 1.6m in width and up to 1.05m in depth. One archaeological feature was identified within the trench (Plate 2). This was a posthole that measured 0.21m by 0.18m with a depth of 0.17m. The posthole contained a post-pipe that measured 0.1m in diameter. The fill of the post-pipe was charcoal rich. This feature was half-sectioned, and no datable artefactual material was retrieved. An extension to the trench was excavated to uncover any associated features. This was on the east side and measured 4m by 5m. No further features were located in either trench. Also within this trench was a north-south orientated filed drain, indicating post-medieval or modern land usage.

There was a notable change in the natural deposits within this trench (Plate 3). The northern half of the trench contained the orange brown natural over the grey stony natural. However, the second half of the trench contained various soft undulating layers of coarse sands, decayed quartz deposits and grey sandy clay. At first it was thought that these layers represented the fill of a large ditch, or other such waterlogged environment where deposits would settle in such a manner. However no archaeological material such as charcoal was found within the layers and no cut edges could be

determined. These layers therefore represent geological features.

4 Summary of Archaeological Findings

4.1 Previous excavations of prehistoric sites in Carrickmines Great

The development site lies within a rich archaeological landscape, with archaeological sites dating from the prehistoric and medieval periods. The archaeological monuments and sites in the vicinity of the development site are described above. Carrickmines Castle is located adjacent to the site, a number of prehistoric sites were also uncovered during the construction of the South Eastern Motorway in Carrickmines Great townland.

These sites dated from the Neolithic. A Neolithic/Bronze Age site with evidence for a building / structure, pottery, flint tools, and three stones with rock art was excavated in Carrickmines Great (Clinton, 2003). A Bronze Age settlement site with evidence for at least three structures, flint knapping/tool production and other ‘industrial’ activity was located two fields to the south of the proposed development site (O’Drisceoil, 2004).

4.2 Archaeology at the ‘Park and Ride’

The testing programme uncovered evidence of archaeological activity, two finds of a prehistoric date and one archaeological feature of unknown date. The two finds, a small pottery sherd and a flint blade/scrapper were stray finds (not in situ) found in the subsoil layer. There were no features identified within the trenches that were associated with these finds.

The archaeological cut feature that was located during the test trenching was in Trench 8. This posthole is suggestive of prehistoric structural remains and it was sealed by the subsoil layer and cutting the natural layer. There was no dating evidence found for the posthole, but given it was sealed by the subsoil layer it is likely to be prehistoric in date. It was located 0.2m from the eastern trench edge; no features were located to the west of it within the trench. A trench extension was excavated to the east to determine the presence of associated features. A trench of 4m by 5m was excavated and no further features were located.

While this posthole appears to be an isolated feature of as yet undetermined function, it does suggest the existence of a larger archaeological site. This may only be uncovered during topsoil removal over a larger area. It is worth noting that the posthole and two stray finds were located in close proximity to each other, to the south of the ‘Park and Ride’ area and along the northern part of the access road (see Fig 8).

Carrickmines Castle is located to the southwest of the proposed development site. The extent of these remains has been established by archaeological work associated with the construction of the South Eastern Motorway. The boundary of this medieval castle complex does not appear to encroach into the Park and Ride site. No medieval finds or features were uncovered during the testing programme. Though it is noted that only half of the footprint was available to test, and the remaining area is closer to the medieval castle site.

5 Impact Statement

One archaeological feature was identified during this course of the testing programme. Despite the excavation of a trench extension, no further features were identified. However, this posthole and the two prehistoric finds found within 15m of it would strongly suggest the presence of further archaeological activity.

The proposed development includes the construction of a park and ride facility and access road. This will involve ground preparations and large scale earthmoving. These works will have a significant impact on the identified archaeology and will remove the feature and other associated features and finds that may be present.

Approximately one half of the footprint of the proposed development including part of the access road was not accessible at the time of testing. It is not known whether archaeological features are present in this half of the development site. It is therefore not possible to assess the impact of the development.

