

# Walshestown, County Kildare

## Restoration Plan

March 2008

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*“The Punchestown Perspective”*



# 0 Contents

1. Introduction
2. Site analysis (visual and physical)
3. Outline restoration concept
4. Restoration masterplan
5. Restoration cross sections (illustrative)
6. Photomontage views (existing and proposed)

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# 1 Introduction

## INTRODUCTION

Golder Associates Ireland (“Golder”) have been instructed by Cemex (ROI) Ltd. to assess the restoration options for a former sand and gravel quarry at Walshestown, Co Kildare on land adjoining Punchestown Racecourse. Founded in 1793, the Punchestown racecourse is considered as Ireland’s premier National Hunt Racecourse and is regarded as the natural home of Irish National Hunt Racing. It is therefore of key importance that any site restoration proposals at the Walshestown site do not adversely impact on the use and enjoyment of this site.

The former extraction site is 70 hectares in extent located 5 kilometres south east of Naas. Approximately 50 hectares of the site has been worked in the past to depths of 25 metres.

The site lies within the eastern uplands character area which is identified in the Kildare County Restoration Plan 2005-2011. These areas contain some of the elements of both upland and lowland areas. A preliminary landscape and visual assessment of the site was carried out to inform conceptual restoration proposals shown in this document with reference also made to Council policy refs: TA1-4 (inclusive)

A checklist of elements to include in the restoration plan was also compiled which includes the following:

- Re-create “Priests Hill”, a knoll feature removed during mineral extraction operations within the site. It is enshrined in local folklore that from here priests used to watch the racing when Ireland’s bishops once tried to enforce a ban on priests going to the Festival.
- Provide a linear water feature to facilitate drainage from Punchestown Race Course. This water feature will be designed to provide annual water demands for Race Course irrigation during drought conditions, estimated to be in the region of 6.0 million gallons per annum.
- Removal of Cypress trees along the western site boundary to remove cast shadow and frost pocket aspects from within the race course curtilage.
- Remove existing stone wall and move eastwards by approximately 4.0 metres (subject to approval).
- Provide a 3.0m ambulance track and associated passing bay along the outside of the Race Course on Cemex lands.
- Improve site security generally and install lockable gated access points.

Section 2 in this document shows the site’s visual and physical characteristics. Principal views and site features are assessed and taken into consideration.

Section 3 shows The Outline Restoration Concept

- **Phase 1 [after first 3 years]**  
Considers the site’s restoration potential in detail. One of the Key concerns is to minimise views from Punchestown Racecourse onto the Cemex site at project initiation.
- **Phase 2**  
Illustrates how the site will be worked from west to east away from the racecourse, thus minimising views of restoration operations. These areas, once infilled to formation level will be progressively restored.
- **Phase 3**  
Shows how the final working and restoration of the site will be completed. Double fenced hedgerow will be planted. Areas of pasture seeded and native woodland established.

Section 4 shows final restoration of the site which is principally restored to pasture, woodland and wetland areas. During phase 1, advance screening measures would be developed along the site’s western boundary to reduce views in to the site operation areas using excavated materials on site. These outer slopes would be graded to a gradient of approximately 1:4, seeded and woodland planted. A linear water feature would also be created between the screen mound and the race course boundary to enhance the visual experience of race goers visiting the Punchestown. The new ambulance track will also be installed at this stage.

Section 5 shows illustrative cross sections through the restoration masterplan

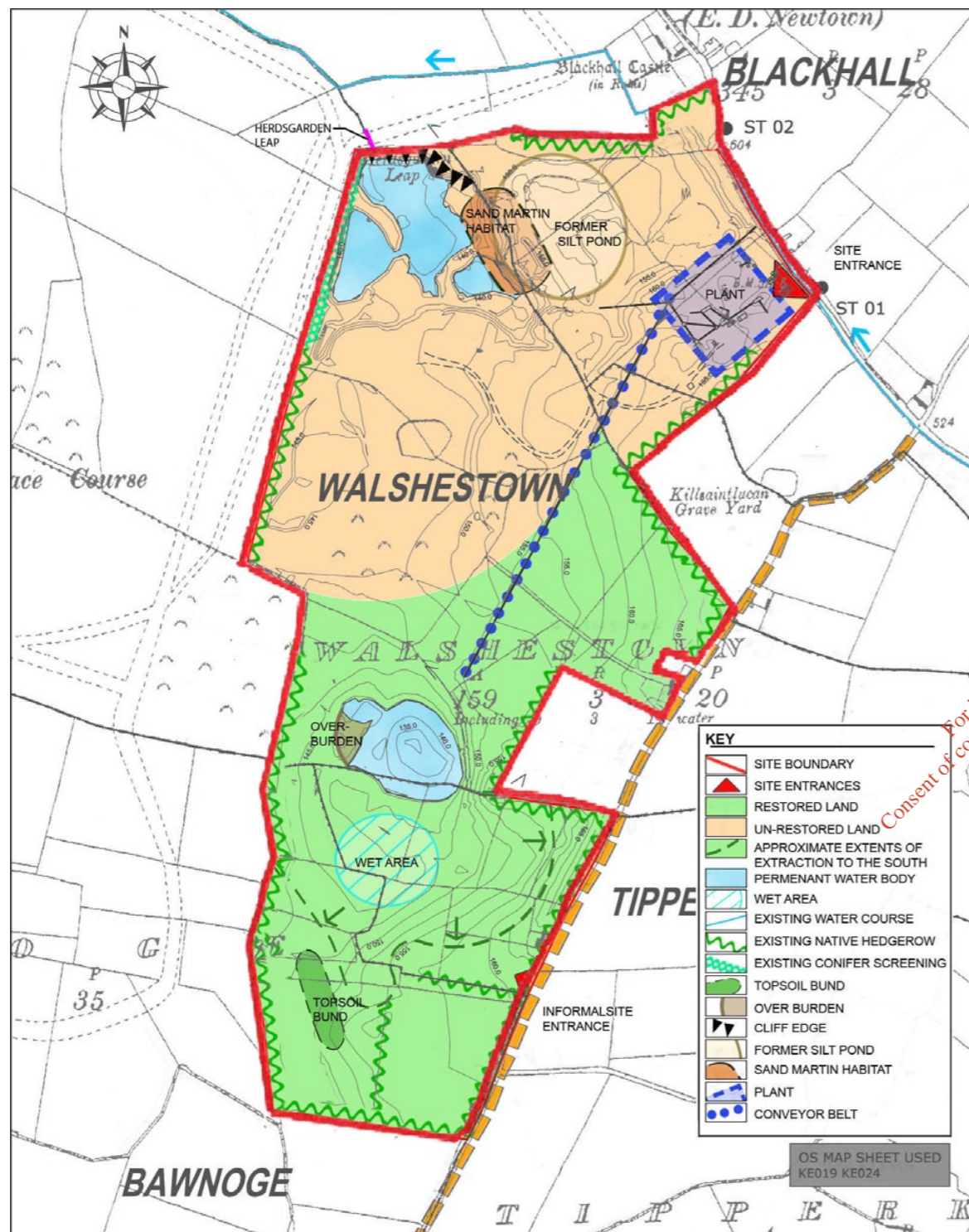
Section 6 illustrates existing and proposed views of the site from 2 viewpoint locations.

- Viewpoint 1 is looking due east towards Cemex lands from Punchestown stand. Three photoviews are provided including:
  - 1.(a) Existing view
  - 1.(b) Proposed view
  - 1.(c) Proposed view after first 3 years (Phase 1)
- Viewpoint 2 is looking due west from within the site towards the centre of the racecourse. Two photoviews are provided, including:
  - 2.(a) Existing view
  - 2.(b) Proposed view (Phase 3)

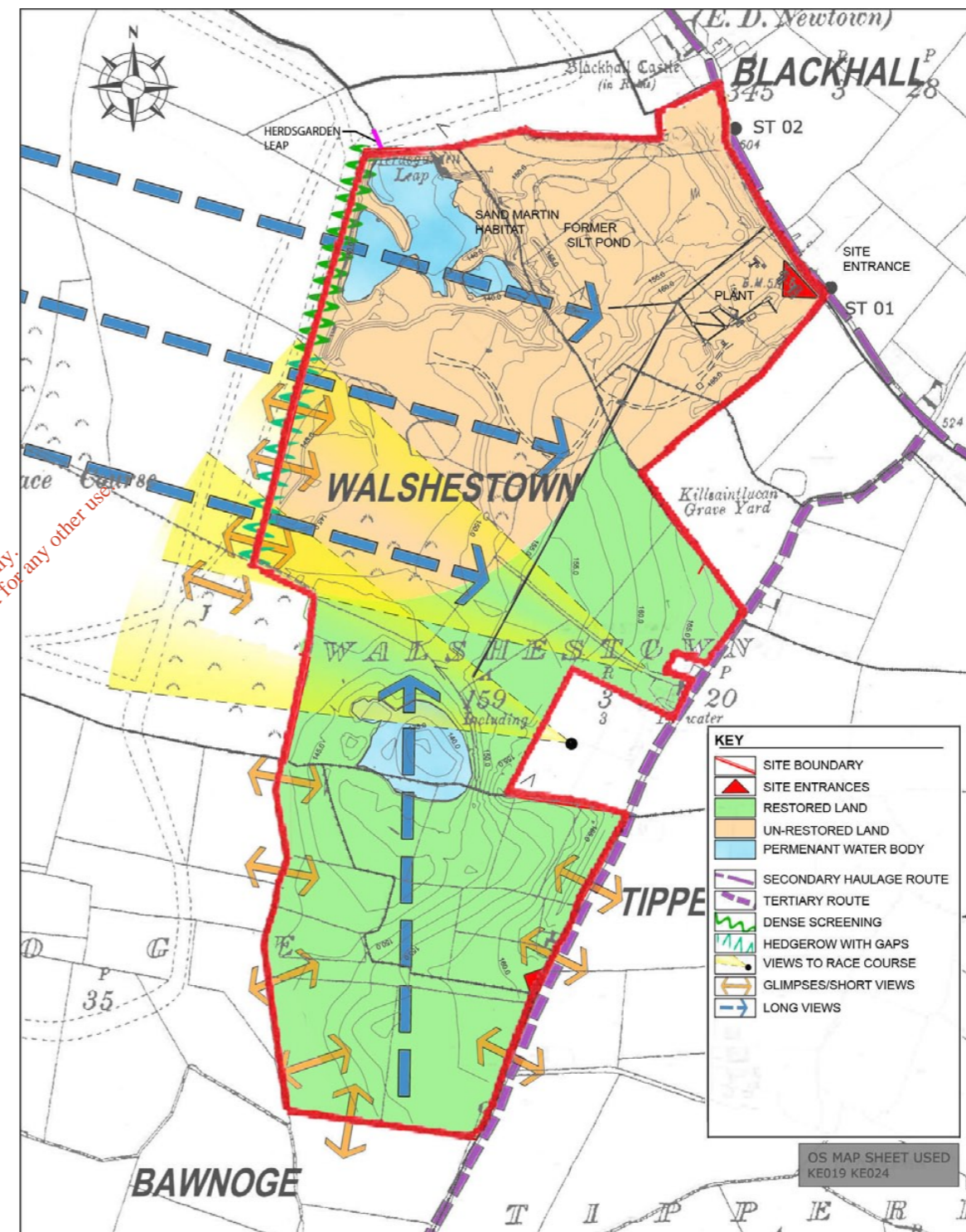




# 2 Site analysis



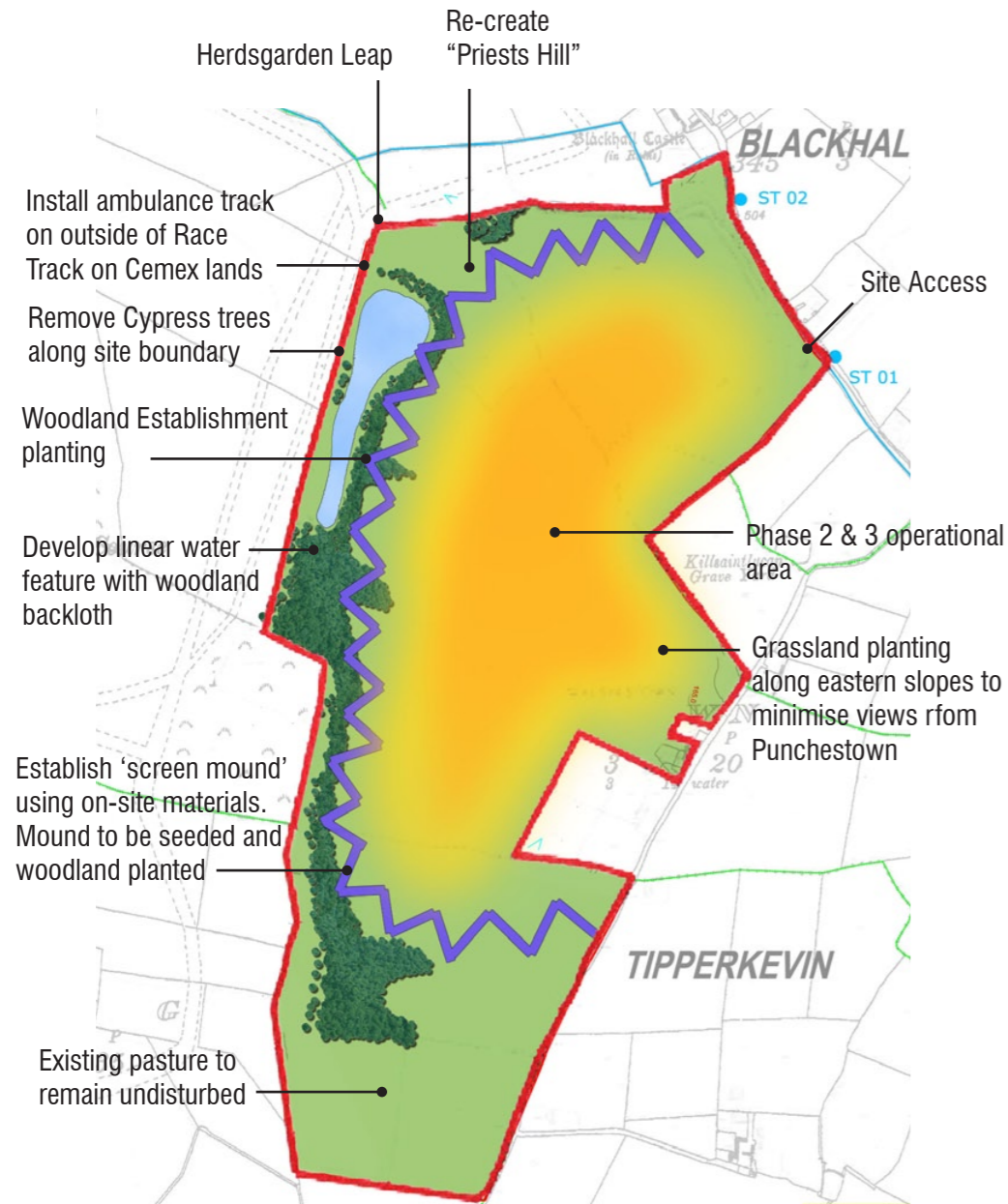
Physical conditions



Views and access

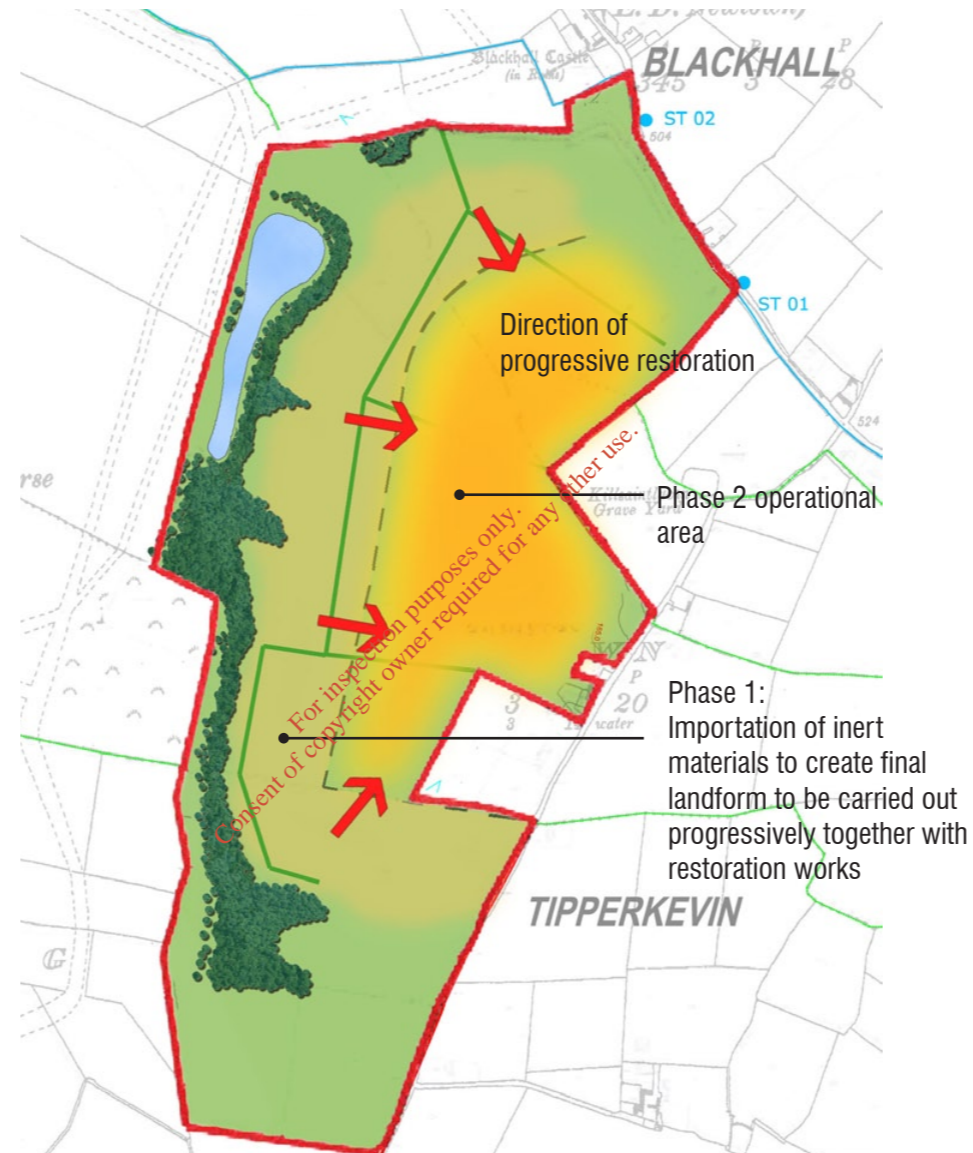


# 3 Restoration phasing



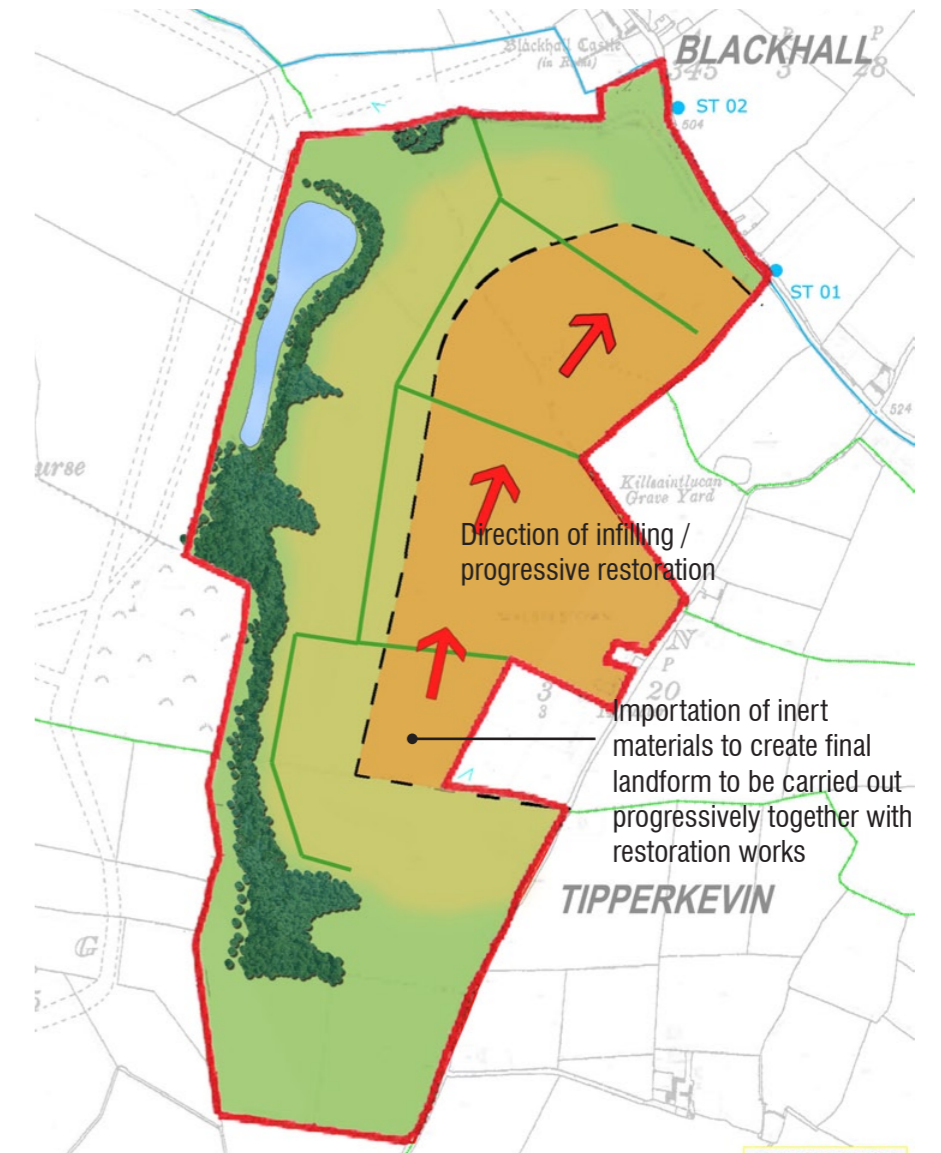
## Phase 1

- All site establishment / restoration works will be carried out in first 3 years.
- Restoration of western site margins to screen infill operations to the east to establish a woodland fringe.
- Re-create Priest's Hill and install ambulance track.
- Carry out seeding fencing and woodland planting.
- Create a linear water feature.