Conclusions and Recommendations

Archaeology in the form of one posthole and two prehistoric finds were identified during the testing. Despite the

excavation of an extension trench around the posthole, no further features were located. However, given the location of the proposed development site in a rich archaeological landscape, it is likely that further features are present. This may only be established once the topsoil has been removed over a much wider area.

6.1 Further Testing

Approximately one half of the entire proposed development site was archaeologically tested. The area not tested consisted of land under cover of mature trees, hedges and shrubs; the lawn in front of Priorsland house and the walled rose garden to the north, all was inaccessible for a JCB.

The untested half of the site is closer to Carrickmines castle and though the extent of the castle remains appears to be outside the development area, there is a possibility of further medieval activity outside the limits of the castle complex. Also given the number of prehistoric archaeological sites found in the vicinity of development site, it is recommended that a further phase of archaeological testing be undertaken when this part of the site is fully accessible.

6.2 Monitoring

Based on the findings of this testing programme, it is recommended that all groundworks prior to topsoil removal be monitored by a suitably qualified archaeologist under licence to the Department of the Environment, Heritage and Local Government, and the National Museum of Ireland.

It is recommended that topsoil removal as part of the groundworks stage of construction be undertaken by machinery with grading buckets only and under the direction of the monitoring archaeologist.

Topsoil removal should take place well in advance of the main bulk excavation for the park and ride facility and other construction works in order to allow an adequate amount of time for archaeological resolution should further features be identified.

Please note that all recommendations are subject to approval of the National Monuments Section of the Department of the Environment, Heritage and Local Government and the National Museum of Ireland.

Appendix 1 National Monuments Legislation

All archaeological sites have the full protection of the national monuments legislation (Principal Act 1930; Amendments 1954, 1987, 1994 and 2004).

In the 1987 Amendment of Section 2 of the Principal Act (1930), the definition of a national monument is specified as:

any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections,

any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position,

any, or any part of any, prehistoric or ancient

*(i) tomb, grave or burial deposit, or
(ii) ritual, industrial or habitation site,*

and

any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site...

Under Section 14 of the Principal Act (1930):

It shall be unlawful...

to demolish or remove wholly or in part or to disfigure, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),

or

to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...

Under Amendment to Section 23 of the Principal Act (1930),

A person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all the sites and ‘places’ recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to ‘registered’ sites (Section 8(1), National Monuments Amendment Act 1954) as follows:

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

The 2004 Amendment Act gives:

discretion to the Minister for the Environment, Heritage and Local Government to grant consent or otherwise issue directions in respect of a national monument notwithstanding the fact that such consent or directions may involve injury to, interference with, or the destruction in whole or in part, of the monument. In so doing, the Minister will not be restricted to archaeological considerations alone, but can consider the wider public interest.



A hand-drawn map of the Killybegs area in County Londonderry. The map shows various townships and parishes, including Killybegs, Parrish, Rathmickell, Killturnan, Whitechurch, and The Grange Protestant Land. A red circle marks the 'Approximate Site Location' near Carrickmaine. The map also shows 'The High Road' and 'The Grange'. Other labels include 'Loughnasstane', 'Shanganagh', 'Brennans town', 'Loghenstowne', 'Killy', 'Carrickmaine', 'and Glanmuck', 'Ballicorona', 'Promptstone', 'Ballibetagh', and 'The Grange'. The map is oriented with North at the top, indicated by a compass rose.