## Phase 2

- Carry out progressive restoration and working from west to east.
- Areas of pasture established; hedgerows and woodlands planted.
- Restoration maintenance works to be on-going, to include fencing, hedgerows, woodland management, grass and weed control.



## Phase 2

- Carry out progressive restoration working from south to north.
- Areas of pasture established, hedgerow and woodlands planted.
- 5 year after care programme to be implemented on final restoration.

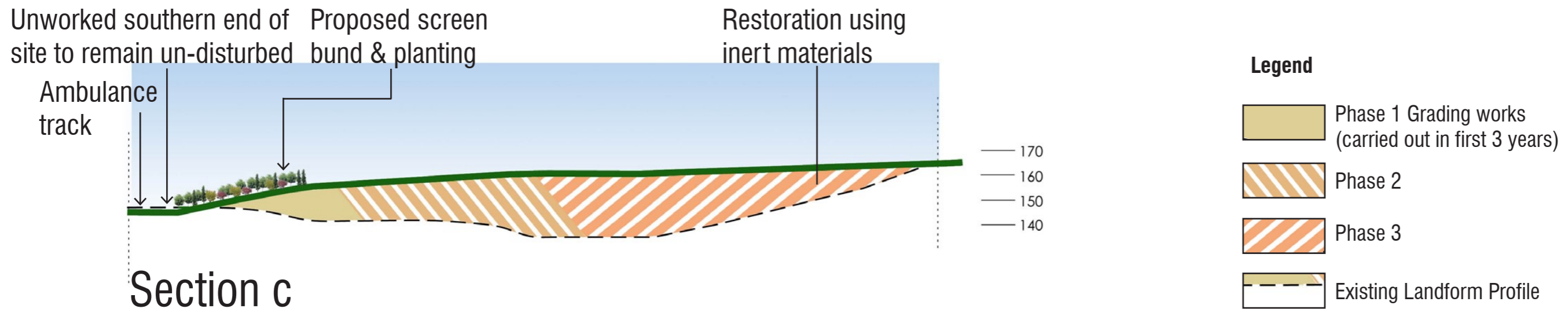
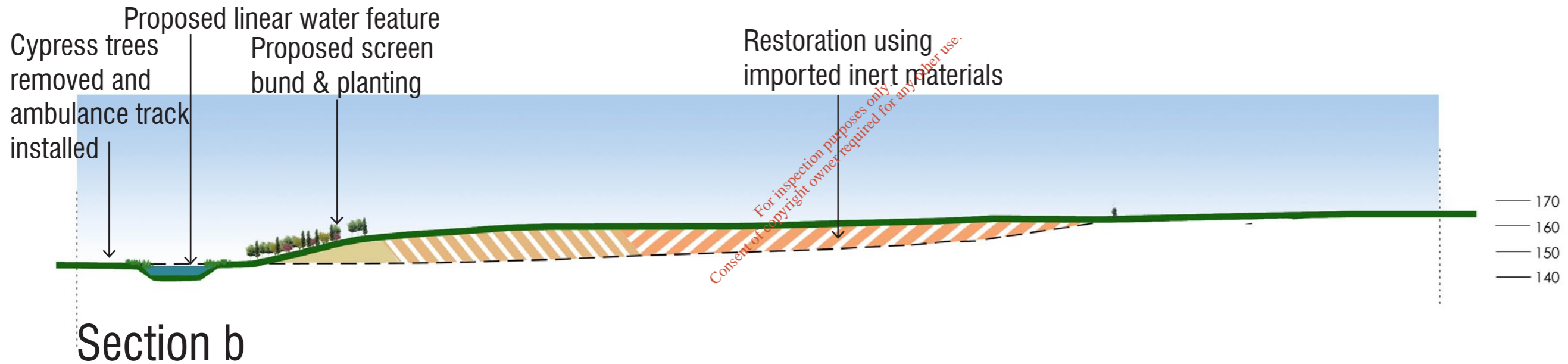
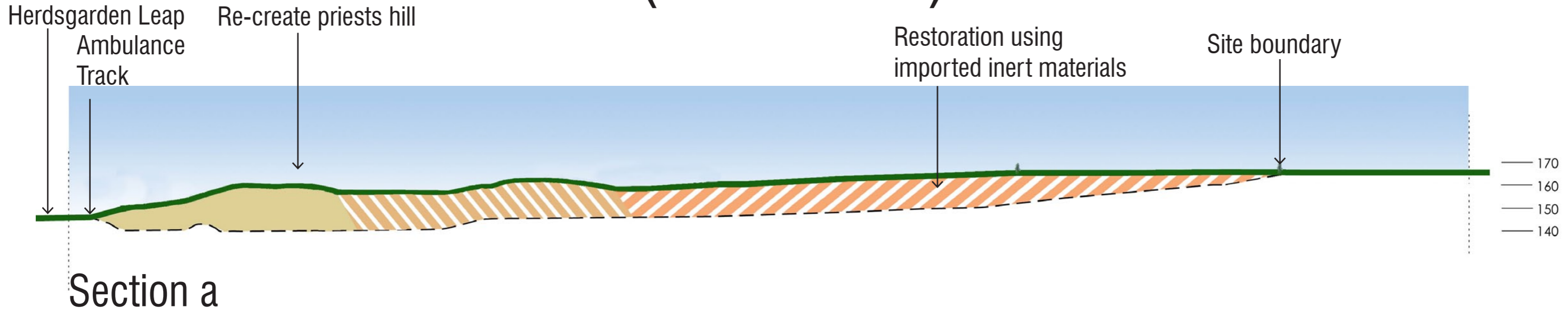


# 4 Restoration masterplan










# 5 Restoration sections (illustrative)



## Legend

-  Phase 1 Grading works (carried out in first 3 years)
-  Phase 2
-  Phase 3
-  Existing Landform Profile
-  Proposed Landform Profile



# 6 Photo views

1(a). Existing view looking east towards Cemex lands from Punchestown Stand.

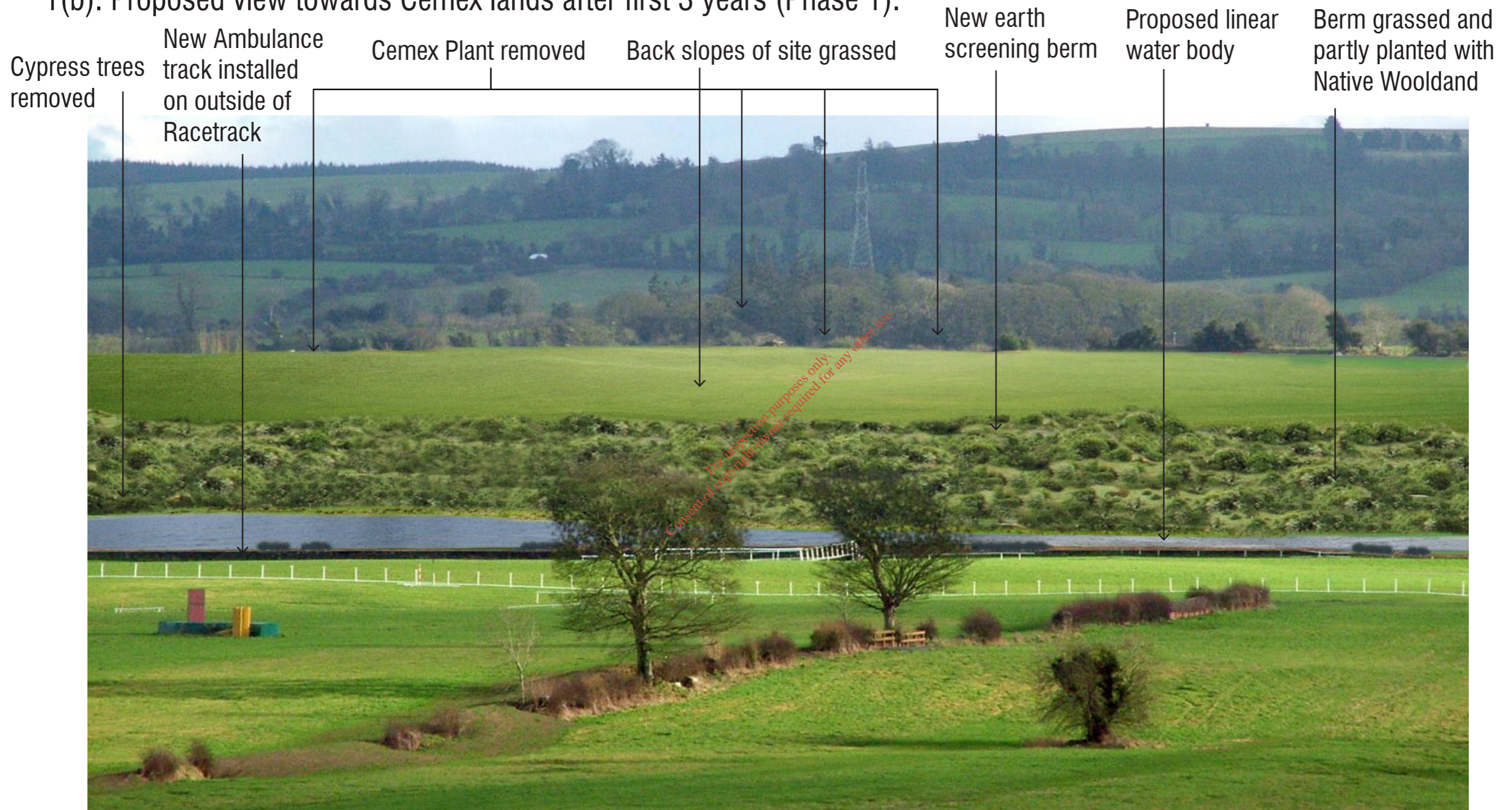


Existing



# 6 Photo views

1(b). Proposed view towards Cemex lands after first 3 years (Phase 1).