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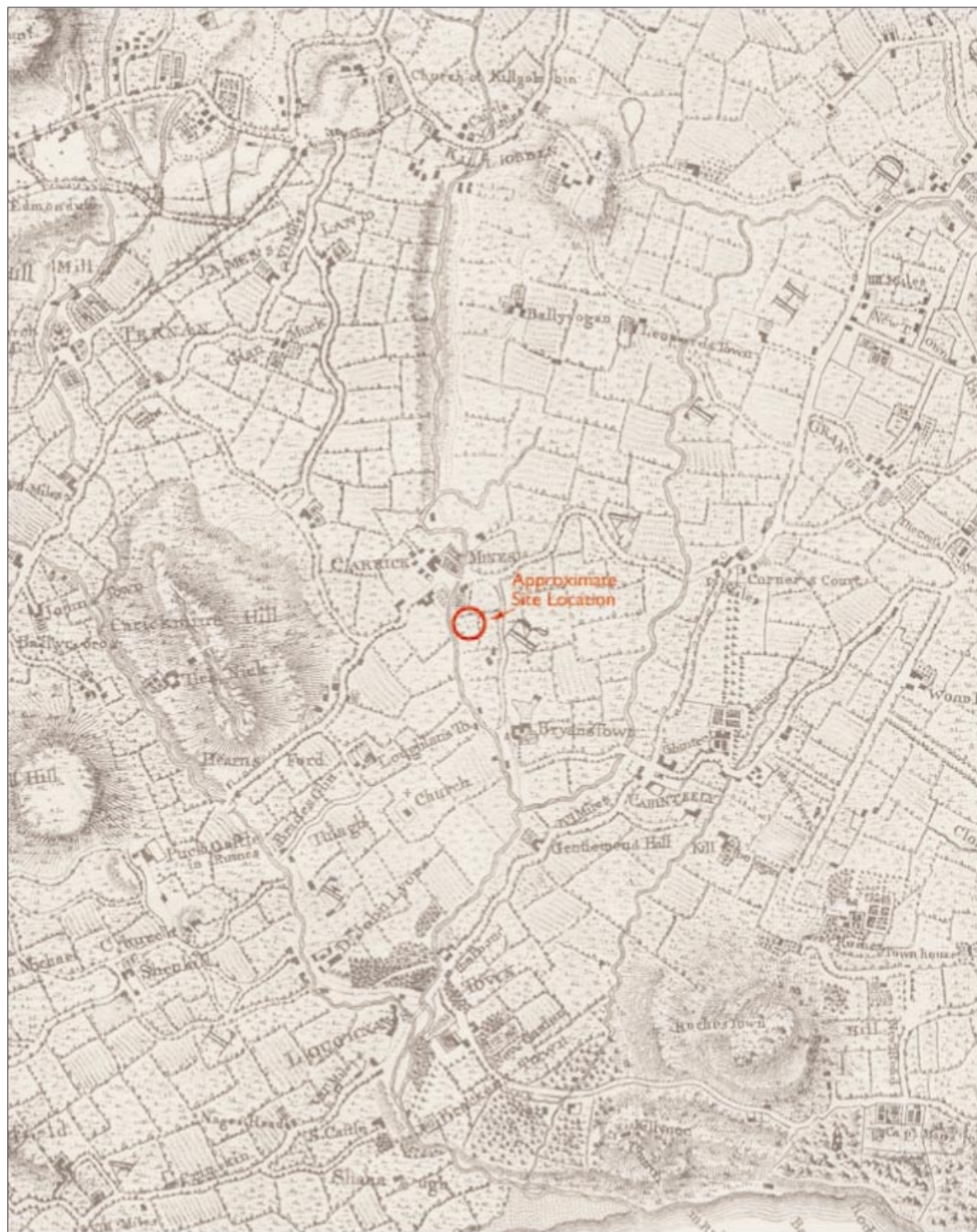


Fig 5: John Rocque's Map of Dublin 1760



Fig 6: John Taylor's Map 1816

BUS SET-DOWN/PICK-UP
 PROPOSED BICYCLE PARKING AREA
 CAR DROP OFF
 PROPOSED FENCE
 PROPOSED SUB-STATION
 N
 FOOTPATH
 LIFTS
 TWO-LEVEL PARK
 PROPOSED
 FOOTPATH
 TWO-LEVEL PARK
 RAMP PARK
 Park and Ride
 T5(a)
 T4
 T3
 Find
 T1
 T2
 T6
 T5(b)
 T7
 PROPOSED FENCE
 Archaeology (Posthole)
 Access Road
 PROPOSED FENCE

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Plate 1: Trench 8 Looking North



Plate 2 : Posthole in Trench 8 Half Section



Plate 3 : Section of Trench 8 Showing Change in Natural to South of Site