## Proposed view illustrating

- Removal of Plant and Cypress trees
- Linear water feature / water supply for Punchestown Racecourse
- Provision of Ambulance track
- Earth screening berms (grassed)
- Establishment of Native Woodland



# 6 Photo views

## 1(c). Proposed view towards Cemex Lands fully restored (Phase 3)



### Proposed view illustrating

- Linear water feature / water supply for Punchestown Racecourse
- Provision of Ambulance Track
- Restored foreground landscape
- Maturing Native Woodland



# 6 Photo views

2(a). Existing view looking due west towards the centre of the racecourse



Existing



# 6 Photomontage views

2(b). Proposed view looking due west towards the centre of the racecourse (Phase 3).



## Proposed view illustrating

- Linear water feature / water supply for Punchestown Racecourse
- Recreation of 'Priests Hill'
- Restored foreground landscape



**Golder Associates Ireland**

**Walshestown Pit Restoration**

**Traffic and Transport Assessment**

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**October 2008**



# Golder Associates Ireland

## Walshestown Pit Restoration

### Traffic and Transport Assessment

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Issue Date	Revision	Comment
6 <sup>th</sup> June 2008	D1	First Draft
22 <sup>nd</sup> September 2008	D2	Second Draft
17 <sup>th</sup> October 2008	F	Final



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## Executive Summary

This report addresses the traffic related impacts of the proposed quarry restoration operation in the townland of Walshestown, Co. Kildare. The Application Site area is approximately 68 ha. and accesses directly onto the L6042 County Road, to the south-east of Naas and to the north-west of Blessington. Material is to be imported to the quarry from sites in the greater Dublin and Leinster region. The remediation works are intended to restore the site to pre-extraction levels.

The site has been quarried since the late 1960s, under a number of planning permissions, most recently the 1996 permission (P.P.R. No. 96/100, P.L.09.098844) which allowed for 95 truck movements per day, or 190 trips. [ENFO, EIS No. 506]. It is not envisaged that there will be any additional truck movements generated as a result of the proposed restoration activities.

Classified traffic counts were undertaken to obtain an accurate representation of the traffic movements in the vicinity of the development and National Roads Authority (NRA) traffic growth factors were applied to the count data to estimate future year flows. The development flows to and from the site have been assessed following discussions with the client on the current and proposed future level of activity at the site. The total daily trips assessed under this traffic and transport assessment associated with the remediation operation is 276, 248 of which relate to HGVs (90%). This includes a short term peaking factor of 1.3.

The link capacity of the L6042 County Road and the R410 Regional Road have been assessed, and the junction capacity at the site access, at the L6042/L2023 junction and at the R410/L2023 junction were also examined for the assessment years of 2010, 2015 and 2025 in accordance with the National Roads Authority's "Traffic and Transport Assessment Guidelines" (September 2007). Each of the link and junction capacity assessments have also been undertaken for 2023, when the operations at the site are proposed to cease.

Two developments adjacent to the proposed quarry restoration operation have been identified. Behan's Land Restoration Ltd and CPI Ltd generate considerable HGV traffic movements in the vicinity of the proposed development and are also serviced by the L6042 County Road. The cumulative impacts of all three developments have been identified and assessed as part of this traffic and transport assessment.

The assessment indicates that the site access and the L6042/L2023 junction will continue to operate within capacity for each of the Assessment Years. The assessment indicates that the R410/L2023 junction will continue to operate within capacity until the year 2018. Between 2018 and 2023 the junction would operate above capacity in the PM Peak hours. Following the cessation of restoration work activity the R410/L2023 junction will operate below capacity in the PM Peak. The provision of a "ghost-island" right turn lane would improve the operational performance of the R410/L2023 junction after 2018, and it is recommended that the provision of a "ghost-island" right turn lane be incorporated into a redesigned R410/L2023 junction that meets the requirements as set out in NRA DMRB TD 42 and that such a redesigned junction should be operational from the year 2018.

It is considered that both the L6042 and the R410 are currently operating within capacity, and will continue to do so with the addition of the development traffic. However there will be a reduction in level of service (LOS) on the R410 in future years.

Currently each of the access/junctions assessed have limited sightlines for exiting vehicles, and it is recommended that alterations to the junction layouts be undertaken to ensure adequate sightlines are provided, or to mitigate the effects of the curtailed visibility envelopes. The forward visibility on the L6042 approaching the junction with the L2023 is significantly reduced due to the presence of a private dwelling which is located immediately adjacent to the L6042.

As a maximum of ten staff members are intended to be engaged at the site, adequate parking facilities are required to be provided to cater for their needs along with additional facilities for visitors. Due to the rural location of the development public transport and pedestrian/cyclist facilities have not been examined as part of this report.



## Glossary of Terms

<b>Road Network:</b>	The existing and proposed public and private roads within the study area.
<b>Traffic Growth:</b>	The normal expected growth in traffic over time.
<b>Trip:</b>	One movement in or out of the study area by foot, cycle or vehicle.
<b>Thresholds:</b>	Minimum intervention levels at which Transport and Traffic Assessments are to be conducted.
<b>Generated Trips:</b>	Additional trips made as a result of the presence of a development.
<b>Peak Time:</b>	Time of day at which the transport demands from a development are greatest.
<b>Capacity Calculations:</b>	Standardised methods of estimating traffic capacity on links and at junctions.
<b>Trip Distribution:</b>	The estimated directional distribution of the estimated traffic at each junction in the study area.
<b>Trip Assignment:</b>	The final estimated flows of traffic for each direction of travel at each junction and along each link within the study area.
<b>TRICS:</b>	A database containing empirically obtained trip generation data for a wide range of different types of developments.

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# 1 Introduction

## 1.1 General

PMCE Ltd was commissioned in April 2008 by Golder Associates Ireland to undertake a review of the likely traffic impacts at the location of the proposed restoration activities at Walshestown Pit, Co. Kildare (Refer to Figure 1.1).

The development consists of the importation of inert soils for the restoration of a previously extracted quarry. The development lands are located off the L6042 County Road which in turn forms a priority junction with the L2023 County Road, which in turn forms a junction with the R410 Regional Road at Beggars End Crossroads, to the north west of the site.

## 1.2 Information Reviewed

In preparing this report, reference has been made to the following documents:-

- "Traffic and Transport Assessment Guidelines" (September 2007) published by the National Roads Authority;
- "Guidelines for Traffic Impact Assessment" (September 1994) published by the Institution of Highways and Transportation;
- "Future Traffic Forecasts 2002 to 2040" (2003) published by the National Roads Authority;
- Traffic Count Survey Data, collected by Abacus Transportation Surveys Ltd;
- Topographical Survey Data and Ordnance Survey Mapping provided by Golder Associates Ireland; and
- Historical Traffic Information provided by the applicant, Cemex (ROI) Ltd.

## 1.3 Scope

The objective of this report is to examine the traffic implications associated with the proposed development in terms of its integration with existing traffic in the area. The report determines and quantifies the extent of additional trips generated by the development, and the impact on operational performance of such trips on the local road network.



## 1.4 Methodology

The methodology adopted for this appraisal and report involved, in brief:-

- A site visit;
- Classified Traffic Counts undertaken on 7<sup>th</sup> May 2008 at the locations detailed in section 2.3;
- Existing Traffic – The traffic count data was used to develop PICADY models for Junctions 1, 2 & 3 as shown on Figure 2.1; and
- Future Year Assessments – The estimated future year volumes on the study area network, as a result of the increase in background traffic and the additional development related traffic, was used to assess the future operational performance of the links and junctions both at the assumed year of opening and closing of the development and at two future assessment years.

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## 2 Existing Conditions

### 2.1 The Site

The quarry is located approximately 5km south east of the town of Naas and approximately 6km north west of the town of Blessington, Co. Kildare, in the townland of Walshestown. The access to the quarry is approximately 13 metres in width, widening to approximately 30 metres at its interface with the L6042. The total area of the site is approximately 68 ha.

The lands surrounding the site can be characterised as rural in nature, with land uses in the area being amenity, agricultural, extractive and single-house residential. The lands contiguous to the western boundary of the site comprise Punchestown Race Course. There are scattered residential properties in the vicinity of the site.

### 2.2 Existing Road Network

#### 2.2.1 L6042 County Road

The L6042 County Road extends from the L2023 to the north-west of the site to the L6097 to the south-east of the site. The road is approximately 6 metres in width at the site access and approximately 5.5 metres in width elsewhere. It has a horizontal and vertical alignment typical of many rural roads, incorporating short radius curves in both the horizontal and vertical. These result in curtailed visibility for drivers. No pedestrian facilities exist along the road.

#### 2.2.2 L2023 County Road

The L2023 County Road extends between the R411 to the west and the R410 to the east. The road is approximately 6.5 metres in width in the vicinity of the priority junction with the L6042 County Road. The L2023 forms part of a five arm junction (Beggar's End) with the R410, the L6035 and the L2019 to the east of its junction with the L6042.

#### 2.2.3 L6041 County Road

The L6041 forms a priority junction with the L6042 approximately half way between the site access and the priority junction with the L2023. The L6041 will not be used as a haul route for site traffic.

#### 2.2.4 L6035 County Road

The L6035 County Road extends in a north-south direction and forms part of the five arm junction (Beggar's End) with the R410, the L2023 and the L2019. The road is approximately approximately 4.5m to 5.0m in width. It approaches the junction on a relatively steep vertical gradient, with a short level area on the immediate approach to the R410.



### 2.2.5 L2019 County Road

The L2019 County Road extends in a north-east to-south-west direction and forms part of a five arm junction with the R410, the L2023 and the L6035. The road is approximately 4.5m to 5.0m in width.

### 2.2.6 R410 Regional Road

The R410 Regional Road extends between Naas in the north-west and Blessington in the south-east in the vicinity of the site. The road is approximately 5.5m to 7.5m in width. It is expected that the majority of incoming material accessing the application site will do so via the R410.

## 2.3 Traffic Volumes

Classified traffic counts were carried out at Junctions 1, 2 & 3 (Figure 2.1). The counts were carried out between 7:00am and 6:00pm at the site access and between 7:00am and 7:00pm at Junctions 2 and 3. These time periods encompass the proposed main operating hours of the proposed development and also includes the peak hours on the County and Regional Roads. Surveyed vehicles were broken down into five categories as follows:-

- Cars;
- LGVs (Light Goods Vehicles);
- OGV1 (Two and three axle goods vehicles);
- OGV2 (Four and five axle goods vehicles); and
- Buses.

The detailed results of the traffic survey are summarised in Tables 2.1 and 2.2. The morning and evening peak hours at Junction 1 have been established as 08:00 to 09:00 and 16:00 to 17:00. The morning and evening peak hours at Junctions 2 & 3 have been established as 08:30 to 09:30 and 16:15 to 17:15.

The count data has been converted to Annual Average Daily Traffic (AADT) values, as given in Tables 2.1 and 2.2, using the methods described in "Expansion Factors For Short Period Traffic Counts" (John Devlin/National Roads Authority, 1978, RT 201). Table 3B of the document relating to Rural Intertown Routes and Table 4B relating to Rural Tourist Routes were used in the expansion of traffic counts to AADTs.

A combined rural intertown factor of 1.438 was used to determine the AADT for the R410 Regional and a combined rural tourist factor of 1.601 was used to determine the AADTs for the County Roads. Both factors were arrived at by combining the individual hourly factors for the count duration.



## 2.4 Historical Traffic Generation

The site has been quarried since the late 1960s, under a number of planning permissions, most recently the 1996 permission (P.P.R. No. 96/100, P.L.09.098844) which allowed for 95 truck movements per day, or 190 trips. [ENFO, EIS No. 506]. It is not envisaged that there will be any additional truck movements generated as a result of the proposed restoration activities.

## 2.5 Other Developments In Vicinity Of Application Site

### 2.5.1 Behan's Land Restoration Ltd

A Waste License Application for the restoration of Behan's Lands was submitted in June 2008. This site is also serviced by the L6042 County Road. The 7<sup>th</sup> May 2008 traffic count took account of traffic movements servicing this site. According to Behan's Land Restoration Ltd. application to the EPA, it is envisaged that this development will generate 120 trips per day over a 15 year period.

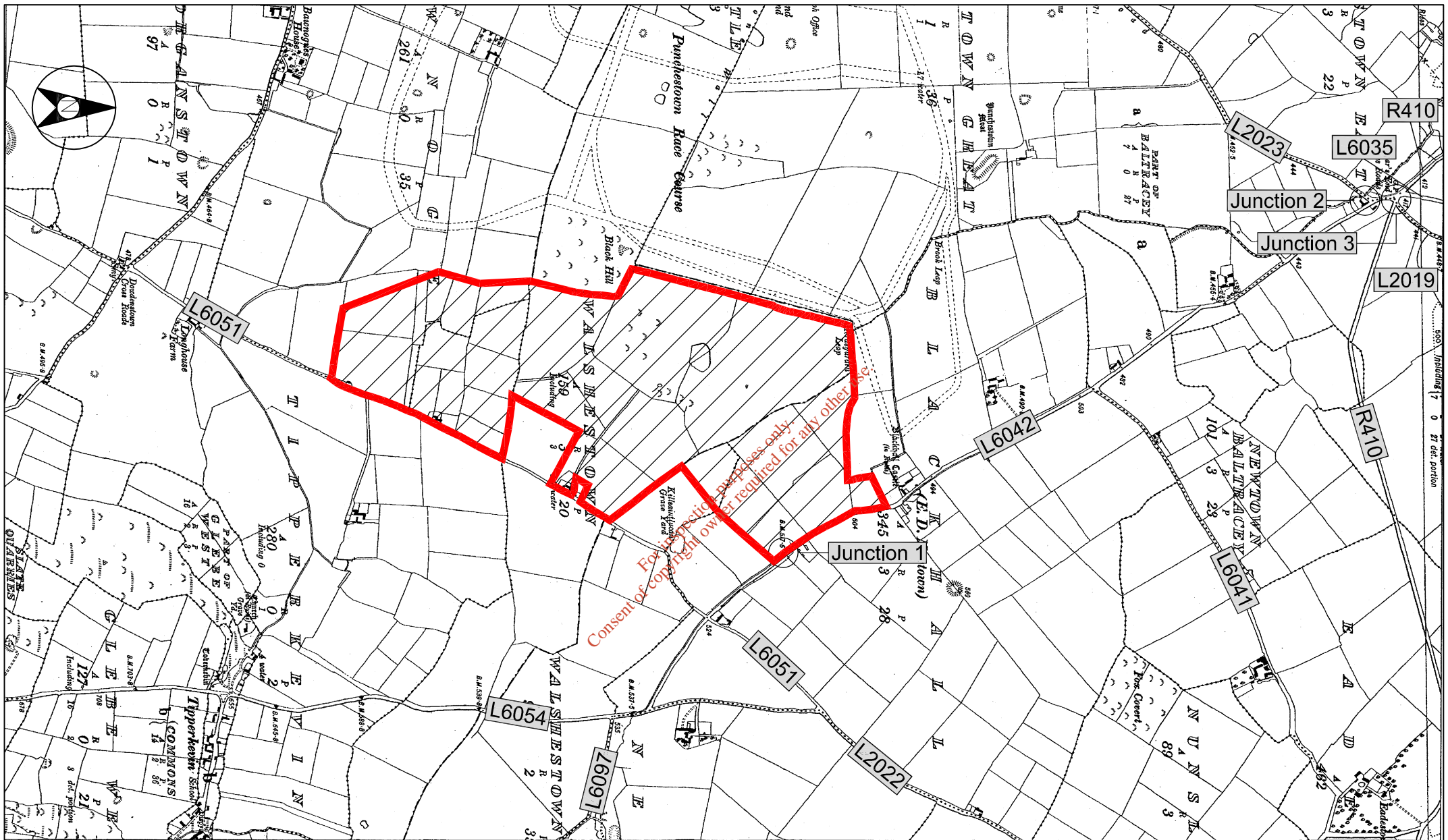
The traffic count undertaken on 7<sup>th</sup> May 2008 noted 100 HGV trips. As part of the assessment of the background traffic on the junctions impacted on by the proposed development, an additional 20 daily HGV trips have been added to the count data information to allow for the maximum number of trips proposed by Behan's Land Restoration Ltd.

### 2.5.2 CPI Ltd


CPI Ltd submitted a planning application to Kildare County Council in January 2008 for the continuance of use of existing quarry workings (P.Ref.01/2270, PI.09.130209) at Newtown Great, Naas, Co Kildare. This development is also serviced by the L6042 County Road. According to the EIS submitted as part of the application, it is predicted that this development will operate for 9 to 11 years extracting 250,000 to 300,000 tonnes per annum with a further two years required to restore the site for agricultural use. During extraction it is forecast that 4 loads will depart the site each hour giving a total of 86 truck movements per day.

The traffic count undertaken on 7<sup>th</sup> May 2008 noted 108 HGV trips travelling to/from the direction of the CPI Ltd facility. As part of the assessment of the background traffic on the junctions impacted on by the proposed development, an additional 64 HGV trips have been added to the count data information to allow for the maximum number of trips proposed by CPI Ltd in the traffic section of their EIS.





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Rev.	Comment	Date
F	Revised Site Boundary	17/10/08

Notes:

- Do Not Scale - use figured dimensions only.
- Drawing is the property of PMCE Ltd.

Legend:

Site Extents

Project:

**Walshestown Pit Restoration,  
Walshestown, Co. Kildare**

Drawing Title:

**Site Boundary and  
Local Road Network**

Drawn:	DGF	Date:	17/10/08
Checked:	PJM	Scale:	NTS
Approved:	PJM	Status:	Final
Drawing No:	Figure 2.1	Revision:	F

**Table 2.1: Two-way Surveyed Flows and Calculated AADT for Junction 1**

Hour Ending	L6042 North of Site Access	Site Access	L6042 South of Adjacent Quarry
08:00	54	3	38
09:00	116	5	107
10:00	96	2	87
11:00	73	7	62
12:00	66	4	49
13:00	79	3	62
14:00	86	5	71
15:00	83	4	74
16:00	90	3	80
17:00	127	7	106
18:00	114	4	102
<b>Period Total</b>	<b>984</b>	<b>47</b>	<b>838</b>
<b>Period Total HGVs</b>	<b>225</b>	<b>24</b>	<b>122</b>
<b>% HGVs</b>	<b>22.9%</b>	<b>51.1%</b>	<b>14.6%</b>
<b>Total AADT</b>	<b>1575</b>	<b>N/A</b>	<b>1341</b>

**Table 2.2: Two-way Surveyed Flows and Calculated AADT for Junctions 2 & 3**

Hour Ending	L6035	R410 North	L2023	L6042	R410 South	L2019
08:00	27	268	205	91	98	117
09:00	98	424	349	153	120	164
10:00	58	355	279	163	100	137
11:00	34	283	208	108	71	74
12:00	37	245	215	106	74	89
13:00	34	275	193	133	66	91
14:00	50	343	243	151	73	126
15:00	46	306	235	129	72	126
16:00	77	329	305	158	57	118
17:00	108	474	432	194	93	185
18:00	108	417	415	189	107	198
19:00	85	386	330	190	100	151
<b>Period Total</b>	<b>762</b>	<b>4105</b>	<b>3469</b>	<b>1765</b>	<b>1031</b>	<b>1576</b>
<b>Period Total HGVs</b>	<b>27</b>	<b>393</b>	<b>313</b>	<b>252</b>	<b>76</b>	<b>89</b>
<b>% HGVs</b>	<b>3.5%</b>	<b>9.6%</b>	<b>9.2%</b>	<b>14.3%</b>	<b>7.4%</b>	<b>5.6%</b>
<b>Total AADT</b>	<b>1220</b>	<b>5902</b>	<b>5457</b>	<b>2825</b>	<b>1482</b>	<b>2523</b>



## 3 Proposed Development

### 3.1 General

The development consists of a quarry restoration operation on 68 ha in the townland of Walshestown, Co. Kildare. The existing site has been the subject of a quarrying operation and it is now intended to restore the site by accepting inert soils and return the site to pre-extraction levels. Approximately 8.28 million tonnes of material are required to restore the site and it is expected that the works will be carried out over a thirteen year duration. It is assumed that 75% of the imported material will be from sites in the Dublin region with the remaining 25% of material being sourced in the greater Leinster region.

The operator is proposing to undertake the following works:-

- Importing inert materials;
- Handling and screening of inert materials;
- Recovery of soils from on-site or off-site sources for the purposes of placing these materials on the lands for restoration;
- Backfilling the site with the available on-site and imported inert materials;
- Re-contouring the on-site natural soils and existing made-ground berms and embankments to tie into the natural contours of the site (1976 levels) and producing a sloped surface that would fit into the local landscape;
- Providing boundary landscaping and seeding of restored areas; and
- Providing all necessary ancillary surface water drainage systems

### 3.2 Trip Generation

#### 3.2.1 Site Operations

The void on site is approximately 4.6 million cubic metres. Using a conversion factor of 1.8 to convert to tonnes gives 8.28 million tonnes of material required to restore the existing pit. The client is proposing to use a combination of 20 and 28 tonne trucks to import the material, resulting in an average of 24 tonnes per truck.

The EIS in 1996 for the extraction operation at the same site predicted that material would be extracted at a rate of 95 loads per day. It is proposed to restore the site at the same rate that it was extracted, therefore it is proposed to import 95 loads per day during the restoration operation.

Assuming an average truck load of 24 tonnes gives 2,280 tonnes of material imported daily. The proposed restoration works will be operational for 275 days per year, therefore 627,000 tonnes are proposed to be imported per annum.

The importation of approximately 8.28 million tonnes of material will result in a project duration of 13 years 2½ months from the year of opening and will result in an average of 523 truck loads arriving at the site each week. The proposed operating hours of the facility are:-

- Six days per week (Monday to Saturday) inclusive; and
- The facility opening times will be 07:00 to 18:00 on Monday to Friday and 07:00 to 14:00 on Saturday.

### 3.2.2 Staff Trips

The site currently employs five staff members and it is anticipated that this is likely to increase to ten staff members. Staff movements generate 4 trips (2 inbound + 2 outbound) per working day based on an inspection of the surveyed data. One inbound trip in the morning peak and one outbound in the evening peak is associated with each staff member. Therefore staff are forecast to generate twenty peak hour trips, ten trips inbound in the morning and ten trips outbound in the evening peak. It is assumed that 80% of staff car movements would be to/from the L6042 north of the site access with 20% to/from the L6042 south of the access. This distribution is derived from the surveyed non-HGV movements at the site access.

### 3.2.3 Miscellaneous Trips

Eight trips have been assumed to occur daily to cater for possible miscellaneous trips associated with the site. These miscellaneous trips allow for operations meetings, site inspections, maintenance operations for plant and machinery, etc. It is considered possible that these trips may coincide with either peak hour resulting in four trips in each peak. These trips have been distributed similar to the staff trips in Section 3.2.2.

## 3.3 Trip Distribution

Appendix A contains extracts from the TRICS database giving the forecast arrivals/departures distribution for waste sites. It is considered that this category best describes the quarry restoration operation and provides a reliable trip distribution over the duration of a typical day. By inspection it can be seen that the pattern of arrivals/departures is consistent with a short turn around within the sites, e.g. that vehicles generally arrive and depart within a short time period, likely to be less than an hour.

In addition the distribution indicates that the highest proportion of arrivals/departures occurs between 14:00 and 15:00 with a peak of 12.3% (Figure 3.3, Appendix B). For the purposes of this assessment it is assumed that 13% of the traffic entering/exiting the site occurs during both the morning and evening peak.



### 3.4 Trip Rate

The trips generated by the proposed development are based on calculations from the client's proposed site operations as outlined in Section 3.2.1. In an ideal situation a constant supply of material will be imported to the site, this ideal situation is unlikely to reflect the reality of fluctuations in construction project activity due to weather, seasonal variations, etc.

The availability of source material is likely to vary over time, and short term peaking associated with construction and development activities are anticipated. To account for this a peak factor of 1.3 has been adopted, and has been arrived at following a review of the data published by the Central Statistics Office in their "Indices for Total Production in Building and Construction Sector". The data provides information on the economic value of construction activity in three month intervals between the years 2000 to 2007. 2005 provided the maximum deviation between quarterly intervals with a factor of 1.3.

Applying the short term peaking factor of 1.3 gives 124 truck loads daily. The total daily trips associated with the restoration operation would be 276 trips daily (90% HGVs) These numbers are arrived at by summing the following components:-

- 248 HGV trips per day - 124 loads with 2 trips per load – into & out of site;
- 20 staff trips daily (Section 3.2.2); and
- 8 miscellaneous trips daily (Section 3.2.3).

### 3.5 Trip Assignment

It is anticipated that 75% of the imported material will be from sites in the Dublin region with the remaining 25% of material being sourced in the greater Leinster region. Table 3.1 outlines the assumed trip distributions for each of the assessed junctions.

Following an assessment of the existing road network in the vicinity of the site and following discussions with the client, it is assumed for the purpose of this assessment that at Junction 1 (the site access) that 100% of the HGV traffic associated with the quarry restoration works will enter/exit from/to the L6042 north of the existing site access. Non-HGV movements have been distributed in accordance with the surveyed light vehicle distribution at the access.

At Junction 2 (L6042/L2023) it is assumed that 100% of HGV movements will be to/from the L2023 east of the junction, in the direction of the R410. Non-HGV movements have been distributed in accordance with the surveyed light vehicle distribution at the junction.

Two possible assignment scenarios have been assessed for at Junction 3. Assignment No. 1 is derived from current vehicle turning movements at the junction and is considered the most realistic assignment. Assignment No. 2 is assessed as a possible worst case scenario where 100% of the HGV movements are to/from the R410 north of the junction, in the direction of Naas town.

**Table 3.1: Trip Distributions For Assessed Junctions**

	To/From	HGV Distribution	LV Distribution
Junction No.1	L6042 North	100%	80%
	L6042 South	0%	20%
Junction No.2	L2023 North	100%	75%
	L2023 South	0%	25%
Junction No.3 (Assignment No.1)	R410 North	83%	58%
	L6035	0%	15%
	L2019	0%	23%
	R410 South	17%	4%
Junction No.3 (Assignment No.2)	R410 North	100%	58%
	L6035	0%	15%
	L2019	0%	23%
	R410 South	0%	4%

Note: HGV = Heavy Goods Vehicle  
LV = Light Vehicle

## 4 Road Impacts

### 4.1 Assessment Years

The “Traffic and Transport Assessment Guidelines” published by the National Roads Authority recommend the assessment of traffic in the Opening Year, for the Opening Year +5 years and the Opening Year +15 years. The assessment years for the impact assessment are therefore 2010 for the Opening Year, and 2015 and 2025 for the Assessment Years. An additional assessment year of 2023 has also been examined as this represents the year when the proposed restoration works will be completed. The traffic assessed in the assessment year of 2025 does not include development traffic associated with the quarry restoration works as the development will no longer be operational.

### 4.2 Traffic Growth

The National Roads Authority's publication "Future Traffic Forecasts 2002-2040" has been used to determine future year traffic flows from the 2008 flows. For this assessment the Non-National indices have been used for both the Regional and County Roads traffic forecasts.

**Table 4.1: Traffic Growth Factors**

Road	2008 Existing	2008 - 2010		2008 - 2015		2008 - 2023		2008 - 2025	
		HGV	Other	HGV	Other	HGV	Other	HGV	Other
Regional Road	1.0000	1.036	1.035	1.100	1.097	1.191	1.177	1.218	1.195
County Roads	1.0000	1.036	1.035	1.100	1.097	1.191	1.177	1.218	1.195



### 4.3 Link Capacity Assessment

The National Roads Authority's document "Traffic and Transport Assessment Guidelines" (September 2007) states that a full Traffic and Transport Assessment is required if the development traffic exceeds 10% of the two way flow on the adjoining road. The percentages given in Table 4.2 apply to the development traffic for the L6042 County Road and the R410 Regional Road.

The NRA "Design Manual for Roads and Bridges" (NRA DMRB) Volume 6, TD 9/07 provides guidance on recommended rural road layouts in its Table 4. It advises that the capacity of a single carriageway road with a 7m cross-section width is 8,600 AADT for a Level of Service 'D' (LOS D) and 6,500 AADT for Level of Service 'C' (LOS C).

Level of service (LOS) is a measure of the capacity of a road related to the average vehicular speed and level of congestion on the road. It is defined by the US Highway Capacity Manual and has six levels, ranging from LOS A to LOS F, with A representing free flow and F representing stop/start traffic. LOS C represents stable flow conditions.

The L6042 has a cross-section width of approximately 5.5m to 6.0m, which means the capacity would be less than that for a 7m carriageway as set out in the NRA DMRB, however the background traffic volumes in each of the assessment years (1,538 AADT in 2010) are considerably less than the LOS C capacity of 6,500. The addition of the development traffic AADT of 276 would result in a combined AADT on the L6042 of 1,814 in 2010, with the road continuing to operate at LOS C. The road will continue to operate at LOS C for each of the assessment years.

**Table 4.2: Development Traffic as a % of Existing Link Traffic**

	Existing Traffic				Development Traffic				Development Traffic as a % of Existing Traffic			
<b>L6042 County Road</b>												
	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>
AM Peak	121	128	138	142	46	46	46	0	38%	36%	33%	0%
PM Peak	132	140	152	155	46	46	46	0	35%	33%	30%	0%
AAADT	1538	1627	1768	1804	276	276	276	0	18%	17%	16%	0%
<b>R410 Regional Road</b>												
	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>	<b>2010</b>	<b>2015</b>	<b>2023</b>	<b>2025</b>
AM Peak	462	488	531	542	46	46	46	0	10%	9%	9%	0%
PM Peak	492	520	566	577	46	46	46	0	9%	9%	8%	0%
AAADT	6140	6494	7060	7203	276	276	276	0	4%	4%	4%	0%

The R410 has a cross-section width of approximately 7.0m, with its capacity as set out in the NRA DMRB for a 7m carriageway of 6,500. The existing volumes (5,904 AADT) are less than the LOS C capacity of 6,500. The addition of the development traffic AADT of 276 would result in a combined AADT on the R410 of 6,252, with the road operating at a LOS C for the opening year of 2010. The R410 will operate at a LOS D in the assessment years of 2015 and 2023 as the combined AADT in each year will exceed LOS C 6,500. The R410 will continue to operate at a LOS D in 2025 as the background traffic will exceed LOS C 6,500.

It is considered that both the L6042 and the R410 are currently operating within capacity, and will continue to do so with the addition of the development traffic. However there will be a reduction in LOS on the R410 in future years.

## 4.4 Junction Capacity Analysis

### 4.4.1 General

The capacity of the junctions in the vicinity of the development were assessed using the Transport Research Laboratory's (TRL) computer programme PICADY (Priority Intersection CApacity and DelaY). Each junction was assessed under the trip distributions outlined in Table 3.1, and in the case of Junction 3 for Assignments 1 & 2.

Junction performance is measured as a ratio between the flow and capacity (RFC). The capacity analysis has been carried out for both the AM and PM Peaks for each of the assessment years (2010, 2015, 2023 and 2025). A rural junction with 100 kph speed limits on the approaches and with an RFC below 0.75 is considered to be operating within capacity, with an RFC of 0.75 indicating a junction operating at capacity.

### 4.4.2 Junction 1

The junction at the site access was assessed in accordance with the trip distributions outlined in Table 3.1. The PICADY analysis results for the 2010, 2015, 2023 & 2025 peak hours are summarised in Table 4.3 where the maximum RFCs for each arm of the junction are presented in each assessment year. The existing junction will continue to operate within capacity for each of the Assessment Years for the combined existing traffic, future traffic and the development traffic. The traffic assessed in the assessment year of 2025 does not include development traffic associated with the quarry restoration works as the development will no longer be operational.

**Table 4.3: Summary of PICADY Junction Capacity Analysis at Junction 1**

Junction Arm	Assessment Year			
	2010	2015	2023	2025
Site Access	0.044 (0.072)	0.044 (0.072)	0.044 (0.072)	0.000 (0.000)
Adjacent Site	0.050 (0.088)	0.050 (0.089)	0.050 (0.089)	0.050 (0.090)
L6042	0.086 (0.054)	0.086 (0.055)	0.087 (0.054)	0.000 (0.000)

Note: AM Values (PM Values)

### 4.4.3 Junction 2

Junction 2 was assessed in accordance with the trip distributions outlined in Table 3.1. The PICADY analysis results for the 2010, 2015, 2023 & 2025 peak hours are summarised in Table 4.4 where the maximum RFCs for each arm of the junction are presented in each assessment year. The existing junction will continue to operate within capacity for each of the Assessment Years for the combined existing traffic, future traffic and the development traffic. The traffic assessed in the assessment year of 2025 does not include development traffic associated with the quarry restoration works as the development will no longer be operational.



**Table 4.4: Summary of PICADY Junction Capacity Analysis at Junction 2**

Junction Arm	Assessment Year			
	2010	2015	2023	2025
L6042	0.356 (0.454)	0.363 (0.478)	0.392 (0.504)	0.332 (0.400)
L2023	0.056 (0.061)	0.065 (0.071)	0.065 (0.075)	0.072 (0.081)

Note: AM Values (PM Values)

#### 4.4.4 Junction 3 - Assignment Scenario No. 1

Junction 3 was assessed in accordance with the trip distributions outlined in Table 3.1. The PICADY analysis results for the 2010, 2015, 2023 & 2025 peak hours are summarised in Table 4.5 where the maximum RFCs for each arm of the junction are presented in each assessment year for Trip Assignment No.1. The junction will continue to operate within capacity for the first two assessment years (2010 & 2015). The PICADY analysis indicates that the junction will exceed its theoretical capacity in 2023. 2018 has been calculated as the latest year that Junction 3 would operate below capacity during the period of operations at the site. PICADY outputs for 2018 are included in Table 4.5. The traffic assessed in the assessment year of 2025 does not include development traffic associated with the quarry restoration works as the development will no longer be operational.

**Table 4.5: Summary of PICADY Junction Capacity Analysis at Junction 3 for Assignment No.1**

Junction Arm	Assessment Year				
	2010	2015	2018	2023	2025
L2023	0.523 (0.437)	0.555 (0.497)	0.572 (0.484)	0.611 (0.511)	0.571 (0.460)
R410 South	0.008 (0.016)	0.008 (0.016)	0.008 (0.016)	0.008 (0.016)	0.008 (0.014)
L2019/L6035	0.323 (0.541)	0.354 (0.576)	0.355 (0.591)	0.386 (0.633)	0.393 (0.637)
R410 North	0.443 (0.679)	0.458 (0.709)	0.469 (0.737)	0.481 (0.774)	0.420 (0.741)

Note: AM Values (PM Values)

In 2025 the junction returns to below capacity as the development ceases. For Assignment Scenario No. 1 the junction capacity is exceeded for the PM Peak between 2018-2023. It would remain within capacity during other times of the day.

#### 4.4.5 Junction 3 – Assignment Scenario No. 2

The PICADY analysis results for the 2010, 2015, 2023 & 2025 peak hours are summarised in Table 4.6 where the maximum RFCs for each arm of the junction are presented in each assessment year for Trip Assignment No. 2. The junction will continue to operate within capacity for the first two assessment years (2010 & 2015). The PICADY analysis indicates that the junction will exceed its theoretical capacity in 2023. 2018 has been calculated as the last year that Junction 3 will operate below capacity during the period of operations at the site.

**Table 4.6: Summary of PICADY Junction Capacity Analysis at Junction 3 for Assignment No.2**

Junction Arm	Assessment Year				
	2010	2015	2018	2023	2025
L2023	0.500 (0.421)	0.550 (0.441)	0.567 (0.469)	0.606 (0.481)	0.571 (0.460)
R410 South	0.008 (0.014)	0.008 (0.014)	0.008 (0.014)	0.008 (0.014)	0.008 (0.014)
L2019/L6035	0.321 (0.537)	0.352 (0.569)	0.353 (0.587)	0.384 (0.629)	0.393 (0.637)
R410 North	0.459 (0.690)	0.474 (0.719)	0.485 (0.749)	0.497 (0.785)	0.422 (0.741)

Note: AM Values (PM Values)

In 2025 the junction returns to below capacity as the development ceases. For Assignment Scenario No. 2 the junction capacity is exceeded for the PM Peak only in 2023. It would remain within capacity at all other times of the day.

## 4.5 Summary of Junction Capacity Analysis

### 4.5.1 Junctions 1 & 2

Junctions 1 & 2 will continue to operate within capacity for each of the Assessment Years for the combined existing traffic, future traffic and the development traffic for each of the trip scenarios assessed.

### 4.5.2 Junction 3

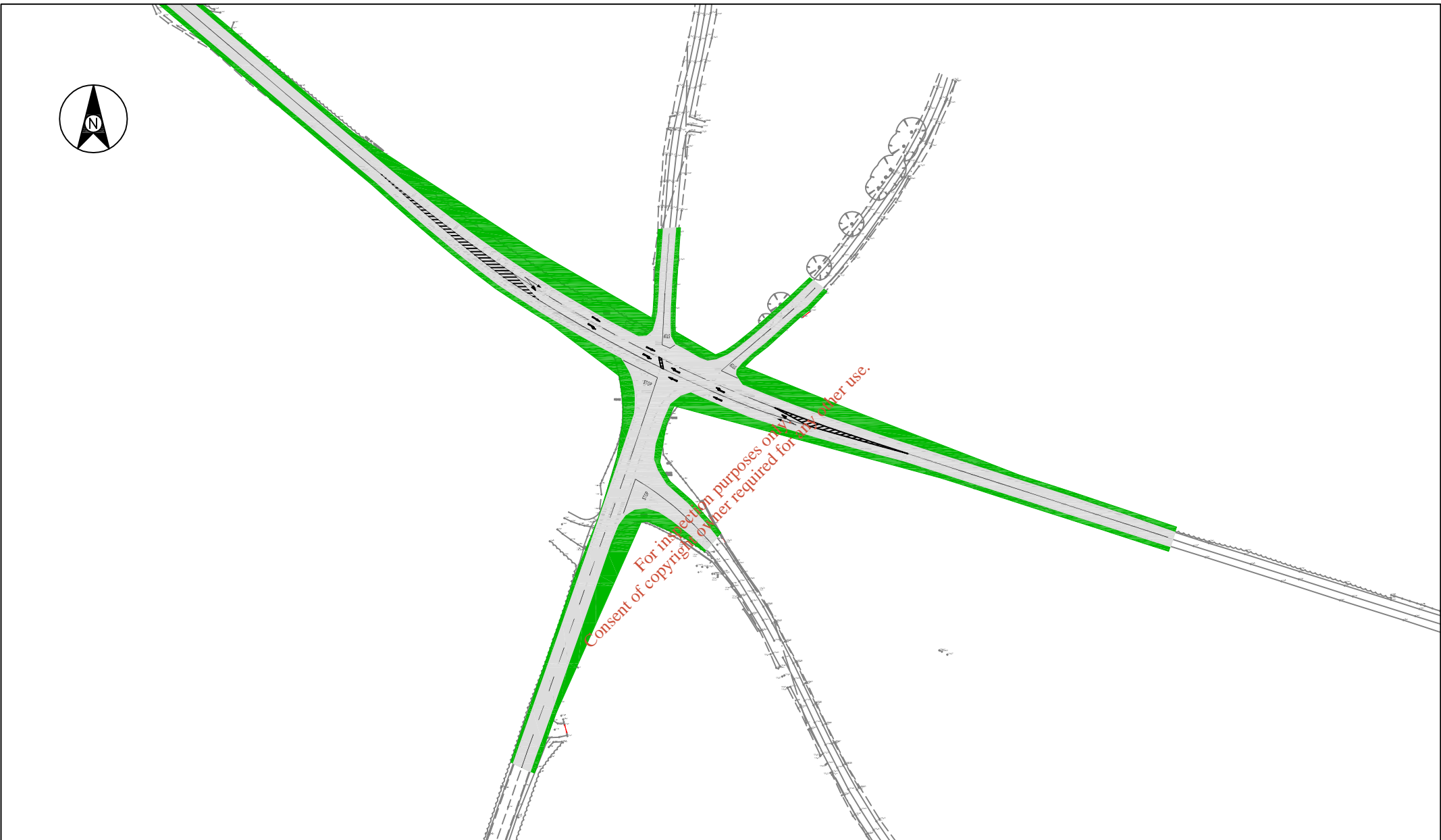
The assessment of the Junction 3 capacity indicated that 2018 will be the last year that Junction 3 will operate below capacity before the site ceases to operate, it will exceed capacity in the remaining years of the quarry restoration operation. Capacity will be exceeded in the PM Peak between 2018 and 2023. In 2025 the junction returns to below capacity as the development ceases.

## 4.6 Possible Mitigation Measures for Junction 3

Figure 4.1 shows a layout for a “ghost island” right turn lane that could be provided at Beggar's End Crossroads. The road layout shown comprises two 3.5m through lanes with a 3.3m wide right turn lane at the junction interface. To the south-east the R410 lanes narrows to 3.0m each to match the the existing cross section. The verge areas indicated on the drawing are those areas required to meet DMRB Standards in terms of sightlines at the side road junctions with the R410 Regional Road.

The junction capacity was assessed with the “ghost-island” right turn lane provision included, which for Assignment No. 1 results in a maximum ratio of flow to capacity of 0.686. Table 4.7 includes results of the PICADY analysis for 2018, 2023 & 2025 which shows that the modified junction would operate within capacity for those Assessment Years.





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Rev.	Comment	Date

**Notes:**

- Do Not Scale - use figured dimensions only.
- Drawing is the property of PMCE Ltd.

**Legend:**

- Carriageway
- Verge

**Project:**  
Walshestown Pit Restoration,  
Walshestown, Co. Kildare

**Drawing Title:**  
Proposed "Ghost-Island"  
Right Turn lane on R410  
Regional Road

<b>Drawn:</b> DGF	<b>Date:</b> 04/09/08
<b>Checked:</b> PJM	<b>Scale:</b> 1:2000
<b>Approved:</b> PJM	<b>Status:</b> Final
<b>Drawing No:</b> Figure 4.1	<b>Revision:</b> F

**Table 4.7: Summary of PICADY Junction Capacity Analysis at Junction 3 for Assignment No.1**

Junction Arm	Assessment Year		
	2018	2023	2025
L2023	0.561 (0.475)	0.599 (0.487)	0.561 (0.451)
R410 South	0.008 (0.014)	0.008 (0.014)	0.007 (0.014)
L2019/L6035	0.353 (0.589)	0.384 (0.631)	0.391 (0.635)
R410 North	0.418 (0.654)	0.429 (0.686)	0.376 (0.657)

Note: AM Values (PM Values)

The junction capacity was also modelled with the “ghost-island” right turn lane provision included for Assignment No. 2, and also indicates that the junction is expected to operate within its theoretical capacity for each of the Assessment Years.

**Table 4.8: Summary of PICADY Junction Capacity Analysis at Junction 3 for Assignment No.2**

Junction Arm	Assessment Year		
	2018	2023	2025
L2023	0.556 (0.460)	0.594 (0.471)	0.561 (0.451)
R410 South	0.008 (0.014)	0.008 (0.014)	0.007 (0.014)
L2019/L6035	0.351 (0.585)	0.382 (0.623)	0.391 (0.635)
R410 North	0.433 (0.664)	0.443 (0.696)	0.376 (0.657)

Note: AM Values (PM Values)

## 5 Road Safety

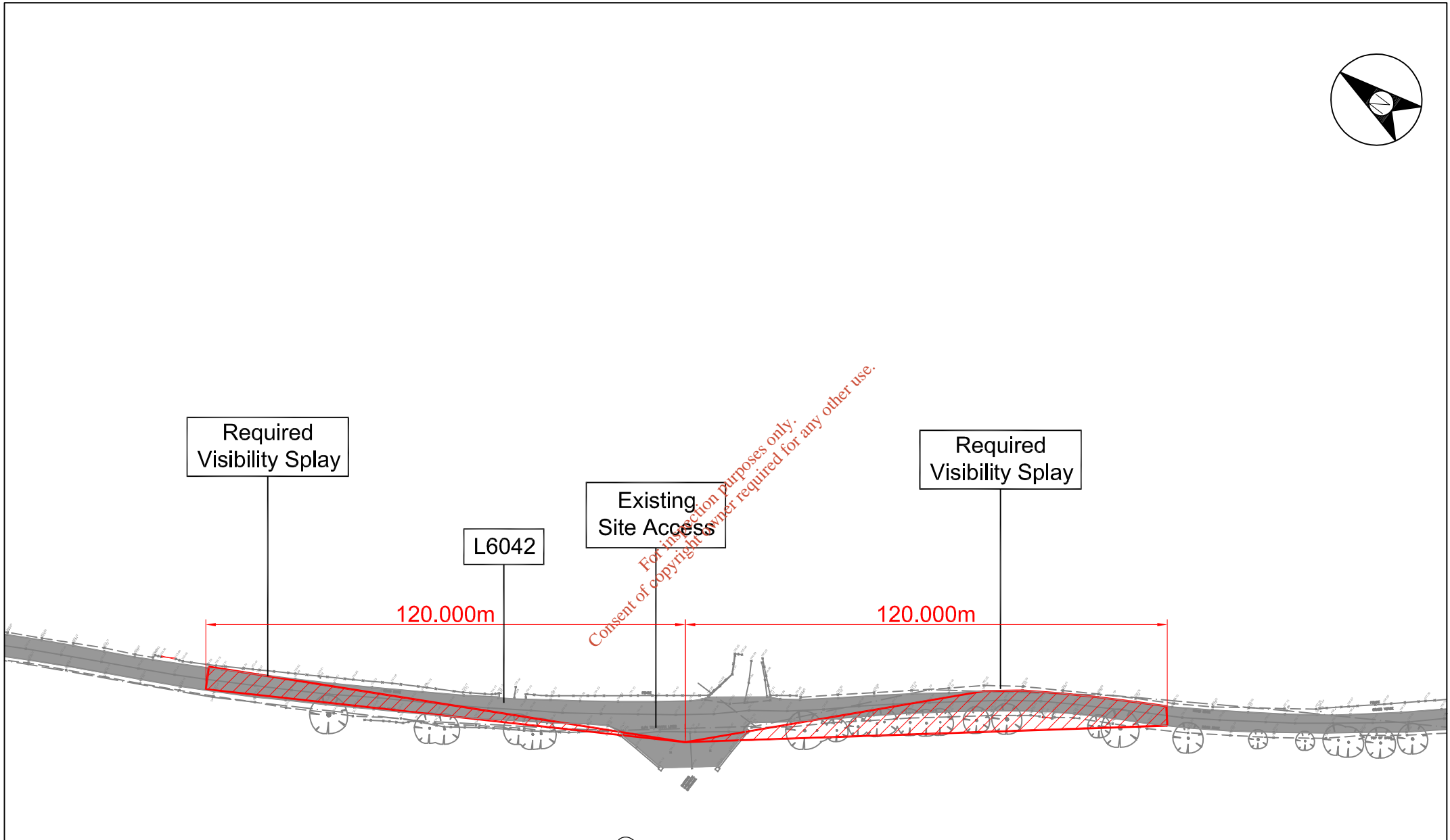
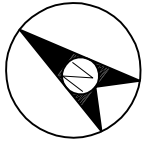
### 5.1 Site Access

To ensure continued provision of the existing visibility envelopes at the existing site access it would be necessary to continue normal verge/hedgerow maintenance, ensuring that the grass/foliage is cut back to maximise visibility.

The current location of the site access onto the L6042 does not provide the required sightlines for exiting vehicles and it is recommended that the access be altered to provide increased visibility slays towards approaching traffic.

NRA DMRB TD 41/95 “Vehicular Access to All-Purpose Trunk Roads” recommends a 120 metre sight distance in both direction from a position 4.5 metre back from the edge of the through road (Figure 5.1).





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Rev.	Comment	Date

**Notes:**

- Do Not Scale - use figured dimensions only.
- Drawing is the property of PMCE Ltd.

**Legend:**

Visibility Splay

**Project:**  
Walshestown Pit Restoration,  
Walshestown, Co. Kildare

**Drawing Title:**  
Required Sightlines at  
Existing Access

<b>Drawn:</b> DGF	<b>Date:</b> 06/05/08
<b>Checked:</b> PJM	<b>Scale:</b> NTS
<b>Approved:</b> PJM	<b>Status:</b> Final
<b>Drawing No:</b> Figure 5.1	<b>Revision:</b> F

## 5.2 L6042/L2023 Junction

The existing L6042/L2023 junction does not afford adequate sightlines towards the L2023 junction for vehicles approaching along the L6042. It is recommended that measures be put in place to maximise the forward visibility for approaching traffic and that other mitigation/warning measures be provided to advise drivers of the upcoming road/junction layout and proximity.

## 5.3 R410/L2023 Junction

The sightlines for exiting vehicles approaching the R410/L2023 junction from both the L6035 and the L2023 are poor particularly to the south of both junctions.

# 6 Parking

The number of proposed staff at the site may vary over the course of the development. The site currently employs five staff members and it is anticipated that this is likely to increase to ten staff members. The on-site parking requirements will need to cater for these staff and for visitors to the site such as site. It is recommended that at least 16 parking spaces be provided.

# 7 Conclusions

An assessment of the link capacity of the L6042 and the R410 indicates that the L6042 will continue to operate within a LOS C for the duration of the development. The R410 will operate at a LOS C in the opening year of 2010 and will reduce to a LOS D in the assessment years of 2015 and 2023. The R410 will continue to operate at a LOS D in 2025 when operations at the site will have ceased.

An assessment of the junction capacity for Junctions 1 & 2 concludes that they will continue to operate within capacity for each of the assessment years. An assessment of the junction capacity at Junction 3 concludes that it will continue to operate within capacity up until the year 2018. It would subsequently operate above capacity until the development ceases. In 2025 the junction would return to operating within capacity.

The provision of a "ghost-island" right turn lane on the R410 to cater for right turning movement from the R410 onto the L2023 would address the capacity issues between 2018 and 2023.

It is recommended that normal verge/hedgerow maintenance is continued to be carried out over the duration of the development to ensure the visibility along the road for exiting and approaching vehicles.



## Appendix A – TRICS Outputs

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TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 12 - CIVIC AMENITY SITES  
 Category : C - LANDFILL  
 VEHICLES

Selected regions and areas:

03	SOUTH WEST	
	WL WILTSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	2 days
09	NORTH	
	TW TYNE & WEAR	1 days
11	SCOTLAND	
	SL SOUTH LANARKSHIRE	1 days
13	REPUBLIC OF IRELAND	
	DL DUBLIN	1 days

Main parameter selection:

Parameter: Site area  
 Range: 25.00 to 65.00 (units: hect)

Date Range: 01/01/99 to 03/10/06

Selected survey days:

Tuesday	1 days
Thursday	5 days

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

Selected Locations:

Free Standing (PPS6 Out of Town)	6
----------------------------------	---

Selected Location Sub Categories:

Out of Town	6
-------------	---

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Optional parameter selection:

Use Class:

Not Known	4 days
B2	1 days

Population within 1 mile:

1,000 or Less	4 days
1,001 to 5,000	2 days

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	4 days

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	4 days



Optional parameter selection (Cont.):

Travel Plan:  
No

6 days

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/C - LANDFILL  
 VEHICLES  
 Calculation factor: 1 hect  
 BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
01:00 - 02:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
02:00 - 03:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
03:00 - 04:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
04:00 - 05:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
05:00 - 06:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
06:00 - 07:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
07:00 - 08:00	6	38.27	0.527	6	38.27	0.174	6	38.27	0.701
08:00 - 09:00	6	38.27	0.505	6	38.27	0.462	6	38.27	0.967
09:00 - 10:00	6	38.27	0.536	6	38.27	0.575	6	38.27	1.111
10:00 - 11:00	6	38.27	0.436	6	38.27	0.488	6	38.27	0.924
11:00 - 12:00	6	38.27	0.627	6	38.27	0.562	6	38.27	1.189
12:00 - 13:00	6	38.27	0.392	6	38.27	0.483	6	38.27	0.875
13:00 - 14:00	6	38.27	0.571	6	38.27	0.444	6	38.27	1.015
14:00 - 15:00	6	38.27	0.627	6	38.27	0.579	6	38.27	1.206
15:00 - 16:00	6	38.27	0.375	6	38.27	0.466	6	38.27	0.841
16:00 - 17:00	6	38.27	0.113	6	38.27	0.340	6	38.27	0.453
17:00 - 18:00	6	38.27	0.017	6	38.27	0.126	6	38.27	0.143
18:00 - 19:00	1	39.70	0.000	1	39.70	0.000	1	39.70	0.000
19:00 - 20:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
20:00 - 21:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
21:00 - 22:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
22:00 - 23:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
23:00 - 24:00	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
<b>Total Rates:</b>			4.726			4.699			9.425

Parameter summary

Trip rate parameter range selected: 25.00 to 65.00 (units: hect)  
 Survey date range: 01/01/99 - 03/10/06  
 Number of weekdays (Monday-Friday): 6  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Optional parameters used in selection: NO  
 Surveys manually removed from selection: 0

